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History Sheet

Rev	Date	Reason for revision	Revised by
0	30 May 2003	Initial issue. This document supercedes all previously issued integrated emissions baseline reports, including *Integrated Emissions Baseline Report for the River Protection Project Waste Treatment Plant* (RPT-W375-ES00001, Rev 2), and Integrated *Emissions Baseline Report Update* (24590-WTP-RPT-PT-02-002, Rev 2). This document reflects a 2 LAW and 2 HLW melter configuration.	E Berríos/J Cook
1	23 January 2004	Update to reflect the following design changes: technetium ion exchange deletion, and HLW and LAW offgas rearrangement. New process data based on R&T tests has also been incorporated along with the addition of two toxic air pollutants. Section 1 provides details of all the changes. No revision bars are shown due to extensive updates.	E Berríos
2	23 February 2006	Update to reflect the following changes: • Design o Deletion of HLW CRV o Pretreatment vessel vent design update to mitigate hydrogen generation o PJM/RFD design update to mitigate mixing issues • Data Reconciliation o Updated LAW and HLW glass formulation based on R&T test results o Equipment DFs updates based on R&T test results, engineering calculations, and vendor information • Air Emissions Bases o Updated inorganic and radionuclide constituents feed vector o Updated organic constituents feed vector o Updated constituents Fv values o Updated COPC list Also added sections in write-up that discuss detailed modeling approach and comparison to baseline cases. Section 1 provides details of all the changes. No revision bars are shown due to extensive updates.	E. Berríos

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Acronyms and Abbreviations

ACM	Aspen Custom Modeler
BBI	best basis inventory
bp	boiling point
CAS	Chemical Abstracts Service
COPC	constituent of potential concern
CRV	concentrate receipt vessel
DF	decontamination factor
Ecology	Washington State Department of Ecology
EPA	US Environmental Protection Agency
ETF	Effluent Treatment Facility
HEME	high-efficiency mist eliminator
HEPA	high-efficiency particulate air (filter)
HLW	high-level waste
IHLW	immobilized high-level waste
ILAW	immobilized low-activity waste
LAW	low-activity waste
LERF	Liquid Effluent Retention Facility
MFPV	melter feed preparation vessel
MFV	melter feed vessel
MW	molecular weight
NO_x	nitrogen oxides
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PF	performance factor
PFD	process flow diagram
PIC	product of incomplete combustion
PJM	pulse-jet mixer
PTF	pretreatment facility
R&T	research and technology
RF	release fraction
RFD	reverse flow diverter
SBS	submerged bed scrubber

SCFM	standard cubic feet per minute
SCR	selective catalytic reducer
SOW	statement of work
SO_x	sulfur oxides
SSFM	steady state flowsheet model
SVOC	semivolatile organic compound
TOC	total organic carbon
TRU	transuranic elements
TWINS	Tank Waste Information Network System
VSL	Vitreous State Laboratory
WESP	wet electrostatic precipitator
WTP	Hanford Tank Waste Treatment and Immobilization Plant

Executive Summary

The Hanford Tank Waste Treatment and Immobilization Plant (WTP) is designed to vitrify radiochemical waste composed primarily of inorganic salts and oxides, with smaller amounts of organics and radionuclide constituents. An engineering estimate of stack emissions is necessary to facilitate preparation, maintenance, and approval of air permits required for construction and operation of the WTP. The emissions information will also be used to support human health and ecological risk assessment.

The previous version of this report contained estimated emission rates for 470 organic, inorganic, and radionuclide constituents of potential concern (COPCs) from the WTP. The emission rates were estimated using the steady state flowsheet model (SSFM), ACM (Aspen Custom Modeler). This report supercedes earlier reports and reflects emission estimates that are consistent with current regulatory permitting assumptions and aligned with WTP design evolution and research and technology (R&T) data reconciliation.

The following summarizes the report results:

- Based on approved changes to the COPC list, this report now provides air emissions estimates for 456 COPCs. These changes include reducing feed hazardous organic constituents from 250 to 219 and increasing PIC constituents from 120 to 135.
- Estimated emission rates for 219 hazardous organic feed constituents, 135 organic products of incomplete combustion (PICs), 49 inorganic constituents, 46 radionuclide constituents, 5 criteria pollutants, and 2 added toxic air pollutants have been predicted. These emissions are associated with two pretreatment process flues, one low-activity waste (LAW) vitrification process flue, and three high-level waste (HLW) vitrification process flues. Pretreatment, LAW, and HLW cell flues are not part of the scope of this document.
- Predicted emission rates for all 456 COPCs are conservative and bound the emissions of two LAW melters with expanded capacity and two HLW melters. The concentration of the hazardous organic constituents in the feed utilized for this analysis is 189 times greater than detected concentrations or the detection limit of an actual Hanford tank sample collected from a high organic-bearing waste. The inorganic and radionuclide feed bases are also conservative.
- The WTP baseline steady state flowsheet version 3.1 was used to produce this emissions profile. This flowsheet represents the WTP's latest design bases and R&T information as of 23 December 2005. Section 1 provides an overview of the changes since the previous revision of this document.
- R&T data from testing at the Vitreous State Laboratory was used to estimate generation rates of PICs from all three facilities. The PIC emission rates were calculated on the basis that these constituents are present in the stack at an upper analytical detection limit.
- Evaporator partitioning and organic vessel vent emissions were predicted from known liquid-phase concentrations using vapor-liquid equilibrium. Henry's Law constants for 219 organic compounds in the feed were compiled for the vapor-liquid equilibrium calculations. Use of Henry's Law method is considered conservative as it is assumed that organic constituents reach full equilibrium between the liquid and vapor phase.
- Emission rates for 11 additional potential hazardous feed organic COPCs are provided for initial evaluation. These constituents have not been officially added to the WTP air permitting and risk assessment scopes. These results are provided in Section 9.

1 Introduction

Since the release of Revision 1 of this report, there have been significant design and bases changes that affect the Hanford Tank Waste Treatment and Immobilization Plant (WTP) air emissions generation. This new information is reflected in this updated profile. The data from this profile will supplement the update of the WTP's risk assessment analysis and air permits.

The changes that have occurred can be categorized as design changes, bases changes, research and technology (R&T) data reconciliation, and air emissions bases changes. All these changes, which are reflected in this new emissions profile, are addressed in the following text. These changes reflect the WTP project's design as of 23 December 2005.

1.1 Design Changes

1.1.1 Pretreatment Facility (PTF)

- Airflows for the pulse-jet mixers (PJMs) and reverse flow diverters (RFDs) were updated to accommodate new mixing requirements for non-Newtonian fluids. It has been assumed for the air emissions flowsheet evaluations that all PJM/RFDs operate at the same time and therefore contribute simultaneously to the PJM/RFD main header. This provides bounding releases from the PTF PJM/RFD stack.
- Purge air requirements for the pretreatment vessel vents system were updated to reflect a new strategy to mitigate hydrogen generation in the facility. It has been assumed for the air emissions flowsheet evaluations that all PTF vessels operate at the same time thus providing bounding air emission rates from the PTF vessel vents.

1.1.2 Low-Activity Waste (LAW) Facility

- Activated carbon beds are the main abatement technology for ^{129}I and acid gases (HF, HCl). The caustic scrubber remains the main abatement unit for sulfur oxides (SO_x) and has incidental removal of ^{129}I, acid gases, and nitrogen oxides (NO_x) conservatively assumed to be 10 %.

1.1.3 High-Level Waste (HLW) Facility

- The concentrate receipt vessels (CRVs) were deleted to mitigate non-Newtonian fluid mixing issues.
- PJM/RFD airflow rates were updated to reflect new mixing requirements. It has been assumed in this flowsheet evaluation that all PJM/RFDs operate at the same time and therefore contribute simultaneously to the PJM/RFD main header. This provides bounding releases from the HLW PJM/RFD stack.

1.2 Design Bases Update and R&T Data Reconciliation

1.2.1 Pretreatment Facility

- Decontamination factors (DFs) were updated for some constituents per the latest engineering data and/or vendor information.

- Vessel vent split fractions were updated to reflect the latest design basis.

1.2.2 LAW Facility

- Ammonia slip from the selective catalytic reducer (SCR) was updated with a limit of 78 ppmv per the latest vendor information. An ammonia dilution air amount of 700 standard cubic feet per minute (SCFM) was also incorporated.
- LAW glass formulation was updated to account for glass and process limitations.
- DFs were updated for some constituents per the latest R&T data and/or vendor information.

1.2.3 HLW Facility

- Ammonia slip from the SCR was updated with a limit of 10 ppmv per the latest vendor information. An ammonia dilution air amount of 200 SCFM was also incorporated.
- HLW glass formulation was updated to account for glass and process limitations.
- DFs were updated for some constituents per the latest R&T data and/or vendor information.

1.2.4 General Air Emissions Bases Update

1.2.4.1 Inorganic and Radionuclide Constituents Feed Vector

Previous air emissions estimates for inorganic and radionuclide constituents were based on Rev 0A of the *WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector* (24590-WTP-M4C-FRP-00001). Since this revision, the calculation has been updated to include changes to the Statement of Work (SOW) maximum concentrations and best basis inventory (BBI) data. This updated feed vector was tested in the air emissions flowsheet. Based on the results of the test run it was determined that the nature of the feed vector (all constituents at their maximum concentration) was not providing bounding conditions for air emissions purposes. Extensive R&T data reconciliation has been incorporated into the WTP flowsheet since 2004. Part of this data reconciliation includes glass formulation updates, glass quality constraints, and process constraints. Having a feed vector with all constituents at maximum concentrations activates a significant amount of these constraints, which in turn causes the feed to be diluted within the process and dramatically reduces the feed rate into the front end of the process.

Based on these findings, sensitivity runs were performed that tested different feed vector scenarios to determine which case would provide the bounding conditions. The scenarios tested included the following:

- Average inorganic and radionuclide concentrations (documented in *Evaluation of Air Emissions Feed Vector Scenarios* [24590-WTP-MRQ-PO-05-0044])
- Average inorganic and maximum radionuclide concentrations (documented in 24590-WTP-MRQ-PO-05-0044)
- Typical Envelope A feed at air emissions conditions (documented in *Steady State Flowsheet (ACM) Baseline Envelopes A/D, B/D, and C Runs for Air Emissions Comparison* [24590-WTP-MRR-PO-05-020])
- Typical Envelope B feed at air emissions conditions (documented in 24590-WTP-MRR-PO-05-020)

- Typical Envelope C feed at air emissions conditions (documented in 24590-WTP-MRR-PO-05-020)

All the results from these scenarios where analyzed against the previous air emissions results presented in Rev 1 of this report. After careful evaluation, it was concluded that average inorganic and maximum radionuclide constituents feed concentrations provide reasonable bounding conditions for the WTP air emissions, and therefore these were selected as the feed vector to be used for this air emissions estimate. The development of this feed vector has been documented in Rev 0D of 24590-WTP-M4C-FRP-00001.

1.2.4.2 Organic Constituents

1.2.4.2.1 Deletion and Rearrangement of Constituents

A total of 250 hazardous feed organic constituents were originally scoped for analysis under the WTP air emissions profile. Since then, the hazardous organic constituents list has been updated, in agreement with the regulatory agencies, and the number of hazardous organic constituents in the feed has been reduced to 219 (CCN 097844). Updates to this list included deletion of pesticides and herbicides and reclassification of feed constituents to products of incomplete combustion (PICs). The affected constituents under these changes are the following:

- Constituents (herbicides and pesticides) deleted from the COPC list:
  - 1582-09-08 Trifluralin
  - 1836-75-5 Nitrofen
  - 2385-85-5 Mirex
  - 309-00-2 Aldrin
  - 319-86-8 Delta-BHC
  - 465-73-6 Isodrin
  - 50-29-3 4,4'-DDT
  - 60-57-1 Dieldrin
  - 72-20-8 Endrin
  - 72-54-8 4,4'-DDD
  - 75-99-0 2,2 Dichloropropionic Acid
  - 8001-35-2 Toxaphene
  - 88-85-7 2-sec-butyl-4,6-dinitrophenol (Dinoseb)
  - 93-72-1 Silvex (2,4,5-TP)
  - 93-76-5 2,4,5-T

- Constituents deleted from the feed organic list and moved to the PIC list:
  - 100-25-4 1,4-Dinitrobenzene
  - 118-74-1 Hexachlorobenzene
  - 205-82-3 Benzo(j)fluoranthene
  - 205-99-2 Benzo(b)fluoranthene
  - 207-08-9 Benzo(k)fluoranthene
  - 218-01-9 Chrysene
  - 319-84-6 Hexachlorocyclohexane (Lindane) Alpha BHC
  - 319-85-7 Hexachlorocyclohexane (Lindane) Beta BHC
  - 56-55-3 Benzo(a)anthracene

- 58-89-9 gamma-BHC (Lindane)
- 72-43-5 Methoxychlor
- 72-55-9 4,4'-DDE
- 76-44-8 Heptachlor
- 82-68-8 Pentachloronitrobenzene (PCBN)
- 87-86-5 Pentachlorophenol
- 94-75-7 2,4-D and Esters (160C typed)

Emission rates for these constituents are now calculated in the *Air Emissions Estimation of Products of Incomplete Combustion for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-05-007).

Changes to the analyzed organic COPCs are documented in CCN 097844 and in the *Regulatory Data Quality Objectives Optimization Report* (24590-WTP-RPT-MGT-04-001). These changes reduced the number of hazardous organic constituents in the feed from 250 to 219.

1.2.4.2.2 Feed Vector

Based on the organic COPC changes, the feed concentrations calculation for the organic constituents was updated. During this update, instead of using the previously assumed 4 wt% total organic carbon (TOC) in the feed, the maximum TOC expected (with added contingency) for the tanks analyzed in the *WTP Air Emissions Hazardous Organic Constituents Feed Concentrations* (24590-WTP-M4C-FRP-00006) was selected (calculated to be 2.5 %). In addition, the detection limits were updated, as necessary, based on recent available R&T data and the *Regulatory Data Quality Objectives Optimization Report* (24590-WTP-RPT-MGT-04-001). All these changes are documented in the *WTP Air Emissions Hazardous Organic Constituents Feed Concentrations* (24590-WTP-M4C-FRP-00006).

1.2.4.2.3 Steady State Flowsheet Model (SSFM) Modeled Constituents

Some of the feed constituents that were deleted or reclassified as PICs were used as representative constituents in the SSFM. Those deleted or reclassified were replaced with new constituents so that air emission rates calculations for those non-modeled constituents could be performed. The deleted modeled constituents include:

- 118-74-1 Hexachlorobenzene
- 218-01-9 Chrysene
- 309-00-2 Aldrin
- 319-85-7 Hexachlorocyclohexane (Lindane) Beta BHC
- 58-89-9 gamma-BHC (Lindane)
- 60-57-1 Dieldrin
- 76-44-8 Heptachlor
- 8001-35-2 Toxaphene
- 87-86-5 Pentachlorophenol
- 88-85-7 2-sec-Butyl-4,6-dinitrophenol (Dinoseb)

The new modeled constituents used to substitute for the deleted constituents are:

- 101-84-8 Diphenyl ether
- 1321-64-8 Pentachloronaphthalene
- 193-39-5 Indeno(1,2,3-cd)pyrene
- 206-44-0 Fluoranthene
- 26140-60-3 Terphenyls
- 3697-24-3 5-Methylchrysene
- 59-89-2 N-nitrosomorpholine
- 621-64-7 Di-n-Propylnitrosamine
- 64-19-7 Acetic acid
- 83-32-9 Acenaphthene
- 95-50-1 o-Dichlorobenzene

1.2.4.2.4 F_v values

Based on CCN 129507, F_v values were updated due to reconciliation of new regulatory data. F_v is a unitless parameter used to classify a constituent as being in one of three categories: vapor phase, particle phase, or particle-bound phase. This phase type affects the removal efficiency of the offgas control system for that compound. An F_v value of 1 indicates that the constituent exists only in the vapor phase. An F_v value of less than 1, for example 0.9, means that 90 % of the compound exists in the vapor phase and 10 % is particle-bound (i.e., [1-0.9]*100%). Therefore, removal efficiency for the particulate and vapor phase portions of the constituent will differ based on the phase except in operations such as the thermal oxidizers and carbon beds where removal efficiency is independent of phase type. An F_v value of less than 0.05 indicates that the constituent exists only in the particle phase.

1.3 Air Emissions Sources

The intent of this emissions estimate is to arrive at appropriately realistic and conservatively bounded emission rates that rely upon defensible, documented assumptions. The emission rates at the process flues are referred to in this document as *abated emissions*. This document also presents unabated emission rates. These unabated emission rates correspond to the emission rates of COPCs at generation points in the process. This document provides the methods and assumptions for arriving at the emission rates from the emission sources addressed below.

1.3.1 Pretreatment Facility

Pretreatment emission sources consist of the following:

- Unabated emissions from the evaporator offgases, vessel vent exhaust, and exhaust from the RFDs and PJMs. Unabated air emissions for evaporator offgas and vessel vent exhaust are represented by stream PVP01. For the PJM/RFD exhaust, the unabated air emissions are represented by stream PJV04.

- Abated emissions from the pretreatment offgas treatment system. Abated emissions for the evaporators and vessel vents are represented by stream PVP12. For the PJM/RFD exhaust, the abated emissions are represented by stream PJV11.

1.3.2 LAW Vitrification

LAW vitrification emission sources are:

- Feed to the LAW melter (except for organic constituents as this information is not required for risk assessment analysis or air permit evaluation). This composition is represented by stream LFP04.
- Unabated emissions from the LAW melter. This composition is represented by stream LMP06. This stream represents the unabated emission rates from both LAW melters.
- Unabated emissions from LAW vessel vents. This composition is represented by stream LVP01.
- Abated emissions from the LAW melter offgas treatment systems, including vessel vents. This composition is represented by stream LVP18.

1.3.3 HLW Vitrification

HLW vitrification emission sources are made up of the following:

- Feed to the HLW melter (except for organic constituents as this information is not required for risk assessment analysis or air permit evaluation). This composition is represented by stream HFP03.
- Unabated emissions from the HLW melter and PJM/RFD exhaust. For the HLW melter, the unabated air emissions are represented by stream HMP06. This stream represents the unabated air emission rates for both HLW melters. For the PJM/RFD exhaust, the unabated air emissions are represented by stream PJV32.
- Unabated emissions from HLW vessel vents. This composition is represented by stream HOP10.
- Abated emissions from the HLW melter offgas, vessel vents, and RFD/PJM exhaust offgas treatment systems. The abated emissions for the HLW melter offgas and vessel vents are represented by stream HOP31. The PJM/RFD abated emissions are represented by stream PJV34. Stream HOP31 represents the air emission rates for both HLW melter offgas systems.

This document is structured as outlined below:

- Section 2 provides an overview of the WTP process.
- Sections 3, 4, and 5 identify the COPCs evaluated and describe the SSFM, the primary tool used for the evaluation.
- Sections 6, 7, and 8 provide the flowsheet conditions, flowsheet structure, and bases for the emissions profile generation.
- Section 9 provides a summary of the emissions estimates and a complete analysis that compares the WTP baseline air emissions developed in this report to baseline air emissions for Envelopes A/D, B/D, and C.
- Appendix A contains SSFM stream-specific report output for unabated, abated, and feed points in the WTP process for all modeled constituents. The rest of the appendices provide supporting

documentation for the emissions profile generated. These appendices are referenced throughout the document.

2 WTP Process Configuration

2.1 General Description

Table 1 lists the process flow diagrams (PFDs) that establish the basis for this updated emissions flowsheet and analysis. Figure 1 provides a simplified overview of the WTP process. In Figure 1, the movement of low-activity and high-level waste can be traced from a starting point in the DOE double-shell tank system (shown in the lower-left corner of the diagram) through the various pretreatment unit operations (including feed evaporation, ultrafiltration, and cesium ion exchange) and into the LAW and HLW melter systems. The treatment of offgas resulting from operations of the pretreatment and melter processes (including RFD and pulse-jet mixing and vessel ventilation of vessels not individually depicted on the diagram) can also be traced to a point source emission location in the pretreatment, LAW vitrification, or HLW vitrification stack. The diagram has shading to distinguish the offgas treatment steps from other process operations.

Figures 2, 3, 4, and 5 provide a more detailed depiction of the WTP process. Figures 2 and 3 focus on the pretreatment processes and vessels. Figures 4 and 5 show the LAW vitrification and HLW vitrification processes, respectively. The figures show the configuration of major system components and include selected stream names that correspond to stream identifiers in the SSFM. Figure 2, for example, shows stream FRP14 coming from the double-shell tanks into the HLW feed receipt vessel. Stream FRP14 is the unique identifier in the SSFM that corresponds to the HLW feed vector established for the emission estimate. Sections 8.2 and 8.3 include additional details on the assumed composition and basis for this feed stream. General process descriptions for the three main WTP facilities are provided below.

2.2 Pretreatment Overview

The Hanford tank farm contractor transfers waste from the waste tanks to the WTP PTF. LAW Envelopes A, B, and C are transferred to the WTP as solutions that contain dissolved and suspended solids (LAW precipitated salts). HLW undissolved solids (Envelope D) are transferred as slurry to the PTF.

Low sodium concentration (< 5 molar) waste received from the tank farms and some low sodium concentration recycle streams from the pretreatment and vitrification facilities are concentrated in the waste feed evaporator. Normally, the sodium concentration from the waste feed evaporator is about 5 molar sodium. However, other processing constraints (for example, undissolved solids concentration and slurry-specific gravity) may require a lower sodium concentration.

When the sodium concentration is acceptable for further processing (either as received or after evaporation), the waste goes through the following processes:

- LAW Envelopes A or B are blended with HLW feeds (Envelope D) in an ultrafilter preparation vessel. The ratio of LAW to HLW undissolved solids is established to support both immobilized low-activity waste (ILAW) and immobilized high-level waste (IHLW) glass production rates. The blended HLW and LAW feed streams are filtered to separate the LAW liquid stream (permeate) from the slurry. The LAW permeate then is processed through the ion exchange process discussed below.

The concentrated solids slurry is caustic leached (if warranted), washed, oxidative leached (if warranted) and blended with Cs concentrate from ion exchange and strontium (Sr) and transuranic (TRU) solids from ^{90}Sr/TRU precipitation (see below) before being transferred to the HLW vitrification facility.

- Envelope C feeds contain organic complexants that cause the Sr and some TRU waste to remain in the solution. This waste undergoes a ^{90}Sr/TRU precipitation process before filtration. The filtration step then separates the ^{90}Sr/TRU solids, manganese oxide solids (a byproduct from the precipitation process), and entrained solids from permeate (LAW stream). The ^{90}Sr/TRU precipitate is washed and stored for blending with HLW feed before HLW vitrification. The ^{90}Sr/TRU precipitate (Envelope C solids) is not caustic leached. Envelope C permeates are processed through the ion exchange processes.
- After filtration, the permeate undergoes ion exchange to remove ^{137}Cs. The ^{137}Cs eluate is concentrated by evaporation and then blended with pretreated HLW solids before transfer to the HLW vitrification process. The last step taken in the pretreatment facility is to concentrate the treated LAW liquid by evaporation prior to transferring to the LAW vitrification facility for processing .

The pretreatment building also contains a process vessel ventilation system, an offgas treatment system, and a stack. Liquid effluents are either recycled back into the facility or sent to the Hanford Site Liquid Effluent Retention Facility (LERF)/200 Area Effluent Treatment Facility (ETF). Figures 2 and 3 represent an overview of the pretreatment process.

2.3 LAW Vitrification Overview

Treated Envelope A, B, and C supernatants from pretreatment are transferred to the LAW vitrification facility for processing. The LAW vitrification process consists of two melter systems operated in parallel. Each melter system has a set of feed preparation vessels; a large-capacity, joule-heated ceramic melter; and an offgas treatment system. The facility also has a secondary offgas system shared by the two melter systems. The following description applies to each of the two LAW melter systems.

Pretreated LAW waste feeds are received into one of two common LAW concentrate receipt vessels inside the LAW vitrification building. Batches of concentrated LAW feed are transferred from these vessels to melter feed preparation vessels, where glass formers and sucrose are added and blended to form a uniform batch of feed to the LAW melters. The slurry feed is transferred to the melter feed vessels, where it is fed continuously to the LAW melters.

Each LAW melter is designed to operate at a facility design capacity rate of 15 metric tons per day of immobilized low-activity waste (ILAW). The feed enters the melter from the top and forms a cold cap above the melt pool. Volatile components in the feed are evaporated or decomposed, then drawn off through the melter offgas system. Nonvolatile components react to form oxides or other compounds dissolved in the glass matrix. Bubblers agitate the mixture to increase the glass production rate. An airlift system pours the glass from the melter into stainless steel containers. Each container holds about 6 metric tons of ILAW.

Each LAW melter system has its own primary offgas equipment, including a film cooler, submerged bed scrubber (SBS), and wet electrostatic precipitator (WESP). Particulates and condensables, including entrained or volatilized radionuclides in the melter offgas stream, are captured in the SBS and WESP. Condensables from the SBS and the WESP are collected in the liquid effluent system and recycled to the treated LAW evaporator in the pretreatment facility. The primary offgas systems join after the WESP,

and are routed to the secondary offgas system. At this point, the LAW vessel vent header joins the offgas. The secondary offgas system provides final filtration, removes mercury, destroys organics, reduces NO_x, and removes halides. This is done by using high-efficiency particulate air (HEPA) filters, activated carbon columns, a thermal catalytic oxidizer, a selective catalytic reducer, and a caustic scrubber. After being filled, each ILAW container cools for several days, then a lid is sealed to the top of the container and external contamination is removed by a CO_2 decontamination process. Figure 4 provides an overview of the LAW vitrification process.

The LAW container decontamination using CO_2 is not shown in Figure 4. Exhaust from this process is treated by the building's ventilation system, which is not part of this document's scope. No secondary wastes are generated from this decontamination process that are recycled within the plant.

2.4 HLW Vitrification Overview

The HLW vitrification facility receives the pretreated HLW feed from the pretreatment facility. Treated Envelope D slurry and the LAW intermediate waste products (separated ^{90}Sr/TRU and ^{137}Cs) make up the feed to the HLW vitrification facility. The HLW vitrification process consists of two joule-heated ceramic melters fed by independent feed and blending vessel trains, a dedicated offgas treatment system for each melter, and a common secondary effluent collection system. A common canister receipt system supplies canisters to separate melter pouring systems, providing immobilized high-level waste (IHLW) to a common product canister decontamination and export system. HLW feed concentrate is transferred from the pretreatment building to the HLW melter feed preparation vessels in the HLW vitrification building. Batches of HLW feed concentrate are transferred to one of the two melter feed preparation vessels. The feed concentrate is blended with glass-forming chemicals, and then mixed to ensure uniformity. The melter feed slurry is transferred to the melter feed vessel, where it can be fed to a dedicated HLW melter.

Each HLW melter is designed to operate at a facility design capacity rate of 3 metric tons per day of IHLW. The melter feed slurry is introduced at the top of the melter and forms a cold cap on the surface of the melt pool. Water and volatile components evaporate or decompose and are drawn off through the offgas system. Nonvolatile components react to form oxides, which become part of the molten glass.

Each HLW melter has a dedicated primary and secondary offgas system where the offgas from the melter passes through a film cooler, SBS, WESP, high-efficiency mist eliminators (HEMEs), and HEPA filters, to remove particulates and radionuclides. The offgas then passes through a secondary offgas system consisting of fans, activated carbon beds, recuperative heat exchangers, a silver mordenite column, a thermal catalytic oxidizer, and a selective catalytic reducer. This secondary system removes mercury and halides, destroys organics, and reduces NO_x.

An airlift system inside the melter pours molten IHLW glass into stainless steel canisters. The filled canister is then inspected, the glass sampled as necessary, and the canister sealed. The canisters from the two melters are decontaminated by a nitric acid/cerium (HNO_3/Ce^{+4}) chemical milling process that dissolves a thin layer of the canister outer wall material. Canister decontamination waste effluents are then recycled and transferred to the pretreatment building. The decontaminated canister is then swabbed remotely to determine contamination levels. If the surface contamination is within specification limits, the filled canister is transferred to the interim storage area, where it is stored before transfer to DOE. Figure 5 provides an overview of the HLW vitrification process.

2.5 Air Emissions Objective

Figure 6 graphically depicts the objectives of the emissions estimate. For this emissions estimate, it is assumed that the WTP feed streams contain 314 individual constituents of potential concern. An additional 135 products of incomplete combustion (PICs) plus 5 criteria pollutants and 2 toxic air pollutants that could be generated as a result of the treatment process are also considered. The resulting emission rates for 456 constituents from the pretreatment and vitrification processes are estimated.

3 Constituents of Potential Concern

This section provides the bases for selecting the COPCs analyzed in this report. The WTP emissions estimate scope includes 456 COPCs, which were identified through development of the *Environmental Risk Assessment Work Plan for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-ENS-03-006). These COPCs were originally selected with consideration to guidance provided in the *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 2005), the *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 1999b), and through interactions with the US Environmental Protection Agency (EPA) Region 10 and the Washington State Department of Ecology (Ecology).

The COPC selection criteria identified compounds that fell within one or more of the following categories:

- A compound with the potential to be emitted due to the presence of the compound or its precursors in the waste feed
- A compound that was potentially a product of incomplete combustion
- A compound potentially toxic to humans
- A compound with a propensity for bio-accumulating or bio-concentrating in human and ecological food chains

The 456 COPCs contain chemical and radionuclide constituents, and include compounds not known to be present at detectable concentrations in the actual waste. A total of 268 organic and inorganic chemical COPCs associated with WTP feed streams were identified. The chemical constituents are composed of 219 hazardous organic compounds and 49 inorganic compounds (see Section 5.2). An additional 135 organic PICs were identified as being potentially formed in the treatment process along with 5 criteria pollutants and 2 toxic air pollutants that are classified as acid gases (hydrochloric and hydrofluoric acids). Cl_2 is another toxic air pollutant to be considered. It is assumed in the WTP flowsheet that all gaseous chlorine generated in the offgas is in the form of HCl. This assumption is supported by R&T test results, which show that the dominant gaseous form of chlorine in the offgas system is HCl. The chemical COPCs were compiled using input from the following sources:

- *Regulatory Data Quality Objectives Supporting Tank Waste Remediation System Privatization Project* (Wiemers and others 1998)
- List of PICs identified in Table A.1 of *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 2005)
- Criteria pollutants regulated by the *National Primary and Secondary Ambient Air Quality Standards* (40 CFR 50)

Table 2 lists the 219 hazardous organic constituents and 135 organic PICs. Table 3 lists the 49 inorganic constituents, the five (5) criteria pollutants (NO_2 and NO are counted as one criteria pollutant), and the two (2) toxic air pollutants. In each table, the compounds are sorted using their unique Chemical Abstracts Service (CAS) registry number.

A total of 46 radionuclide constituents associated with WTP feed streams were identified. The radionuclide constituents were derived from Hanford's best basis inventory (BBI) and include 16 radionuclides identified as contributing greater than 99.99 % of the radioactivity in the tank waste (Kupfer 1999). Information used to establish the radionuclide inventory originated from key historical records, various chemical flowsheets used in reprocessing of irradiated Hanford Site reactor fuels, and calculations of radionuclide isotope generation and decay. Table 4 identifies the 46 radionuclide COPCs. Figure 6 shows a representation of the breakdown of all the COPCs.

Additional details on the selection of COPCs can be found in Section 4 of the *Environmental Risk Assessment Work Plan for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-ENS-03-006).

Eleven (11) additional hazardous feed organic COPCs are being considered for addition to the scope of the WTP air permits and risk assessment. The air emissions analysis for these constituents is presented separately in this report (see Section 9). If it is agreed by WTP and the regulatory agencies to add these constituents to the WTP scope, they will be reflected as part of the total COPC list in later revisions of this report.

4 Analysis Tool

The emissions estimate was developed using the WTP baseline steady state flowsheet model (SSFM). This flowsheet represents the latest WTP design and is constantly being updated to include the latest design bases, requirements, and R&T testing results. The flowsheet tracks the main constituents that are expected to have the biggest effect on the material and energy balance of the plant. The constituents tracked in the flowsheet account for 125 of the constituents required to be analyzed, per Section 3. Thus, to facilitate the estimation of the rest of the unanalyzed constituents, several calculations were performed that determined these emission rates based on the results provided by the SSFM. Section 5 describes this process in detail.

The flowsheet tracks the partitioning of the constituents across the pretreatment and vitrification facilities, and provides a steady state representation of process stream compositions through the WTP. It provides an overall material and energy balance with time-averaged flow rates and makes it possible to apply the use of simple equipment DFs or more complicated thermodynamic calculations. The SSFM uses the Henry's Law concept to estimate releases of organic compounds from vessel vents within all facilities, and evaporator overheads.

The SSFM is separated into equipment-oriented areas that represent pretreatment and vitrification unit operations. Pretreatment consists primarily of evaporation, precipitation, ultrafiltration, and ion exchange separation processes. LAW and HLW vitrification consist of staging and preparation vessels to prepare the pretreated feed for vitrification. The pretreatment, LAW vitrification, and HLW vitrification unit operations also include offgas treatment, effluent, and recycle streams. In addition, the HLW facility

takes into account the recycle from the container decontamination system. Section 7 provides more detail on the flowsheet structure.

A verification and validation process is performed on each release version of the SSFM consistent with NQA-1 requirements and the WTP *Quality Assurance Manual* (24590-WTP-QAM-QA-01-001). This emissions estimate was performed on version 3.1 of the steady state flowsheet. Details on this version of the flowsheet can be found in the *Steady-State Flowsheet (ACM) Model Design Document* (24590-WTP-MDD-PR-01-003). Several adjustments were required to be implemented into version 3.1 of the SSFM to align it with the latest design changes and data reconciliation as presented in Sections 1.1 and 1.2. These changes are documented in the *Steady-State Flowsheet (ACM), 2005 Air Emissions Profile* (24590-WTP-MRR-PO-05-022).

5 Representative Constituents in the Emissions Analysis

To calculate the air emission rates for the remainder of the constituents not tracked in the SSFM, an approach for correlating the emission rates for compounds included in the SSFM with the remaining unanalyzed constituents was established with consideration to physical properties, chemical class, and feed concentration. This approach for selecting representative compounds and applying the SSFM results to determine the rate for constituents not tracked in the flowsheet is described in the following sections.

5.1 Selection of Representative Hazardous Feed Organic COPCs

A subset of the organic COPCs was selected to represent the larger list of organic COPCs in the SSFM. In total, 51 of the 219 organic feed COPCs were selected. The basis for selection of these compounds is discussed below. The SSFM was not used to estimate PICs as these were estimated in a separate report. The methodology for addressing PIC emissions is described in Section 8.4.

Henry's Law constants were compiled for all of the feed organics. The *Vessel Vents and PJM/RFD Emissions* (RPT-24590-EN00001) document shows the compilation process for these Henry's Law constants. These constants were divided into 29 groups based upon closeness of numerical values within a group. An additional 6 subgroups were added to differentiate between particle and vapor phase within assessment groups. Constituents from each of these groups were selected for analysis using the SSFM.

To supplement constituents selected based upon Henry's Law, additional compounds were selected based upon physical properties including boiling point (bp), offgas phase, and solubility. Specifically, the constituents' boiling points were classified as one of the following three groups:

- Volatile (bp < 100 °C)
- Semivolatile (100 °C < bp < 300 °C)
- Nonvolatile (bp > 300 °C)

The organic aqueous solubility was classified as one of the following two groups:

- Insoluble (solubility in water < 0.01 g per 100 mL)
- Slightly soluble/soluble (solubility in water ≥ 0.01 g per 100 mL)

Constituents representing the applicable combinations of these physical properties (such as semivolatile and insoluble compounds) were included in the analysis.

Several additional compounds were selected to ensure that each of the following 13 chemical families were represented:

- Aromatic halogenated hydrocarbons
- Aromatic non-halogenated hydrocarbons
- Non-aromatic non-halogenated hydrocarbons
- Non-aromatic halogenated hydrocarbons
- Dioxin and furan compounds
- Polychlorinated biphenyls (PCBs)
- Phthalates
- Light polycyclic aromatic hydrocarbons (PAHs); molecular weight (MW) less than 200 g/mole
- Heavy PAHs (MW greater than 200 g/mole)
- Light substituted benzene compounds (MW less than 200 g/mole)
- Other light semivolatile organic compounds (SVOCs) (MW less than 200 g/mole)
- Other heavy SVOCs (MW greater than 200 g/mole)

Table 2 identifies the organic COPCs that were selected for analysis using the SSFM based upon the criteria and rationale discussed above. The emissions rates for the non-modeled constituents were calculated using the results of the 51 tracked constituents. Methodology on how these rates were calculated is documented in the *Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report* (24590-WTP-M4C-FRP-00005), which is included as Appendix B of this report.

5.2 Selection of Representative Inorganic, Radionuclide, and Criteria Pollutant COPCs

The radionuclide and inorganic constituents currently tracked in the steady state flowsheet comprise about 72 % of the total inorganic and radionuclide constituents included in the scope of the WTP air permits and environmental risk assessment. Specifically, the SSFM tracks 38 out of 49 of the inorganic constituents, 4 out of 5 criteria pollutants, 30 out of 46 radionuclide constituents, and the 2 toxic air pollutants (Cl_2 is tracked as HCl). Tables 3 and 4 identify the inorganic and radionuclide constituents that were analyzed with the SSFM. The emission rates for the constituents not modeled were calculated based on the results of the modeled constituents. The methodology used to document these rates is presented in the *Integrated Emissions Baseline Report Non-modeled Inorganic and Radionuclide Constituents Air Emission Rates Estimation* (24590-WTP-M4C-FRP-00003), which is included as Appendix C of this report.

Of all the inorganic and radionuclide constituents and criteria pollutants, the only ones that are not estimated for this analysis are ozone, bromide, and iodine (I_2). Ozone is usually produced by passing an electrical discharge through O_2 gas or through dry air. Based on current process design, ozone is not expected at the WTP and therefore is not presented in this emission estimate. The presence of bromide is known to lead to very rapid corrosion of carbon steel tanks. This constituent is prohibited from Hanford tank wastes, and no process history for its introduction exists. Bromide is therefore not presented in this emissions estimate. Based on Hanford Tank Farm historical data and data from the best basis inventory,

all iodine found in the tank wastes is classified as ^{129}I. Therefore, this air emissions estimate based the iodine inventory in the tanks as being entirely radioactive iodine-129 (^{129}I).

5.3 Application of Representative Organic COPCs

As stated in Section 5.1, the existing process and emissions analysis configuration is dependent on Henry's Law, boiling point, phase type, and, to a lesser extent, solubility. As intended by the grouping methods described above, constituents within the same organic group are expected to behave similarly in the process. Therefore, the emission rates for the non-modeled constituent are calculated based on the performance factor (PF) of the modeled constituent. This PF is calculated as follows:

$$PF = \frac{\text{mass rate at waste feed [representative compound]}}{\text{mass rate at point of interest [representative compound]}}$$

The *mass rate at the point of interest* refers to the mass rate of a representative compound at various points in the process train, such as at the plant stack or the unabated emission to each offgas treatment unit. The *mass rate at waste feed* refers to the mass rate of each representative compound in the SSFM analyzed waste feed. The mass rate for the waste feed in the above equation is the sum of HLW (stream FRP14) and LAW feed (stream FRP01) rates for the compound. The PF is assumed to be the same for the associated compounds that are not part of the baseline SSFM.

5.3.1 Estimation of Coplanar PCB Emissions

The feed organic compounds listed in Table 2 include 14 coplanar PCB congeners. Coplanar PCBs have four or more chlorine atoms with few substitutions in the ortho positions. The rings can rotate into the same plane if not blocked from rotation by ortho-substituted chlorine atoms and, in this coplanar configuration, exhibit dioxin-like properties. For the purpose of the emissions estimate, the 14 coplanar PCBs comprise 1 % of the total PCB emissions concentration. This basis is consistent with EPA guidance regarding PCB emissions from combustion facilities (EPA 2005). Assuming that 1 % concentration is evenly distributed across the 14 coplanar compounds, an individual coplanar PCB emission rate is calculated as 1/14 of 1 % of the total PCB emissions from each of the WTP process flues. Total PCBs are represented in the SSFM by CAS registry number 1336-36-3.

5.4 Application of Representative Inorganic and Radionuclide COPCs

As described in Section 5.2, the baseline SSFM tracks 38 of the 49 inorganic constituents, 4 out of 5 criteria pollutants, 30 of the 46 radionuclide constituents, and the 2 toxic air pollutants. The emission rates for compounds not estimated using the SSFM are based on the emission rate of a representative analyzed compound that is chemically or physically similar. This is achieved using the same approach described for the organic constituents in Section 5.3 (i.e., calculation of PF).

Selection of the representative constituents for the non-modeled constituents is described in the following subsections. Table 5 provides the final selection of the representative constituents.

5.4.1 Representative Inorganic COPCs in the SSFM

An initial analysis was performed to determine if similar constituents were being analyzed. If an inorganic constituent had a counterpart radioactive constituent being modeled, then the emission rates of

the nonradioactive constituents were calculated based on the results of the modeled counterpart. This approach was used for the following constituents:

Non-modeled Constituent	Modeled Counterpart
Co	^{60}Co
Sn	^{126}Sn
Sb	^{125}Sb
U	^{234}U

The rest of the constituents were categorized into nonvolatile, semivolatile, and volatile inorganics. The emission rate for zirconium (Zr) was used to estimate the emission rates for nonvolatile inorganics, such as tantalum (Ta), tungsten (W), and beryllium (Be). This approach was based on the following:

- The primary mechanism for nonvolatile inorganics to enter the melter offgas and vessel vent system stream is through entrainment, which is not specific to chemical species.
- The DFs for the HLW and LAW offgas treatment equipment are determined based on the average of the particle size distributions of aluminum (Al), iron (Fe), and Zr.

For semivolatile and volatile inorganics, such as molybdenum (Mo), thallium (Tl), and selenium (Se), the DFs that were reported in engineering calculations were compared to other analyzed semivolatile and volatile elements. The elements with the most comparable overall DFs are used as the representative elements.

5.4.2 Representative Radionuclide COPCs in the SSFM

A methodology similar to that applied to the inorganic COPCs has been applied to the radionuclide constituents. Counterpart constituents are as follows:

Non-modeled Constituent	Modeled Counterpart
^{134}Cs	^{137}Cs
^{137m}Ba	^{137}Cs
^{90}Y	^{90}Sr
^{59}Ni	^{63}Ni
^{113m}Cd	Cd
^{232}U	^{233}U
^{242}Pu	^{241}Pu
^{243}Am	^{241}Am
^{242}Cm	^{243}Cm
^{93}Zr	Zr

The emission rate for zirconium is used to estimate the emission rates for nonvolatile radionuclides, such as radium-226 (^{226}Ra), protactinium-231 (^{231}Pa), actinium-227 (^{227}Ac), radium-228 (^{228}Ra), and niobium-93m (^{93m}Nb).

For semivolatile and volatile radionuclides, the DFs that were reported in the engineering calculations were compared to other analyzed semivolatile and volatile elements. The elements with the most comparable overall DFs were used as the representative elements. Table 5 shows the summary of the representative constituents analysis.

6 Process Flowsheet Conditions

The baseline steady state flowsheet provides WTP material and energy balance information and data. This flowsheet is also the tool to provide the WTP emissions profile used to support environmental air permitting and risk assessment activities. Even though the same flowsheet is used, parameters used for generating emissions estimates differ from the ones used for baseline plant performance. The operating parameters within the unit operations remain the same (operating temperatures and pressures, for example). The major differences between the parameters are found in the feed vector, equipment performance (DFs), and plant throughput rates. The DFs and throughput rates utilized for the WTP material and energy balance provide the best realistic conditions for plant operations. The DFs and throughput rates used for this air emissions estimate conservatively estimate plant operation, which bounds plant air emissions for regulatory and risk assessment purposes.

For a complete detail of operating conditions for each unit operation within the WTP, refer to Sections 2 (Pretreatment), 3 (LAW), and 4 (HLW) of *Flowsheet Bases, Assumptions, and Requirements* (24590-WTP-RPT-PT-02-005). Section 8 of this report presents an overview of the operating conditions for the offgas systems and conditions used for this emissions profile, including throughput rates, feed vector, and equipment DFs.

7 Flowsheet Description and Emissions Analysis

This section provides an overview of the setup and structure of the flowsheet and how the emissions analysis is performed. For a detailed description of the depiction of the WTP flowsheet using the ACM (Aspen Custom Modeler) software, refer to the *Steady State Flowsheet (ACM) Model Design Document* (24590-WTP-MDD-PR-01-003).

7.1 Flowsheet Description

A description of the setup and structure of the flowsheet is provided below.

7.1.1 Inputs

The SSFM uses a large number of input (constrained) variables to specify the values within the equation matrix. The constrained variables fall into two categories: parameters and fixed variables. Parameters typically include constant properties such as DFs. Fixed variables include the operating conditions that define how the process operates. These specific fixed variables used for air emissions evaluations are described in Section 7.2. The air emissions parameters are discussed in Section 8.

7.1.2 Tracking of Constituents

The SSFM tracks components throughout the entire WTP. These components can be classified as solids, liquids, gases, organics, radioactive, nonradioactive, ions, and compounds. In cases where a liquid is split

into gas stream (e.g., the evaporator, vaporizer, and melter), the liquid and the vapor have different component sets. In order to track all of the mass, intermediate arrays are introduced. The components from the liquid stream that do not have a corresponding component in the gas stream are temporarily stored and then equated to a representative component in the gas stream.

Vapor streams have arrays for tracking solids and liquids. Entrained liquids and solids have separate arrays in the gas streams. This allows a distinction between entrained liquids and solids. In addition, this distinction is recognized when gaseous streams are condensed.

7.1.3 System Structure

The overall WTP process has been divided into 30 systems common to the flowsheet. Detailed information on how the flowsheet is constructed for these 30 systems can be found in Section 4 of the *Steady State Flowsheet (ACM) Model Design Document* (24590-WTP-MDD-PR-01-003).

7.1.4 Flowsheet Structure

The SSFM is composed of one single flowsheet encompassing the entire process. Portions of that flowsheet represent the modeling of specific unit operation and systems. Within the SSFM there are 47 independent custom modules. These modules serve as building blocks that are assembled to represent the process. The major plant systems are characterized by either a single module or a combination of modules. Within the individual modules reside the equations that serve to define the processes. The modules are composed of Visual Basic type code defining the mathematical relationship between the fixed variables, the parameters, and the other calculated values based on engineering principles. The modules are connected by streams through which they transfer information defining the properties pertaining to the streams. Collectively, the modules and streams make up the plant systems, which ultimately define the overall process.

7.1.5 Solution Methods

ACM uses iterative solution methods (like the Newton-Raphson method) to simultaneously solve all equations in the flowsheet. The convergence criterion is to make all equation residuals less than the given absolute tolerance.

The flowsheet has large recycle loops that are broken down by introducing tear blocks into them. Convergence of the flowsheet occurs when the tear blocks are aligned (input = output).

7.2 Emissions Analysis

The following subsections describe the methodologies used to determine air emission rates from the main flowsheet contributors. These methodologies correspond to the fixed variables input to the flowsheet.

7.2.1 Pretreatment Emissions Analysis

The pretreatment facility offgas systems are shown in Figures 2 and 3. The pretreatment vessel vent process system (PVP) provides the abatement for offgases from pretreatment process vessels and equipment. The pulse-jet ventilation system (PJV) controls emissions from the exhausts of pretreatment fluidic devices, such as PJMs and RFDs. Each system discharges to the pretreatment stack through separate headers.

Purge air supplied to pretreatment process vessels for hydrogen mitigation is collected and treated by a caustic scrubber, HEME, two stages of HEPA filtration, thermal oxidizer, and carbon bed adsorber prior to discharge through the pretreatment stack. Offgases from pretreatment process equipment, such as evaporator overheads, are also collected and treated by the PVP system.

PJMs are used throughout the pretreatment facility to resuspend solids in process vessels and to disperse mixtures before sampling process liquids. RFDs are used for liquid transfers and collecting samples of process liquids. Both PJMs and RFDs are fluidic devices that use compressed air to draw process liquid into a charge vessel, located within the process vessel, and then force the liquid back out to achieve the desired operation. The exhaust air from these operations, along with entrained aerosols, is collected and treated by medium efficiency mist eliminators, or demisters, and two stages of HEPA filtration prior to discharge through the pretreatment stack.

Sections 7.2.1.1 through 7.2.1.3 describe the emissions analysis methods for pretreatment facility emissions associated with:

- Vessel vent exhaust
- Evaporator overheads
- RFD/PJM exhaust

7.2.1.1 Vessel Vent Exhaust

The exhaust from the vessel vent system consists of the purge air supplied to pretreatment process vessels for controlling radiolytic hydrogen generation within the vessel vapor space. In addition to increasing in temperature and moisture content, the purge air also becomes contaminated as it passes through the vessel vapor space. Mixing, sparging, radiolytic hydrogen generation, process transfers, and evaporation contribute to the release of aerosols and particulates into the vessel vent offgas stream.

To determine air emission rates for inorganic and radionuclide constituents in the PTF vessel vents, a liquid entrainment factor has been calculated for all process vessels based on *PT Vessel Vent System Baseline Operating Conditions and Radioactive Aerosol Loading of Exhaust Air Streams* (RPT-W375PT-PR00021). These entrainment factors are provided in Section 8. From the entrainment factor, the quantity of an inorganic or radionuclide constituent in the vessel vent offgas stream can be determined by multiplying the quantity of the constituent entering the vessel in the liquid phase by the entrainment factor for that vessel.

For organic constituents, the quantity of organics in the offgas stream is determined through the application of Henry's Law, which estimates the equilibrium gas phase concentration of a compound from the known liquid phase concentration (RPT-24590-EN00001, *Vessel Vents and PJM/RFD Emissions*). The Henry's Law method was selected because it is considered a conservative approach as it assumes that the constituent reaches full equilibrium between the liquid and gas phases. Henry's Law constants used for the organic constituents are presented in Table 2. The Henry's Law method was used in the flowsheet to calculate the organic emission releases throughout the vessel vent systems (pretreatment and both vitrification plants) and evaporator systems. The constants were developed on the basis that operating conditions on the vessels are near standard temperature and pressure conditions; thus, the Henry's Law constants at standard conditions are used. Details on selection of the Henry's Law constants can be found in Section 5 of RPT-24590-EN00001.

All constituents released from the vessel vents are collected in a common header and directed to the offgas treatment system. In this system, the removal efficiency of each constituent is dependent on its phase, solubility, auto ignition temperature, and molecular weight. The details for this system are discussed in Section 8.6.1.

The pretreatment vessel vent thermal oxidizer is designed for a minimum operating temperature of 1600 °F (24590-PTF-M0C-PVP-00001) and could generate some PICs. For purposes of the emissions analysis, PICs are defined as compounds identified in Table A-1 of the *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 2005), but are not components of the waste feed. It has been conservatively established for emissions estimation purposes that PICs are present at the pretreatment stack at their estimated detection limits. This basis was verified by comparing the detection limits to what has been observed in the results of tests performed by R&T on the offgas treatment systems. Limits used for this evaluation are generally higher than what has been observed on the tests. The rationale and discussion for this basis are provided in Section 8.4.

7.2.1.2 Evaporator Overheads

The pretreatment facility contains three evaporators to reduce the volume of certain streams prior to further processing steps. These evaporators are associated with the following process streams:

- Waste feed
- Cesium eluate
- Treated LAW

Each evaporator is analyzed under continuous operation at a pressure of 1.0 to 1.5 psia. The reduced pressure lowers the boiling point of the process stream. The waste feed and treated LAW evaporator overheads are routed to primary condensers, where most of the vapor is condensed at the saturation pressure. Contaminant removal by the evaporators and condensers is estimated using DFs which have been derived by collecting existing evaporator data from working units at the Hanford Site and R&T test results. These are further discussed in Section 8.6.1.

The vapor stream from the cesium evaporator enters the rectifier columns prior to the primary condensers. Section 2.6-1 of *Flowsheet Bases, Assumptions, and Requirements* (24590-WTP-RPT-PT-02-005) shows how the DFs for the cesium evaporator/rectifier are derived. Noncondensable vapors from all four evaporators join the vessel vent header prior to the offgas treatment system as shown in Figures 2 and 3. For the purpose of the analysis, the evaporator/condenser overheads are considered to be saturated air containing entrained evaporator liquid.

Specific equipment DFs used for emissions analysis are presented in Section 8.6 of this report.

7.2.1.3 RFD and PJM Exhaust

Both RFDs and PJMs work by using compressed air to raise and lower process fluid in a charge vessel located inside the process vessel. One end of the charge vessel is connected to a jet pump pair that provides the suction for drawing liquid up into the charge vessel and the drive for forcing the liquid back out of the charge vessel. At the end of the drive phase, residual compressed air in the charge vessel passes back up through the jet pump pair and into the PJV system header. Significant quantities of

compressed air are exhausted through the jet pump pair during the suction and vent phases. Cycle times can vary from less than 1 minute to more than 10 minutes. Liquid aerosols and radiolytic particulates will become entrained in the exhausts from the jet pump pair via the charge vessel.

For organic, inorganic, and radionuclide constituents, an aerosol entrainment factor is used to calculate the amount of process liquid in the charge vessel that is transferred to the exhaust stream. The aerosol entrainment factor is derived from the BNFL release fraction (RF) of 1×10^{-10} for exhausts from RFDs (BNFL, Inc 1996). The RF is defined as the ratio of activity or mass per unit volume in the exhaust to the activity or mass per unit volume in the process liquid. The total aerosol release (mass flow rate) is equal to the RF multiplied by the ratio of the volumetric flow rate of the RFD/PJM exhaust to the volumetric flowrate of the process liquid multiplied by the mass flow rate of the process liquid.

$$RF = \frac{activity\ or\ mass\ /\ volume\ in\ air}{activity\ or\ mass\ /\ volume\ in\ liquid}$$

$$RF = \frac{lbs(i)\ /\ ft^3\ vent}{lbs(i)\ /\ ft^3\ liquid}$$

where (i) is constituent of interest

For RF in terms of flowrate:

$$RF = \frac{lbs(i)\ /\ \min in\ vent}{lbs(i)\ /\ \min in\ liquid} \times \frac{ft^3\ /\ \min liquid}{ft^3\ /\ \min vent}$$

where:

RF is 1×10^{-10} for RFD exhaust
lbs(i)/min in liquid is known
ft^3/min liquid is known
ft^3/min vent is known (fixed value of RFD/PJM exhaust)

$\therefore$ lbs(i)/min in vent is RF × lbs(i)/min in liquid × $\frac{ft^3\ /\ \min vent}{ft^3\ /\ \min liquid}$

7.2.2 LAW and HLW Vitrification Emissions Analysis

The LAW and HLW vitrification facilities have devoted offgas systems for controlling emissions. Additional detail regarding the vitrification facilities is provided below.

7.2.2.1 LAW and HLW Vessel Ventilation Systems

The exhaust from the vessel vent system consists mainly of air inleakage and instrument air addition to process vessels. This air becomes contaminated as it passes through the vessel vapor space. Mixing,

sparging, radiolytic hydrogen generation (in HLW only), process transfers, and evaporation contribute to the release of aerosols and particulates into the vessel vent offgas stream.

As in the PTF, a liquid entrainment factor has been calculated for inorganic and radionuclide constituents for all process vessels. The LAW entrainment factors are based on calculation *System 234 LAW Vessel Ventilation Calculation* (CALC-W375LV-PR00022). For HLW, the entrainment factors are based on Section 4.3.3.4 of the *Flowsheet Bases, Assumptions, and Requirements* (24590-WTP-RPT-PT-02-005). From the entrainment factor for inorganic and radionuclide constituents, the quantity of a constituent in the vessel vent offgas stream can be determined by multiplying the quantity of the constituent entering the vessel in the liquid phase by the entrainment factor for that vessel. As in the PTF, the quantity of organics in the offgas stream is determined through the application of Henry's Law, which estimates the equilibrium gas phase concentration of a compound from the known liquid phase concentration.

7.2.2.2 LAW and HLW Melters

For the melters, the feed enters from the top and forms a cold cap above the melt pool. Volatile and semivolatile compounds are evaporated or decomposed, then drawn off through the melter offgas system. Nonvolatile compounds react to form oxides or other compounds dissolved in the glass matrix. Behavior in the melter is represented in the flowsheet by chemical reactions and application of DFs. These DFs and reactions are based on R&T test results, engineering calculations, and literature research. A complete list of reactions occurring in the melters can be found in Section 3.2.3 for LAW and Section 4.2.3 for HLW in the *Flowsheet Bases, Assumptions, and Requirements* (24590-WTP-RPT-PT-02-005). Specific DFs used for emissions analysis for the melters are presented in Section 8.6 of this report.

7.2.2.3 Vitrification Scrubbers

The submerged bed scrubber (SBS), in both HLW and LAW, and the LAW caustic scrubber behavior in the flowsheet are also represented by operating conditions, occurring chemical reactions, and DFs applied. The SBS is used to quench the hot offgas exiting the melters and to remove large particulates. The LAW caustic scrubber is used to remove SO_x and to provide final offgas quenching. Some incidental acid gas removal and soluble salts removal also occurs in this unit. For a listing of chemical reactions and operating conditions for each scrubber, refer to Section 3.3.3 for LAW and Section 4.3.3 for HLW of *Flowsheet Bases, Assumptions, and Requirements* (24590-WTP-RPT-PT-02-005). The DFs and chemical reactions have been derived from R&T test results, engineering calculations, and literature research. Specific DFs used for emissions analysis for all three scrubbers are presented in Section 8.6 of this report.

7.2.2.4 Remaining Vitrification Offgas Unit Operations

The remainder of the unit operations' behavior in the offgas systems (WESP, HEME – HLW only, activated carbon beds, silver mordenite – HLW only, selective catalytic oxidizer, and selective catalytic reducer) is represented by applying pertinent DFs. Some chemical reactions also occur in these units. For example, in the selective catalytic oxidizer, SO_2 is oxidized to SO_3, and CO is oxidized to CO_2. The DFs and chemical reactions have been derived from R&T test results, vendor information, and literature search. For a listing of chemical reactions and operating conditions for all these units, refer to Section 3.3.3 for LAW and Section 4.3.3 for HLW of *Flowsheet Bases, Assumptions, and Requirements* (24590-WTP-RPT-PT-02-005). Specific DFs used for emissions analysis for all these units are discussed in Section 8.6 of this report.

7.2.2.5 HLW PJM/RFD Exhaust

Entrainment factors from these units are calculated in the same manner as the PTF PJM/RFD entrainment factors as discussed in Section 7.2.1.3. Refer to that section for further details.

8 Emissions Analysis Bases

As stated in Section 6, the differences between the baseline design and the air emissions case analyzed in the SSFM are the throughput rates, DFs, and feed vector. This section outlines the bases for the air emissions case.

8.1 Throughput and Operating Conditions

Design throughput rate for the LAW melters is 15 metric tons of glass per day (MTG/d) each and 3 MTG/d for each HLW melter. This equates to a total design rate of 30 MTG/d ILAW and 6 MTG/d IHLW. Although the LAW facility has only two melters, provisions exist to add a third melter. For the purpose of this analysis, throughput rates of 50 MTG/d for the LAW facility and 6 MTG/d for the HLW facility are used. The higher LAW rate bounds the facility's emission rates if increased capacity is introduced in the future.

The PTF has the capability to process LAW waste at a throughput of 80 MTG/d in order to support LAW and the alternate LAW process technology. Per negotiations with the regulatory agencies, the WTP cannot be permitted for the excess capacity until the alternate technology is defined. Therefore, the throughput for the WTP permits is based on the vitrification plants throughput (50 MTG/d ILAW and 6 MTG/d IHLW). Because the LAW and HLW vitrification stacks emission rates dominate the WTP inorganic and radionuclide air emissions, and because it is assumed that all the PTF vessels operate and contribute to the PTF vessel vent system at the same time, the additional PTF capacity is not expected to significantly increase the PTF stack air emissions.

8.1.1 Feed Conditions

LAW feed envelopes fall within a range of 4 to 10 moles of sodium per liter. The lower sodium molarity feeds will be processed by the WTP at a higher rate. In order to bound the emissions estimate, the WTP feed is set at a 4 molar sodium concentration.

8.1.2 General Pretreatment Facility Conditions

During normal operations, any feed that enters the pretreatment plant with a sodium molarity of 5 molar or higher bypasses the feed evaporator. To conservatively maximize emissions from the pretreatment facility, the sodium molarity of feed streams was set at 4 molar sodium, as stated in Section 8.1.1.

Feed rate into the plant depends on the feed characteristics, which in turn determine glass composition. After the feed is evaporated in the waste feed evaporation process system (FEP) evaporator, it is sent to the ultrafiltration system so that HLW solids can be washed and concentrated. The HLW solids are concentrated until they reach a 20 wt% set point. While this is being achieved, the LAW feed is constantly being fed forward to the cesium ion exchange system. The cesium ion exchange system removes the cesium from the LAW feed with an efficiency of 99.997 % so that the LAW source term requirements are met. The LAW feed then continues to the treated LAW evaporator where it is

evaporated to a set point of 8 molar sodium so that the waste volume is reduced before going to the LAW facility. Immediately after the treated LAW evaporation process system (TLP) , the LAW feed splits between the LAW facility and the future LAW processing plant. For this emissions analysis all the LAW feed goes to LAW vitrification. The feed is then forwarded to the concentrate receipt vessels (CRVs) in the LAW facility.

After ultrafiltration, the HLW solids are sent to the HLW lag storage area before being transferred to the HLW vitrification facility. From this point on, the HLW feed is fed in a batch method to the HLW melter feed preparation vessels (MFPVs).

Detailed operating conditions for all other systems in the pretreatment facility are as stated in Section 2 of 24590-WTP-RPT-PT-02-005. Conditions are similar to those stated for processing Envelope A waste. No leaching occurs in the emissions analysis, as it was determined from scenarios evaluated that leaching does not provide a bounding air emissions case for WTP.

8.1.3 General LAW Facility Conditions

The LAW feed is transferred in batches from the TLP system storage vessel to the LAW CRVs. From the CRV, the feed is fed forward in batches to the MFPVs. Sampling in the CRVs determines the size of the batch to be sent to the MFPV and the glass recipe required to produce compliant glass. Once the glass former chemicals are introduced into the MFPVs, the contents are thoroughly mixed and fed forward to the melter feed vessels (MFVs). The MFV then provides a constant feed supply to the LAW melters. The LAW air emissions feed vector allows 20 % waste loading (monitored as Na_2O loading) into the glass. LAW waste oxide loading is defined as the weight of sodium oxide (Na_2O) to the total weight of waste and glass formers. This waste loading is in the upper range for the ILAW glass (nominal operating range will be between 14 % and 17 %). Higher waste loading indicates a larger volume of waste being fed into the melter, which in turn equates to higher contaminant release from the melters. The offgas generated from the melters is then treated through the primary and secondary offgas systems where contaminants are removed to ensure that the offgas emitted from the LAW stack is compliant with all air permits.

8.1.4 HLW Facility Conditions

The HLW feed is transferred in batches from the HLW lag storage vessel to the HLW MFPV. Sampling in the MFPV determines the recipe required to produce compliant glass. Once the glass former chemicals are introduced into the MFPVs, the contents are thoroughly mixed and resampled to verify correct glass formulation. From here, the waste is fed forward to the MFVs. The MFV then provides a constant feed supply to the HLW melters. The HLW air emissions feed vector allows 40 % waste loading into the glass. HLW waste loading is defined as the weight of waste oxides to the total oxides and glass formers. This waste loading is in the upper range for the IHLW glass (nominal operating range will be between 30 % and 35 %). Higher waste loading indicates a larger volume of waste being fed into the melter, which in turn equates to higher contaminant releases from the melters. The offgas generated from the melters is then treated through the primary and secondary offgas systems where contaminants are removed to ensure that the offgas emitted from the HLW stack is compliant with all air permits.

8.2 Feed Concentration for Organic Compounds

Organic characterization data applicable to the organic COPCs from candidate double-shell tank system feed streams is not completely available. To compensate for data gaps, an approach for establishing a

conservative, bounding basis for hazardous organic concentrations was used. The approach, which relies on previous analytical work relating to total organic carbon (TOC) in the double-shell tanks, process knowledge, and hazardous organic analyses, is summarized below.

Based on maximum TOC analyses from double-shell tanks scheduled for processing during the first 11 years of operation and the WTP's contractual limit for TOC, a value of 2.5 wt% TOC was used for this analysis. Non-regulated organics, such as complexants and low molecular weight acids (Campbell and others 1995), have been measured between 78 % and 99 % of TOC. These results are biased low, as the analysis methods do not adequately address most paraffins and many phosphates.

In the previous release of this report, 87.5 % was used to represent a minimum proportion of unregulated organic content, and the remainder was assumed to be regulated chemicals (12.5 %). Because selected hazardous organic constituents have been eliminated from the feed (CCN 097844), it is assumed for this evaluation that the percentage of accounted organic constituents (e.g., oxalate) increases to 90 % (from 87.5%) of the 2.5 wt% TOC in the feed, while the remaining 10 % of the 2.5 wt% TOC in the feed is assumed to be hazardous organic constituents. This equates to a drop of 2.5 % of the unaccounted hazardous organic constituents in the feed. LAW and HLW are assumed to contain equal concentrations of unaccounted hazardous organic constituents. The TOC concentration includes the hazardous organic COPCs and other nonregulated organic compounds that were used in Hanford processes. More specifically, the origins of organic compounds in Hanford tanks are associated with one of the following:

- Process additions (such as complexants and solvent extractants)
- Laboratory wastes
- Decontamination solutions
- Other minor additions

With the exception of process additions, few records exist about the amount of organic compounds added to the tanks. As part of the safety programs for the tanks, Hanford personnel have conducted a number of studies that focused on accounting for the predominant contributors to the historically measured TOC values. The studies have shown that the process additions, particularly the complexants, and their associated degradation products comprise the majority of the organic compounds in the tanks. Specifically, the predominant organic complexants used in the Hanford processes include ethylenediamine tetraacetate (EDTA), hydroxyethylenediamine triacetate (HEDTA), glycolate, and citrate. Lesser amounts of complexants, such as nitrilotriacetic acid (NTA), di-(2-ethylhexyl) phosphoric acid, and oxalic acid, were used. The degradation products from the complexants are low molecular weight materials whose parent acids include formic, acetic, glycolic, oxalic, succinic, and citric acids.

The 10 % of TOC that was not accounted for as complexants has been distributed across the organic COPCs using the analytical results performed on two representative tanks (Klinger and others 1999) and from the guidance of the *Regulatory Data Quality Objectives Optimization Report* (24590-WTP-RPT-MGT-04-001). To compensate for data uncertainty, a scaling factor was applied. This factor was determined by summing the concentrations of compounds that were detected with those compounds that were undetected (assumed to be present at their detection limit) and dividing 10 % of the TOC by this sum. This resulted in a scale factor of approximately 189. The increased values have been used as feed concentrations in the emissions estimate. A complete list of the resulting feed concentrations is included in Table 6. Generation of this feed vector is documented in *WTP Air Emissions Hazardous Organic Constituents Feed Concentrations* (24590-WTP-M4C-FRP-00006). This calculation is attached as Appendix D of this report.

8.2.1 Feed Concentration for Polychlorinated Biphenyls

The Hanford double-shell tanks are known to contain PCB remediation waste that will be included in the mixed waste feed processed by the WTP. The list of organic COPCs identified in Table 2 includes the PCBs scoped by this emissions estimate.

DOE and its contractors have been working with EPA and Ecology to resolve regulatory issues associated with managing PCB remediation waste at the WTP. On 31 August 2000, DOE, EPA, and Ecology signed the *Framework Agreement for Management of Polychlorinated Biphenyls (PCBs) in Hanford Tank Waste* (DOE and others 2000). This agreement establishes that the waste feed to the WTP be limited to 50 parts per million PCBs. The agreement does not specify whether this concentration applies to the liquid fraction, the solid fraction, or both.

Solubility information for PCB compounds indicates that they are essentially insoluble in water. Specifically, data is available indicating solubilities that range from 1.3E-06 to 5.7E-8 g/100 mL of water (Howard and others 1997). In applying the PCB feed criteria specified in the *Framework Agreement for Management of Polychlorinated Biphenyls (PCBs) in Hanford Tank Waste* (DOE and others 2000), it has been assumed that the 50 parts per million by weight would be most appropriately applied to Envelope D HLW feed streams, as Envelope D is principally composed of undissolved salt and oxide solids. The emissions estimate has thus assumed an HLW feed concentration for total PCBs of 50 mg/kg. The LAW feed concentration for total PCBs was established using the same methodology described in Section 8.2 for other organic COPCs. This concentration (0.4 mg/L) has been used for LAW feeds and is bounding considering the near insolubility of PCBs in aqueous salt solution.

8.3 Feed Concentrations for Inorganic and Radionuclide Compounds

Inorganic and radionuclide constituents feed concentrations for air emissions analysis are based on two main sources, the SOW maximum concentrations and the Tank Waste Information Network System (TWINS), which provides the BBI for all Hanford tanks. Tanks evaluated for BBI information are based on the latest WTP feed delivery sequence as specified in calculation *WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector* (24590-WTP-M4C-FRP-00001). The calculation also provides the basis for the type of waste being processed for each tank (i.e., supernate, slat cake, or solids). This information determined which data from the BBI was going to be used for the feed vector analysis. The tanks and types of waste used for evaluation are as follows.

<u>LAW</u>

- AN-102 supernate (Envelope C)
- AN-103 dissolved solids (salt cake) and supernate (Envelope A)
- AN-104 dissolved solids (salt cake) (Envelope A)
- AN-105 dissolved solids (salt cake) and supernate (Envelope A)
- AN-107 supernate (Envelope C)
- AP-101 supernate (Envelope A)
- AP-102 supernate (Envelope A)
- AP-103 supernate (Envelope A)
- AP-104 supernate (Envelope A)

- AP-105 supernate (Envelope A)
- AW-101 dissolved solids (salt cake) and supernate (Envelope A)
- AZ-101 supernate (Envelope B)
- AZ-102 supernate (Envelope B)
- SY-101 supernate (Envelope A)

HLW

- AW-104 solids (Envelope D)
- AY-101 solids (Envelope D)
- AY-102/C-106 solids (Envelope D)
- AZ-101 solids (Envelope D)
- AZ-102 solids (Envelope D)
- C-104 solids (Envelope D)
- C-107 solids (Envelope D)

The average concentration of each inorganic constituent, except Hg, from all the evaluated tanks was selected and used as the feed concentration for the emissions analysis. The Hg amount used was the SOW maximum. For radionuclide constituents, the SOW maximum concentrations were used. Whenever there was no SOW maximum specified for a radionuclide constituent, the maximum BBI value was used.

The previous air emissions feed vector for inorganic and radionuclide constituents was based on Revision 0A of the *WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector* (24590-WTP-M4C-FRP-00001). Since this revision, the calculation was updated to include changes to the SOW maximum concentrations and updated BBI data. Maximum concentrations were selected for all constituents. This updated feed vector was tested in the air emissions flowsheet. Based on the results of the test run it was determined that the nature of the feed vector (all constituents at their maximum concentrations) was not providing bounding conditions for air emissions purposes. Extensive R&T data reconciliation has been incorporated into the WTP flowsheet since 2004. Part of this data reconciliation included glass formulation updates, glass quality constraints, and process constraints. Having a feed vector with all constituents at maximum concentrations activates a significant amount of these constraints, which in turn causes the feed to be diluted within the process and dramatically reduces the feed rate into the front end of the process. These constraints are mainly activated by the inorganic constituents. After several test runs, it was determined that average feed concentrations for inorganic constituents and maximum feed concentrations radionuclide constituents conservatively bound scenarios for WTP air emissions purposes.

This selection process and the determination of the final emissions analysis feed vector can be found in *WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector* (24590-WTP-M4C-FRP-00001), which is attached as Appendix E of this report. A summary of the inorganic and radionuclide feed vector selected is included in Table 7 for LAW feed and Table 8 for HLW feed.

8.4 Concentration of Products of Incomplete Combustion

The list of COPCs discussed in Section 3 includes 135 PICs that are not known or suspected to be components of the WTP feed streams. These constituents have been included based upon their potential to be formed within thermal components of the WTP process; specifically, the vitrification melters and thermal oxidizing components of the pretreatment and vitrification offgas treatment systems. The subject PICs are composed of volatile and semivolatile compounds. The semivolatile compounds include a subset of PAHs, dioxins, and furans that are of particular interest to risk assessment.

EPA's *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 2005) provides guidance for establishing emissions estimates for facilities that are not yet operational. The guidance states the following:

> Good engineering practice dictates a check of, and comparison with, data from similar existing units. Stack test reports for facilities of similar technology, design, operation, capacity, auxiliary fuels, waste feed types, and air pollution control standards (APCSs) should be used to estimate COPC emission rates for new facilities that have not been constructed.
>
> If the preferred option of using surrogate data from similar facilities is not available, some state environmental agencies enforce emission rate limits based on state laws. Since these limits cannot be exceeded, they can be used to develop emission rate estimates for the risk assessment. The facility will demonstrate that its emissions are less than those considered in the permit and risk assessment during the trial or risk burn.

The EPA guidance has been utilized in selecting the method for estimating PIC emissions at the WTP. There have been two mixed waste treatment facilities in Washington State and Idaho that have pursued regulatory permits that include human health and ecological risk assessment similar to that required for the WTP. Although neither facility has been operated to date, both have been used as precedents for estimating PIC emissions resulting from the treatment process. In the cases of both precedent facilities, emission rates for PICs were estimated by multiplying the PIC detection limit (or in some cases, one-half the detection limit) by the airflow rate at the stack sampling location. A similar methodology has been used to estimate PIC emissions at the WTP; here, PIC emission rates are based upon the assumption that each PIC will be present in the pretreatment, HLW, and LAW process flues at its corresponding analytical detection limit.

In order to establish a basis for achievable stack detection limits, available R&T data was reviewed. Tests were conducted at the VSL of the Catholic University of America. These tests were performed on a small-scale vitrification system with WTP simulants that were spiked with selected hazardous organic compounds. The tests were conducted to assess destruction efficiencies in the melter and collect data on hazardous constituents in the offgas stream, including PICs. A total of 24 tests were conducted to study the effects of various parameters on hazardous organics emissions. These parameters included feed type, residence time, cold-cap coverage, plenum temperature, and presence of sugar as a reductant.

The VSL melter exhaust was sampled and monitored for volatiles, semivolatiles, dioxins, and furans. EPA SW-846 (EPA 2004) Method 0030 was used to sample volatile constituents from the offgas stream. The volatile samples were analyzed using Method 8260-B. Semivolatile analytes were sampled using Method 0010 and analyzed using Method 8270-C. Dioxins and furans were sampled using 40 CFR 60 Method 23 and analyzed using Method 8290. Details of the small-scale melter testing and results are

documented in *Determination of the Fate of Hazardous Organics During Vitrification of WTP LAW and HLW Simulants* (VSL 1999).

In addition to these tests, more tests were performed using the DM1200 pilot melter for regulatory and design purposes. Some of these tests included spiking with hazardous organic constituents. During these tests, PIC analysis was performed. Data from these reports was also used to determine detection limits for PICs. These reports are *Final Report Integrated Off-Gas System Test on the DM1200 Melter with RPP-WTP LAW Sub-Envelope C1 Simulants* (24590-101-TSA-W000-0009-111-01); *Final Report Integrated Off-Gas System Test on the DM1200 Melter with RPP-WTP LAW Sub-Envelope A1 Simulants* (24590-101-TSA-W000-0009-111-02); and *Final Report Regulatory Off-Gas Emissions Testing on the DM1200 Melter System Using HLW and LAW Simulants* (24590-101-TSA-W000-0009-166-00001).

Assumed detection limit concentrations have been applied based upon four groupings of compounds: volatile organics, semivolatiles, PAHs, and dioxins/furans. The detection limits reported from the VSL work should be conservative from an emissions perspective because the test work was not intended to drive detection limits to the lowest achievable levels. If longer sample durations and high-resolution analytical techniques are used, it is expected that lower detection limits could be achieved. A summary of the resulting detection limit concentrations for the volatile, semivolatile, and PAH groupings are shown in Table 9. Detection limits for each of the individual dioxin and furan compounds are also specified in Table 9. The concentrations of PICs shown in Table 9 have been multiplied by the volumetric flowrate for the applicable process flues to produce the individual PIC emission rates that are summarized in the document *Air Emissions Estimation of Products of Incomplete Combustion for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-05-007), which is included as Appendix F of this report.

8.5 Phase Allocation of Constituents of Potential Concern

For the purpose of the emissions analysis, the COPCs are partitioned to the vapor phase, particle phase, or particle-bound phase. Vapor-phase emissions are those emitted as volatile gases. Particle-phase emissions are particulate constituents (generally metals or other inorganics). Particle-bound emissions are volatile or semivolatile constituents that are bound to other particles. Throughout the flowsheet, particle-bound constituents are treated as both vapor and particulate constituents. Amount of the constituent in each phase is determined by the F_v value.

The phase type for each COPC is determined based on a partitioning factor, *Fv,* as provided in the methodology published in the draft *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 2005). The *Fv* is defined as follows:

$$Fv = 1 - \frac{cS_t}{p_l + cS_t}$$

where:

c is Junge constant [1.7×10^{-04} atmospheres-centimeter (atm-cm)]

p_l is liquid phase vapor pressure of compound (atm)

S_t is Whitby's average surface area of particles (3.5×10^{-06} cm^2/cm^3 air)

As shown in the above equation, as the vapor pressure increases, the *Fv* would approach 1. The following criteria (EPA 2005) are used to aid the determination of phase types:

- *Fv* is less than 0.05: the compound is particle phase
- *Fv* is equal to 1.0: the compound is vapor phase
- *Fv* is less than 1.0 but greater than or equal to 0.05: the compound is particle-bound phase and is treated as both vapor and particle. For example, an *Fv* value of 0.95 indicates that the constituent is 95% vapor and 5% particle. For an *Fv* value of 0.10, 10% of the constituent is vapor and 90% is particle.

For the WTP emissions analysis, the COPCs were evaluated for *Fv* at ambient conditions (25 °C, atmospheric pressure). Where available, the *Fv* values for individual COPCs were taken directly from the EPA guidance document titled *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 2005). *Fv* values for the remaining COPCs were estimated using the equation defining *Fv* (shown above) and liquid-phase vapor pressure data collected for the individual COPCs. Tables 2, 3 and 4 provide the phase types for organic, inorganic, and radionuclide COPCs, respectively. The methodology used to establish constituent phase is summarized in "Update 2: Vapor Phase Partitioning Coefficients" (CCN 129507). This document is included as Appendix G of this report and lists the *Fv* values for each COPC, including the vapor pressure data used for the estimates.

8.6 Equipment Decontamination Factors

For the emission analysis, DFs are used to predict the removal of COPCs by the offgas treatment systems. As shown in the following equation, the DF is a function of removal efficiency (η).

$$DF = \frac{1}{1-\eta}$$

The equipment DFs are established based on the following information sources:

- Available experimental or treatability study data
- Available engineering calculations on DFs
- Offgas phase allocation of COPCs (see Section 8.5)
- Vendor literature

The SSFM has DFs for unit operations based on nominal operating conditions. These DFs provide the best realistic performance to be expected from the unit operations. For emissions purposes, the design basis DFs were used. These DFs are sometimes lower (and more conservative) than the DFs expected to ensure that the profile obtained is bounding. The DFs per facility are described in the following sections.

8.6.1 Pretreatment Vessel Vents and Offgas Treatment Systems

The unabated quantities of organic, inorganic, and radionuclide constituents in the pretreatment facility offgas streams are estimated as described in Section 7.2.1. Entrainment factors are used in determining the inorganic and radionuclide quantities in the vessel vent and RFD/PJM exhausts. Henry's Law constants are used in determining the quantity of organic compounds from the vessel vents and

evaporators. Inorganic and radionuclide constituents' emissions from the evaporator overheads are determined from equipment DFs based on similar operating evaporators in the Hanford Site and on R&T test results.

Table 10 shows the vessel vent entrainment factors used to calculate the unabated emission rates for the inorganic and radionuclide constituents. Table 2 includes the Henry's Law constants used to determine unabated emissions for the organic constituents using vapor-liquid equilibrium. Table 11 shows the evaporator DFs used to determine emission rates from the unit for unabated inorganic and radionuclide constituents.

The emission control equipment DFs for the PVP and PJV systems are based primarily on vendor information. Table 12 presents the offgas treatment DFs and basis for the inorganic and radionuclide constituents. Table 13 provides the organic DFs for the pretreatment offgas treatment equipment. The methodology used to estimate the DFs for each organic constituent in the PVP system's thermal oxidizer and carbon bed adsorbers is presented in Appendix H. Removal efficiency for each constituent through the thermal oxidizer was based on the difference between the thermal oxidizer operating temperature and the constituents' auto-ignition temperature. The carbon bed removal efficiency for each constituent was based on the constituent's molecular weight.

8.6.2 LAW and HLW Melter Offgas Treatment Systems

The principal components of the melter offgas stream are air and water vapor. Secondary components of the melter offgas stream are acid gases and aerosols. Water in the melter feed is vaporized to steam. Acid gases are generated from the decomposition of salts and organic compounds in the feed. Aerosols are present due to cold-cap solids being entrained in the offgas stream. The HLW melter offgas is expected to contain less acid gases than LAW melter offgas. However, the HLW melter offgas will contain higher concentrations of radionuclides than the LAW melter offgas.

All the DFs used for this emissions analysis are based on actual R&T testing results, vendor information, and engineering calculations. The DFs used for emissions analysis in the vitrification plants are presented in Tables 14 and 15 (LAW and HLW respectively) for inorganic and radionuclide constituents. Table 16 shows the removal efficiencies expected for the organic constituents within the vitrification plants.

9 Summary of Emissions Analysis Results

This section provides the results from this evaluation.

9.1 WTP Baseline Air Emissions Results

The SSFM output identifies the emission rates for the 125 analyzed organic, inorganic, and radionuclide constituents, and criteria pollutants. This output is provided in Appendix A for the modeled constituents. As discussed in Section 5, representative compounds are used to estimate emission rates for compounds not analyzed within the SSFM. Tables 17 through 19 present the estimated emissions for each of the organic, inorganic, and radionuclide COPCs, respectively. The emission rates at the stack are referred to as abated emissions. In addition to stack emission rates, the SSFM produces output for unabated (or uncontrolled) emission points that correspond to the stack emission rates. The SSFM streams that are summarized in Tables 17 through 19 include the following.

Feed streams

- Feed from tank farms to HLW feed receipt (FRP14)
- Feed from tank farms to LAW feed receipt (FRP01)

Abated emissions

- The abated pretreatment vessel vent (stream PVP12)
- The abated pretreatment RFD/PJM vent (stream PJV11)
- The LAW process offgas and vessel vent (stream LVP18)
- The HLW process offgas and vessel vent (stream HOP31)
- The HLW RFD/PJM vent (stream PJV34)

Unabated emissions

- The unabated pretreatment vessel vent (stream before PVP01)
- The unabated pretreatment RFD/PJM (stream PJV04)
- LAW melter feed (stream LFP04 – for inorganic and radionuclide constituents only)
- The unabated LAW melter offgas (stream LMP06)
- The unabated LAW vessel vent (stream LVP01 – for inorganic and radionuclide constituents only)
- HLW melter feed (stream HFP03 – for inorganic and radionuclide constituents only)
- The unabated HLW melter offgas (stream HMP06)
- The unabated HLW vessel vent (stream HOP10 – for inorganic and radionuclide constituents only)
- The unabated HLW RFD/PJM (stream PJV32)

All of the values in Tables 17 and 18 are listed in grams per second. Table 19 values are presented in curies per year. The PIC emission rate estimates are presented in Table 20. Rates are shown in units of grams per second and are provided for the pretreatment, HLW, and LAW process flues. If any of the values calculated were less than 1×10^{-15} grams per second or curies per year, they were considered to be zero. This threshold was selected because emission rates less than 1×10^{-15} are difficult to reliably detect or measure.

As expected, the pretreatment processes contribute the highest abated organic emission rates, and vitrification processes contribute the highest abated inorganic and radionuclide emission rates. The vitrification processes are the main contributors of Hg, NO_2 and SO_2 emissions. They are also the main contributors of ^{129}I, ^{3}H, ^{14}C, and ^{137}Cs.

Emission estimates have been prepared, as detailed in Tables 17, 18, 19, and 20, in accordance with current comprehension of waste feed materials, normal process operations, and treatment efficiencies. The emissions estimate has retained conservatism with respect to composition, treatment, and analysis to ensure safe operation and protection of human health and the environment.

9.2 Additional Hazardous Feed Organic COPCs Air Emissions

Based on the *Industrial Hygiene Chemical Vapor Technical Basis* (CHG 2004), 11 additional hazardous organic constituents not scoped by the WTP air permits, have been measured in Hanford tank headspaces. It is unknown if these 11 constituents will be present in the WTP waste feed; therefore, the WTP and regulatory agencies have not opted to include them in the air permits and environmental risk evaluations to date. To provide an initial evaluation of the air emission rates for these constituents, their rates are presented in Table 21. The input bases for the 11 additional hazardous feed organic COPCs are documented in CCN 128557, which is included as Appendix I of this report.

9.3 Baseline Air Emissions Comparison to Baseline Envelopes A/D, B/D, and C Expected Air Emissions

Baseline air emission estimates were calculated for Envelopes A/D, B/D, and C so that they could be compared to the baseline WTP air emissions developed in this report. Results for radionuclide and inorganic constituents are shown in Tables 22 and 23, respectively. Only the results from the modeled constituents are presented in the tables, as the same trends would be seen in the non-modeled constituents. A complete result of the organic constituents is not presented as their evaluation was done differently. The organic constituents are fed into the flowsheet on an mg/l basis; therefore, their introduction in the process is based on feed rates into the PTF. Therefore, total feed rates were compared to determine which would have the highest organic constituents feed rates. It should be noted that feed rate depends on many process variables with the main ones being feed characteristics, glass composition corresponding to the particular feed, and the glass production rate desired. The results are as follows:

- Air emissions total feed rate: 11.3 gpm
- Envelope A total feed rate: 9.6 gpm
- Envelope B total feed rate: 3.6 gpm
- Envelope C total feed rate: 4 gpm

The production rates targeted for all these scenarios were 50 MTG/d ILAW and 6 MTG/d IHLW so that the air emissions baseline was met to the extent possible. Envelope A reached both targeted production rates, but Envelopes B and C fell short for the HLW production rates. This is due to the nature of the feeds and lack of solids available in those feeds to meet the HLW targeted production rates.
Based on these results, the organic air emissions are conservatively bound by the air emissions case as it has the highest feed rate of all the cases.

For radionuclide constituents, feed concentrations used are the maximum allowed and therefore are expected to conservatively bound the radionuclide air emissions from the WTP process. This is clearly shown in Table 22, where all highest emission rates are attributed to the air emissions case.

Inorganic constituents are also conservatively bounded by the air emissions case as can be seen by the results shown in Table 23. The results show that ammonia is not bounded by the emissions case. In reality, it is expected that it will be, as the results for Envelopes A/D, B/D, and C do not include the updated ammonia slip requirements, which will significantly lower these numbers. Ammonia and nitric acid in the PTF are shown to be bounded by Envelopes A and B. These runs (A/D, B/D, and C) do not include an update to the rectifiers in the cesium ion exchange process system (CXP), which can result in an overestimate of the amount of ammonia and nitric acid in the PTF. This update was included in the air emissions case and is expected to represent the bounding rates for these constituents.

10 References

10.1 Project Documents

24590-101-TSA-W000-0004-125-00004, Rev 00A, *Test Summary: WTP Flowsheet Evaluation of Mercury-Containing Hanford Waste Simulant.*

24590-101-TSA-W000-0009-111-01, Rev 00B, *Final Report Integrated Off-Gas System Test on the DM1200 Melter with RPP-WTP LAW Sub-Envelope C1 Simulants.*

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24590-HLW-MKD-HOP-00019, Rev 3, *Mechanical Data Sheet, HLW Catalytic Oxidizer/Reducer.*

24590-HLW-MVD-HOP-00015, Rev 1, *Mechanical Data Sheet, Activated Carbon Adsorber.*

24590-LAW-MKC-LVP-00004, *LAW Melters Offgas Caustic Scrubbers (LVP-SCB-00001) Process Conditions and Requirements.*

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24590-LAW-MKD-LVP-00012, Rev 3, *Mechanical Data Sheet, LAW Catalytic Oxidizer/Reducer.*

24590-PTF-M0C-PVP-00001, Rev C, *Duty of Pretreatment Vessel Vent Thermal Oxidizer (PVP-OXID-00001).*

24590-WTP-M4C-FRP-00001, Rev D, *WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector.*

24590-WTP-M4C-FRP-00003, Rev D, *Integrated Emissions Baseline Report Non-Modeled Inorganic and Radionuclide Constituents Air Emission Rates Estimation.*

24590-WTP-M4C-FRP-00005, Rev C, *Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report.*

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24590-WTP-MDD-PR-01-003, Rev 7, *Steady-State Flowsheet (ACM) Model Design Document.*

24590-WTP-MRQ-PO-05-0044, Rev 0, *Evaluation of Air Emissions Feed Vector Scenarios.*

24590-WTP-MRR-PO-05-020, Rev 0, *Steady State Flowsheet (ACM) Baseline Envelopes A/D, B/D, and C Runs for Air Emissions Comparison.*

24590-WTP-MRR-PO-05-022, Rev 0, *Steady State Flowsheet (ACM), 2005 Air Emissions Profile.*

24590-WTP-QAM-QA-01-001, *Quality Assurance Manual.*

24590-WTP-RPT-ENS-03-006, Rev 0, *Environmental Risk Assessment Work Plan for the Hanford Tank Waste Treatment and Immobilization Plant.*

24590-WTP-RPT-ENV-01-004, Rev 1, *Best Available Radionuclide Control Technology Analysis for the WTP.*

24590-WTP-RPT-MGT-04-001, Rev 0, *Regulatory Data Quality Objectives Optimization Report.*

24590-WTP-RPT-PO-05-007, Rev 1, *Air Emissions Estimation of Products of Incomplete Combustion for the Hanford Tank Waste Treatment and Immobilization Plant.*

24590-WTP-RPT-PT-02-005, Rev 3, *Flowsheet Bases, Assumptions, and Requirements.*

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10.2 Codes and Standards

40 CFR 50. *National Primary and Secondary Ambient Air Quality Standards*, Code of Federal Regulations, as amended.

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10.3 Other Documents

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Table 1 List of Process Flow Diagrams

Facility	System	Process Flow Diagram Name	Drawing #	Rev #
Pretreatment	FRP	Waste Feed Receipt	24590-PTF-M5-V17T-00003	1
	FEP	Waste Feed Evaporation (Sheet 1 of 2)	24590-PTF-M5-V17T-00004001	1
	FEP	Waste Feed Evaporation (Sheet 2 of 2)	24590-PTF-M5-V17T-00004002	1
	TLP	Treated LAW Evaporation	24590-PTF-M5-V17T-00005	1
	TCP	Treated LAW Concentrate Storage	24590-PTF-M5-V17T-00006	1
	HLP	HLW Feed Receipt	24590-PTF-M5-V17T-00007	1
	HLP	HLW Lag Storage and Feed Blending	24590-PTF-M5-V17T-00008	2
	UFP	Ultrafiltration Feed Preparation	24590-PTF-M5-V17T-00009	1
	UFP	Ultrafiltration	24590-PTF-M5-V17T-00010	2
	UFP	Ultrafiltration Permeate Collection	24590-PTF-M5-V17T-00011	1
	CXP	Cesium Ion Exchange Process Vessels	24590-PTF-M5-V17T-00012	1
	CXP	Cesium Ion Exchange Process Columns	24590-PTF-M5-V17T-00013	1
	CNP	Cesium Nitric Acid Recovery Process	24590-PTF-M5-V17T-00014	1
	CRP	Cesium Resin Addition Process	24590-PTF-M5-V17T-00018	1
	RDP	Spent Resin Collection And Dewatering Process	24590-PTF-M5-V17T-00020	1
	PVP/PVV/PJV	Pretreatment Vessel Vents Process (PVP/PVV)	24590-PTF-M5-V17T-00021001	1
	PVP/PVV/PJV	Pretreatment RFD/PJM Exhaust (PJV)	24590-PTF-M5-V17T-00021002	1
	PVP/PVV/PJV	Pretreatment Vessel Passive Purge Air Inlets (PVP)	24590-PTF-M5-V17T-00021003	1
	PVP/PVV/PJV	Pretreatment Vessels Vent Exhaust Header (PVP)	24590-PTF-M5-V17T-00021004	1
	PWD	Pretreatment Effluent, Plant Wash and Disposal	24590-PTF-M5-V17T-00022001	2
	PWD	Pretreatment Plant Wash and Disposal	24590-PTF-M5-V17T-00022002	2
	PWD/RLD	Pretreatment Radioactive Liquid Disposal (RLD)	24590-PTF-M5-V17T-00022003	1
	PWD/RLD	Pretreatment Radioactive Liquid Disposal/Recycle (RLD)	24590-PTF-M5-V17T-00022004	1
	NAR	Pretreatment Process Reagents	24590-PTF-M5-V17T-00023001	1
	SHR/SNR	Pretreatment Process Reagents	24590-PTF-M5-V17T-00023002	1
	DIW	Pretreatment Process Reagents	24590-PTF-M5-V17T-00023003	1
	AFR/STR/SPR	Pretreatment Process Reagents	24590-PTF-M5-V17T-00023004	1
	CXP	Cesium Ion Exchange Process Collection Vessels	24590-PTF-M5-V17T-00025	0
LAW Vitrification	LCP/GFR/LFP	LAW Concentrate Receipt & Melter 1 Feed	24590-LAW-M5-V17T-00001	5
	LCP/GFR/LFP	LAW Concentrate Receipt & Melter 2 Feed	24590-LAW-M5-V17T-00002	5
	LMP/LOP	LAW Vitrification Melter 1	24590-LAW-M5-V17T-00004	4
	LMP/LOP	LAW Vitrification Melter 2	24590-LAW-M5-V17T-00005	4
	LOP	Melter 1 Primary Offgas Treatment	24590-LAW-M5-V17T-00007	4
	LOP	Melter 2 Primary Offgas Treatment	24590-LAW-M5-V17T-00008	4
	AMR/LVP	LAW Vitrification Ammonia & Secondary Offgas	24590-LAW-M5-V17T-00010	4
	LVP	LAW Vit Secondary Offgas Treatment	24590-LAW-M5-V17T-00011	4
	CDG	LAW Vitrification Container Decontamination	24590-LAW-M5-V17T-00013	3
	RLD	LAW Liquid Effluent	24590-LAW-M5-V17T-00014	4
	SHR	LAW Cold Chemical Supply	24590-LAW-M5-V17T-00016	4
HLW Vitrification	HCP/GFR/HFP	HLW Receipt & Feed Preparation	24590-HLW-M5-V17T-00001	5
	HMP/HOP	HLW Vitrification Melter 1	24590-HLW-M5-V17T-00002	5
	HOP	HLW Vit Melter 1 Primary Offgas Treatment	24590-HLW-M5-V17T-00003	5
	HOP	HLW Vitrification Melter 1 Secondary Offgas Treatment	24590-HLW-M5-V17T-00004	5
	PJV	HLW Vitrification Pulse Ventilation Treatment	24590-HLW-M5-V17T-00005	4
	HDH	HLW Vitrification HLW Canister Decon	24590-HLW-M5-V17T-00006	5
	RLD	HLW Vitrification Liquid Waste Effluent (Sheet 1)	24590-HLW-M5-V17T-00007001	5
	RLD	HLW Vitrification Liquid Waste Effluent (Sheet 2)	24590-HLW-M5-V17T-00007002	5
	NAR/SHR/AMR/AFR/DIW	HLW Vitrification Reagents	24590-HLW-M5-V17T-00008	5
	NLD	HLW C2 Drains Collection	24590-HLW-M5-V17T-00009	5
	HMP/HOP	HLW Vitrification Melter 2	24590-HLW-M5-V17T-20002	1
	HOP	HLW Vit Melter 2 Primary Offgas Treatment	24590-HLW-M5-V17T-20003	1
	HOP	HLW Vitrification Melter 2 Secondary Offgas Treatment	24590-HLW-M5-V17T-20004	1

Table 2 List of Organic COPCs and PICs

#	CAS Registry Number	Compound	Source	SSFM Indicator?	Henry's Law Constant (bar*m^3/kgmol)	Henry's Law-Based Grouping	Offgas Phase Type
1	100-00-5	p-Nitrochlorobenzene	Feed	-	4.83E-03	10	Vapor
2	100-21-0	p-Phthalic acid	Feed	Yes	3.83E-10	1	Vapor
3	100-41-4	Ethyl benzene	Feed	-	7.78E+00	20	Vapor
4	100-42-5	Styrene	Feed	-	2.71E+00	19	Vapor
5	10061-01-5	cis-1,3-Dichloropropene	Feed	Yes	2.67E+00	19	Vapor
6	10061-02-6	trans-1,3-Dichloropropene	Feed	-	8.60E-01	17	Vapor
7	101-55-3	4-Bromophenylphenyl ether	Feed	-	1.15E-01	14	Vapor
8	101-84-8	Diphenyl ether	Feed	Yes	2.75E-01	16	Vapor
9	106-35-4	3-Heptanone	Feed	-	8.96E-02	14	Vapor
10	106-42-3	p-Xylene (Dimethyl benzene)	Feed	-	6.81E+00	19	Vapor
11	106-46-7	1,4-Dichlorobenzene	Feed	-	2.38E+00	18	Vapor
12	106-88-7	1,2-Epoxybutane	Feed	-	1.78E-01	15	Vapor
13	106-93-4	Ethylene dibromide (1,2-Dibromoethane)	Feed	Yes	6.58E-01	16	Vapor
14	106-97-8	Butane	Feed	Yes	9.37E+02	26	Vapor
15	106-99-0	1,3-Butadiene	Feed	Yes	7.26E+01	23	Vapor
16	107-02-8	Acrolein	Feed	-	1.20E-01	14	Vapor
17	107-05-1	3-Chloropropene (Allyl chloride)	Feed	-	1.09E+01	20	Vapor
18	107-06-2	1,2-Dichloroethane (Ethylene chloride)	Feed	-	1.16E+00	17	Vapor
19	107-12-0	Propionitrile	Feed	-	3.65E-02	13	Vapor
20	107-13-1	Acrylonitrile	Feed	-	1.36E-01	14	Vapor
21	107-18-6	2-Propene-1-ol	Feed	-	4.92E-03	10	Vapor
22	107-31-3	Formic acid, methyl ester	Feed	-	2.20E-01	15	Vapor
23	107-66-4	Dibutylphosphate	Feed	-	4.20E-06	5	Particle-bound
24	107-87-9	2-Pentanone	Feed	-	8.25E-02	14	Vapor
25	108-03-2	1-Nitropropane	Feed	-	8.59E-02	14	Vapor
26	108-05-4	Vinyl acetate	Feed	-	5.04E-01	16	Vapor
27	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	Feed	-	1.36E-01	14	Vapor
28	108-20-3	Bis(isopropyl)ether	Feed	-	2.25E+00	18	Vapor
29	108-38-3	m-Xylene (Dimethyl benzene)	Feed	-	7.09E+00	19	Vapor
30	108-39-4	m-Cresol	Feed	-	8.45E-04	9	Vapor
31	108-87-2	Methylcyclohexane	Feed	Yes	4.24E+02	25	Vapor
32	108-88-3	Toluene	Feed	Yes	6.55E+00	19	Vapor
33	108-90-7	Chlorobenzene	Feed	-	3.07E+00	19	Vapor
34	108-93-0	Cyclohexanol	Feed	-	4.34E-03	10	Vapor
35	108-94-1	Cyclohexanone	Feed	-	8.88E-03	11	Vapor
36	108-95-2	Phenol	Feed	Yes	3.29E-04	8	Vapor
37	109-66-0	n-Pentane	Feed	-	1.23E+03	26	Vapor
38	109-99-9	Tetrahydrofuran	Feed	-	6.96E-02	13	Vapor

Table 2 List of Organic COPCs and PICs

#	CAS Registry Number	Compound	Source	SSFM Indicator?	Henry's Law Constant (bar*m^3/kgmol)	Henry's Law-Based Grouping	Offgas Phase Type
39	110-12-3	5-Methyl-2-hexanone	Feed	-	1.58E-01	15	Vapor
40	110-43-0	2-Heptanone	Feed	-	1.67E-01	15	Vapor
41	110-54-3	n-Hexane	Feed	Yes	1.78E+03	27	Vapor
42	110-62-3	n-Valeraldehyde	Feed	-	1.45E-01	15	Vapor
43	110-82-7	Cyclohexane	Feed	Yes	1.48E+02	24	Vapor
44	110-83-8	Cyclohexene	Feed	-	4.49E+01	22	Vapor
45	110-86-1	Pyridine	Feed	-	1.09E-02	11	Vapor
46	111-65-9	n-Octane	Feed	-	3.17E+03	28	Vapor
47	111-76-2	Ethylene glycol monobutyl ether	Feed	-	1.58E-03	9	Vapor
48	111-84-2	n-Nonane	Feed	Yes	3.36E+03	28	Vapor
49	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	Feed	-	2.66E-04	30	Particle-bound
50	117-84-0	n-Dioctyl phthalate	Feed	-	2.54E-03	32	Particle-bound
51	120-12-7	Anthracene	Feed	Yes	5.49E-02	13	Particle-bound
52	120-82-1	1,2,4-Trichlorobenzene	Feed	Yes	1.40E+00	17	Vapor
53	120-83-2	2,4-Dichlorophenol	Feed	-	5.44E-03	10	Vapor
54	121-44-8	Triethylamine	Feed	-	1.47E-01	15	Vapor
55	121-69-7	Dimethylaniline	Feed	-	5.61E-02	13	Vapor
56	122-39-4	N,N-Diphenylamine	Feed	Yes	3.35E-03	10	Vapor
57	123-19-3	4-Heptanone	Feed	-	5.42E-02	13	Vapor
58	123-38-6	n-Propionaldehyde	Feed	-	7.24E-02	14	Vapor
59	123-51-3	3-Methyl-1-butanol	Feed	-	1.39E-02	12	Vapor
60	123-86-4	Acetic acid n-butyl ester	Feed	-	2.77E-01	16	Vapor
61	123-91-1	1,4-Dioxane	Feed	-	4.74E-03	10	Vapor
62	126-73-8	Tributyl phosphate	Feed	Yes	1.48E-04	7	Particle-bound
63	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	Feed	-	2.44E-01	16	Vapor
64	127-18-4	Perchloroethylene (tetrachloroethylene)	Feed	Yes	1.75E+01	21	Vapor
65	127-19-5	N,N-Dimethylacetamide	Feed	-	1.29E-05	5	Vapor
66	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	Feed	-	4.07E-03	32	Vapor
67	129-00-0	Pyrene	Feed	Yes	1.17E-02	33	Particle-bound
68	1321-64-8	Pentachloronaphthalene	Feed	Yes	1.16E-01	14	Particle-bound
69	1321-65-9	Trichloronaphthalene	Feed	-	2.11E-01	15	Particle-bound
70	132-64-9	Dibenzofuran	Feed	Yes	2.10E-01	15	Particle-bound
71	1335-87-1	Hexachloronaphthalene	Feed	-	8.59E-02	14	Particle-bound
72	1335-88-2	Tetrachloronaphthalene	Feed	-	1.57E-01	15	Particle-bound
73	1336-36-3	Polychlorinated biphenyls (PCBs)	Feed	Yes	4.10E-01	35	Vapor
74	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	Feed	-	1.32E-01	14	Vapor
75	141-79-7	4-Methyl-3-penten-2-one	Feed	-	3.62E-02	13	Vapor
76	142-82-5	n-Heptane	Feed	-	1.97E+03	27	Vapor

Table 2 List of Organic COPCs and PICs

#	CAS Registry Number	Compound	Source	SSFM Indicator?	Henry's Law Constant (bar*m^3/kgmol)	Henry's Law-Based Grouping	Offgas Phase Type
77	144-62-7	Oxalic acid	Feed	Yes	1.41E-07	3	Vapor
78	156-60-5	trans-1,2-Dichloroethylene	Feed	-	9.26E+00	20	Vapor
79	1634-04-4	Methyl tert-butyl ether	Feed	-	5.79E-01	16	Vapor
80	189-55-9	Dibenzo[a,i]pyrene	Feed	-	1.39E-05	5	Particle
81	189-64-0	Dibenzo[a,h]pyrene	Feed	-	1.39E-05	5	Particle
82	191-24-2	Benzo(g,h,i)perylene	Feed	-	3.27E-04	30	Particle-bound
83	191-30-0	Benzo[a,i]pyrene	Feed	-	1.39E-05	5	Particle
84	192-65-4	Dibenzo[a,e]pyrene	Feed	-	1.39E-05	5	Particle
85	193-39-5	Indeno(1,2,3-cd)pyrene	Feed	Yes	3.43E-04	30	Particle
86	206-44-0	Fluoranthene	Feed	Yes	8.74E-03	33	Particle-bound
87	208-96-8	Acenaphthylene	Feed	Yes	1.13E-01	14	Vapor
88	2234-13-1	Octachloronaphthalene	Feed	-	1.01E-01	14	Particle-bound
89	224-42-0	Dibenz[a,j]acridine	Feed	-	1.88E-06	4	Particle-bound
90	226-36-8	Dibenz[a,h]acridine	Feed	-	1.88E-06	4	Particle-bound
91	25551-13-7	Trimethyl benzene	Feed	-	7.15E+00	19	Vapor
92	26140-60-3	Terphenyls	Feed	Yes	3.14E-02	34	Particle-bound
93	27154-33-2	Trichlorofluoroethane	Feed	-	1.23E+02	23	Vapor
94	287-92-3	Cyclopentane	Feed	-	1.86E+02	24	Vapor
95	31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	Feed	-	2.84E-01	35	Particle-bound
96	32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	Feed	-	9.28E-03	33	Particle-bound
97	32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	Feed	-	8.14E-01	17	Particle-bound
98	32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	Feed	-	6.76E-02	34	Particle-bound
99	35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	Feed	-	9.87E-03	33	Particle-bound
100	35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	Feed	-	8.88E-03	33	Particle-bound
101	3697-24-3	5-Methylchrysene	Feed	Yes	5.46E-03	32	Particle-bound
102	3825-26-1	Ammonium perfluorooctanoate	Feed	-	9.87E-02	14	Vapor
103	38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	Feed	-	9.55E-03	14	Particle-bound
104	39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	Feed	-	3.82E-01	33	Particle-bound
105	4170-30-3	2-Butenaldehyde (2-Butenal)	Feed	Yes	9.55E-03	11	Vapor
106	50-00-0	Formaldehyde	Feed	-	3.33E-04	8	Vapor
107	50-32-8	Benzo(a)pyrene	Feed	Yes	4.51E-04	30	Particle-bound
108	52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	Feed	-	6.76E-02	34	Particle-bound
109	53-70-3	Dibenzo(a,h)anthracene	Feed	-	1.21E-04	7	Particle-bound
110	540-59-0	1,2-Dichloroethylene	Feed	-	4.03E+00	19	Vapor
111	540-84-1	2,2,4-Trimethylpentane	Feed	-	3.00E+03	28	Vapor
112	541-73-1	1,3-Dichlorobenzene	Feed	-	2.60E+00	19	Vapor
113	56-23-5	Carbon tetrachloride	Feed	Yes	2.72E+01	22	Vapor
114	563-80-4	3-Methyl-2-butanone	Feed	-	9.60E-02	14	Vapor

Table 2 List of Organic COPCs and PICs

#	CAS Registry Number	Compound	Source	SSFM Indicator?	Henry's Law Constant (bar*m^3/kgmol)	Henry's Law-Based Grouping	Offgas Phase Type
115	56-49-5	3-Methylcholanthrene	Feed	-	2.97E+03	28	Particle-bound
116	57-14-7	1,1-Dimethylhydrazine	Feed	Yes	1.23E-02	12	Vapor
117	57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	Feed	-	2.84E-01	15	Particle-bound
118	58-90-2	2,3,4,6-Tetrachlorophenol	Feed	Yes	8.72E-03	11	Vapor
119	591-78-6	2-Hexanone	Feed	-	9.20E-02	14	Vapor
120	59-50-7	4-Chloro-3-methylphenol	Feed	-	2.42E-03	32	Vapor
121	59-89-2	N-Nitrosomorpholine	Feed	Yes	2.42E-05	6	Vapor
122	602-87-9	5-Nitroacenaphthene	Feed	-	1.10E-03	9	Particle-bound
123	60-29-7	Ethyl ether	Feed	-	1.21E+00	17	Vapor
124	603-34-9	Triphenylamine	Feed	Yes	5.34E-03	32	Vapor
125	60-34-4	Methylhydrazine	Feed	-	2.99E-03	10	Vapor
126	60-35-5	Acetamide	Feed	Yes	1.11E-05	5	Vapor
127	621-64-7	Di-n-Propylnitrosamine	Feed	Yes	5.31E-03	10	Vapor
128	624-83-9	Methyl isocyanate	Feed	-	9.14E-01	17	Vapor
129	627-13-4	Nitric acid, propyl ester	Feed	-	1.25E+00	17	Vapor
130	62-75-9	N-Nitroso-N,N-dimethylamine	Feed	Yes	1.80E-03	9	Vapor
131	630-20-6	1,1,1,2-Tetrachloroethane	Feed	-	2.39E+00	18	Vapor
132	64-17-5	Ethyl alcohol	Feed	-	4.93E-03	10	Vapor
133	64-18-6	Formic acid	Feed	-	1.65E-04	7	Vapor
134	64-19-7	Acetic acid	Feed	Yes	9.87E-05	6	Vapor
135	65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	Feed	-	2.84E-01	15	Particle-bound
136	67-56-1	Methyl alcohol (Methanol)	Feed	-	4.49E-03	10	Vapor
137	67-63-0	2-Propyl alcohol (Isopropanol)	Feed	-	7.99E-03	11	Vapor
138	67-64-1	2-Propanone (Acetone)	Feed	-	3.92E-02	13	Vapor
139	67-66-3	Chloroform	Feed	-	3.62E+00	19	Vapor
140	67-72-1	Hexachloroethane	Feed	-	3.84E+00	19	Vapor
141	684-16-2	Hexafluoroacetone	Feed	-	3.03E+00	19	Vapor
142	69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	Feed	-	6.76E-02	34	Particle-bound
143	70362-50-4	3,4,4',5-Tetrachlorobiphenyl	Feed	-	9.28E-03	33	Particle-bound
144	71-23-8	n-Propyl alcohol	Feed	-	7.31E-03	11	Vapor
145	71-36-3	n-Butyl alcohol	Feed	-	8.69E-03	11	Vapor
146	71-43-2	Benzene	Feed	Yes	5.48E+00	19	Vapor
147	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	Feed	-	1.70E+01	21	Vapor
148	74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	Feed	-	2.84E-01	15	Particle-bound
149	74-83-9	Bromomethane (Methyl bromide)	Feed	-	6.16E+00	19	Vapor
150	74-87-3	Chloromethane (Methyl chloride)	Feed	-	8.70E+00	20	Vapor
151	74-97-5	Bromochloromethane	Feed	-	1.44E+00	17	Vapor
152	74-99-7	Methylacetylene	Feed	-	1.09E+01	20	Vapor

Table 2 List of Organic COPCs and PICs

#	CAS Registry Number	Compound	Source	SSFM Indicator?	Henry's Law Constant (bar*m^3/kgmol)	Henry's Law-Based Grouping	Offgas Phase Type
153	75-00-3	Chloroethane	Feed	-	1.10E+01	20	Vapor
154	75-01-4	Vinyl chloride (1-Chloroethene)	Feed	-	2.74E+01	22	Vapor
155	75-05-8	Acetonitrile	Feed	Yes	3.40E-02	13	Vapor
156	75-07-0	Acetaldehyde	Feed	-	6.58E-02	13	Vapor
157	75-09-2	Dichloromethane (Methylene chloride)	Feed	-	3.21E+00	19	Vapor
158	75-12-7	Formamide	Feed	Yes	1.37E-06	4	Vapor
159	75-15-0	Carbon disulfide	Feed	-	1.42E+01	20	Vapor
160	75-21-8	Ethylene oxide (Oxirane)	Feed	-	1.46E-01	15	Vapor
161	75-27-4	Bromodichloromethane	Feed	-	2.09E+00	18	Vapor
162	75-34-3	1,1-Dichloroethane	Feed	-	5.55E+00	19	Vapor
163	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	Feed	-	2.58E+01	22	Vapor
164	75-43-4	Dichlorofluoromethane	Feed	-	1.07E+01	20	Vapor
165	75-45-6	Chlorodifluoromethane	Feed	-	4.01E+01	22	Vapor
166	75-50-3	Trimethylamine	Feed	-	1.03E-01	14	Vapor
167	75-52-5	Nitromethane	Feed	-	2.82E-02	13	Vapor
168	75-55-8	2-Methylaziridine	Feed	-	8.31E-03	11	Vapor
169	75-61-6	Difluorodibromomethane	Feed	-	3.04E+01	22	Vapor
170	75-63-8	Trifluorobromomethane	Feed	-	4.92E+02	25	Vapor
171	75-65-0	2-Methyl-2-propanol	Feed	-	8.93E-03	11	Vapor
172	75-69-4	Trichlorofluoromethane	Feed	-	9.57E+01	23	Vapor
173	75-71-8	Dichlorodifluoromethane	Feed	-	3.39E+02	25	Vapor
174	76-03-9	Trichloroacetic acid	Feed	-	1.33E-05	5	Vapor
175	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	Feed	-	1.45E+02	24	Vapor
176	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	Feed	-	1.12E+02	23	Vapor
177	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	Feed	-	5.19E+02	25	Vapor
178	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	Feed	-	2.76E+03	28	Vapor
179	76-15-3	Chloropentafluoroethane	Feed	Yes	5.51E+03	29	Vapor
180	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	Feed	-	9.65E-03	11	Vapor
181	78-87-5	1,2-Dichloropropane	Feed	-	2.78E+00	19	Vapor
182	78-92-2	1-Methylpropyl alcohol (2-Butanol)	Feed	-	8.94E-03	11	Vapor
183	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	Feed	-	5.62E-02	13	Vapor
184	79-00-5	1,1,2-Trichloroethane	Feed	-	8.13E-01	17	Vapor
185	79-01-6	Trichloroethylene	Feed	Yes	9.72E+00	20	Vapor
186	79-09-4	Propionic acid	Feed	-	4.39E-04	8	Vapor
187	79-10-7	2-Propenoic acid	Feed	-	3.65E-04	8	Vapor
188	79-20-9	Methyl acetate	Feed	-	1.13E-01	14	Vapor
189	79-34-5	1,1,2,2-Tetrachloroethane	Feed	-	3.62E-01	16	Vapor
190	83-32-9	Acenaphthene	Feed	Yes	1.82E-01	15	Vapor

Table 2 List of Organic COPCs and PICs

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191	84-66-2	Diethyl phthalate	Feed	Yes	6.02E-04	8	Vapor
192	84-74-2	Dibutyl phthalate	Feed	Yes	1.79E-03	31	Particle-bound
193	85-01-8	Phenanthrene	Feed	-	4.17E-02	13	Particle-bound
194	85-68-7	Butylbenzyl phthalate	Feed	-	1.24E-03	31	Particle-bound
195	86-73-7	Fluorene	Feed	-	9.49E-02	14	Vapor
196	87-68-3	Hexachlorobutadiene	Feed	Yes	1.02E+01	20	Vapor
197	88-06-2	2,4,6-Trichlorophenol	Feed	-	2.57E-03	10	Vapor
198	88-72-2	2-Nitrotoluene	Feed	-	1.23E-02	12	Vapor
199	88-75-5	2-Nitrophenol	Feed	-	1.26E-02	12	Vapor
200	88-89-1	Picric acid	Feed	Yes	1.68E-08	2	Particle-bound
201	91-20-3	Naphthalene	Feed	Yes	4.34E-01	16	Vapor
202	91-22-5	Quinoline	Feed	-	1.65E-03	9	Vapor
203	91-58-7	2-Chloronapthalene	Feed	-	3.16E-01	16	Vapor
204	92-52-4	1,1`-Biphenyl	Feed	-	3.04E-01	16	Vapor
205	92-93-3	4-Nitrobiphenyl	Feed	-	3.49E-03	10	Particle-bound
206	95-13-6	Indene	Feed	-	1.57E+00	18	Vapor
207	95-47-6	o-Xylene	Feed	-	5.11E+00	19	Vapor
208	95-48-7	o-Cresol (2-Methylphenol)	Feed	-	1.18E-03	9	Vapor
209	95-49-8	2-Chlorotoluene	Feed	-	3.52E+00	19	Vapor
210	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	Feed	Yes	1.89E+00	18	Vapor
211	95-57-8	2-Chlorophenol	Feed	-	1.11E-02	11	Vapor
212	95-95-4	2,4,5-Trichlorophenol	Feed	-	1.60E-03	9	Vapor
213	96-22-0	3-Pentanone	Feed	-	8.76E-02	14	Vapor
214	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	Feed	-	2.83E+00	19	Vapor
215	98-51-1	p-tert-Butyltoluene	Feed	-	1.51E+01	21	Vapor
216	98-82-8	Cumene	Feed	-	1.13E+01	20	Vapor
217	98-83-9	alpha-Methylstyrene	Feed	-	2.52E+00	19	Vapor
218	98-86-2	Acetophenone	Feed	Yes	1.03E-02	11	Vapor
219	98-95-3	Nitrobenzene	Feed	-	2.37E-02	12	Vapor
1	100-02-7	4-Nitrophenol	Pic	-	-	-	Particle-bound
2	100-25-4	1,4-Dinitrobenzene	Pic	-	-	-	Particle-bound
3	100-44-7	Benzyl chloride	Pic	-	-	-	Vapor
4	100-51-6	Benzyl alcohol	Pic	-	-	-	Vapor
5	100-52-7	Benzaldehyde	Pic	-	-	-	Vapor
6	101-77-9	4,4-Methylenedianiline	Pic	-	-	-	Vapor
7	103-33-3	Azobenzene	Pic	-	-	-	Vapor
8	103-65-1	n-Propyl benzene (Isocumene)	Pic	-	-	-	Vapor
9	104-51-8	n-Butylbenzene	Pic	-	-	-	Vapor

Table 2 List of Organic COPCs and PICs

#	CAS Registry Number	Compound	Source	SSFM Indicator?	Henry's Law Constant (bar*m^3/kgmol)	Henry's Law-Based Grouping	Offgas Phase Type
10	105-67-9	2,4-Dimethylphenol	Pic	-	-	-	Vapor
11	106-43-4	4-Chlorotoluene (p-Tolyl chloride)	Pic	-	-	-	Vapor
12	106-44-5	p-Cresol (4-Methyl phenol)	Pic	-	-	-	Vapor
13	106-47-8	p-Chloroaniline	Pic	-	-	-	Vapor
14	106-49-0	p-Toluidine	Pic	-	-	-	Vapor
15	106-51-4	Quinone	Pic	-	-	-	Vapor
16	106-89-8	EPichlorohydrin (1-chloro-2,3-epoxypropane)	Pic	-	-	-	Vapor
17	107-19-7	Propargyl alcohol	Pic	-	-	-	Vapor
18	107-21-1	Ethylene glycol	Pic	-	-	-	Vapor
19	107-98-2	Propylene gylcol monomethyl ether	Pic	-	-	-	Vapor
20	108-60-1	Dichloroisopropyl ether	Pic	-	-	-	Vapor
21	108-67-8	1,3,5-Trimethyl benzene	Pic	-	-	-	Vapor
22	108-86-1	Bromobenzene (Phenyl bromide)	Pic	-	-	-	Vapor
23	109-77-3	Malononitrile	Pic	-	-	-	Vapor
24	109-86-4	2-Methoxyethanol	Pic	-	-	-	Vapor
25	110-80-5	2-Ethoxyethanol	Pic	-	-	-	Vapor
26	111-15-9	Ethylene glycol monoethyl ether acetate	Pic	-	-	-	Vapor
27	111-44-4	Bis(2-chloroethyl) ether	Pic	-	-	-	Vapor
28	111-91-1	Bis(2-chloroethoxy)methane	Pic	-	-	-	Particle-bound
29	1120-71-4	1,3-Propane sultone	Pic	-	-	-	Vapor
30	118-74-1	Hexachlorobenzene	Pic	-	-	-	Vapor
31	119-90-4	3,3'-Dimethoxybenzidine (ortol-dianisidine)	Pic	-	-	-	Particle-bound
32	121-14-2	2,4-Dinitrotoluene	Pic	-	-	-	Particle-bound
33	122-66-7	1,2-Diphenylhydrazine	Pic	-	-	-	Vapor
34	123-33-1	Maleic hydrazide	Pic	-	-	-	Vapor
35	124-48-1	Chlorodibromomethane	Pic	-	-	-	Vapor
36	131-11-3	Dimethylphthalate	Pic	-	-	-	Vapor
37	131-89-5	2-Cyclohexyl-4,6-dinitrophenol	Pic	-	-	-	Particle-bound
38	133-06-2	Captan	Pic	-	-	-	Vapor
39	135-98-8	sec-Butylbenzene	Pic	-	-	-	Vapor
40	145-73-3	Endothall	Pic	-	-	-	Particle
41	156-59-2	cis-1,2-Dichloroethene	Pic	-	-	-	Vapor
42	1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	Pic	-	-	-	Particle-bound
43	192-97-2	Benzo(e)pyrene	Pic	-	-	-	Particle-bound
44	19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	Pic	-	-	-	Particle
45	205-82-3	Benzo(j)fluoranthene	Pic	-	-	-	Particle-bound
46	205-99-2	Benzo(b)fluoranthene	Pic	-	-	-	Particle-bound
47	207-08-9	Benzo(k)fluoranthene	Pic	-	-	-	Particle-bound

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#	CAS Registry Number	Compound	Source	SSFM Indicator?	Henry's Law Constant (bar*m^3/kgmol)	Henry's Law-Based Grouping	Offgas Phase Type
48	218-01-9	Chrysene	Pic	-	-	-	Particle-bound
49	23950-58-5	Pronamide	Pic	-	-	-	Particle-bound
50	25013-15-4	Methyl styrene (mixed isomers)	Pic	-	-	-	Vapor
51	319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	Pic	-	-	-	Vapor
52	319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	Pic	-	-	-	Particle-bound
53	3268-87-9	Octachlorodibenzo(p)dioxin	Pic	-	-	-	Particle
54	35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	Pic	-	-	-	Particle
55	39001-02-0	Octachlorodibenzofuran	Pic	-	-	-	Particle
56	39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	Pic	-	-	-	Particle
57	40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	Pic	-	-	-	Particle-bound
58	41851-50-7	Chlorocyclopentadiene	Pic	-	-	-	Vapor
59	460-19-5	Cyanogen	Pic	-	-	-	Vapor
60	506-68-3	Cyanogen bromide	Pic	-	-	-	Vapor
61	506-77-4	Cyanogen chloride	Pic	-	-	-	Vapor
62	510-15-6	Chlorobenzilate	Pic	-	-	-	Particle-bound
63	51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	Pic	-	-	-	Particle-bound
64	51-28-5	2,4-Dinitrophenol	Pic	-	-	-	Vapor
65	51-79-6	Ethyl Carbamate (urethane)	Pic	-	-	-	Vapor
66	528-29-0	o-Dinitrobenzene	Pic	-	-	-	Particle-bound
67	532-27-4	2-Chloroacetophenone	Pic	-	-	-	Vapor
68	534-52-1	4,6-Dinitro-o-cresol	Pic	-	-	-	Vapor
69	5385-75-1	Dibenzo(a,e)fluoranthene	Pic	-	-	-	Particle
70	540-73-8	1,2-Dimethylhydrazine	Pic	-	-	-	Vapor
71	542-75-6	1,3-Dichloropropene	Pic	-	-	-	Vapor
72	542-88-1	Dichloromethyl ether	Pic	-	-	-	Vapor
73	55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	Pic	-	-	-	Particle
74	56-55-3	Benzo(a)anthracene	Pic	-	-	-	Particle-bound
75	57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	Pic	-	-	-	Particle-bound
76	57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	Pic	-	-	-	Particle-bound
77	57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	Pic	-	-	-	Particle-bound
78	57-24-9	Strychnine	Pic	-	-	-	Particle
79	57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	Pic	-	-	-	Particle
80	57-74-9	Chlordane	Pic	-	-	-	Particle-bound
81	58-89-9	gamma-BHC (Lindane)	Pic	-	-	-	Vapor
82	584-84-9	2,4-Toluene diisocyante	Pic	-	-	-	Vapor
83	593-60-2	Bromoethene	Pic	-	-	-	Vapor
84	60-11-7	Dimethyl aminoazobenzene	Pic	-	-	-	Particle-bound
85	606-20-2	2,6-Dinitrotoluene	Pic	-	-	-	Vapor

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86	60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	Pic	-	-	-	Particle-bound
87	608-93-5	Pentachlorobenzene	Pic	-	-	-	Vapor
88	61626-71-9	Dichloropentadiene	Pic	-	-	-	Vapor
89	62-50-0	Ethyl methanesulfonate	Pic	-	-	-	Vapor
90	62-53-3	Aniline	Pic	-	-	-	Vapor
91	65-85-0	Benzoic acid	Pic	-	-	-	Vapor
92	67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	Pic	-	-	-	Particle
93	70-30-4	Hexachlorophene	Pic	-	-	-	Particle
94	70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	Pic	-	-	-	Particle-bound
95	72-43-5	Methoxychlor	Pic	-	-	-	Particle-bound
96	72-55-9	4,4'-DDE	Pic	-	-	-	Particle-bound
97	72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	Pic	-	-	-	Particle-bound
98	74-88-4	Iodomethane (Methyl iodide)	Pic	-	-	-	Vapor
99	74-95-3	Methylene bromide	Pic	-	-	-	Vapor
100	75-25-2	Bromoform	Pic	-	-	-	Vapor
101	75-29-6	2-Chloropropane	Pic	-	-	-	Vapor
102	75-44-5	Phosgene	Pic	-	-	-	Vapor
103	76-01-7	Pentachloroethane	Pic	-	-	-	Vapor
104	76-44-8	Heptachlor	Pic	-	-	-	Vapor
105	764-41-0	1,4-Dichloro-2-butene	Pic	-	-	-	Vapor
106	765-34-4	Glycidylaldehyde	Pic	-	-	-	Vapor
107	77-47-4	Hexachlorocyclopentadiene	Pic	-	-	-	Vapor
108	77-78-1	Dimethyl sulfate	Pic	-	-	-	Vapor
109	80-62-6	Methyl methacrylate	Pic	-	-	-	Vapor
110	82-68-8	Pentachloronitrobenzene (PCBN)	Pic	-	-	-	Vapor
111	822-06-0	Hexamethylene-1,5-diisocyanate	Pic	-	-	-	Vapor
112	823-40-5	Toluene-2,6-diamine	Pic	-	-	-	Vapor
113	85-44-9	Phthalic anhydride	Pic	-	-	-	Vapor
114	87-61-6	1,2,3-Trichlorobenzene	Pic	-	-	-	Vapor
115	87-86-5	Pentachlorophenol	Pic	-	-	-	Particle-bound
116	88-74-4	o-Nitroaniline (2-Nitroaniline)	Pic	-	-	-	Vapor
117	90-04-0	o-Anisidine	Pic	-	-	-	Vapor
118	91-57-6	2-Methylnaphthalene	Pic	-	-	-	Vapor
119	91-94-1	3,3'-Dichlorobenzidine	Pic	-	-	-	Particle-bound
120	924-16-3	N-Nitrosodi-n-butylamine	Pic	-	-	-	Vapor
121	94-59-7	Safrole	Pic	-	-	-	Vapor
122	94-75-7	2,4-D and esters (160C typed)	Pic	-	-	-	Particle-bound
123	95-53-4	o-Toluidine	Pic	-	-	-	Vapor

Table 2 List of Organic COPCs and PICs

#	CAS Registry Number	Compound	Source	SSFM Indicator?	Henry's Law Constant (bar*m^3/kgmol)	Henry's Law-Based Grouping	Offgas Phase Type
124	95-63-6	1,2,4-Trimethyl benzene	Pic	-	-	-	Vapor
125	95-94-3	1,2,4,5-Tetrachlorobenzene	Pic	-	-	-	Vapor
126	96-12-8	1,2-Dibromo-3-chloropropane	Pic	-	-	-	Vapor
127	96-18-4	1,2,3-Trichloropropane	Pic	-	-	-	Vapor
128	96-45-7	Ethylene thiourea	Pic	-	-	-	Vapor
129	97-63-2	Ethyl methacrylate	Pic	-	-	-	Vapor
130	98-01-1	Furfural	Pic	-	-	-	Vapor
131	98-06-6	tert-Butyl benzene	Pic	-	-	-	Vapor
132	98-07-7	Benzotrichloride	Pic	-	-	-	Vapor
133	99-35-4	1,3,5-Trinitrobenzene	Pic	-	-	-	Particle-bound
134	99-65-0	1,3-Dinitrobenzene	Pic	-	-	-	Vapor
135	99-87-6	p-Cymene	Pic	-	-	-	Vapor

Table 3 List of Inorganic COPCs and Criteria Pollutants

CAS Registry Number	Constituent	Constituent Family	SSFM Indicator?	Phase
14265-44-2	Phosphate	Non-metals and Anions	Yes	Particle
14280-30-9	Hydroxide	Non-metals and Anions	Yes	Particle
14797-55-8	Nitrate	Non-metals and Anions	Yes	Particle
14797-65-0	Nitrite	Non-metals and Anions	Yes	Particle
14808-79-8	Sulfate	Non-metals and Anions	Yes	Particle
16887-00-6	Chloride	Non-metals and Anions	Yes	Particle
16984-48-8	Fluoride	Non-metals and Anions	Yes	Particle
18540-29-9	Chromium (hexavalent)	Metals	Yes	Particle
24959-67-9	Bromide	Non-metals and Anions	-	Particle
57-12-5	Cyanide	Non-metals and Anions	-	Vapor
63705-05-5	Total Sulfur	Non-metals and Anions	Yes	Particle
7429-90-5	Aluminum	Metals	Yes	Particle
7439-89-6	Iron	Metals	Yes	Particle
7439-92-1	Lead	Metals	Yes	Particle
7439-93-2	Lithium	Metals	Yes	Particle
7439-95-4	Magnesium	Metals	Yes	Particle
7439-96-5	Manganese	Metals	Yes	Particle
7439-97-6	Mercury	Metals	Yes	Vapor
7439-98-7	Molybdenum	Metals	-	Particle
7440-02-0	Nickel	Metals	Yes	Particle
7440-09-7	Potassium	Metals	Yes	Particle
7440-16-6	Rhodium	Metals	Yes	Particle
7440-21-3	Silicon	Metals	Yes	Particle
7440-22-4	Silver	Metals	Yes	Particle
7440-23-5	Sodium	Metals	Yes	Particle
7440-24-6	Strontium (total)	Metals	Yes	Particle
7440-25-7	Tantalum	Metals	-	Particle
7440-28-0	Thallium	Metals	-	Particle
7440-31-5	Tin	Metals	-	Particle
7440-33-7	Tungsten	Metals	-	Particle
7440-36-0	Antimony	Metals	-	Particle
7440-38-2	Arsenic	Metals	Yes	Particle
7440-39-3	Barium	Metals	Yes	Particle
7440-41-7	Beryllium	Metals	-	Particle
7440-42-8	Boron	Metals	Yes	Particle
7440-43-9	Cadmium	Metals	Yes	Particle
7440-48-4	Cobalt	Metals	-	Particle
7440-50-8	Copper	Metals	Yes	Particle
7440-61-1	Uranium	Metals	-	Particle
7440-62-2	Vanadium	Metals	-	Particle

Table 3 List of Inorganic COPCs and Criteria Pollutants

CAS Registry Number	Constituent	Constituent Family	SSFM Indicator?	Phase
7440-65-5	Yttrium	Metals	-	Particle
7440-66-6	Zinc	Metals	Yes	Particle
7440-67-7	Zirconium	Metals	Yes	Particle
7440-69-9	Bismuth	Metals	Yes	Particle
7440-70-2	Calcium	Metals	Yes	Particle
7553-56-2	Iodine (I2)	Non-metals and Anions	-	Vapor
7647-01-0	Hydrochloric Acid	Acid gas	Yes	Vapor
7664-39-3	Hydrofluoric Acid	Acid gas	Yes	Vapor
7664-41-7	Ammonia	Non-metals and Anions	Yes	Vapor
7723-14-0	Phosphorous	Non-metals and Anions	-	Particle
7782-49-2	Selenium	Metals	-	Particle
10028-15-6	Ozone	Criteria Pollutant	-	Vapor
10102-44-0	Nitrogen dioxide	Criteria Pollutant	Yes	Vapor
10102-43-9	Nitric oxide	Criteria Pollutant	Yes	Vapor
630-08-0	Carbon monoxide	Criteria Pollutant	Yes	Vapor
7446-09-5	Sulfur dioxide	Criteria Pollutant	Yes	Vapor
no cas #	particulate matter	Criteria Pollutant	-	Particle

Table 4 List of Radionuclide COPCs

CAS Registry Number	Constituent	SSFM Indicator?	Offgas Phase
10028-17-8	Tritium	Yes	Vapor
10045-97-3	Cesium-137	Yes	Particle
10098-91-6	Yttrium-90	-	Particle
10098-97-2	Strontium-90	Yes	Particle
10198-40-0	Cobalt-60	Yes	Particle
13966-29-5	Uranium-234	Yes	Particle
13967-48-1	Ruthenium-106	-	Particle
13967-70-9	Cesium-134	-	Particle
13968-55-3	Uranium-233	Yes	Particle
13981-15-2	Curium-244	Yes	Particle
13981-16-3	Plutonium-238	Yes	Particle
13981-37-8	Nickel-63	Yes	Particle
13981-97-0	Barium-137m	-	Particle
13982-10-0	Plutonium-242	Yes	Particle
13982-63-3	Radium-226	-	Particle
13982-70-2	Uranium-236	Yes	Particle
13994-20-2	Neptunium-237	Yes	Particle
14119-32-5	Plutonium-241	Yes	Particle
14119-33-6	Plutonium-240	Yes	Particle
14133-76-7	Technetium-99	Yes	Particle
14158-29-3	Uranium-232	-	Particle
14234-35-6	Antimony-125	Yes	Particle
14331-85-2	Protactinium-231	-	Particle
14336-70-0	Nickel-59	-	Particle
14391-16-3	Europium-155	Yes	Particle
14596-10-2	Americium-241	Yes	Particle
14683-23-9	Europium-152	Yes	Particle
14762-75-5	Carbon-14	Yes	Vapor
14952-40-0	Actinium-227	-	Particle
14993-75-0	Americium-243	Yes	Particle
15046-84-1	Iodine-129	Yes	Vapor
15117-48-3	Plutonium-239	Yes	Particle
15117-96-1	Uranium-235	Yes	Particle
15262-20-1	Radium-228	-	Particle
15510-73-3	Curium-242	-	Particle
15585-10-1	Europium-154	Yes	Particle
15594-54-4	Thorium-229	-	Particle
15715-94-3	Samarium-151	Yes	Particle
15751-77-6	Zirconium-93	-	Particle
15757-87-6	Curium-243	Yes	Particle
15832-50-5	Tin-126	Yes	Particle
7440-03-1	Niobium-93m	-	Particle
7440-29-1	Thorium-232	Yes	Particle
7440-61-1	Uranium-238	Yes	Particle
14336-66-4	Cadmium-113m	-	Particle
15758-45-9	Selenium-79	-	Particle

Table 5 Representative Compounds for Inorganics and Radionuclides

Radionuclide		Metals		Non-metals and Anions	
Unanalyzed Compound	Representative Compounds	Unanalyzed Compound	Representative Compounds	Unanalyzed Compound	Representative Compounds
Cs-134	Cs-137	Be	Zr	CN	PO_4
Ba-137m	Cs-137	Y	Sr-90	-	-
Ra-226	Zr	V	Bi	-	-
Ra-228	Zr	Ta	Zr	-	-
Ac-227	Zr	Mo	Bi	-	-
Y-90	Sr-90	W	Zr	-	-
Zr-93	Zr	Co	Co-60	-	-
Nb-93m	Zr	Tl	F	-	-
Ni-59	Ni-63	Sn	Sn-126	-	-
Ru-106	F	Sb	Sb-125	-	-
Cd-113m	Cd	Se	F	-	-
Se-79	F	U	U-234	-	-
Th-229	Th-232	-	-	-	-
Pa-231	Zr	-	-	-	-
U-232	U-233	-	-	-	-
Pu-242	Pu-241	-	-	-	-
Am-243	Am-241	-	-	-	-
Cm-242	Cm-243	-	-	-	-

Table 6 Estimated Organic Feed Concentrations

CAS #	COPC	Conc (mg/L)	In SSFM
100-00-5	p-Nitrochlorobenzene	40	No
100-21-0	p-Phthalic acid	60	Yes
100-41-4	Ethyl benzene	4	No
100-42-5	Styrene	4	No
10061-01-5	cis-1,3-Dichloropropene	4	Yes
10061-02-6	trans-1,3-Dichloropropene	4	No
101-55-3	4-Bromophenylphenyl ether	60	No
101-84-8	Diphenyl ether	10	Yes
106-35-4	3-Heptanone	4	No
106-42-3	p-Xylene (Dimethyl benzene)	10	No
106-46-7	1,4-Dichlorobenzene	4	No
106-88-7	1,2-Epoxybutane	10	No
106-93-4	Ethylene dibromide (Dibromethane)	4	Yes
106-97-8	Butane	10	Yes
106-99-0	1,3-Butadiene	4	Yes
107-02-8	Acrolein	10	No
107-05-1	3-Chloropropene (Allyl chloride)	4	No
107-06-2	1,2-Dichloroethane (Ethylene chloride)	4	No
107-12-0	Propionitrile	10	No
107-13-1	Acrylonitrile	20	No
107-18-6	2-Propene-1-ol	60	No
107-31-3	Formic acid, methyl ester	60	No
107-66-4	Dibutylphosphate	60	No
107-87-9	2-Pentanone	20	No
108-03-2	1-Nitropropane	60	No
108-05-4	Vinyl acetate	60	No
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	10	No
108-20-3	Bis(isopropyl)ether	10	No
108-38-3	m-Xylene (Dimethyl benzene)	10	No
108-39-4	m-Cresol	10	No
108-87-2	Methylcyclohexane	10	Yes
108-88-3	Toluene	4	Yes

Table 6 Estimated Organic Feed Concentrations

CAS #	COPC	Conc (mg/L)	In SSFM
108-90-7	Chlorobenzene	4	No
108-93-0	Cyclohexanol	10	No
108-94-1	Cyclohexanone	10	No
108-95-2	Phenol	60	Yes
109-66-0	n-Pentane	10	No
109-99-9	Tetrahydrofuran	4	No
110-12-3	5-Methyl-2-hexanone	4	No
110-43-0	2-Heptanone	4	No
110-54-3	n-Hexane	10	Yes
110-62-3	n-Valeraldehyde	60	No
110-82-7	Cyclohexane	10	Yes
110-83-8	Cyclohexene	4	No
110-86-1	Pyridine	20	No
111-65-9	n-Octane	10	No
111-76-2	Ethylene glycol monobutyl ether	60	No
111-84-2	n-Nonane	10	Yes
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	60	No
117-84-0	n-Dioctyl phthalate	60	No
120-12-7	Anthracene	60	Yes
120-82-1	1,2,4-Trichlorobenzene	10	Yes
120-83-2	2,4-Dichlorophenol	60	No
121-44-8	Triethylamine	10	No
121-69-7	Dimethylaniline	10	No
122-39-4	N,N-Diphenylamine	20	Yes
123-19-3	4-Heptanone	4	No
123-38-6	n-Propionaldehyde	20	No
123-51-3	3-Methyl-1-butanol	10	No
123-86-4	Acetic acid n-butyl ester	0.2	No
123-91-1	1,4-Dioxane	2	No
126-73-8	Tributyl phosphate	40	Yes
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	10	No
127-18-4	Perchloroethylene (tetrachloroethylene)	4	Yes

Table 6 Estimated Organic Feed Concentrations

CAS #	COPC	Conc (mg/L)	In SSFM
127-19-5	N,N-Dimethylacetamide	10	No
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	20	No
129-00-0	Pyrene	60	Yes
1321-64-8	Pentachloronaphthalene	60	Yes
1321-65-9	Trichloronaphthalene	60	No
132-64-9	Dibenzofuran	60	Yes
1335-87-1	Hexachloronaphthalene	60	No
1335-88-2	Tetrachloronaphthalene	60	No
1336-36-3	Polychlorinated biphenyls (PCBs)	0.4	Yes
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	0.2	No
141-79-7	4-Methyl-3-penten-2-one	60	No
142-82-5	n-Heptane	10	No
144-62-7	Oxalic acid	3,000	Yes
156-60-5	trans-1,2-Dichloroethylene	10	No
1634-04-4	Methyl tert-butyl ether	10	No
189-55-9	Dibenzo[a,i]pyrene	60	No
189-64-0	Dibenzo[a,h]pyrene	60	No
191-24-2	Benzo(g,h,i)perylene	60	No
191-30-0	Benzo[a,i]pyrene	60	No
192-65-4	Dibenzo[a,e]pyrene	60	No
193-39-5	Indeno(1,2,3-cd)pyrene	60	Yes
206-44-0	Fluoranthene	60	Yes
208-96-8	Acenaphthylene	60	Yes
2234-13-1	Octachloronaphthalene	0.2	No
224-42-0	Dibenz[a,j]acridine	60	No
226-36-8	Dibenz[a,h]acridine	60	No
2551-13-7	Trimethyl benzene	10	No
26140-60-3	Terphenyls	60	Yes
27154-33-2	Trichlorofluoroethane	10	No
287-92-3	Cyclopentane	10	No
3697-24-3	5-Methylchrysene	60	Yes
3825-26-1	Ammonium perfluorooctanoate	60	No

Table 6 Estimated Organic Feed Concentrations

CAS #	COPC	Conc (mg/L)	In SSFM
4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	10	Yes
50-00-0	Formaldehyde	10	No
50-32-8	Benzo(a)pyrene	38	Yes
53-70-3	Dibenzo(a,h)anthracene	38	No
540-59-0	1,2-Dichloroethylene	10	No
540-84-1	2,2,4-Trimethylpentane	10	No
541-73-1	1,3-Dichlorobenzene	4	No
56-23-5	Carbon tetrachloride	4	Yes
563-80-4	3-Methyl-2-butanone	10	No
56-49-5	3-Methylcholanthrene	60	No
57-14-7	1,1-Dimethylhydrazine	60	Yes
58-90-2	2,3,4,6-Tetrachlorophenol	60	Yes
591-78-6	2-Hexanone	10	No
59-50-7	4-Chloro-3-methylphenol	60	No
59-89-2	N-Nitrosomorpholine	60	Yes
602-87-9	5-Nitroacenaphthene	60	No
60-29-7	Ethyl ether	60	No
603-34-9	Triphenylamine	60	Yes
60-34-4	Methylhydrazine	10	No
60-35-5	Acetamide	10	Yes
621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	60	Yes
624-83-9	Methyl isocyanate	10	No
627-13-4	Nitric acid, propyl ester	5	No
62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	60	Yes
630-20-6	1,1,1,2-Tetrachloroethane	10	No
64-17-5	Ethyl alcohol	10	No
64-18-6	Formic acid	15,000	No
64-19-7	Acetic acid	21,704	Yes
67-56-1	Methyl alcohol (Methanol)	10	No
67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	2	No
67-64-1	2-Propanone (Acetone)	20	No
67-66-3	Chloroform	4	No

Table 6 Estimated Organic Feed Concentrations

CAS #	COPC	Conc (mg/L)	In SSFM
67-72-1	Hexachloroethane	60	No
684-16-2	Hexafluoroacetone	10	No
71-23-8	n-Propyl alcohol	4	No
71-36-3	n-Butyl alcohol	10	No
71-43-2	Benzene	4	Yes
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	4	No
74-83-9	Bromomethane (Methyl bromide)	4	No
74-87-3	Chloromethane (Methyl chloride)	4	No
74-97-5	Bromochloromethane	10	No
74-99-7	Methylacetylene	60	No
75-00-3	Chloroethane	4	No
75-01-4	Vinyl chloride (1-Chloroethene)	4	No
75-05-8	Acetonitrile	10	Yes
75-07-0	Acetaldehyde	60	No
75-09-2	Dichloromethane (Methylene chloride)	4	No
75-12-7	Formamide	60	Yes
75-15-0	Carbon disulfide	10	No
75-21-8	Ethylene oxide (Oxirane)	2	No
75-27-4	Bromodichloromethane	10	No
75-34-3	1,1-Dichloroethane	4	No
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	10	No
75-43-4	Dichlorofluoromethane	4	No
75-45-6	Chlorodifluoromethane	4	No
75-50-3	Trimethylamine	10	No
75-52-5	Nitromethane	60	No
75-55-8	2-Methylaziridine	60	No
75-61-6	Difluorodibromomethane	10	No
75-63-8	Trifluorobromomethane	10	No
75-65-0	2-Methyl-2-propanol	10	No
75-69-4	Trichlorofluoromethane	10	No
75-71-8	Dichlorodifluoromethane	10	No
76-03-9	Trichloroacetic acid	10	No

Table 6 Estimated Organic Feed Concentrations

CAS #	COPC	Conc (mg/L)	In SSFM
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	60	No
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	60	No
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	10	No
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	10	No
76-15-3	Chloropentafluoroethane	10	Yes
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	60	No
78-87-5	1,2-Dichloropropane	4	No
78-92-2	1-Methylpropyl alcohol (2-Butanol)	4	No
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	10	No
79-00-5	1,1,2-Trichloroethane	10	No
79-01-6	Trichloroethylene	10	Yes
79-09-4	Propionic acid	60	No
79-10-7	2-Propenoic acid	60	No
79-20-9	Methyl acetate	60	No
79-34-5	1,1,2,2-Tetrachloroethane	0.02	No
83-32-9	Acenaphthene	60	Yes
84-66-2	Diethyl phthalate	60	Yes
84-74-2	Dibutyl phthalate	60	Yes
85-01-8	Phenanthrene	60	No
85-68-7	Butylbenzyl phthalate	60	No
86-73-7	Fluorene	60	No
87-68-3	Hexachlorobutadiene	10	Yes
88-06-2	2,4,6-Trichlorophenol	60	No
88-72-2	2-Nitrotoluene	10	No
88-75-5	2-Nitrophenol	60	No
88-89-1	Picric acid	60	Yes
91-20-3	Naphthalene	2	Yes
91-22-5	Quinoline	60	No
91-58-7	2-Chloronapthalene	60	No
92-52-4	1,1`-Biphenyl	40	No
92-93-3	4-Nitrobiphenyl	60	No
95-13-6	Indene	60	No

Table 6 Estimated Organic Feed Concentrations

CAS #	COPC	Conc (mg/L)	In SSFM
95-47-6	o-Xylene	4	No
95-48-7	o-Cresol (2-Methylphenol)	10	No
95-49-8	2-Chlorotoluene	60	No
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	4	Yes
95-57-8	2-Chlorophenol	60	No
95-95-4	2,4,5-Trichlorophenol	60	No
96-22-0	3-Pentanone	20	No
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	60	No
98-51-1	p-tert-Butyltoluene	60	No
98-82-8	Cumene	60	No
98-83-9	alpha-Methylstyrene	10	No
98-86-2	Acetophenone	40	Yes
98-95-3	Nitrobenzene	40	No

Table 7 Estimated LAW Feed Characterization

LAW Chemical Analytes Emissions Feed Vector			
Analyte	**Kg**	**Analyte**	**Kg**
Ag	2.32E+01	Ni	2.91E+02
Al	7.02E+04	NO2	2.60E+05
As	7.09E+01	NO3	4.74E+05
B	1.70E+02	OH	2.92E+05
Ba	2.71E+01	Pb	2.76E+02
Be	3.81E+00	Pd	1.09E+01
Bi	4.86E+01	PO4	1.01E+04
Ca	5.38E+02	Pr	6.98E-02
Cd	4.12E+01	Rb	4.16E+00
Ce	6.36E+01	Rh	1.02E+01
Cl	1.48E+04	Ru	1.50E+01
CN	1.17E+01	Sb	4.20E+01
Co	2.04E+01	Se	7.19E+01
Cr	3.24E+03	Si	5.64E+02
Cu	2.30E+01	SO4	2.44E+04
F	3.18E+03	Sr	4.13E+00
Fe	5.27E+02	Ta	5.53E+00
Hg	7.62E+01	Te	1.14E-01
K	3.48E+04	Th	6.59E+01
La	1.40E+01	Ti	7.93E+00
Li	1.96E+01	Tl	5.06E+01
Mg	7.27E+01	U(total)	3.37E+02
Mn	1.78E+02	V	2.78E+01
Mo	1.68E+02	W	4.89E+01
Na	6.21E+05	Y	5.29E+00
Nd	8.32E+01	Zn	4.05E+01
NH3	3.25E+02	Zr	4.17E+01

Table 7 Estimated LAW Feed Characterization

LAW Radionuclide Emissions Feed Vector			
Analyte	Ci	Analyte	Ci
106Ru	8.6E+01	236U	7.76E-02
113mCd	1.33E+02	237Np	1.60E+00
125Sb	1.88E+03	238Pu	9.04E+00
126Sn	2.99E+01	238U	8.98E-01
129I	1.26E+00	239Pu	1.25E+02
134Cs	1.44E+03	240Pu	3.24E+01
137Cs	1.47E+07	241Am	2.02E-03
137mBa	4.78E+06	241Pu	6.80E+02
14C	4.13E+01	242Cm	7.69E+00
151Sm	2.64E+04	242Pu	3.43E-03
152Eu	1.52E+01	243Am	1.32E+00
154Eu	3.15E+03	243Cm	2.18E-01
155Eu	9.11E+02	244Cm	5.16E+00
226Ra	2.55E-04	3H	3.52E+02
227Ac	1.99E-02	59Ni	7.00E+01
228Ra	3.03E-01	60Co	2.71E+02
229Th	9.96E-03	63Ni	4.88E+03
231Pa	2.09E-01	79Se	3.37E+00
232Th	4.86E-02	90Sr	5.86E+05
232U	2.64E-02	90Y	2.74E+05
233U	1.62E+00	93mNb	1.20E+02
234U	1.15E+00	93Zr	1.95E+02
235U	4.53E-02	99Tc	5.20E+03

Table 8 Estimated HLW Feed Characterization

HLW Chemical Analytes Emissions Feed Vector			
Analyte	Kg	Analyte	Kg
Ag	2.74E+02	Ni	1.63E+03
Al	3.85E+04	NO2	1.56E+04
As	1.72E+01	NO3	1.20E+04
B	2.35E+02	OH	1.42E+05
Ba	2.51E+02	Pb	2.14E+03
Be	6.31E+00	Pd	8.77E+01
Bi	1.30E+03	PO4	9.49E+03
Ca	1.50E+03	Pr	8.65E+02
Cd	9.19E+02	Rb	3.72E+01
Ce	3.14E+02	Rh	2.80E+01
Cl	3.07E+02	Ru	1.96E+02
CN	4.98E+00	Sb	6.75E+00
Co	1.30E+01	Se	1.17E+01
Cr	7.78E+02	Si	3.00E+03
Cu	1.07E+02	SO4	3.53E+03
F	5.55E+03	Sr	1.41E+02
Fe	3.98E+04	Ta	4.35E+02
Hg	1.56E+02	Te	4.92E+01
K	7.88E+02	Th	4.77E+03
La	4.65E+02	Ti	5.66E+01
Li	3.26E+01	Tl	1.33E+03
Mg	3.08E+02	U(total)	6.99E+03
Mn	3.65E+03	V	1.12E+01
Mo	1.78E+01	W	8.52E+01
Na	6.18E+04	Y	4.74E+01
Nd	5.04E+02	Zn	1.42E+02
NH3	1.14E-01	Zr	9.71E+03

Table 8 Estimated HLW Feed Characterization

HLW Radionuclide Emissions Feed Vector			
Analyte	Ci	Analyte	Ci
106Ru	5.12E+02	236U	5.58E-01
113mCd	3.88E+02	237Np	1.20E+02
125Sb	5.19E+04	238Pu	5.68E+02
126Sn	2.43E+02	238U	9.56E+00
129I	4.71E-01	239Pu	5.03E+03
134Cs	1.23E+02	240Pu	1.33E+03
137Cs	2.43E+06	241Am	1.46E+05
137mBa	3.50E+05	241Pu	3.57E+04
14C	1.05E+01	242Cm	2.48E+01
151Sm	6.31E+05	242Pu	1.24E-01
152Eu	7.79E+02	243Am	1.18E+01
154Eu	8.44E+04	243Cm	2.05E+02
155Eu	1.25E+04	244Cm	4.66E+03
226Ra	5.16E-04	3H	1.05E+02
227Ac	2.02E+00	59Ni	3.01E+01
228Ra	1.48E+00	60Co	1.62E+04
229Th	5.53E-01	63Ni	2.81E+03
231Pa	1.70E-01	79Se	5.24E+00
232Th	3.97E+00	90Sr	1.62E+07
232U	2.26E+00	90Y	5.52E+06
233U	3.25E+02	93mNb	1.13E+02
234U	1.69E+01	93Zr	2.09E+02
235U	4.06E-01	99Tc	2.43E+04

Table 9 Summary of Assumed Stack Concentrations for PICs

CAS Registry Number	PIC Grouping or Individual Constituent	Assumed Stack Concentration [a] (ug/dscm)
Various	Volatile organic PICs (38 constituents)	2
Various	Semi-volatile PICs (72 constituents)[b]	15
Various	polycyclic aromatic PICs (8 constituents)	3
	dioxins/furans (17 constituents)	See below
1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	1.84E-05
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	1.56E-05
3268-87-9	Octachlorodibenzo(p)dioxin	7.82E-05
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	3.13E-05
39001-02-0	Octachlorodibenzofuran	2.92E-04
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05
40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	1.56E-05
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	1.24E-03
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.12E-04
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	1.61E-03
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	1.74E-03
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	7.89E-04
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	4.05E-04
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.31E-03
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	1.61E-03
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	3.55E-05

a Stack concentrations are based upon historical laboratory and pilot testing performed in support of the WTP.

b Except 4,6-Dinitro-o-cresol (534-52-1) which was detected in a VSL test (Envelope C1) at 295 µg/dscm.

Table 10 Pretreatment Process Vessel Vent Entrainment Factors

Vessel Vent Stream No.	Process Vessels	Vessel Split Liquid Fraction
FRP04	FRP-VSL-00002ABCD	4.73E-08
FEP04	FEP-VSL-00017AB	5.58E-07
FEP10	FEP-VSL-00005	7.00E-08
HLP07	HLP-VSL-00022	3.00E-07
HLP04	HLP-VSL-00027AB	2.25E-08
HLP04	HLP-VSL-00028	2.25E-08
UFP20	UFP-VSL-00001AB	4.49E-07
UFP11	UFP-VSL-00002AB	4.45E-07
UFP35	UFP-VSL-00062ABC	5.18E-07
CXP02	CXP-VSL-00001	9.00E-08
CXP02	CXP-VSL-00005	1.00E-06
CNP16	CNP-BRKPT-00002	1.00E-06
CNP16	CNP-VSL-00003	1.00E-06
CNP16	CNP-VSL-00004	3.00E-07
CRP07	CRP-VSL-00002	1.00E-06
CXP27	CXP-VSL-00026ABC	1.00E-06
RDP02	RDP-VSL-00002ABC	1.00E-06
TLP06	TLP-VSL-00009AB	1.00E-06
TLP11	TLP-VSL-00002	1.00E-06
TCP01	TCP-VSL-00001	1.00E-06
PWD03	PWD-VSL-00015	1.96E-08
PWD03	PWD-VSL-00016	1.96E-08
PWD09	PWD-VSL-00033	1.00E-06
PWD11	PWD-VSL-00043	1.65E-08
PWD07	PWD-VSL-00044	1.31E-09
RLD12	RLD-VSL-00017AB	1.00E-06
RLD02	RLD-TK-00006AB	1.00E-06

Table 11 Pretreatment Emissions Analysis Evaporators and Condensers Decontamination Factors

Inorganic Constituents[a]	FEP, CNP, TLP Evaporator		FEP, CNP, TLP Condenser	
	DF	Reference	DF	Reference
Silver	1.01E+03	1	5.31E+02	1
Aluminum	1.52E+03	1	6.50E+02	1
Arsenic	1.01E+03	1	6.50E+02	1
Boron	1.01E+03	1	5.65E+02	1
Barium	1.01E+03	1	4.96E+02	1
Bismuth	4.00E+03	1	2.79E+04	1
Calcium	1.00E+03	1	1.72E+01	1
Cadmium	2.21E+04	1	6.50E+02	1
Chloride	5.26E+02	1	7.70E+03	1
Chromium (hexavalent)	3.54E+04	1	5.32E+03	1
Copper	1.01E+03	1	5.31E+02	1
Flouride	2.43E+04	1	1.89E+03	1
Iron	1.01E+03	1	5.01E+02	1
Mercury	1.01E+03	1	6.49E+02	1
Potassium	3.54E+03	1	6.37E+02	1
Lithium	3.03E+04	1	6.26E+02	1
Magnesium	1.01E+03	1	2.86E+01	1
Manganese	1.01E+03	1	6.09E+02	1
Sodium	3.03E+04	1	6.26E+02	1
Nickel	2.95E+04	1	6.50E+02	1
Nitrite	2.43E+03	1	1.04E+04	1
Nitrate	5.77E+02	1	1.04E+04	1
Hydroxide	1.01E+03	1	6.50E+02	1
Phosphorous	1.01E+03	1	2.30E+02	1
Lead	4.00E+03	1	2.79E+04	1
Phosphate	1.01E+03	1	6.50E+02	1
Total Sulfur	1.01E+03	1	6.50E+02	1
Silicon	1.01E+03	1	2.30E+02	1
Sulfate	1.42E+03	1	4.21E+03	1
Strontium (total)	2.32E+05	1	1.17E+04	1
Zinc	1.01E+03	1	6.17E+02	1
Zirconium	1.01E+03	1	5.01E+02	1
Beryllium	1.01E+03	1	5.01E+02	1
Cyanide	1.01E+03	1	6.50E+02	1
Cobalt	1.01E+03	1	6.50E+02	1
Molybdenum	4.00E+03	1	2.79E+04	1
Rhodium	1.01E+03	1	5.01E+02	1
Antimony	4.00E+03	1	2.79E+04	1
Selenium	2.43E+04	1	1.89E+03	1
Tin	4.00E+03	1	2.79E+04	1
Tantalum	1.01E+03	1	5.01E+02	1
Thallium	2.43E+04	1	1.89E+03	1
Uranium	1.01E+03	1	6.50E+02	1
Vanadium	4.00E+03	1	2.79E+04	1
Tungsten	1.01E+03	1	5.01E+02	1
Yttrium	2.32E+05	1	1.17E+04	1
Hydrochloric Acid	1	1	1	1
Hydrofluoric Acid	1	1	1	1
Carbon monoxide	1	1	1	1
Carbon dioxide	1	1	1	1
Nitric oxide	1	1	1	1
Nitrogen dioxide	1	1	1	1
Sulfur dioxide	1	1	1	1
Ammonia/Ammonium	1.11	1	12.4	1

Table 11 Pretreatment Emissions Analysis Evaporators and Condensers Decontamination Factors

Radionuclide Constituents[b]	FEP, CNP, TLP Evaporator		FEP, CNP, TLP Condenser	
	DF	Reference	DF	Reference
Americium-241	1.41E+06	1	3.18E+03	1
Carbon-14	1.01E+03	1	6.50E+02	1
Cobalt-60	1.10E+03	1	6.50E+02	1
Curium-243	1.10E+03	1	6.50E+02	1
Curium-244	1.10E+03	1	6.50E+02	1
Cesium-137	9.36E+07	1	2.34E+04	1
Europium-152	1.41E+06	1	3.18E+03	1
Europium-154	1.41E+06	1	3.18E+03	1
Europium-155	1.41E+06	1	3.18E+03	1
Tritium	1	1	1	1
Iodine-129	4.33E+02	1	9.10E+02	1
Nickel-63	2.95E+04	1	6.50E+02	1
Neptunium-237	1.01E+03	1	6.50E+02	1
Plutonium-238	3.74E+06	1	3.12E+03	1
Plutonium-239	3.74E+06	1	3.12E+03	1
Plutonium-240	3.74E+06	1	3.12E+03	1
Plutonium-241	3.74E+06	1	3.12E+03	1
Antimony-125	4.00E+03	1	2.79E+04	1
Samarium-151	3.74E+06	1	3.12E+03	1
Tin-126	4.00E+03	1	2.79E+04	1
Strontium-90	2.32E+05	1	1.17E+04	1
Technetium-99	1.01E+03	1	6.50E+02	1
Thorium-232	1.01E+03	1	6.49E+02	1
Uranium-233	1.01E+03	1	6.49E+02	1
Uranium-234	1.01E+03	1	6.50E+02	1
Uranium-235	1.01E+03	1	6.50E+02	1
Uranium-236	1.01E+03	1	6.49E+02	1
Uranium-238	1.01E+03	1	6.49E+02	1
Yttrium-90	2.32E+05	1	1.17E+04	1
Ruthenium-106	2.43E+04	1	1.89E+03	1
Cesium-134	9.36E+07	1	2.34E+04	1
Barium-137m	9.36E+07	1	2.34E+04	1
Plutonium-242	3.74E+06	1	3.12E+03	1
Radium-226	1.01E+03	1	5.01E+02	1
Uranium-232	1.01E+03	1	6.49E+02	1
Protactinium-231	1.01E+03	1	5.01E+02	1
Nickel-59	2.95E+04	1	6.50E+02	1
Actinium-227	1.01E+03	1	5.01E+02	1
Americium-243	1.41E+06	1	3.18E+03	1
Radium-228	1.01E+03	1	5.01E+02	1
Curium-242	1.10E+03	1	6.50E+02	1
Thorium-229	1.01E+03	1	6.49E+02	1
Zirconium-93	1.01E+03	1	5.01E+02	1
Niobium-93m	1.01E+03	1	5.01E+02	1
Cadmium-113m	2.21E+04	1	6.50E+02	1
Selenium-79	2.43E+04	1	1.89E+03	1

Notes:

a Mercury in the pretreatment offgas is assumed to be in the vapor phase.

b ^{3}H and ^{14}C are assumed to have the same DF as water and CO_2, respectively; therefore, a DF of 1 has been specified for these constituents.

Reference:

1 Tables 2.2-1 and 2.2-2 from the *Flowsheet Bases, Assumptions, and Requirements*, 24590-WTP-RPT-PT-02-005.

Table 12 Pretreatment Emissions Analysis Equipment Decontamination Factors

Inorganic Constituents[a]	PVPCaustic Scrubber		PVP HEME		PVV and PJV Primary HEPA		PVV and PJV Secondary HEPA		PVP Thermal Oxidizer		PVP Carbon Bed Adsorber		PJV Demister	
	DF	Reference	DF	Reference	DF	Reference	DF	Reference	DF	Reference	DF	Reference	DF	Reference
Silver	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Aluminum	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Arsenic	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Boron	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Barium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Bismuth	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Calcium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Cadmium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Chloride	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Chromium (hexavalent)	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Copper	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Flouride	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Iron	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Mercury	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Potassium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Lithium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Magnesium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Manganese	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Sodium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Nickel	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Nitrite	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Nitrate	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Hydroxide	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Phosphorous	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Lead	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Phosphate	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Total Sulfur	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Silicon	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Sulfate	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Strontium (total)	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Zinc	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Zirconium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Beryllium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Cyanide	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Cobalt	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Molybdenum	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Rhodium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Antimony	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Selenium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Tin	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Tantalum	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Thallium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Uranium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Vanadium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Tungsten	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Yttrium	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Hydrochloric Acid	3	B	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Hydrofluoric Acid	3	B	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Carbon monoxide	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Carbon dioxide	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Nitric oxide	1.8	E	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Nitrogen dioxide	1.8	E	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Sulfur dioxide	3	B	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Ammonia/Ammonium	3	B	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A

Table 12 Pretreatment Emissions Analysis Equipment Decontamination Factors

Radionuclide Constituents[b]	PVP Caustic Scrubber		PVP HEME		PVV and PJV Primary HEPA		PVV and PJV Secondary HEPA		PVP Thermal Oxidizer		PVP Carbon Bed Adsorber		PJV Demister	
	DF	Reference	DF	Reference	DF	Reference	DF	Reference	DF	Reference	DF	Reference	DF	Reference
Americium-241	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Carbon-14	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Cobalt-60	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Curium-243	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Curium-244	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Cesium-137	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Europium-152	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Europium-154	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Europium-155	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Tritium	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Iodine-129	3.5	E	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A	1	N/A
Nickel-63	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Neptunium-237	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Plutonium-238	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Plutonium-239	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Plutonium-240	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Plutonium-241	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Antimony-125	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Samarium-151	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Tin-126	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Strontium-90	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Technetium-99	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Thorium-232	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Uranium-233	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Uranium-234	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Uranium-235	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Uranium-236	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Uranium-238	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Yttrium-90	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Ruthenium-106	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Cesium-134	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Barium-137m	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Plutonium-242	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Radium-226	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Uranium-232	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Protactinium-231	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Nickel-59	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Actinium-227	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Americium-243	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Radium-228	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Curium-242	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Thorium-229	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Zirconium-93	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Niobium-93m	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Cadmium-113m	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D
Selenium-79	3.5	E	200	A	2,000	C	100	C	1	N/A	1	N/A	5	D

Notes:

a Mercury in the pretreatment offgas is assumed to be in the vapor phase.

b ^{3}H and ^{14}C are assumed to have the same DF as water and CO_2, respectively; therefore, a DF of 1 has been specified for these constituents.

Reference:

A 24590-PTF-3YD-PVP-00001, *System Description for Pretreatment Vessel Vent Process System, PVP*, section 6.2.4 for HEME.

B Assumption.

C Based on the *Best Available Radionuclide Control Technology Analysis for the WTP*, 24590-WTP-RPT-ENV-01-004

D 24590-PTF-3YD-PJV-00001, *System Description for PTF Pulse Jet Ventilation System (PJV)*, section 7.2.

E From 24590-PTF-MKD-PVP-00002, *Mechanical Data Sheet, PTF Vessel Vent Caustic Scrubber.*

N/A No removal is expected for this constituent.

Table 13 Summary of Pretreatment Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	PT Caustic Scrubber a	PT HEME b	All HEPAs (First) c	All HEPAs (Second) c	PT Thermal Oxidizer d	PT Carbon Bed Adsorber d	PT PJM/RFD Demister e
100-00-5	p-Nitrochlorobenzene	Vapor	1	1	1	1	10,000	5	1
100-21-0	p-Phthalic acid	Vapor	1	1	1	1	20	50	1
100-41-4	Ethyl benzene	Vapor	1	1	1	1	10,000	1	1
100-42-5	Styrene	Vapor	1	1	1	1	10,000	1	1
10061-01-5	cis-1,3-Dichloropropene	Vapor	1	1	1	1	100	1	1
10061-02-6	trans-1,3-Dichloropropene	Vapor	1	1	1	1	50	1	1
101-55-3	4-Bromophenylphenyl ether	Vapor	1	1	1	1	3.33333333	50	1
101-84-8	Diphenyl ether	Vapor	1	1	1	1	50	5	1
106-35-4	3-Heptanone	Vapor	1	1	1	1	10,000	1	1
106-42-3	p-Xylene (Dimethyl benzene)	Vapor	1	1	1	1	1,000	1	1
106-46-7	1,4-Dichlorobenzene	Vapor	1	1	1	1	50	2	1
106-88-7	1,2-Epoxybutane	Vapor	1	1	1	1	10,000	1	1
106-93-4	Ethylene dibromide (Dibromethane)	Vapor	1	1	1	1	1	10	1
106-97-8	Butane	Vapor	1	1	1	1	10,000	1	1
106-99-0	1,3-Butadiene	Vapor	1	1	1	1	10,000	1	1
107-02-8	Acrolein	Vapor	1	1	1	1	10,000	1	1
107-05-1	3-Chloropropene (Allyl chloride)	Vapor	1	1	1	1	10,000	1	1
107-06-2	1,2-Dichloroethane (Ethylene chloride)	Vapor	1	1	1	1	10,000	1	1
107-12-0	Propionitrile	Vapor	1	1	1	1	1,000	1	1
107-13-1	Acrylonitrile	Vapor	1	1	1	1	10,000	1	1
107-18-6	2-Propene-1-ol	Vapor	1	1	1	1	10,000	1	1
107-31-3	Formic acid, methyl ester	Vapor	1	1	1	1	10,000	1	1
107-66-4	Dibutylphosphate	Particle-bound	1/3.5	1/200	1/2000	1/100	1,000	1	1/5
107-87-9	2-Pentanone	Vapor	1	1	1	1	10,000	1	1
108-03-2	1-Nitropropane	Vapor	1	1	1	1	10,000	1	1
108-05-4	Vinyl acetate	Vapor	1	1	1	1	10,000	1	1
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	Vapor	1	1	1	1	10,000	1	1
108-20-3	Bis(isopropyl)ether	Vapor	1	1	1	1	10,000	1	1
108-38-3	m-Xylene (Dimethyl benzene)	Vapor	1	1	1	1	1,000	1	1
108-39-4	m-Cresol	Vapor	1	1	1	1	1,000	2	1
108-87-2	Methylcyclohexane	Vapor	1	1	1	1	10,000	1	1
108-88-3	Toluene	Vapor	1	1	1	1	10,000	1	1
108-90-7	Chlorobenzene	Vapor	1	1	1	1	20	5	1
108-93-0	Cyclohexanol	Vapor	1	1	1	1	10,000	2	1
108-94-1	Cyclohexanone	Vapor	1	1	1	1	10,000	2	1
108-95-2	Phenol	Vapor	1	1	1	1	10	20	1

Table 13 Summary of Pretreatment Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	PT Caustic Scrubber a	PT HEME b	All HEPAs (First) c	All HEPAs (Second) c	PT Thermal Oxidizer d	PT Carbon Bed Adsorber d	PT PJM/RFD Demister e
109-66-0	n-Pentane	Vapor	1	1	1	1	10,000	1	1
109-99-9	Tetrahydrofuran	Vapor	1	1	1	1	10,000	1	1
110-12-3	5-Methyl-2-hexanone	Vapor	1	1	1	1	10,000	1	1
110-43-0	2-Heptanone	Vapor	1	1	1	1	10,000	1	1
110-54-3	n-Hexane	Vapor	1	1	1	1	10,000	1	1
110-62-3	n-Valeraldehyde	Vapor	1	1	1	1	10,000	1	1
110-82-7	Cyclohexane	Vapor	1	1	1	1	10,000	1	1
110-83-8	Cyclohexene	Vapor	1	1	1	1	10,000	1	1
110-86-1	Pyridine	Vapor	1	1	1	1	10,000	1	1
111-65-9	n-Octane	Vapor	1	1	1	1	10,000	1	1
111-76-2	Ethylene glycol monobutyl ether	Vapor	1	1	1	1	10,000	2	1
111-84-2	n-Nonane	Vapor	1	1	1	1	10,000	2	1
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	Particle-bound	1/3.5	1/200	1/2000	1/100	10,000	5	1/5
117-84-0	n-Dioctyl phthalate	Particle-bound	1/3.5	1/200	1/2000	1/100	10,000	5	1/5
120-12-7	Anthracene	Particle-bound	1/3.5	1/200	1/2000	1/100	1,000	5	1/5
120-82-1	1,2,4-Trichlorobenzene	Vapor	1	1	1	1	100	5	1
120-83-2	2,4-Dichlorophenol	Vapor	1	1	1	1	3.33333333	50	1
121-44-8	Triethylamine	Vapor	1	1	1	1	10,000	1	1
121-69-7	Dimethylaniline	Vapor	1	1	1	1	10,000	2	1
122-39-4	N,N-Diphenylamine	Vapor	1	1	1	1	50	5	1
123-19-3	4-Heptanone	Vapor	1	1	1	1	10,000	1	1
123-38-6	n-Propionaldehyde	Vapor	1	1	1	1	10,000	1	1
123-51-3	3-Methyl-1-butanol	Vapor	1	1	1	1	10,000	1	1
123-86-4	Acetic acid n-butyl ester	Vapor	1	1	1	1	10,000	1	1
123-91-1	1,4-Dioxane	Vapor	1	1	1	1	10,000	1	1
126-73-8	Tributyl phosphate	Particle-bound	1/3.5	1/200	1/2000	1/100	10,000	5	1/5
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	Vapor	1	1	1	1	10,000	1	1
127-18-4	Perchloroethylene (tetrachloroethylene)	Vapor	1	1	1	1	1	10	1
127-19-5	N,N-Dimethylacetamide	Vapor	1	1	1	1	10,000	2	1
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	Vapor	1	1	1	1	10,000	5	1
129-00-0	Pyrene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
1321-64-8	Pentachloronaphthalene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
1321-65-9	Trichloronaphthalene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
132-64-9	Dibenzofuran	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
1335-87-1	Hexachloronaphthalene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
1335-88-2	Tetrachloronaphthalene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5

Table 13 Summary of Pretreatment Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	PT Caustic Scrubber a	PT HEME b	All HEPAs (First) c	All HEPAs (Second) c	PT Thermal Oxidizer d	PT Carbon Bed Adsorber d	PT PJM/RFD Demister e
1336-36-3	Polychlorinated biphenyls (PCBs)	Vapor	1	1	1	1	3.33333333	50	1
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	Vapor	1	1	1	1	10,000	1	1
141-79-7	4-Methyl-3-penten-2-one	Vapor	1	1	1	1	10,000	1	1
142-82-5	n-Heptane	Vapor	1	1	1	1	10,000	1	1
144-62-7	Oxalic acid	Vapor	1	1	1	1	10	20	1
156-60-5	trans-1,2-Dichloroethylene	Vapor	1	1	1	1	10,000	1	1
1634-04-4	Methyl tert-butyl ether	Vapor	1	1	1	1	10,000	1	1
189-55-9	Dibenzo[a,i]pyrene	Particle	3.5	200	2000	100	3.33333333	50	5
189-64-0	Dibenzo[a,h]pyrene	Particle	3.5	200	2000	100	3.33333333	50	5
191-24-2	Benzo(g,h,i)perylene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
191-30-0	Benzo[a,i]pyrene	Particle	3.5	200	2000	100	3.33333333	50	5
192-65-4	Dibenzo[a,e]pyrene	Particle	3.5	200	2000	100	3.33333333	50	5
193-39-5	Indeno(1,2,3-cd)pyrene	Particle	3.5	200	2000	100	3.33333333	50	5
206-44-0	Fluoranthene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
208-96-8	Acenaphthylene	Vapor	1	1	1	1	3.33333333	50	1
2234-13-1	Octachloronaphthalene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
224-42-0	Dibenz[a,j]acridine	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
226-36-8	Dibenz[a,h]acridine	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
25551-13-7	Trimethyl benzene	Vapor	1	1	1	1	1,000	2	1
26140-60-3	Terphenyls	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
27154-33-2	Trichlorofluoroethane	Vapor	1	1	1	1	1	10	1
287-92-3	Cyclopentane	Vapor	1	1	1	1	10,000	1	1
3697-24-3	5-Methylchrysene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
3825-26-1	Ammonium perfluorooctanoate	Vapor	1	1	1	1	3.33333333	50	1
4170-30-3	2-Butenaldehyde (2-Butenal)	Vapor	1	1	1	1	10,000	1	1
50-00-0	Formaldehyde	Vapor	1	1	1	1	10,000	1	1
50-32-8	Benzo(a)pyrene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
53-70-3	Dibenzo(a,h)anthracene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
540-59-0	1,2-Dichloroethylene	Vapor	1	1	1	1	10,000	1	1
540-84-1	2,2,4-Trimethylpentane	Vapor	1	1	1	1	10,000	1	1
541-73-1	1,3-Dichlorobenzene	Vapor	1	1	1	1	50	2	1
56-23-5	Carbon tetrachloride	Vapor	1	1	1	1	1	5	1
563-80-4	3-Methyl-2-butanone	Vapor	1	1	1	1	10,000	1	1
56-49-5	3-Methylcholanthrene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
57-14-7	1,1-Dimethylhydrazine	Vapor	1	1	1	1	10,000	1	1
58-90-2	2,3,4,6-Tetrachlorophenol	Vapor	1	1	1	1	3.33333333	10	1

Table 13 Summary of Pretreatment Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	PT Caustic Scrubber a	PT HEME b	All HEPAs (First) c	All HEPAs (Second) c	PT Thermal Oxidizer d	PT Carbon Bed Adsorber d	PT PJM/RFD Demister e
591-78-6	2-Hexanone	Vapor	1	1	1	1	1,000	1	1
59-50-7	4-Chloro-3-methylphenol	Vapor	1	1	1	1	3.33333333	20	1
59-89-2	N-Nitrosomorpholine	Vapor	1	1	1	1	10,000	2	1
602-87-9	5-Nitroacenaphthene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
60-29-7	Ethyl ether	Vapor	1	1	1	1	10,000	1	1
603-34-9	Triphenylamine	Vapor	1	1	1	1	3.33333333	50	1
60-34-4	Methylhydrazine	Vapor	1	1	1	1	10,000	1	1
60-35-5	Acetamide	Vapor	1	1	1	1	10,000	2	1
621-64-7	Di-n-Propylnitrosamine	Vapor	1	1	1	1	10,000	2	1
624-83-9	Methyl isocyanate	Vapor	1	1	1	1	1,000	1	1
627-13-4	Nitric acid, propyl ester	Vapor	1	1	1	1	10,000	1	1
62-75-9	N-Nitroso-N,N-dimethylamine	Vapor	1	1	1	1	10,000	2	1
630-20-6	1,1,1,2-Tetrachloroethane	Vapor	1	1	1	1	1	10	1
64-17-5	Ethyl alcohol	Vapor	1	1	1	1	10,000	1	1
64-18-6	Formic acid	Vapor	1	1	1	1	10,000	1	1
64-19-7	Acetic acid	Vapor	1	1	1	1	10,000	1	1
67-56-1	Methyl alcohol (Methanol)	Vapor	1	1	1	1	10,000	1	1
67-63-0	2-Propyl alcohol (Isopropanol)	Vapor	1	1	1	1	10,000	1	1
67-64-1	2-Propanone (Acetone)	Vapor	1	1	1	1	10,000	1	1
67-66-3	Chloroform	Vapor	1	1	1	1	1	2	1
67-72-1	Hexachloroethane	Vapor	1	1	1	1	1	50	1
684-16-2	Hexafluoroacetone	Vapor	1	1	1	1	1	1	1
71-23-8	n-Propyl alcohol	Vapor	1	1	1	1	10,000	1	1
71-36-3	n-Butyl alcohol	Vapor	1	1	1	1	10,000	1	1
71-43-2	Benzene	Vapor	1	1	1	1	100	1	1
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	Vapor	1	1	1	1	1,000	1	1
74-83-9	Bromomethane (Methyl bromide)	Vapor	1	1	1	1	1,000	1	1
74-87-3	Chloromethane (Methyl chloride)	Vapor	1	1	1	1	20	1	1
74-97-5	Bromochloromethane	Vapor	1	1	1	1	1	2	1
74-99-7	Methylacetylene	Vapor	1	1	1	1	10,000	1	1
75-00-3	Chloroethane	Vapor	1	1	1	1	1,000	1	1
75-01-4	Vinyl chloride (1-Chloroethene)	Vapor	1	1	1	1	10,000	1	1
75-05-8	Acetonitrile	Vapor	1	1	1	1	1,000	1	1
75-07-0	Acetaldehyde	Vapor	1	1	1	1	10,000	1	1
75-09-2	Dichloromethane (Methylene chloride)	Vapor	1	1	1	1	50	1	1
75-12-7	Formamide	Vapor	1	1	1	1	10,000	1	1

Table 13 Summary of Pretreatment Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	PT Caustic Scrubber a	PT HEME b	All HEPAs (First) c	All HEPAs (Second) c	PT Thermal Oxidizer d	PT Carbon Bed Adsorber d	PT PJM/RFD Demister e
75-15-0	Carbon disulfide	Vapor	1	1	1	1	10,000	1	1
75-21-8	Ethylene oxide (Oxirane)	Vapor	1	1	1	1	10,000	1	1
75-27-4	Bromodichloromethane	Vapor	1	1	1	1	1	5	1
75-34-3	1,1-Dichloroethane	Vapor	1	1	1	1	10,000	1	1
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	Vapor	1	1	1	1	10,000	1	1
75-43-4	Dichlorofluoromethane	Vapor	1	1	1	1	1,000	1	1
75-45-6	Chlorodifluoromethane	Vapor	1	1	1	1	50	1	1
75-50-3	Trimethylamine	Vapor	1	1	1	1	10,000	1	1
75-52-5	Nitromethane	Vapor	1	1	1	1	10,000	1	1
75-55-8	2-Methylaziridine	Vapor	1	1	1	1	10,000	1	1
75-61-6	Difluorodibromomethane	Vapor	1	1	1	1	1	1	1
75-63-8	Trifluorobromomethane	Vapor	1	1	1	1	1	1	1
75-65-0	2-Methyl-2-propanol	Vapor	1	1	1	1	10,000	1	1
75-69-4	Trichlorofluoromethane	Vapor	1	1	1	1	1	1	1
75-71-8	Dichlorodifluoromethane	Vapor	1	1	1	1	1	1	1
76-03-9	Trichloroacetic acid	Vapor	1	1	1	1	1	50	1
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	Vapor	1	1	1	1	20	5	1
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	Vapor	1	1	1	1	20	5	1
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	Vapor	1	1	1	1	20	2	1
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	Vapor	1	1	1	1	1	1	1
76-15-3	Chloropentafluoroethane	Vapor	1	1	1	1	1	1	1
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	Vapor	1	1	1	1	10,000	1	1
78-87-5	1,2-Dichloropropane	Vapor	1	1	1	1	1,000	1	1
78-92-2	1-Methylpropyl alcohol (2-Butanol)	Vapor	1	1	1	1	10,000	1	1
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	Vapor	1	1	1	1	1,000	1	1
79-00-5	1,1,2-Trichloroethane	Vapor	1	1	1	1	10,000	1	1
79-01-6	Trichloroethylene	Vapor	1	1	1	1	10,000	1	1
79-09-4	Propionic acid	Vapor	1	1	1	1	10,000	1	1
79-10-7	2-Propenoic acid	Vapor	1	1	1	1	10,000	1	1
79-20-9	Methyl acetate	Vapor	1	1	1	1	10,000	1	1
79-34-5	1,1,2,2-Tetrachloroethane	Vapor	1	1	1	1	1	10	1
83-32-9	Acenaphthene	Vapor	1	1	1	1	3.33333333	50	1
84-66-2	Diethyl phthalate	Vapor	1	1	1	1	10,000	5	1
84-74-2	Dibutyl phthalate	Particle-bound	1/3.5	1/200	1/2000	1/100	10,000	5	1/5
85-01-8	Phenanthrene	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
85-68-7	Butylbenzyl phthalate	Particle-bound	1/3.5	1/200	1/2000	1/100	10,000	5	1/5

Table 13 Summary of Pretreatment Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	PT Caustic Scrubber a	PT HEME b	All HEPAs (First) c	All HEPAs (Second) c	PT Thermal Oxidizer d	PT Carbon Bed Adsorber d	PT PJM/RFD Demister e
86-73-7	Fluorene	Vapor	1	1	1	1	3.33333333	50	1
87-68-3	Hexachlorobutadiene	Vapor	1	1	1	1	50	5	1
88-06-2	2,4,6-Trichlorophenol	Vapor	1	1	1	1	3.33333333	50	1
88-72-2	2-Nitrotoluene	Vapor	1	1	1	1	10,000	2	1
88-75-5	2-Nitrophenol	Vapor	1	1	1	1	3.33333333	20	1
88-89-1	Picric acid	Particle-bound	1/3.5	1/200	1/2000	1/100	10,000	5	1/5
91-20-3	Naphthalene	Vapor	1	1	1	1	1,000	2	1
91-22-5	Quinoline	Vapor	1	1	1	1	10,000	2	1
91-58-7	2-Chloronapthalene	Vapor	1	1	1	1	3.33333333	50	1
92-52-4	1,1`-Biphenyl	Vapor	1	1	1	1	1,000	5	1
92-93-3	4-Nitrobiphenyl	Particle-bound	1/3.5	1/200	1/2000	1/100	3.33333333	50	1/5
95-13-6	Indene	Vapor	1	1	1	1	1,000	2	1
95-47-6	o-Xylene	Vapor	1	1	1	1	10,000	1	1
95-48-7	o-Cresol (2-Methylphenol)	Vapor	1	1	1	1	1,000	2	1
95-49-8	2-Chlorotoluene	Vapor	1	1	1	1	10,000	2	1
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	Vapor	1	1	1	1	50	2	1
95-57-8	2-Chlorophenol	Vapor	1	1	1	1	10,000	2	1
95-95-4	2,4,5-Trichlorophenol	Vapor	1	1	1	1	3.33333333	50	1
96-22-0	3-Pentanone	Vapor	1	1	1	1	10,000	1	1
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	Vapor	1	1	1	1	3.33333333	50	1
98-51-1	p-tert-Butyltoluene	Vapor	1	1	1	1	10,000	2	1
98-82-8	Cumene	Vapor	1	1	1	1	10,000	2	1
98-83-9	alpha-Methylstyrene	Vapor	1	1	1	1	100	2	1
98-86-2	Acetophenone	Vapor	1	1	1	1	100	2	1
98-95-3	Nitrobenzene	Vapor	1	1	1	1	10,000	2	1

a From 24590-PTF-MKD-PVP-00002, *Mechanical Data Sheet, PTF Vessel Vent Caustic Scrubber.*
b Based on 24590-PTF-3YD-PVP-00001, *System Description for Pretreatment Vessel Vent Process System*, PVP, Section 6.2.4.
c Based on the *Best Available Radionuclide Control Technology Analysis for the WTP*, 24590-WTP-RPT-ENV-01-004, Rev 1.
d Based on results presented in Appendix H.
e From 24590-PTF-3YD-PJV-00001, *System Description for PTF Pulse Jet Ventilation System (PJV)*, Section 7.2
f Particle-bound consituents have both vapor and particle DFs. The amount of the constituent in each phase is determined by the constituent's Fv value.

Table 14 LAW Vitrification Emissions Analysis Equipment Decontamination Factors

Inorganic Constituents	Melter		SBS		WESP		HEPA (First)		HEPA (Second)		LAW S-AC Column		Thermal Cat Ox		NOx SCR		LAW Caustic Scrubber	
	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref
Silver	30	(1)	1.8	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Aluminum	100	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Arsenic	6	(1)	4.8	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Boron	30	(1)	16.1	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Barium	100	(1)	90	(1)	12	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Bismuth	80	(1)	2.6	(1)	30	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Calcium	75	(1)	20	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Cadmium	10	(1)	1.6	(1)	80	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Chloride	1.9	(1)	3.4	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Chromium (hexavalent)	41	(1)	3.4	(1)	13	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Copper	200	(1)	2.9	(1)	30	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Flouride	4	(1)	4.8	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Iron	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Mercury	1	(1)	3.7	(1)	1	(1)	1	(2)	1	(2)	100	(8)	1	(1)	1	(1)	1	(1)
Potassium	20	(1)	1.7	(1)	60	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Lithium	100	(1)	2.1	(1)	40	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Magnesium	200	(1)	3.6	(1)	10	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Manganese	75	(1)	30	(1)	10	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Sodium	100	(1)	2.6	(1)	30	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Nickel	89	(1)	4	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Nitrite	Destroyed	(1)	6.5	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Nitrate	Destroyed	(1)	6.5	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Hydroxide	1	(1)	6.5	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Phosphorous	40	(1)	1.7	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Lead	82	(1)	2.3	(1)	36	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Phosphate	40	(1)	1.7	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Total Sulfur	Calculated	(1)	20	(1)	1	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Silicon	300	(1)	30	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Sulfate	Calculated	(1)	5.6	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Strontium (total)	100	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Zinc	100	(1)	17.7	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Zirconium	300	(1)	16.7	(1)	10	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Beryllium	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Cyanide	40	(1)	6.5	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Cobalt	200	(1)	3.2	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)

Table 14 LAW Vitrification Emissions Analysis Equipment Decontamination Factors

Inorganic Constituents	Melter		SBS		WESP		HEPA (First)		HEPA (Second)		LAW S-AC Column		Thermal Cat Ox		NOx SCR		LAW Caustic Scrubber	
	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref
Molybdenum	80	(1)	8.7	(1)	480	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Rhodium	53	(1)	3.3	(1)	480	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Antimony	80	(1)	3.7	(1)	12	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Selenium	1.7	(1)	8.4	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Tin	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Tantalum	250	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Thallium	6	(1)	73	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Uranium	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Vanadium	80	(1)	5	(1)	860	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Tungsten	250	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Yttrium	100	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Carbon monoxide	Produced	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(11)	20	(10)	1	(11)	1	(11)
Carbon Dioxide	Produced	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(11)	1	(11)	1	(11)	1	(7)
Nitric Oxide	Produced	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(11)	1	(11)	20	(9)	1.1	(7)
Nitrogen Dioxide	Produced	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(11)	1	(11)	20	(9)	1.1	(7)
Hydrochloric Acid	Produced	(1)	1	(1)	1.3	(1)	1	(2)	1	(2)	33.3	(8)	1	(11)	1	(11)	1.1	(7)
Hydrofluoric Acid	Produced	(1)	2	(1)	1.1	(1)	1	(2)	1	(2)	33.3	(8)	1	(11)	1	(11)	1.1	(7)
Sulfur dioxide	Produced	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(11)	1.2	(10)	1	(11)	33.3	(7)
Ammonia/Ammonium	Produced	(1)	Calculated	(1)	1	(1)	1	(2)	1	(2)	1	(11)	1	(11)	1	(11)	1	(12)
Americium-241	80	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Carbon-14	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)	1	(7)
Cobalt-60	200	(1)	3.2	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Curium-243	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Curium-244	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Cesium-137	2	(1)	2.4	(1)	30	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Europium-152	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Europium-154	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Europium-155	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Tritium	1	(3)	Calculated	(3)	Calculated	(3)	1	(3)	1	(3)	1	(3)	1	(3)	1	(3)	1	(3)
Iodine-129	1.1	(1)	1.2	(1)	1	(1)	1	(2)	1	(2)	100	(8)	1	(1)	1	(1)	1.1	(7)
Nickel-63	89	(1)	4	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Neptunium-237	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Plutonium-238	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Plutonium-239	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Plutonium-240	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)

Table 14 LAW Vitrification Emissions Analysis Equipment Decontamination Factors

Inorganic Constituents	Melter		SBS		WESP		HEPA (First)		HEPA (Second)		LAW S-AC Column		Thermal Cat Ox		NOx SCR		LAW Caustic Scrubber	
	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref
Plutonium-241	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Antimony-125	80	(1)	3.7	(1)	12	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Samarium-151	1,370	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Tin-126	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Strontium-90	100	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Technetium-99	3	(1)	3.3	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Thorium-232	250	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Uranium-233	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Uranium-234	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Uranium-235	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Uranium-236	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Uranium-238	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Yttrium-90	100	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Ruthenium-106	3.9	(1)	3.6	(1)	4	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Cesium-134	2	(1)	2.4	(1)	30	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Barium-137m	2	(1)	2.4	(1)	30	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Plutonium-242	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Radium-226	6	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Uranium-232	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Protactinium-231	1,370	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Nickel-59	89	(1)	4	(1)	20	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Actinium-227	1,370	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Americium-243	80	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Radium-228	6	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Curium-242	200	(1)	40	(1)	11	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Thorium-229	250	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Zirconium-93	300	(1)	17	(1)	10	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Niobium-93m	1,000	(1)	73	(1)	50	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Cadmium-113m	10	(1)	1.6	(1)	80	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)
Selenium-79	1.7	(1)	8.4	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(6)

Table 14 LAW Vitrification Emissions Analysis Equipment Decontamination Factors

Notes:
The following notes correspond to Table 14, LAW Vitrification Emissions Analysis Equipment Decontamination Factors, and provide the bases for vitrification melter and offgas decontamination factors for the facility emissions report.

1 Based on CCN 128548, "Air Emissions Vitrification Melters and Primary Offgas Decontamination Factors".

2 Based on the BARCT analysis, 24590-WTP-RPT-ENV-01-004, Rev 1, Section 4.2.2.1.

3 It is assumed that tritium (H-3) will have the same decontamination factor (DF) as water in the respective process unit. This DF is calculated by the flowsheet depending on the operating conditions of the unit.

4 It is assumed that carbon-14 will have the same DF as carbon dioxide in the respective process unit. No reduction in capture efficiency has been incorporated.

5 No particulate removal efficiency is assumed.

6 The LAW caustic scrubber is assumed to have a particulate scrubbing efficiency DF of 1.

7 Although the LAW caustic scrubber may have a small collection efficiency (<10 %) for carbon dioxide, it is assumed to be 0 % (DF = 1). Since the unit has not been designed as an abatement technology for carbon dioxide (i.e., carbon-14), the unit will be operated to minimize carbon dioxide capture in order to minimize solids sent to the Hanford Effluent Treatment Facility. Therefore, no capture of carbon dioxide (i.e., carbon-14) removal can be assumed. Acid gas and iodine removal requirements previously identified for the caustic scrubber have been moved to the sulfur impregnated carbon beds (24590-LAW-MKC-LVP-00004). Some acid gas and iodine removal is still expected in this unit and therefore a 10 % reduction is assumed for this evaluation (DF = 1.1). Due to lower pH operation of the scrubber, NO_x removal efficiency is expected to be lower. Therefore, a 10 % removal (DF = 1.1) is also assumed for NO_x in this evaluation. The removal efficiency of SO_x in the scrubber is stated as 97 % (DF = 33.3).

8 The design basis mercury DFs for the LAW S-AC columns is 100, per document 24590-LAW-MKC-LVP-00005. No reduction in efficiency is recommended since the unit's efficiency will effectively be infinite until breakthrough is approached. This unit also removes iodine and acid gases. The iodine removal efficiency is specified as 99 % (DF = 100) and for acid gases is 97 % (DF = 33.3).

9 Based on the LAW catalytic oxidizer/reducer datasheet (24590-LAW-MKD-LVP-00012), the NO_x removal efficiency is 98 % (DF = 50), but to bound the NO_x emissions, a DF of 20 (95 % removal efficiency) is used.

10 The thermal catalytic oxidizer (TCO) is known to oxidize both carbon monoxide (CO) and sulfur dioxide (SO_2) to carbon dioxide (CO_2) and sulfur trioxide (SO_3), respectively. Per contacts with catalyst vendors, the oxidation efficiency of carbon monoxide tends to be higher then the realized organic destruction efficiency, while the oxidation of sulfur dioxide tends to be less. However, to be conservative, the carbon monoxide conversion DF in the TCO emissions will be assumed to be equal to the organic DF destruction removal efficiency. For SO_2, the vendor recommended an oxidization efficiency of 20 % (DF = 1.2).

11 No gas scrubbing efficiency is assumed.

12 It is assumed that no ammonia (DF = 1) will be removed in the LAW caustic scrubber because of the alkaline conditions.

Table 15 HLW Vitrification Emissions Analysis Equipment Decontamination Factors

Inorganic Constituents	HLW Melter		SBS		WESP		HEME		HEPA (First)		HEPA (Second)		AgZ Column		S-AC Column		Thermal Cat Ox		NOx SCR	
	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref
Silver	30	(1)	1.8	(1)	50	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Aluminum	100	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Arsenic	21	(1)	4.8	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Boron	30	(1)	30	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Barium	100	(1)	24	(1)	12	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Bismuth	58	(1)	2.6	(1)	30	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Calcium	75	(1)	20	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Cadmium	10	(1)	1.6	(1)	80	(1)	110	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Chloride	1.9	(1)	3.4	(1)	20	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Chromium (hexavalent)	100	(1)	3.4	(1)	13	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Copper	170	(1)	2.9	(1)	30	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Flouride	4	(1)	4.8	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Iron	120	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Mercury	1	(1)	3.7	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(1)	1000	(7)	1	(1)	1	(1)
Potassium	20	(1)	1.7	(1)	60	(1)	110	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Lithium	100	(1)	2.1	(1)	40	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Magnesium	63	(1)	20	(1)	10	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Manganese	75	(1)	30	(1)	10	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Sodium	100	(1)	2.6	(1)	30	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Nickel	89	(1)	5.9	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Nitrite	Destroyed	(1)	18.2	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Nitrate	Destroyed	(1)	18.2	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Hydroxide	1	(1)	18.2	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Phosphorous	40	(1)	18.2	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Lead	80	(1)	2.3	(1)	36	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Phosphate	40	(1)	18.2	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Total Sulfur	3	(1)	8	(1)	1	(1)	1	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Silicon	230	(1)	30	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Sulfate	2.7	(1)	4	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Strontium (total)	100	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Zinc	100	(1)	20	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Zirconium	190	(1)	30	(1)	10	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Beryllium	120	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Cyanide	40	(1)	18.2	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Cobalt	72	(1)	3.2	(1)	20	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Molybdenum	58	(1)	8.7	(1)	200	(1)	490	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Rhodium	37	(1)	6.1	(1)	530	(1)	500	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Antimony	100	(1)	3.7	(1)	12	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)

Table 15 HLW Vitrification Emissions Analysis Equipment Decontamination Factors

Inorganic Constituents	HLW Melter		SBS		WESP		HEME		HEPA (First)		HEPA (Second)		AgZ Column		S-AC Column		Thermal Cat Ox		NOx SCR	
	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref
Selenium	2	(1)	5.9	(1)	200	(1)	490	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Tin	120	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Tantalum	72	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Thallium	72	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Uranium	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Vanadium	58	(1)	4.6	(1)	370	(1)	500	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Tungsten	72	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Yttrium	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Carbon monoxide	Produced	(1)	1	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(10)	1	(10)	20	(9)	1	(10)
Carbon Dioxide	Produced	(1)	1	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(10)	1	(10)	1	(10)	1	(10)
Nitric Oxide	Produced	(1)	1	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(10)	1	(10)	1	(10)	20	(8)
Nitrogen Dioxide	Produced	(1)	1	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(10)	1	(10)	1	(10)	20	(8)
Hydrochloric Acid	Produced	(1)	1	(1)	1.3	(1)	1	(1)	1	(2)	1	(2)	1000	(6)	1	(10)	1	(10)	1	(10)
Hydrofluoric Acid	Produced	(1)	2	(1)	1.14	(1)	2	(1)	1	(2)	1	(2)	1000	(6)	1	(10)	1	(10)	1	(10)
Sulfur dioxide	Produced	(1)	1	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1	(10)	1	(10)	1.2	(9)	1	(10)
Ammonia/Ammonium	Produced	(1)	Calculated	(1)	1.1	(1)	1.01	(1)	1	(2)	1	(2)	1	(10)	1	(10)	1	(10)	1	(10)
Americium-241	58	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Carbon-14	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)	1	(4)
Cobalt-60	72	(1)	3.2	(1)	20	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Curium-243	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Curium-244	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Cesium-137	30	(1)	2.4	(1)	30	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Europium-152	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Europium-154	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Europium-155	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Tritium	1	(3)	Calculated	(3)	Calculated	(3)	Calculated	(3)	1	(3)	1	(3)	1	(3)	1	(3)	1	(3)	1	(3)
Iodine-129	1.1	(1)	1.1	(1)	1	(1)	1	(1)	1	(2)	1	(2)	1000	(6)	1	(1)	1	(1)	1	(1)
Nickel-63	89	(1)	5.9	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Neptunium-237	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Plutonium-238	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Plutonium-239	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Plutonium-240	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Plutonium-241	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Antimony-125	100	(1)	3.7	(1)	12	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Samarium-151	130	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Tin-126	120	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Strontium-90	100	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Technetium-99	3	(1)	3.9	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)

Table 15 HLW Vitrification Emissions Analysis Equipment Decontamination Factors

Inorganic Constituents	HLW Melter		SBS		WESP		HEME		HEPA (First)		HEPA (Second)		AgZ Column		S-AC Column		Thermal Cat Ox		NOx SCR	
	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref	DF	Ref
Thorium-232	72	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Uranium-233	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Uranium-234	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Uranium-235	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Uranium-236	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Uranium-238	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Yttrium-90	100	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Ruthenium-106	3.9	(1)	3.6	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Cesium-134	30	(1)	2.4	(1)	30	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Barium-137m	30	(1)	2.4	(1)	30	(1)	100	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Plutonium-242	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Radium-226	4	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Uranium-232	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Protactinium-231	72	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Nickel-59	89	(1)	5.9	(1)	20	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Actinium-227	130	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Americium-243	58	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Radium-228	4	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Curium-242	72	(1)	40	(1)	11	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Thorium-229	72	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Zirconium-93	190	(1)	30	(1)	10	(1)	90	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Niobium-93m	72	(1)	427	(1)	20	(1)	470	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Cadmium-113m	10	(1)	1.6	(1)	80	(1)	110	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)
Selenium-79	2	(1)	5.9	(1)	200	(1)	490	(1)	2,000	(2)	100	(2)	1	(5)	1	(5)	1	(5)	1	(5)

Table 15 HLW Vitrification Emissions Analysis Equipment Decontamination Factors

Notes:
The following notes correspond to Table 15, HLW Vitrification Emissions Analysis Equipment Decontamination Factors, and provide the bases for vitrification melter and offgas decontamination factors for the facility emissions report.

1 Based on CCN 128548, "Air Emissions Vitrification Melters and Primary Offgas Decontamination Factors".

2 Based on the BARCT analysis, 24590-WTP-RPT-ENV-01-004, Rev 1, Section 4.2.2.1.

3 It is assumed that tritium (H-3) will have the same decontamination factor (DF) as water in the respective process unit. This DF is calculated by the flowsheet depending on the operating conditions of the unit.

4 It is assumed that carbon-14 will have the same DF as carbon dioxide in the respective process unit. No reduction in capture efficiency has been incorporated.

5 No particulate removal efficiency is assumed.

6 Based on Section 7.13, calculation 24590-HLW-MKC-HOP-00002, Rev B, no reduction in efficiency is recommended since the silver mordenite's efficiency will effectively be infinite until breakthrough is approached.

7 The design basis mercury DFs for the HLW S-AC column is 1000, per document 24590-HLW-MVD-HOP-00015. No reduction in efficiency is recommended since the unit's efficiency will effectively be infinite until breakthrough is approached.

8 Based on the HLW catalytic oxidizer/reducer datasheet (24590-HLW-MKD-HOP-00019), the NO_x removal efficiency is 95 % (DF = 20).

9 The thermal catalytic oxidizer (TCO) is known to oxidize both carbon monoxide (CO) and sulfur dioxide (SO_2) to carbon dioxide (CO_2) and sulfur trioxide (SO_3), respectively. Per contacts with catalyst vendors, the oxidation efficiency of carbon monoxide tends to be higher then the realized organic destruction efficiency, while the oxidation of sulfur dioxide tends to be less. However, to be conservative, the carbon monoxide conversion DF in the TCO emissions will be assumed to be equal to the organic DF destruction removal efficiency. For SO_2, the vendor recommended an oxidization efficiency of 20 % (DF = 1.2).

10 No gas scrubbing efficiency is assumed.

Table 16 Summary of LAW and HLW Vitrification Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	HLW & LAW Melters a	HLW & LAW Submerged Bed Scrubber b	HLW & LAW WESP b	HLW HEME b	LAW Caustic Scrubber c	All HEPAs (First) d	All HEPAs (Second) d	HLW & LAW Thermal Catalytic Oxidizer e
100-00-5	p-Nitrochlorobenzene	Vapor	1.1	1	1	1	1	1	1	20
100-21-0	p-Phthalic acid	Vapor	1.1	1	1	1	1	1	1	20
100-41-4	Ethyl benzene	Vapor	1.1	1	1	1	1	1	1	20
100-42-5	Styrene	Vapor	1.1	1	1	1	1	1	1	20
10061-01-5	cis-1,3-Dichloropropene	Vapor	1.1	1	1	1	1	1	1	20
10061-02-6	trans-1,3-Dichloropropene	Vapor	1.1	1	1	1	1	1	1	20
101-55-3	4-Bromophenylphenyl ether	Vapor	1.1	1	1	1	1	1	1	20
101-84-8	Diphenyl ether	Vapor	1.1	1	1	1	1	1	1	20
106-35-4	3-Heptanone	Vapor	1.1	1	1	1	1	1	1	20
106-42-3	p-Xylene (Dimethyl benzene)	Vapor	1.1	1	1	1	1	1	1	20
106-46-7	1,4-Dichlorobenzene	Vapor	1.1	1	1	1	1	1	1	20
106-88-7	1,2-Epoxybutane	Vapor	1.1	1	1	1	1	1	1	20
106-93-4	Ethylene dibromide (Dibromethane)	Vapor	1.1	1	1	1	1	1	1	20
106-97-8	Butane	Vapor	1.1	1	1	1	1	1	1	20
106-99-0	1,3-Butadiene	Vapor	1.1	1	1	1	1	1	1	20
107-02-8	Acrolein	Vapor	1.1	1	1	1	1	1	1	20
107-05-1	3-Chloropropene (Allyl chloride)	Vapor	1.1	1	1	1	1	1	1	20
107-06-2	1,2-Dichloroethane (Ethylene chloride)	Vapor	1.1	1	1	1	1	1	1	20
107-12-0	Propionitrile	Vapor	1.1	1	1	1	1	1	1	20
107-13-1	Acrylonitrile	Vapor	1.1	1	1	1	1	1	1	20
107-18-6	2-Propene-1-ol	Vapor	1.1	1	1	1	1	1	1	20
107-31-3	Formic acid, methyl ester	Vapor	1.1	1	1	1	1	1	1	20
107-66-4	Dibutylphosphate	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
107-87-9	2-Pentanone	Vapor	1.1	1	1	1	1	1	1	20
108-03-2	1-Nitropropane	Vapor	1.1	1	1	1	1	1	1	20
108-05-4	Vinyl acetate	Vapor	1.1	1	1	1	1	1	1	20
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	Vapor	1.1	1	1	1	1	1	1	20
108-20-3	Bis(isopropyl)ether	Vapor	1.1	1	1	1	1	1	1	20
108-38-3	m-Xylene (Dimethyl benzene)	Vapor	1.1	1	1	1	1	1	1	20
108-39-4	m-Cresol	Vapor	1.1	1	1	1	1	1	1	20
108-87-2	Methylcyclohexane	Vapor	1.1	1	1	1	1	1	1	20
108-88-3	Toluene	Vapor	1.1	1	1	1	1	1	1	20
108-90-7	Chlorobenzene	Vapor	1.1	1	1	1	1	1	1	20
108-93-0	Cyclohexanol	Vapor	1.1	1	1	1	1	1	1	20
108-94-1	Cyclohexanone	Vapor	1.1	1	1	1	1	1	1	20
108-95-2	Phenol	Vapor	1.1	1	1	1	1	1	1	20
109-66-0	n-Pentane	Vapor	1.1	1	1	1	1	1	1	20
109-99-9	Tetrahydrofuran	Vapor	1.1	1	1	1	1	1	1	20
110-12-3	5-Methyl-2-hexanone	Vapor	1.1	1	1	1	1	1	1	20
110-43-0	2-Heptanone	Vapor	1.1	1	1	1	1	1	1	20
110-54-3	n-Hexane	Vapor	1.1	1	1	1	1	1	1	20
110-62-3	n-Valeraldehyde	Vapor	1.1	1	1	1	1	1	1	20
110-82-7	Cyclohexane	Vapor	1.1	1	1	1	1	1	1	20
110-83-8	Cyclohexene	Vapor	1.1	1	1	1	1	1	1	20
110-86-1	Pyridine	Vapor	1.1	1	1	1	1	1	1	20
111-65-9	n-Octane	Vapor	1.1	1	1	1	1	1	1	20
111-76-2	Ethylene glycol monobutyl ether	Vapor	1.1	1	1	1	1	1	1	20
111-84-2	n-Nonane	Vapor	1.1	1	1	1	1	1	1	20
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20

Table 16 Summary of LAW and HLW Vitrification Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	HLW & LAW Melters a	HLW & LAW Submerged Bed Scrubber b	HLW & LAW WESP b	HLW HEME b	LAW Caustic Scrubber c	All HEPAs (First) d	All HEPAs (Second) d	HLW & LAW Thermal Catalytic Oxidizer e
117-84-0	n-Dioctyl phthalate	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
120-12-7	Anthracene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
120-82-1	1,2,4-Trichlorobenzene	Vapor	1.1	1	1	1	1	1	1	20
120-83-2	2,4-Dichlorophenol	Vapor	1.1	1	1	1	1	1	1	20
121-44-8	Triethylamine	Vapor	1.1	1	1	1	1	1	1	20
121-69-7	Dimethylaniline	Vapor	1.1	1	1	1	1	1	1	20
122-39-4	N,N-Diphenylamine	Vapor	1.1	1	1	1	1	1	1	20
123-19-3	4-Heptanone	Vapor	1.1	1	1	1	1	1	1	20
123-38-6	n-Propionaldehyde	Vapor	1.1	1	1	1	1	1	1	20
123-51-3	3-Methyl-1-butanol	Vapor	1.1	1	1	1	1	1	1	20
123-86-4	Acetic acid n-butyl ester	Vapor	1.1	1	1	1	1	1	1	20
123-91-1	1,4-Dioxane	Vapor	1.1	1	1	1	1	1	1	20
126-73-8	Tributyl phosphate	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	Vapor	1.1	1	1	1	1	1	1	20
127-18-4	Perchloroethylene (tetrachloroethylene)	Vapor	1.1	1	1	1	1	1	1	20
127-19-5	N,N-Dimethylacetamide	Vapor	1.1	1	1	1	1	1	1	20
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	Vapor	1.1	1	1	1	1	1	1	20
129-00-0	Pyrene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
1321-64-8	Pentachloronaphthalene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
1321-65-9	Trichloronaphthalene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
132-64-9	Dibenzofuran	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
1335-87-1	Hexachloronaphthalene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
1335-88-2	Tetrachloronaphthalene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
1336-36-3	Polychlorinated biphenyls (PCBs)	Vapor	1.1	1	1	1	1	1	1	20
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	Vapor	1.1	1	1	1	1	1	1	20
141-79-7	4-Methyl-3-penten-2-one	Vapor	1.1	1	1	1	1	1	1	20
142-82-5	n-Heptane	Vapor	1.1	1	1	1	1	1	1	20
144-62-7	Oxalic acid	Vapor	1.1	1	1	1	1	1	1	20
156-60-5	trans-1,2-Dichloroethylene	Vapor	1.1	1	1	1	1	1	1	20
1634-04-4	Methyl tert-butyl ether	Vapor	1.1	1	1	1	1	1	1	20
189-55-9	Dibenzo[a,i]pyrene	Particle	1.1	20	20	90	1	2000	100	20
189-64-0	Dibenzo[a,h]pyrene	Particle	1.1	20	20	90	1	2000	100	20
191-24-2	Benzo(g,h,i)perylene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
191-30-0	Benzo[a,i]pyrene	Particle	1.1	20	20	90	1	2000	100	20
192-65-4	Dibenzo[a,e]pyrene	Particle	1.1	20	20	90	1	2000	100	20
193-39-5	Indeno(1,2,3-cd)pyrene	Particle	1.1	20	20	90	1	2000	100	20
206-44-0	Fluoranthene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
208-96-8	Acenaphthylene	Vapor	1.1	1	1	1	1	1	1	20
2234-13-1	Octachloronaphthalene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
224-42-0	Dibenz[a,j]acridine	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
226-36-8	Dibenz[a,h]acridine	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
25551-13-7	Trimethyl benzene	Vapor	1.1	1	1	1	1	1	1	20
26140-60-3	Terphenyls	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
27154-33-2	Trichlorofluoroethane	Vapor	1.1	1	1	1	1	1	1	20
287-92-3	Cyclopentane	Vapor	1.1	1	1	1	1	1	1	20
3697-24-3	5-Methylchrysene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
3825-26-1	Ammonium perfluorooctanoate	Vapor	1.1	1	1	1	1	1	1	20
4170-30-3	2-Butenaldehyde (2-Butenal)	Vapor	1.1	1	1	1	1	1	1	20
50-00-0	Formaldehyde	Vapor	1.1	1	1	1	1	1	1	20

Table 16 Summary of LAW and HLW Vitrification Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	HLW & LAW Melters a	HLW & LAW Submerged Bed Scrubber b	HLW & LAW WESP b	HLW HEME b	LAW Caustic Scrubber c	All HEPAs (First) d	All HEPAs (Second) d	HLW & LAW Thermal Catalytic Oxidizer e
50-32-8	Benzo(a)pyrene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
53-70-3	Dibenzo(a,h)anthracene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
540-59-0	1,2-Dichloroethylene	Vapor	1.1	1	1	1	1	1	1	20
540-84-1	2,2,4-Trimethylpentane	Vapor	1.1	1	1	1	1	1	1	20
541-73-1	1,3-Dichlorobenzene	Vapor	1.1	1	1	1	1	1	1	20
56-23-5	Carbon tetrachloride	Vapor	1.1	1	1	1	1	1	1	20
563-80-4	3-Methyl-2-butanone	Vapor	1.1	1	1	1	1	1	1	20
56-49-5	3-Methylcholanthrene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
57-14-7	1,1-Dimethylhydrazine	Vapor	1.1	1	1	1	1	1	1	20
58-90-2	2,3,4,6-Tetrachlorophenol	Vapor	1.1	1	1	1	1	1	1	20
591-78-6	2-Hexanone	Vapor	1.1	1	1	1	1	1	1	20
59-50-7	4-Chloro-3-methylphenol	Vapor	1.1	1	1	1	1	1	1	20
59-89-2	N-Nitrosomorpholine	Vapor	1.1	1	1	1	1	1	1	20
602-87-9	5-Nitroacenaphthene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
60-29-7	Ethyl ether	Vapor	1.1	1	1	1	1	1	1	20
603-34-9	Triphenylamine	Vapor	1.1	1	1	1	1	1	1	20
60-34-4	Methylhydrazine	Vapor	1.1	1	1	1	1	1	1	20
60-35-5	Acetamide	Vapor	1.1	1	1	1	1	1	1	20
621-64-7	Di-n-Propylnitrosamine	Vapor	1.1	1	1	1	1	1	1	20
624-83-9	Methyl isocyanate	Vapor	1.1	1	1	1	1	1	1	20
627-13-4	Nitric acid, propyl ester	Vapor	1.1	1	1	1	1	1	1	20
62-75-9	N-Nitroso-N,N-dimethylamine	Vapor	1.1	1	1	1	1	1	1	20
630-20-6	1,1,1,2-Tetrachloroethane	Vapor	1.1	1	1	1	1	1	1	20
64-17-5	Ethyl alcohol	Vapor	1.1	1	1	1	1	1	1	20
64-18-6	Formic acid	Vapor	1.1	1	1	1	1	1	1	20
64-19-7	Acetic acid	Vapor	1.1	1	1	1	1	1	1	20
67-56-1	Methyl alcohol (Methanol)	Vapor	1.1	1	1	1	1	1	1	20
67-63-0	2-Propyl alcohol (Isopropanol)	Vapor	1.1	1	1	1	1	1	1	20
67-64-1	2-Propanone (Acetone)	Vapor	1.1	1	1	1	1	1	1	20
67-66-3	Chloroform	Vapor	1.1	1	1	1	1	1	1	20
67-72-1	Hexachloroethane	Vapor	1.1	1	1	1	1	1	1	20
684-16-2	Hexafluoroacetone	Vapor	1.1	1	1	1	1	1	1	20
71-23-8	n-Propyl alcohol	Vapor	1.1	1	1	1	1	1	1	20
71-36-3	n-Butyl alcohol	Vapor	1.1	1	1	1	1	1	1	20
71-43-2	Benzene	Vapor	1.1	1	1	1	1	1	1	20
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	Vapor	1.1	1	1	1	1	1	1	20
74-83-9	Bromomethane (Methyl bromide)	Vapor	1.1	1	1	1	1	1	1	20
74-87-3	Chloromethane (Methyl chloride)	Vapor	1.1	1	1	1	1	1	1	20
74-97-5	Bromochloromethane	Vapor	1.1	1	1	1	1	1	1	20
74-99-7	Methylacetylene	Vapor	1.1	1	1	1	1	1	1	20
75-00-3	Chloroethane	Vapor	1.1	1	1	1	1	1	1	20
75-01-4	Vinyl chloride (1-Chloroethene)	Vapor	1.1	1	1	1	1	1	1	20
75-05-8	Acetonitrile	Vapor	1.1	1	1	1	1	1	1	20
75-07-0	Acetaldehyde	Vapor	1.1	1	1	1	1	1	1	20
75-09-2	Dichloromethane (Methylene chloride)	Vapor	1.1	1	1	1	1	1	1	20
75-12-7	Formamide	Vapor	1.1	1	1	1	1	1	1	20
75-15-0	Carbon disulfide	Vapor	1.1	1	1	1	1	1	1	20
75-21-8	Ethylene oxide (Oxirane)	Vapor	1.1	1	1	1	1	1	1	20
75-27-4	Bromodichloromethane	Vapor	1.1	1	1	1	1	1	1	20

Table 16 Summary of LAW and HLW Vitrification Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	HLW & LAW Melters a	HLW & LAW Submerged Bed Scrubber b	HLW & LAW WESP b	HLW HEME b	LAW Caustic Scrubber c	All HEPAs (First) d	All HEPAs (Second) d	HLW & LAW Thermal Catalytic Oxidizer e
75-34-3	1,1-Dichloroethane	Vapor	1.1	1	1	1	1	1	1	20
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	Vapor	1.1	1	1	1	1	1	1	20
75-43-4	Dichlorofluoromethane	Vapor	1.1	1	1	1	1	1	1	20
75-45-6	Chlorodifluoromethane	Vapor	1.1	1	1	1	1	1	1	20
75-50-3	Trimethylamine	Vapor	1.1	1	1	1	1	1	1	20
75-52-5	Nitromethane	Vapor	1.1	1	1	1	1	1	1	20
75-55-8	2-Methylaziridine	Vapor	1.1	1	1	1	1	1	1	20
75-61-6	Difluorodibromomethane	Vapor	1.1	1	1	1	1	1	1	20
75-63-8	Trifluorobromomethane	Vapor	1.1	1	1	1	1	1	1	20
75-65-0	2-Methyl-2-propanol	Vapor	1.1	1	1	1	1	1	1	20
75-69-4	Trichlorofluoromethane	Vapor	1.1	1	1	1	1	1	1	20
75-71-8	Dichlorodifluoromethane	Vapor	1.1	1	1	1	1	1	1	20
76-03-9	Trichloroacetic acid	Vapor	1.1	1	1	1	1	1	1	20
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	Vapor	1.1	1	1	1	1	1	1	20
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	Vapor	1.1	1	1	1	1	1	1	20
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	Vapor	1.1	1	1	1	1	1	1	20
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	Vapor	1.1	1	1	1	1	1	1	20
76-15-3	Chloropentafluoroethane	Vapor	1.1	1	1	1	1	1	1	20
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	Vapor	1.1	1	1	1	1	1	1	20
78-87-5	1,2-Dichloropropane	Vapor	1.1	1	1	1	1	1	1	20
78-92-2	1-Methylpropyl alcohol (2-Butanol)	Vapor	1.1	1	1	1	1	1	1	20
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	Vapor	1.1	1	1	1	1	1	1	20
79-00-5	1,1,2-Trichloroethane	Vapor	1.1	1	1	1	1	1	1	20
79-01-6	Trichloroethylene	Vapor	1.1	1	1	1	1	1	1	20
79-09-4	Propionic acid	Vapor	1.1	1	1	1	1	1	1	20
79-10-7	2-Propenoic acid	Vapor	1.1	1	1	1	1	1	1	20
79-20-9	Methyl acetate	Vapor	1.1	1	1	1	1	1	1	20
79-34-5	1,1,2,2-Tetrachloroethane	Vapor	1.1	1	1	1	1	1	1	20
83-32-9	Acenaphthene	Vapor	1.1	1	1	1	1	1	1	20
84-66-2	Diethyl phthalate	Vapor	1.1	1	1	1	1	1	1	20
84-74-2	Dibutyl phthalate	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
85-01-8	Phenanthrene	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
85-68-7	Butylbenzyl phthalate	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
86-73-7	Fluorene	Vapor	1.1	1	1	1	1	1	1	20
87-68-3	Hexachlorobutadiene	Vapor	1.1	1	1	1	1	1	1	20
88-06-2	2,4,6-Trichlorophenol	Vapor	1.1	1	1	1	1	1	1	20
88-72-2	2-Nitrotoluene	Vapor	1.1	1	1	1	1	1	1	20
88-75-5	2-Nitrophenol	Vapor	1.1	1	1	1	1	1	1	20
88-89-1	Picric acid	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
91-20-3	Naphthalene	Vapor	1.1	1	1	1	1	1	1	20
91-22-5	Quinoline	Vapor	1.1	1	1	1	1	1	1	20
91-58-7	2-Chloronapthalene	Vapor	1.1	1	1	1	1	1	1	20
92-52-4	1,1`-Biphenyl	Vapor	1.1	1	1	1	1	1	1	20
92-93-3	4-Nitrobiphenyl	Particle-bound	1.1	1/20	1/20	1/90	1	1/2000	1/100	20
95-13-6	Indene	Vapor	1.1	1	1	1	1	1	1	20
95-47-6	o-Xylene	Vapor	1.1	1	1	1	1	1	1	20
95-48-7	o-Cresol (2-Methylphenol)	Vapor	1.1	1	1	1	1	1	1	20
95-49-8	2-Chlorotoluene	Vapor	1.1	1	1	1	1	1	1	20
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	Vapor	1.1	1	1	1	1	1	1	20

Table 16 Summary of LAW and HLW Vitrification Offgas Treatment Equipment DFs for Organic COPCs

CAS Registry Number	Compound	Phase f	HLW & LAW Melters a	HLW & LAW Submerged Bed Scrubber b	HLW & LAW WESP b	HLW HEME b	LAW Caustic Scrubber c	All HEPAs (First) d	All HEPAs (Second) d	HLW & LAW Thermal Catalytic Oxidizer e
95-57-8	2-Chlorophenol	Vapor	1.1	1	1	1	1	1	1	20
95-95-4	2,4,5-Trichlorophenol	Vapor	1.1	1	1	1	1	1	1	20
96-22-0	3-Pentanone	Vapor	1.1	1	1	1	1	1	1	20
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	Vapor	1.1	1	1	1	1	1	1	20
98-51-1	p-tert-Butyltoluene	Vapor	1.1	1	1	1	1	1	1	20
98-82-8	Cumene	Vapor	1.1	1	1	1	1	1	1	20
98-83-9	alpha-Methylstyrene	Vapor	1.1	1	1	1	1	1	1	20
98-86-2	Acetophenone	Vapor	1.1	1	1	1	1	1	1	20
98-95-3	Nitrobenzene	Vapor	1.1	1	1	1	1	1	1	20

a Per the *Final Report Integrated Off-Gas System Tests on the DM-1200 Melter with RPP-WTP LAW Sub-Envelope A1 Simulants* (24590-101-TSA-W000-0009-111-02) and *Final Report Integrated Off-Gas System Test on the DM-1200 Melter with RPP-WTP LAW Sub-Envelope C1 Simulants (24590-101-TSA-W000-0009-111-01)*, the DM-1200 melter organic DRE ranged from 0 % to 33 % for Envelope A and 42 % to 57 % for Envelope C. Because of the observed inefficient destruction efficiency in the DM-1200 melter, a combined VOC/SVOC DRE of 10 % (DF=1.1) for both the HLW and LAW melters is recommended.

b Miscellaneous anion species and nonvolatile organics are defined with the average cation DF due to various speciation potentials.

c The LAW caustic scrubber is assumed to have a particulate scrubbing efficiency DF of 1.

d Based on the *Best Available Radionuclide Control Technology Analysis for the WTP*, 24590-WTP-RPT-ENV-01-004, Rev 1.

e Per the VSL report *Final Report Off-Line Tests of the DM-1200 Thermal Catalytic Oxidation (TCO) Unit* (24590-101-TSA-W000-0009-87-09), the TCO can achieve a DRE of >99 % if the offgas residence time exceeds 0.4 seconds. If the residence time drops to 0.15 seconds, a DRE of ~95 % would be expected. No difference in efficiency was observed between SVOCs and VOCs. Preliminary TCO information (based on early vendor contacts) provided residence times between 0.05 and 0.1 seconds. There is also concern that the TCO units will lose efficiency over time due to poisoning. Therefore, a VOC/SVOC DRE of 90 % was initially recommended for the facility emissions report. However, per E&NS management direction, a 95 % organic DRE abatement efficiency is to be used for emissions modeling.

f Particle bound constituents have both vapor and particle DFs. The amount of the constituents in each phase is determined by the constituents F_v values.

Table 17 Summary of Organic Constituents Emission Rates for the WTP

CAS #	COPC	Feed	Unabated Streams					Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LMP06	HMP06	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
100-00-5	p-Nitrochlorobenzene	2.86E-02	1.55E-02	2.20E-08	4.26E-04	8.68E-05	5.65E-11	3.10E-07	2.20E-08	2.17E-05	4.49E-06	5.65E-11
100-21-0	p-Phthalic acid	4.29E-02	2.38E-09	1.90E-07	4.14E-01	2.28E-03	1.43E-09	2.38E-12	1.90E-07	2.07E-02	1.14E-04	1.43E-09
100-41-4	Ethyl benzene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00
100-42-5	Styrene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	5.21E-15	0.00E+00
10061-01-5	cis-1,3-Dichloropropene	2.86E-03	2.85E-03	1.66E-09	0.00E+00	1.51E-15	0.00E+00	2.85E-05	1.66E-09	0.00E+00	1.49E-14	0.00E+00
10061-02-6	trans-1,3-Dichloropropene	2.86E-03	2.83E-03	1.67E-09	0.00E+00	6.76E-14	0.00E+00	5.65E-05	1.67E-09	1.02E-15	2.08E-13	0.00E+00
101-55-3	4-Bromophenylphenyl ether	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	2.09E-04	2.69E-08	3.24E-09	4.97E-09	0.00E+00
101-84-8	Diphenyl ether	7.14E-03	6.98E-03	4.21E-09	2.72E-13	1.22E-12	0.00E+00	2.79E-05	4.21E-09	1.25E-13	2.03E-12	0.00E+00
106-35-4	3-Heptanone	2.86E-03	2.33E-03	1.79E-09	2.88E-09	2.72E-09	0.00E+00	2.33E-07	1.79E-09	2.16E-10	3.31E-10	0.00E+00
106-42-3	p-Xylene (Dimethyl benzene)	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	7.15E-06	4.15E-09	0.00E+00	1.31E-14	0.00E+00
106-46-7	1,4-Dichlorobenzene	2.86E-03	2.79E-03	1.68E-09	0.00E+00	4.89E-13	0.00E+00	2.79E-05	1.68E-09	4.90E-15	8.13E-13	0.00E+00
106-88-7	1,2-Epoxybutane	7.14E-03	6.33E-03	4.36E-09	4.38E-10	6.95E-10	0.00E+00	6.33E-07	4.36E-09	4.42E-11	1.46E-10	0.00E+00
106-93-4	Ethylene dibromide (Dibromethane)	2.86E-03	2.72E-03	1.70E-09	4.42E-13	3.60E-12	0.00E+00	2.72E-04	1.70E-09	1.21E-13	3.22E-12	0.00E+00
106-97-8	Butane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
106-99-0	1,3-Butadiene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00
107-02-8	Acrolein	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-07	4.48E-09	5.40E-10	8.28E-10	0.00E+00
107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00
107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.86E-03	2.83E-03	1.67E-09	0.00E+00	6.76E-14	0.00E+00	2.83E-07	1.67E-09	1.02E-15	2.08E-13	0.00E+00
107-12-0	Propionitrile	7.14E-03	2.97E-03	5.17E-09	5.34E-07	2.75E-07	6.21E-14	2.97E-07	5.17E-09	3.11E-08	1.97E-08	6.21E-14
107-13-1	Acrylonitrile	1.43E-02	1.16E-02	8.95E-09	1.44E-08	1.36E-08	0.00E+00	1.16E-06	8.95E-09	1.08E-09	1.66E-09	0.00E+00
107-18-6	2-Propene-1-ol	4.29E-02	2.33E-02	3.30E-08	6.40E-04	1.30E-04	8.48E-11	2.33E-06	3.30E-08	3.25E-05	6.73E-06	8.48E-11
107-31-3	Formic acid, methyl ester	4.29E-02	3.80E-02	2.61E-08	2.63E-09	4.17E-09	0.00E+00	3.80E-06	2.61E-08	2.65E-10	8.78E-10	0.00E+00
107-66-4	Dibutylphosphate	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	5.05E-09	6.74E-08	1.76E-03	1.07E-04	0.00E+00
107-87-9	2-Pentanone	1.43E-02	1.16E-02	8.95E-09	1.44E-08	1.36E-08	0.00E+00	1.16E-06	8.95E-09	1.08E-09	1.66E-09	0.00E+00
108-03-2	1-Nitropropane	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	3.49E-06	2.69E-08	3.24E-09	4.97E-09	0.00E+00
108-05-4	Vinyl acetate	4.29E-02	4.06E-02	2.56E-08	3.57E-11	1.50E-10	0.00E+00	4.06E-06	2.56E-08	6.63E-12	8.39E-11	0.00E+00
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-07	4.48E-09	5.40E-10	8.28E-10	0.00E+00
108-20-3	Bis(isopropyl)ether	7.14E-03	6.97E-03	4.21E-09	0.00E+00	1.22E-12	0.00E+00	6.97E-07	4.21E-09	1.22E-14	2.03E-12	0.00E+00
108-38-3	m-Xylene (Dimethyl benzene)	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	7.15E-06	4.15E-09	0.00E+00	1.31E-14	0.00E+00
108-39-4	m-Cresol	7.14E-03	6.00E-04	7.44E-09	4.99E-04	9.71E-05	0.00E+00	3.00E-07	7.44E-09	2.51E-05	4.94E-06	0.00E+00
108-87-2	Methylcyclohexane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-07	4.15E-09	0.00E+00	0.00E+00	0.00E+00
108-88-3	Toluene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00
108-90-7	Chlorobenzene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-05	1.66E-09	0.00E+00	5.21E-15	0.00E+00
108-93-0	Cyclohexanol	7.14E-03	3.88E-03	5.49E-09	1.07E-04	2.17E-05	1.41E-11	1.94E-07	5.49E-09	5.42E-06	1.12E-06	1.41E-11
108-94-1	Cyclohexanone	7.14E-03	1.24E-03	5.88E-09	2.24E-05	7.17E-06	0.00E+00	6.20E-08	5.88E-09	1.16E-06	3.93E-07	0.00E+00
108-95-2	Phenol	4.29E-02	1.31E-03	5.94E-08	1.78E-02	1.95E-03	0.00E+00	6.56E-06	5.94E-08	8.93E-04	9.80E-05	0.00E+00
109-66-0	n-Pentane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
109-99-9	Tetrahydrofuran	2.86E-03	1.19E-03	2.07E-09	2.14E-07	1.10E-07	2.48E-14	1.19E-07	2.07E-09	1.25E-08	7.87E-09	2.48E-14
110-12-3	5-Methyl-2-hexanone	2.86E-03	2.53E-03	1.74E-09	1.75E-10	2.78E-10	0.00E+00	2.53E-07	1.74E-09	1.77E-11	5.85E-11	0.00E+00
110-43-0	2-Heptanone	2.86E-03	2.53E-03	1.74E-09	1.75E-10	2.78E-10	0.00E+00	2.53E-07	1.74E-09	1.77E-11	5.85E-11	0.00E+00

Table 17 Summary of Organic Constituents Emission Rates for the WTP

CAS #	COPC	Feed	Unabated Streams					Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LMP06	HMP06	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
110-54-3	n-Hexane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
110-62-3	n-Valeraldehyde	4.29E-02	3.80E-02	2.61E-08	2.63E-09	4.17E-09	0.00E+00	3.80E-06	2.61E-08	2.65E-10	8.78E-10	0.00E+00
110-82-7	Cyclohexane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-07	4.15E-09	0.00E+00	0.00E+00	0.00E+00
110-83-8	Cyclohexene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00
110-86-1	Pyridine	1.43E-02	2.48E-03	1.18E-08	4.49E-05	1.43E-05	0.00E+00	2.48E-07	1.18E-08	2.33E-06	7.87E-07	0.00E+00
111-65-9	n-Octane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
111-76-2	Ethylene glycol monobutyl ether	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	1.80E-07	4.47E-08	1.51E-04	2.97E-05	0.00E+00
111-84-2	n-Nonane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	3.58E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.29E-02	1.48E-01	7.17E-08	1.86E-02	1.25E-03	7.93E-10	3.84E-07	9.32E-09	1.63E-05	1.11E-06	1.03E-10
117-84-0	n-Dioctyl phthalate	4.29E-02	2.38E-02	3.15E-08	2.23E-04	6.06E-05	4.08E-11	4.05E-07	2.68E-08	8.29E-06	2.34E-06	3.47E-11
120-12-7	Anthracene	4.29E-02	2.02E-02	3.04E-08	1.19E-06	7.26E-07	7.45E-13	4.02E-06	3.03E-08	7.56E-08	5.90E-08	7.44E-13
120-82-1	1,2,4-Trichlorobenzene	7.14E-03	7.07E-03	4.18E-09	0.00E+00	1.69E-13	0.00E+00	1.41E-05	4.18E-09	2.55E-15	5.20E-13	0.00E+00
120-83-2	2,4-Dichlorophenol	4.29E-02	2.33E-02	3.30E-08	6.40E-04	1.30E-04	8.48E-11	1.40E-04	3.30E-08	3.25E-05	6.73E-06	8.48E-11
121-44-8	Triethylamine	7.14E-03	6.33E-03	4.36E-09	4.38E-10	6.95E-10	0.00E+00	6.33E-07	4.36E-09	4.42E-11	1.46E-10	0.00E+00
121-69-7	Dimethylaniline	7.14E-03	2.97E-03	5.17E-09	5.34E-07	2.75E-07	6.21E-14	1.49E-07	5.17E-09	3.11E-08	1.97E-08	6.21E-14
122-39-4	N,N-Diphenylamine	1.43E-02	1.57E-03	1.36E-08	4.26E-04	8.68E-05	5.65E-11	6.27E-06	1.36E-08	2.17E-05	4.49E-06	5.65E-11
123-19-3	4-Heptanone	2.86E-03	1.19E-03	2.07E-09	2.14E-07	1.10E-07	2.48E-14	1.19E-07	2.07E-09	1.25E-08	7.87E-09	2.48E-14
123-38-6	n-Propionaldehyde	1.43E-02	1.16E-02	8.95E-09	1.44E-08	1.36E-08	0.00E+00	1.16E-06	8.95E-09	1.08E-09	1.66E-09	0.00E+00
123-51-3	3-Methyl-1-butanol	7.14E-03	1.42E-03	5.73E-09	1.23E-05	4.26E-06	0.00E+00	1.42E-07	5.73E-09	6.48E-07	2.40E-07	0.00E+00
123-86-4	Acetic acid n-butyl ester	1.35E-04	1.28E-04	8.06E-11	1.13E-13	4.72E-13	0.00E+00	1.28E-08	8.06E-11	2.09E-14	2.65E-13	0.00E+00
123-91-1	1,4-Dioxane	1.43E-03	7.76E-04	1.10E-09	2.13E-05	4.34E-06	2.83E-12	7.76E-08	1.10E-09	1.08E-06	2.24E-07	2.83E-12
126-73-8	Tributyl phosphate	2.86E-02	4.56E-04	4.43E-08	1.81E-02	1.51E-03	9.66E-10	9.08E-09	4.42E-08	8.96E-04	7.51E-05	9.62E-10
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	7.14E-03	6.77E-03	4.26E-09	5.95E-12	2.49E-11	0.00E+00	6.77E-07	4.26E-09	1.10E-12	1.40E-11	0.00E+00
127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-04	1.66E-09	0.00E+00	0.00E+00	0.00E+00
127-19-5	N,N-Dimethylacetamide	7.14E-03	8.46E-06	1.13E-08	5.93E-03	3.61E-04	0.00E+00	8.46E-10	1.13E-08	2.97E-04	1.81E-05	0.00E+00
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.43E-02	7.93E-03	1.05E-08	7.43E-05	2.02E-05	1.36E-11	1.59E-07	1.05E-08	3.79E-06	1.07E-06	1.36E-11
129-00-0	Pyrene	4.29E-02	9.35E-03	3.79E-08	1.06E-04	3.46E-05	2.45E-11	5.57E-05	3.77E-08	5.56E-06	1.92E-06	2.43E-11
1321-64-8	Pentachloronaphthalene	4.29E-02	4.19E-02	2.53E-08	2.76E-12	7.35E-12	0.00E+00	2.44E-04	2.45E-08	1.23E-12	1.19E-11	0.00E+00
1321-65-9	Trichloronaphthalene	4.29E-02	3.80E-02	2.61E-08	2.63E-09	4.17E-09	0.00E+00	2.28E-04	2.61E-08	2.65E-10	8.76E-10	0.00E+00
132-64-9	Dibenzofuran	4.29E-02	3.41E-02	2.71E-08	5.25E-09	8.33E-09	0.00E+00	2.05E-04	2.70E-08	5.29E-10	1.74E-09	0.00E+00
1335-87-1	Hexachloronaphthalene	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	2.06E-04	2.64E-08	3.16E-09	4.86E-09	0.00E+00
1335-88-2	Tetrachloronaphthalene	4.29E-02	3.80E-02	2.61E-08	2.63E-09	4.17E-09	0.00E+00	2.26E-04	2.59E-08	2.62E-10	8.68E-10	0.00E+00
1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03	4.26E-03	1.36E-09	5.82E-11	2.08E-10	1.20E-15	2.56E-05	1.36E-09	1.02E-11	9.47E-11	1.20E-15
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.35E-04	1.10E-04	8.48E-11	1.37E-10	1.29E-10	0.00E+00	1.10E-08	8.48E-11	1.02E-11	1.57E-11	0.00E+00
141-79-7	4-Methyl-3-penten-2-one	4.29E-02	1.78E-02	3.10E-08	3.20E-06	1.65E-06	3.73E-13	1.78E-06	3.10E-08	1.87E-07	1.18E-07	3.73E-13
142-82-5	n-Heptane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
144-62-7	Oxalic acid	2.14E+00	3.27E-05	3.41E-06	1.83E+00	1.08E-01	0.00E+00	1.63E-07	3.41E-06	9.16E-02	5.40E-03	0.00E+00
156-60-5	trans-1,2-Dichloroethylene	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.15E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
1634-04-4	Methyl tert-butyl ether	7.14E-03	6.77E-03	4.26E-09	5.95E-12	2.49E-11	0.00E+00	6.77E-07	4.26E-09	1.10E-12	1.40E-11	0.00E+00
189-55-9	Dibenzo[a,i]pyrene	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	2.31E-15	6.77E-14	2.26E-11	1.57E-14	0.00E+00

Table 17 Summary of Organic Constituents Emission Rates for the WTP

CAS #	COPC	Feed	Unabated Streams					Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LMP06	HMP06	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
189-64-0	Dibenzo[a,h]pyrene	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	2.31E-15	6.77E-14	2.26E-11	1.57E-14	0.00E+00
191-24-2	Benzo(g,h,i)perylene	4.29E-02	1.48E-01	7.17E-08	1.86E-02	1.25E-03	7.93E-10	5.75E-05	4.66E-09	4.21E-06	2.93E-07	5.15E-11
191-30-0	Benzo[a,i]pyrene	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	2.31E-15	6.77E-14	2.26E-11	1.57E-14	0.00E+00
192-65-4	Dibenzo[a,e]pyrene	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	2.31E-15	6.77E-14	2.26E-11	1.57E-14	0.00E+00
193-39-5	Indeno(1,2,3-cd)pyrene	4.29E-02	2.93E-01	6.86E-08	5.91E-10	2.84E-10	5.96E-15	1.33E-11	6.86E-14	1.26E-15	0.00E+00	0.00E+00
206-44-0	Fluoranthene	4.29E-02	4.19E-02	2.53E-08	1.27E-11	7.39E-12	0.00E+00	2.49E-04	2.51E-08	5.79E-12	1.22E-11	0.00E+00
208-96-8	Acenaphthylene	4.29E-02	2.79E-02	2.85E-08	8.65E-08	8.15E-08	0.00E+00	1.67E-04	2.85E-08	6.48E-09	9.92E-09	0.00E+00
2234-13-1	Octachloronaphthalene	1.35E-04	1.10E-04	8.48E-11	1.37E-10	1.29E-10	0.00E+00	4.16E-07	5.33E-11	4.84E-12	8.36E-12	0.00E+00
224-42-0	Dibenz[a,j]acridine	4.29E-02	6.34E-06	6.80E-08	3.65E-02	2.16E-03	0.00E+00	9.17E-09	1.64E-08	1.07E-04	6.32E-06	0.00E+00
226-36-8	Dibenz[a,h]acridine	4.29E-02	6.34E-06	6.80E-08	3.65E-02	2.16E-03	0.00E+00	1.08E-08	1.94E-08	1.49E-04	8.83E-06	0.00E+00
2551-13-7	Trimethyl benzene	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	3.57E-06	4.15E-09	0.00E+00	1.31E-14	0.00E+00
26140-60-3	Terphenyls	4.29E-02	4.19E-02	2.53E-08	8.58E-12	7.38E-12	0.00E+00	2.19E-04	2.21E-08	3.39E-12	1.07E-11	0.00E+00
27154-33-2	Trichlorofluoroethane	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.15E-04	4.14E-09	0.00E+00	0.00E+00	0.00E+00
287-92-3	Cyclopentane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-07	4.15E-09	0.00E+00	0.00E+00	0.00E+00
3697-24-3	5-Methylchrysene	4.29E-02	4.19E-02	2.53E-08	1.37E-11	7.40E-12	0.00E+00	2.07E-04	2.08E-08	5.07E-12	1.01E-11	0.00E+00
3825-26-1	Ammonium perfluorooctanoate	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	2.09E-04	2.69E-08	3.24E-09	4.97E-09	0.00E+00
4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	7.14E-03	1.25E-03	5.88E-09	2.19E-05	7.02E-06	0.00E+00	1.25E-07	5.88E-09	1.14E-06	3.86E-07	0.00E+00
50-00-0	Formaldehyde	7.14E-03	2.80E-04	9.50E-09	2.42E-03	2.93E-04	0.00E+00	2.80E-08	9.50E-09	1.21E-04	1.47E-05	0.00E+00
50-32-8	Benzo(a)pyrene	2.72E-02	1.40E-03	4.73E-08	2.36E-02	1.59E-03	1.00E-09	2.44E-06	1.37E-08	1.01E-04	6.83E-06	2.91E-10
53-70-3	Dibenzo(a,h)anthracene	2.72E-02	4.33E-04	4.21E-08	1.72E-02	1.44E-03	9.18E-10	1.40E-07	2.27E-09	2.64E-06	2.24E-07	4.96E-11
540-59-0	1,2-Dichloroethylene	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	7.15E-07	4.15E-09	0.00E+00	1.31E-14	0.00E+00
540-84-1	2,2,4-Trimethylpentane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
541-73-1	1,3-Dichlorobenzene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-05	1.66E-09	0.00E+00	5.21E-15	0.00E+00
56-23-5	Carbon tetrachloride	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	5.73E-04	1.66E-09	0.00E+00	0.00E+00	0.00E+00
563-80-4	3-Methyl-2-butanone	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-07	4.48E-09	5.40E-10	8.28E-10	0.00E+00
56-49-5	3-Methylcholanthrene	4.29E-02	4.30E-02	2.49E-08	0.00E+00	0.00E+00	0.00E+00	9.39E-05	9.05E-09	0.00E+00	0.00E+00	0.00E+00
57-14-7	1,1-Dimethylhydrazine	4.29E-02	8.54E-03	3.44E-08	7.41E-05	2.56E-05	0.00E+00	8.54E-07	3.44E-08	3.89E-06	1.44E-06	0.00E+00
58-90-2	2,3,4,6-Tetrachlorophenol	4.29E-02	7.12E-03	3.56E-08	1.60E-04	5.01E-05	0.00E+00	2.14E-04	3.56E-08	8.30E-06	2.73E-06	0.00E+00
591-78-6	2-Hexanone	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-06	4.48E-09	5.40E-10	8.28E-10	0.00E+00
59-50-7	4-Chloro-3-methylphenol	4.29E-02	2.38E-02	3.15E-08	2.23E-04	6.06E-05	4.08E-11	3.57E-04	3.15E-08	1.14E-05	3.20E-06	4.08E-11
59-89-2	N-Nitrosomorpholine	4.29E-02	4.19E-02	2.53E-08	1.55E-11	7.41E-12	0.00E+00	2.09E-06	2.53E-08	7.14E-12	1.23E-11	0.00E+00
602-87-9	5-Nitroacenaphthene	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	2.15E-05	4.45E-08	1.50E-04	2.95E-05	0.00E+00
60-29-7	Ethyl ether	4.29E-02	4.24E-02	2.51E-08	0.00E+00	1.01E-12	0.00E+00	4.24E-06	2.51E-08	1.53E-14	3.12E-12	0.00E+00
603-34-9	Triphenylamine	4.29E-02	5.65E-03	3.77E-08	4.46E-04	1.21E-04	8.15E-11	3.39E-05	3.77E-08	2.28E-05	6.39E-06	8.15E-11
60-34-4	Methylhydrazine	7.14E-03	3.88E-03	5.49E-09	1.07E-04	2.17E-05	1.41E-11	3.88E-07	5.49E-09	5.42E-06	1.12E-06	1.41E-11
60-35-5	Acetamide	7.14E-03	8.46E-06	1.13E-08	5.93E-03	3.61E-04	0.00E+00	4.23E-10	1.13E-08	2.97E-04	1.81E-05	0.00E+00
621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.29E-02	4.19E-02	2.53E-08	1.37E-11	7.39E-12	8.48E-11	2.09E-06	2.53E-08	5.49E-07	1.23E-11	8.48E-11
624-83-9	Methyl isocyanate	7.14E-03	7.07E-03	4.18E-09	0.00E+00	1.69E-13	0.00E+00	7.07E-06	4.18E-09	2.55E-15	5.20E-13	0.00E+00
627-13-4	Nitric acid, propyl ester	3.57E-03	3.53E-03	2.09E-09	0.00E+00	8.45E-14	0.00E+00	3.53E-07	2.09E-09	1.28E-15	2.60E-13	0.00E+00
62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	1.80E-07	4.47E-08	1.51E-04	2.97E-05	0.00E+00

Table 17 Summary of Organic Constituents Emission Rates for the WTP

CAS #	COPC	Feed	Unabated Streams					Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LMP06	HMP06	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
630-20-6	1,1,1,2-Tetrachloroethane	7.14E-03	6.97E-03	4.21E-09	0.00E+00	1.22E-12	0.00E+00	6.97E-04	4.21E-09	1.22E-14	2.03E-12	0.00E+00
64-17-5	Ethyl alcohol	7.14E-03	3.88E-03	5.49E-09	1.07E-04	2.17E-05	1.41E-11	3.88E-07	5.49E-09	5.42E-06	1.12E-06	1.41E-11
64-18-6	Formic acid	1.07E+01	1.71E-01	1.66E-05	6.77E+00	5.67E-01	3.62E-07	1.71E-05	1.66E-05	3.39E-01	2.84E-02	3.62E-07
64-19-7	Acetic acid	1.55E+01	1.51E+01	9.12E-06	5.60E-09	2.67E-09	0.00E+00	1.51E-03	9.12E-06	2.57E-09	4.44E-09	0.00E+00
67-56-1	Methyl alcohol (Methanol)	7.14E-03	3.88E-03	5.49E-09	1.07E-04	2.17E-05	1.41E-11	3.88E-07	5.49E-09	5.42E-06	1.12E-06	1.41E-11
67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	1.43E-03	2.48E-04	1.18E-09	4.49E-06	1.43E-06	0.00E+00	2.48E-08	1.18E-09	2.33E-07	7.87E-08	0.00E+00
67-64-1	2-Propanone (Acetone)	1.43E-02	5.94E-03	1.03E-08	1.07E-06	5.50E-07	1.24E-13	5.94E-07	1.03E-08	6.23E-08	3.93E-08	1.24E-13
67-66-3	Chloroform	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	1.43E-03	1.66E-09	0.00E+00	5.21E-15	0.00E+00
67-72-1	Hexachloroethane	4.29E-02	4.29E-02	2.49E-08	0.00E+00	7.66E-15	0.00E+00	8.58E-04	2.49E-08	0.00E+00	7.85E-14	0.00E+00
684-16-2	Hexafluoroacetone	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	7.15E-03	4.15E-09	0.00E+00	1.31E-14	0.00E+00
71-23-8	n-Propyl alcohol	2.86E-03	4.96E-04	2.35E-09	8.97E-06	2.87E-06	0.00E+00	4.96E-08	2.35E-09	4.66E-07	1.57E-07	0.00E+00
71-36-3	n-Butyl alcohol	7.14E-03	1.24E-03	5.88E-09	2.24E-05	7.17E-06	0.00E+00	1.24E-07	5.88E-09	1.16E-06	3.93E-07	0.00E+00
71-43-2	Benzene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-05	1.66E-09	0.00E+00	0.00E+00	0.00E+00
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	0.00E+00	0.00E+00
74-83-9	Bromomethane (Methyl bromide)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	5.21E-15	0.00E+00
74-87-3	Chloromethane (Methyl chloride)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	1.43E-04	1.66E-09	0.00E+00	0.00E+00	0.00E+00
74-97-5	Bromochloromethane	7.14E-03	7.07E-03	4.18E-09	0.00E+00	1.69E-13	0.00E+00	3.53E-03	4.18E-09	2.55E-15	5.20E-13	0.00E+00
74-99-7	Methylacetylene	4.29E-02	4.29E-02	2.49E-08	0.00E+00	0.00E+00	0.00E+00	4.29E-06	2.49E-08	0.00E+00	0.00E+00	0.00E+00
75-00-3	Chloroethane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	0.00E+00	0.00E+00
75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00
75-05-8	Acetonitrile	7.14E-03	2.58E-03	5.28E-09	8.70E-07	4.29E-07	0.00E+00	2.58E-06	5.28E-09	4.96E-08	2.95E-08	0.00E+00
75-07-0	Acetaldehyde	4.29E-02	1.78E-02	3.10E-08	3.20E-06	1.65E-06	3.73E-13	1.78E-06	3.10E-08	1.87E-07	1.18E-07	3.73E-13
75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	5.72E-05	1.66E-09	0.00E+00	5.21E-15	0.00E+00
75-12-7	Formamide	4.29E-02	6.34E-06	6.80E-08	3.65E-02	2.16E-03	0.00E+00	6.34E-10	6.80E-08	1.82E-03	1.08E-04	0.00E+00
75-15-0	Carbon disulfide	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.15E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
75-21-8	Ethylene oxide (Oxirane)	1.43E-03	1.27E-03	8.72E-10	8.76E-11	1.39E-10	0.00E+00	1.27E-07	8.72E-10	8.84E-12	2.93E-11	0.00E+00
75-27-4	Bromodichloromethane	7.14E-03	6.97E-03	4.21E-09	0.00E+00	1.22E-12	0.00E+00	1.39E-03	4.21E-09	1.22E-14	2.03E-12	0.00E+00
75-34-3	1,1-Dichloroethane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	5.21E-15	0.00E+00
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
75-43-4	Dichlorofluoromethane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	0.00E+00	0.00E+00
75-45-6	Chlorodifluoromethane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	5.73E-05	1.66E-09	0.00E+00	0.00E+00	0.00E+00
75-50-3	Trimethylamine	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-07	4.48E-09	5.40E-10	8.28E-10	0.00E+00
75-52-5	Nitromethane	4.29E-02	1.78E-02	3.10E-08	3.20E-06	1.65E-06	3.73E-13	1.78E-06	3.10E-08	1.87E-07	1.18E-07	3.73E-13
75-55-8	2-Methylaziridine	4.29E-02	7.45E-03	3.53E-08	1.35E-04	4.30E-05	0.00E+00	7.45E-07	3.53E-08	6.99E-06	2.36E-06	0.00E+00
75-61-6	Difluorodibromomethane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00
75-63-8	Trifluorobromomethane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00
75-65-0	2-Methyl-2-propanol	7.14E-03	1.24E-03	5.88E-09	2.24E-05	7.17E-06	0.00E+00	1.24E-07	5.88E-09	1.16E-06	3.93E-07	0.00E+00
75-69-4	Trichlorofluoromethane	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00
75-71-8	Dichlorodifluoromethane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00
76-03-9	Trichloroacetic acid	7.14E-03	8.46E-06	1.13E-08	5.93E-03	3.61E-04	0.00E+00	1.69E-07	1.13E-08	2.97E-04	1.81E-05	0.00E+00

Table 17 Summary of Organic Constituents Emission Rates for the WTP

CAS #	COPC	Feed	Unabated Streams					Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LMP06	HMP06	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.29E-02	4.30E-02	2.49E-08	0.00E+00	0.00E+00	0.00E+00	4.30E-04	2.49E-08	0.00E+00	0.00E+00	0.00E+00
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	4.29E-02	2.48E-08	0.00E+00	0.00E+00	0.00E+00	4.29E-04	2.48E-08	0.00E+00	0.00E+00	0.00E+00
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	1.79E-04	4.15E-09	0.00E+00	0.00E+00	0.00E+00
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00
76-15-3	Chloropentafluoroethane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.29E-02	7.45E-03	3.53E-08	1.35E-04	4.30E-05	0.00E+00	7.45E-07	3.53E-08	6.99E-06	2.36E-06	0.00E+00
78-87-5	1,2-Dichloropropane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	5.21E-15	0.00E+00
78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.86E-03	4.96E-04	2.35E-09	8.97E-06	2.87E-06	0.00E+00	4.96E-08	2.35E-09	4.66E-07	1.57E-07	0.00E+00
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	7.14E-03	2.97E-03	5.17E-09	5.34E-07	2.75E-07	6.21E-14	2.97E-06	5.17E-09	3.11E-08	1.97E-08	6.21E-14
79-00-5	1,1,2-Trichloroethane	7.14E-03	7.07E-03	4.18E-09	0.00E+00	1.69E-13	0.00E+00	7.07E-07	4.18E-09	2.55E-15	5.20E-13	0.00E+00
79-01-6	Trichloroethylene	7.14E-03	7.16E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.15E-09	0.00E+00	0.00E+00	0.00E+00
79-09-4	Propionic acid	4.29E-02	1.68E-03	5.70E-08	1.45E-02	1.76E-03	0.00E+00	1.68E-07	5.70E-08	7.28E-04	8.84E-05	0.00E+00
79-10-7	2-Propenoic acid	5.72E-02	2.24E-03	7.60E-08	1.94E-02	2.35E-03	0.00E+00	2.24E-07	7.60E-08	9.70E-04	1.18E-04	0.00E+00
79-20-9	Methyl acetate	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	3.49E-06	2.69E-08	3.24E-09	4.97E-09	0.00E+00
79-34-5	1,1,2,2-Tetrachloroethane	1.35E-05	1.28E-05	8.06E-12	1.13E-14	4.72E-14	0.00E+00	1.28E-06	8.06E-12	2.09E-15	2.65E-14	0.00E+00
83-32-9	Acenaphthene	4.29E-02	4.18E-02	2.52E-08	2.45E-12	7.34E-12	0.00E+00	2.51E-04	2.52E-08	1.13E-12	1.22E-11	0.00E+00
84-66-2	Diethyl phthalate	4.29E-02	2.05E-03	5.46E-08	1.12E-02	1.56E-03	0.00E+00	4.11E-08	5.46E-08	5.62E-04	7.87E-05	0.00E+00
84-74-2	Dibutyl phthalate	4.29E-02	4.09E-03	4.93E-08	4.56E-03	6.92E-04	4.43E-10	8.13E-08	4.90E-08	2.28E-04	3.48E-05	4.41E-10
85-01-8	Phenanthrene	4.29E-02	1.78E-02	3.10E-08	3.20E-06	1.65E-06	3.73E-13	1.07E-04	3.10E-08	1.87E-07	1.18E-07	3.72E-13
85-68-7	Butylbenzyl phthalate	4.29E-02	4.09E-03	4.93E-08	4.56E-03	6.92E-04	4.43E-10	7.75E-08	4.67E-08	2.07E-04	3.17E-05	4.20E-10
86-73-7	Fluorene	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	2.09E-04	2.69E-08	3.24E-09	4.97E-09	0.00E+00
87-68-3	Hexachlorobutadiene	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-05	4.14E-09	0.00E+00	0.00E+00	0.00E+00
88-06-2	2,4,6-Trichlorophenol	4.29E-02	2.33E-02	3.30E-08	6.40E-04	1.30E-04	8.48E-11	1.40E-04	3.30E-08	3.25E-05	6.73E-06	8.48E-11
88-72-2	2-Nitrotoluene	7.14E-03	1.42E-03	5.73E-09	1.23E-05	4.26E-06	0.00E+00	7.12E-08	5.73E-09	6.48E-07	2.40E-07	0.00E+00
88-75-5	2-Nitrophenol	4.29E-02	8.54E-03	3.44E-08	7.41E-05	2.56E-05	0.00E+00	1.28E-04	3.44E-08	3.89E-06	1.44E-06	0.00E+00
88-89-1	Picric acid	4.29E-02	7.76E-08	6.82E-08	3.67E-02	2.16E-03	0.00E+00	1.45E-12	6.37E-08	1.60E-03	9.44E-05	0.00E+00
91-20-3	Naphthalene	1.43E-03	1.30E-03	8.63E-10	3.29E-12	1.29E-11	0.00E+00	6.51E-06	8.63E-10	5.77E-13	6.37E-12	0.00E+00
91-22-5	Quinoline	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	1.80E-07	4.47E-08	1.51E-04	2.97E-05	0.00E+00
91-58-7	2-Chloronapthalene	4.29E-02	4.06E-02	2.56E-08	3.57E-11	1.50E-10	0.00E+00	2.44E-04	2.56E-08	6.63E-12	8.39E-11	0.00E+00
92-52-4	1,1`-Biphenyl	2.86E-02	2.71E-02	1.70E-08	2.38E-11	9.97E-11	0.00E+00	5.41E-06	1.70E-08	4.42E-12	5.59E-11	0.00E+00
92-93-3	4-Nitrobiphenyl	4.29E-02	2.33E-02	3.30E-08	6.40E-04	1.30E-04	8.48E-11	1.40E-04	3.29E-08	3.25E-05	6.72E-06	8.47E-11
95-13-6	Indene	4.29E-02	4.18E-02	2.52E-08	0.00E+00	7.33E-12	0.00E+00	2.09E-05	2.52E-08	7.35E-14	1.22E-11	0.00E+00
95-47-6	o-Xylene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	5.21E-15	0.00E+00
95-48-7	o-Cresol (2-Methylphenol)	7.14E-03	6.00E-04	7.44E-09	4.99E-04	9.71E-05	0.00E+00	3.00E-07	7.44E-09	2.51E-05	4.94E-06	0.00E+00
95-49-8	2-Chlorotoluene	4.29E-02	4.29E-02	2.49E-08	0.00E+00	7.66E-15	0.00E+00	2.14E-06	2.49E-08	0.00E+00	7.85E-14	0.00E+00
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.86E-03	2.79E-03	1.68E-09	0.00E+00	4.89E-13	0.00E+00	2.79E-05	1.68E-09	4.90E-15	8.13E-13	0.00E+00
95-57-8	2-Chlorophenol	4.29E-02	7.45E-03	3.53E-08	1.35E-04	4.30E-05	0.00E+00	3.72E-07	3.53E-08	6.99E-06	2.36E-06	0.00E+00
95-95-4	2,4,5-Trichlorophenol	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	2.16E-05	4.47E-08	1.51E-04	2.97E-05	0.00E+00
96-22-0	3-Pentanone	1.43E-02	1.16E-02	8.95E-09	1.44E-08	1.36E-08	0.00E+00	1.16E-06	8.95E-09	1.08E-09	1.66E-09	0.00E+00
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	4.29E-02	2.49E-08	0.00E+00	7.66E-15	0.00E+00	2.57E-04	2.49E-08	0.00E+00	7.85E-14	0.00E+00

Table 17 Summary of Organic Constituents Emission Rates for the WTP

CAS #	COPC	Feed	Unabated Streams					Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LMP06	HMP06	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
98-51-1	p-tert-Butyltoluene	4.29E-02	4.29E-02	2.48E-08	0.00E+00	0.00E+00	0.00E+00	2.15E-06	2.48E-08	0.00E+00	0.00E+00	0.00E+00
98-82-8	Cumene	4.29E-02	4.29E-02	2.49E-08	0.00E+00	0.00E+00	0.00E+00	2.15E-06	2.49E-08	0.00E+00	0.00E+00	0.00E+00
98-83-9	alpha-Methylstyrene	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	3.57E-05	4.15E-09	0.00E+00	1.31E-14	0.00E+00
98-86-2	Acetophenone	2.86E-02	5.16E-03	2.33E-08	7.50E-05	2.45E-05	0.00E+00	2.58E-05	2.33E-08	3.90E-06	1.36E-06	0.00E+00
98-95-3	Nitrobenzene	2.86E-02	5.69E-03	2.29E-08	4.94E-05	1.70E-05	0.00E+00	2.85E-07	2.29E-08	2.59E-06	9.62E-07	0.00E+00
Coplanar PCB's												
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00

Table 18 Estimated Inorganic COPC Emissions

CAS Number	Compound	Feed	Unabated Streams									Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LFP04	LMP06	LVP01	HFP03	HMP06	HOP10	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter Feed	LAW Melter	LAW Vessel Vent	HLW Melter Feed	HLW Melter	HLW Vessel Vent	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
7440-22-4	Silver	2.09E-02	1.07E-07	7.19E-08	2.45E-03	8.17E-05	7.48E-11	1.91E-02	6.37E-04	3.83E-09	4.04E-10	0.00E+00	7.19E-14	4.54E-12	3.54E-13	2.02E-15
7429-90-5	Aluminum	1.00E+01	6.01E-05	2.08E-05	1.91E+01	1.91E-01	4.58E-07	3.34E+00	3.34E-02	6.69E-07	2.10E-08	4.29E-13	2.08E-11	2.17E-09	4.26E-12	1.05E-13
7440-38-2	Arsenic	8.65E-03	6.89E-08	1.63E-08	8.68E-03	1.45E-03	2.78E-10	1.41E-03	6.72E-05	2.83E-10	4.24E-11	0.00E+00	1.63E-14	7.53E-11	3.89E-14	0.00E+00
7440-42-8	Boron	3.37E-02	2.68E-06	4.80E-07	1.79E+01	5.95E-01	3.69E-07	1.78E+00	5.93E-02	3.57E-07	3.73E-08	1.92E-14	4.80E-13	1.68E-08	1.00E-11	1.87E-13
7440-39-3	Barium	1.97E-02	1.05E-07	6.51E-08	2.80E-03	2.80E-05	8.43E-11	1.71E-02	1.71E-04	3.41E-09	1.07E-10	0.00E+00	6.51E-14	1.30E-13	3.31E-14	0.00E+00
7440-69-9	Bismuth	9.27E-02	2.46E-07	3.26E-07	5.05E-03	6.31E-05	1.52E-10	8.92E-02	1.54E-03	1.79E-08	9.73E-10	1.76E-15	3.26E-13	4.05E-12	9.87E-13	4.87E-15
7440-70-2	Calcium	1.58E-01	2.77E-05	5.15E-07	1.70E+01	2.26E-01	3.45E-07	1.05E-01	1.40E-03	2.11E-08	8.83E-10	1.98E-13	5.15E-13	5.14E-09	3.55E-13	4.41E-15
7440-43-9	Cadmium	6.61E-02	1.96E-07	2.53E-07	5.54E-03	5.54E-04	1.68E-10	6.88E-02	6.88E-03	1.38E-08	4.37E-09	1.40E-15	2.53E-13	2.17E-11	2.44E-12	2.18E-14
16887-00-6	Chloride	1.59E+00	8.77E-06	2.59E-06	1.77E+00	0.00E+00	5.75E-08	6.25E-02	0.00E+00	1.51E-07	7.60E-09	6.26E-14	2.59E-12	2.88E-13	7.56E-15	3.80E-14
18540-29-9	Chromium (hexavalent)	3.94E-01	1.73E-06	7.21E-07	3.72E-01	9.07E-03	1.10E-08	6.16E-02	6.16E-04	4.49E-08	1.04E-09	1.24E-14	7.21E-13	1.03E-09	7.76E-13	5.18E-15
7440-50-8	Copper	9.61E-03	5.35E-08	2.95E-08	2.37E-03	1.18E-05	7.12E-11	7.27E-03	4.27E-05	1.45E-09	2.70E-11	0.00E+00	2.95E-14	6.81E-13	2.46E-14	0.00E+00
16984-48-8	Flouride	7.10E-01	2.96E-06	1.97E-06	4.63E-01	0.00E+00	1.46E-08	3.85E-01	0.00E+00	7.78E-08	4.75E-08	2.11E-14	1.97E-12	7.30E-14	4.32E-15	2.38E-13
7439-89-6	Iron	2.73E+00	1.36E-05	9.78E-06	2.40E+01	1.20E-01	4.83E-07	3.05E+00	2.54E-02	7.32E-07	1.84E-08	9.69E-14	9.78E-12	1.36E-09	3.25E-12	9.21E-14
7439-97-6	Mercury	1.85E-02	2.92E-07	1.65E-07	2.88E-02	2.88E-02	1.07E-09	3.94E-02	3.94E-02	8.17E-09	1.81E-08	2.92E-07	1.65E-07	7.77E-05	1.07E-05	1.81E-08
7440-09-7	Potassium	3.73E+00	2.09E-05	5.89E-06	3.79E+00	1.89E-01	1.16E-07	1.69E-01	8.47E-03	3.40E-08	5.37E-09	1.49E-13	5.89E-12	9.28E-09	3.77E-12	2.69E-14
7439-93-2	Lithium	4.29E-03	1.36E-07	4.36E-08	4.72E+00	4.72E-02	9.57E-08	7.38E-01	7.38E-03	1.48E-07	4.67E-09	0.00E+00	4.36E-14	2.81E-09	4.40E-12	2.34E-14
7439-95-4	Magnesium	2.84E-02	2.56E-06	9.58E-08	6.22E+00	3.11E-02	1.25E-07	2.59E-02	4.11E-04	5.18E-09	2.59E-10	1.83E-14	9.58E-14	4.32E-09	1.14E-13	1.29E-15
7439-96-5	Manganese	2.65E-01	1.21E-06	9.18E-07	8.69E-02	1.16E-03	1.94E-09	2.50E-01	3.33E-03	5.00E-08	2.10E-09	8.67E-15	9.18E-13	1.93E-11	6.19E-13	1.05E-14
7440-23-5	Sodium	7.00E+01	3.37E-04	1.21E-04	6.76E+01	6.76E-01	2.04E-06	6.62E+00	6.62E-02	1.46E-05	3.05E-07	2.40E-12	1.21E-10	4.33E-08	4.32E-11	1.53E-12
7440-02-0	Nickel	1.40E-01	4.37E-07	4.46E-07	9.38E-02	1.05E-03	2.21E-09	1.12E-01	1.26E-03	3.97E-08	1.14E-09	3.12E-15	4.46E-13	6.59E-11	5.93E-13	5.68E-15
14797-65-0	Nitrite	2.85E+01	1.31E-04	4.58E-05	2.66E+01	0.00E+00	7.98E-07	1.73E+00	0.00E+00	3.45E-07	1.97E-13	9.33E-13	4.58E-11	3.99E-12	1.92E-14	0.00E+00
14797-55-8	Nitrate	5.09E+01	3.51E-04	1.03E-04	6.55E+01	0.00E+00	1.96E-06	5.82E+00	0.00E+00	2.47E-05	4.69E-07	2.51E-12	1.03E-10	9.82E-12	1.37E-12	2.34E-12
14280-30-9	Hydroxide	4.04E+01	2.65E-04	7.97E-05	7.39E-01	0.00E+00	2.99E-07	1.65E+01	0.00E+00	7.16E-06	7.68E-08	1.89E-12	7.97E-11	1.49E-12	3.98E-13	3.84E-13
7723-14-0	Phosphorous	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439-92-1	Lead	1.73E-01	4.99E-07	5.65E-07	2.87E-02	3.50E-04	8.65E-10	1.46E-01	1.83E-03	2.93E-08	1.16E-09	3.56E-15	5.65E-13	2.12E-11	1.11E-12	5.79E-15
14265-44-2	Phosphate	1.70E+00	1.12E-05	3.98E-06	1.18E+00	2.96E-02	3.47E-08	6.83E-01	1.71E-02	1.37E-07	1.07E-08	7.99E-14	3.98E-12	4.35E-09	2.61E-12	5.37E-14
63705-05-5	Total Sulfur	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.79E-03	6.29E-03	0.00E+00
7440-21-3	Silicon	5.59E-01	1.15E-05	2.54E-06	2.69E+02	8.95E-01	5.39E-06	3.31E+01	1.44E-01	6.63E-06	9.06E-08	8.19E-14	2.54E-12	1.36E-08	2.46E-11	4.53E-13
14808-79-8	Sulfate	2.81E+00	1.36E-05	4.79E-06	2.56E+00	0.00E+00	7.62E-08	3.05E-01	0.00E+00	6.11E-08	9.09E-15	9.69E-14	4.79E-12	3.81E-13	3.39E-15	0.00E+00
7440-24-6	Strontium (total)	9.90E-03	2.59E-08	3.47E-08	4.87E-04	4.87E-06	1.47E-11	9.51E-03	9.51E-05	1.90E-09	5.98E-11	0.00E+00	3.47E-14	5.54E-14	1.21E-14	0.00E+00
7440-66-6	Zinc	1.38E-02	6.17E-07	1.12E-07	1.42E+01	1.42E-01	2.87E-07	8.07E-01	8.07E-03	1.62E-07	5.08E-09	4.41E-15	1.12E-13	3.65E-09	2.05E-12	2.54E-14
7440-67-7	Zirconium	6.57E-01	3.25E-06	2.36E-06	1.31E+01	4.38E-02	2.64E-07	7.67E-01	4.04E-03	1.54E-07	2.54E-09	2.32E-14	2.36E-12	1.31E-09	7.57E-13	1.27E-14
7440-41-7	Beryllium	4.98E-04	2.47E-09	1.79E-09	3.63E-05	1.81E-07	3.80E-08	4.98E-04	3.83E-06	1.16E-10	1.93E-12	0.00E+00	1.79E-15	1.92E-13	0.00E+00	0.00E+00
57-12-5	Cyanide	1.31E-03	8.60E-09	3.06E-09	9.09E-04	2.27E-05	5.07E-09	5.25E-04	1.31E-05	1.05E-10	8.26E-12	0.00E+00	3.06E-15	8.99E-13	2.02E-15	0.00E+00
7440-48-4	Cobalt	2.35E-03	1.01E-08	8.40E-09	5.89E-05	2.95E-07	3.37E-10	2.33E-03	1.79E-05	4.66E-10	2.04E-11	0.00E+00	8.40E-15	2.47E-14	1.40E-14	0.00E+00
7439-98-7	Molybdenum	1.80E-02	4.77E-08	6.32E-08	9.77E-04	1.22E-05	5.60E-09	1.73E-02	2.67E-04	3.46E-09	1.88E-10	0.00E+00	6.32E-14	4.26E-14	1.60E-15	0.00E+00
7440-16-6	Rhodium	2.96E-03	9.80E-09	8.58E-09	1.07E-03	2.02E-05	3.23E-11	1.96E-03	5.30E-05	3.93E-10	3.34E-11	0.00E+00	8.58E-15	6.39E-14	0.00E+00	0.00E+00
7440-36-0	Antimony	4.52E-03	1.19E-08	1.58E-08	2.39E-04	2.99E-06	1.37E-09	4.33E-03	4.33E-05	8.66E-10	2.73E-11	0.00E+00	1.58E-14	3.43E-13	5.42E-14	0.00E+00
7782-49-2	Selenium	7.76E-03	3.23E-08	2.15E-08	5.05E-03	2.97E-03	3.03E-08	4.20E-03	2.00E-03	8.49E-10	5.19E-10	0.00E+00	2.15E-14	1.78E-11	1.73E-14	2.59E-15
7440-31-5	Tin	3.69E-04	1.05E-09	1.20E-09	5.80E-05	2.90E-07	3.31E-10	3.13E-04	2.41E-06	6.26E-11	1.64E-12	0.00E+00	1.20E-15	4.95E-15	0.00E+00	0.00E+00
7440-25-7	Tantalum	7.28E-03	3.60E-08	2.62E-08	5.30E-04	2.12E-06	5.56E-07	7.27E-03	5.59E-05	1.70E-09	2.82E-11	0.00E+00	2.62E-14	2.78E-12	0.00E+00	0.00E+00
7440-28-0	Thallium	5.54E-03	2.31E-08	1.54E-08	3.61E-03	6.01E-04	2.16E-08	3.00E-03	2.31E-05	6.06E-10	3.70E-10	0.00E+00	1.54E-14	5.20E-13	0.00E+00	1.85E-15
7440-61-1	Uranium	1.43E-01	6.51E-07	4.90E-07	1.35E-02	6.73E-05	7.69E-08	1.31E-01	1.01E-03	2.63E-08	1.15E-09	4.65E-15	4.90E-13	1.15E-12	1.29E-13	5.74E-15

Table 18 Estimated Inorganic COPC Emissions

CAS Number	Compound	Feed	Unabated Streams									Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LFP04	LMP06	LVP01	HFP03	HMP06	HOP10	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter Feed	LAW Melter	LAW Vessel Vent	HLW Melter Feed	HLW Melter	HLW Vessel Vent	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
7440-62-2	Vanadium	3.11E-03	8.27E-09	1.09E-08	1.69E-04	2.12E-06	9.71E-10	2.99E-03	2.30E-05	5.99E-10	3.26E-11	0.00E+00	1.09E-14	7.32E-15	0.00E+00	0.00E+00
7440-33-7	Tungsten	6.46E-03	3.20E-08	2.32E-08	4.70E-04	1.88E-06	4.93E-07	6.45E-03	4.96E-05	1.51E-09	2.50E-11	0.00E+00	2.32E-14	2.47E-12	0.00E+00	0.00E+00
7440-65-5	Yttrium	1.29E-03	3.40E-09	4.48E-09	7.55E-05	7.55E-07	4.32E-10	1.22E-03	1.22E-05	2.45E-10	7.70E-12	0.00E+00	4.48E-15	1.07E-14	1.56E-15	0.00E+00
630-08-0	Carbon monoxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.94E-01	0.00E+00	0.00E+00	2.97E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-02	1.49E-03	0.00E+00
10102-43-9	Nitric Oxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.58E+01	0.00E+00	0.00E+00	2.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E+00	1.04E-01	0.00E+00
10102-44-0	Nitrogen dioxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.62E+00	0.00E+00	0.00E+00	2.99E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E-01	1.49E-02	0.00E+00
7446-09-5	Sulfur dioxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.33E-02	0.00E+00	0.00E+00	7.54E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-03	6.28E-02	0.00E+00
7664-41-7	Ammonia/Ammonium	3.44E-02	8.42E-06	5.34E-08	5.90E-03	5.90E-02	6.19E-10	6.14E-03	1.32E-02	1.23E-09	3.54E-11	2.81E-06	5.34E-08	1.04E-01	9.15E-03	3.54E-11
7647-01-0	Hydrochloric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.61E-01	0.00E+00	0.00E+00	3.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.02E-02	2.60E-05	0.00E+00
7664-39-3	Hydrofluoric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-01	0.00E+00	0.00E+00	1.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.46E-03	2.22E-05	0.00E+00
	Total	2.16E+02	1.28E-03	4.09E-04	5.56E+02	3.44E+01	1.45E-05	7.70E+01	3.07E+00	5.64E-05	1.13E-06	3.10E-06	2.19E-07	1.50E+00	1.99E-01	1.81E-08

Table 19 Estimated Radionuclide COPC Emissions

CAS Number	Compound	Feed	Unabated Streams									Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LFP04	LMP06	LVP01	HFP03	HMP06	HOP10	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter Feed	LAW Melter	LAW Vessel Vent	HLW Melter Feed	HLW Melter	HLW Vessel Vent	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr
14596-10-2	Americium-241	3.15E+05	8.13E-01	1.13E+00	6.62E+03	8.28E+01	2.00E-04	3.14E+05	5.42E+03	6.29E-02	3.41E-03	5.81E-09	1.13E-06	9.42E-07	6.88E-07	1.70E-08
14762-75-5	Carbon-14	1.59E+02	1.17E-03	2.90E-04	1.33E+02	1.33E+02	3.98E-06	2.56E+01	2.56E+01	5.12E-06	0.00E+00	1.17E-03	2.90E-04	1.33E+02	2.56E+01	0.00E+00
10198-40-0	Cobalt-60	3.52E+04	1.51E-01	1.25E-01	8.80E+02	4.40E+00	2.64E-05	3.47E+04	4.82E+02	6.95E-03	3.05E-04	1.08E-09	1.25E-07	3.44E-07	3.77E-07	1.52E-09
15757-87-6	Curium-243	4.34E+02	1.82E-03	1.57E-03	7.55E-01	3.77E-03	2.27E-08	4.39E+02	6.10E+00	8.79E-05	3.84E-06	1.30E-11	1.57E-09	4.30E-11	7.75E-10	1.92E-11
13981-15-2	Curium-244	9.87E+03	4.15E-02	3.57E-02	1.78E+01	8.91E-02	5.36E-07	9.99E+03	1.39E+02	2.00E-03	8.72E-05	2.96E-10	3.57E-08	1.02E-09	1.76E-08	4.36E-10
10045-97-3	Cesium-137	5.40E+07	1.46E+02	1.20E+02	4.35E+03	2.18E+03	1.61E-04	5.58E+07	1.86E+06	1.12E+01	1.18E+00	1.04E-06	1.20E-04	1.51E-04	1.29E-03	5.89E-06
14683-23-9	Europium-152	1.70E+03	4.39E-03	6.05E-03	4.94E+01	2.47E-01	1.48E-06	1.67E+03	2.32E+01	3.35E-04	1.46E-05	3.14E-11	6.05E-09	2.81E-09	2.95E-09	7.30E-11
15585-10-1	Europium-154	1.89E+05	4.99E-01	6.63E-01	1.02E+04	5.11E+01	3.07E-04	1.81E+05	2.52E+03	3.63E-02	1.58E-03	3.56E-09	6.63E-07	5.82E-07	3.20E-07	7.92E-09
14391-16-3	Europium-155	2.95E+04	8.06E-02	1.00E-01	2.95E+03	1.48E+01	8.87E-05	2.69E+04	3.73E+02	5.38E-03	2.35E-04	5.76E-10	1.00E-07	1.68E-07	4.74E-08	1.17E-09
10028-17-8	Tritium	1.39E+03	9.79E-01	3.34E-03	1.43E+02	1.43E+02	5.45E-06	6.23E+02	6.23E+02	1.28E-04	1.98E-04	8.07E-01	3.34E-03	2.73E+01	3.08E+02	1.98E-04
15046-84-1	Iodine-129	5.18E+00	5.11E-05	1.06E-05	4.76E+00	4.33E+00	1.50E-07	1.20E+00	1.09E+00	2.41E-07	6.26E-08	1.46E-05	1.06E-05	3.28E-02	9.91E-04	6.26E-08
13981-37-8	Nickel-63	2.22E+04	9.17E-02	4.64E-02	1.59E+04	1.79E+02	4.79E-04	6.42E+03	7.21E+01	1.28E-03	4.54E-05	6.55E-10	4.64E-08	1.12E-05	3.40E-08	2.27E-10
13994-20-2	Neptunium-237	2.59E+02	1.11E-03	9.27E-04	5.20E+00	2.60E-02	1.56E-07	2.57E+02	3.57E+00	5.15E-05	2.25E-06	7.90E-12	9.27E-10	2.96E-10	4.54E-10	1.12E-11
13981-16-3	Plutonium-238	1.23E+03	3.18E-03	4.41E-03	2.94E+01	1.47E-01	8.84E-07	1.22E+03	1.70E+01	2.44E-04	1.07E-05	2.27E-11	4.41E-09	1.67E-09	2.15E-09	5.33E-11
15117-48-3	Plutonium-239	1.11E+04	2.88E-02	3.93E-02	4.06E+02	2.03E+00	1.22E-05	1.08E+04	1.50E+02	2.17E-03	9.45E-05	2.06E-10	3.93E-08	2.31E-08	1.91E-08	4.73E-10
14119-33-6	Plutonium-240	2.92E+03	7.60E-03	1.04E-02	1.05E+02	5.26E-01	3.16E-06	2.85E+03	3.97E+01	5.71E-04	2.49E-05	5.43E-11	1.04E-08	5.99E-09	5.04E-09	1.25E-10
14119-32-5	Plutonium-241	7.78E+04	2.01E-01	2.77E-01	2.21E+03	1.10E+01	6.64E-05	7.66E+04	1.06E+03	1.53E-02	6.69E-04	1.44E-09	2.77E-07	1.26E-07	1.35E-07	3.35E-09
14234-35-6	Antimony-125	1.16E+05	3.07E-01	4.06E-01	6.14E+03	7.68E+01	1.85E-04	1.11E+05	1.11E+03	2.23E-02	7.02E-04	2.19E-09	4.06E-07	8.64E-06	1.39E-06	3.51E-09
15715-94-3	Samarium-151	1.42E+06	3.75E+00	4.94E+00	8.52E+04	6.22E+01	2.56E-03	1.35E+06	1.04E+04	2.69E-01	6.52E-03	2.68E-08	4.94E-06	9.80E-08	1.58E-08	3.26E-08
15832-50-5	Tin-126	6.15E+02	1.76E-03	2.01E-03	9.68E+01	4.84E-01	2.91E-06	5.23E+02	4.36E+00	1.05E-04	2.74E-06	1.26E-11	2.01E-09	5.51E-09	5.56E-10	1.37E-11
10098-97-2	Strontium-90	3.62E+07	9.56E+01	1.26E+02	2.12E+06	2.12E+04	6.39E-02	3.44E+07	3.44E+05	6.89E+00	2.17E-01	6.83E-07	1.26E-04	2.42E-04	4.39E-05	1.08E-06
14133-76-7	Technetium-99	6.89E+04	4.78E-01	3.12E-01	2.49E+04	8.30E+03	8.52E-04	7.79E+04	2.60E+04	1.58E-02	1.64E-02	3.42E-09	3.12E-07	6.29E-04	1.85E-05	8.20E-08
7440-29-1	Thorium-232	8.56E+00	3.65E-05	3.06E-05	1.95E-01	7.78E-04	5.48E-09	8.51E+00	1.18E-01	1.70E-06	7.38E-08	2.61E-13	3.06E-11	1.09E-12	1.65E-13	3.69E-13
13968-55-3	Uranium-233	6.93E+02	2.93E-03	2.50E-03	5.32E+00	2.66E-02	1.60E-07	6.97E+02	9.67E+00	1.39E-04	6.09E-06	2.09E-11	2.50E-09	3.03E-10	1.23E-09	3.04E-11
13966-29-5	Uranium-234	3.96E+01	1.80E-04	1.35E-04	3.72E+00	1.86E-02	1.12E-07	3.63E+01	5.04E-01	7.27E-06	3.17E-07	1.29E-12	1.35E-10	2.12E-10	6.41E-11	1.59E-12
15117-96-1	Uranium-235	1.01E+00	4.79E-06	3.34E-06	1.46E-01	7.32E-04	4.40E-09	8.74E-01	1.21E-02	1.75E-07	7.14E-09	3.63E-14	3.34E-12	8.35E-12	1.54E-12	3.57E-14
13982-70-2	Uranium-236	1.44E+00	6.98E-06	4.67E-06	2.51E-01	1.25E-03	7.54E-09	1.20E+00	1.67E-02	2.41E-07	9.81E-09	5.28E-14	4.67E-12	1.43E-11	2.12E-12	4.90E-14
7440-61-1	Uranium-238	2.32E+01	1.08E-04	7.78E-05	2.90E+00	1.45E-02	8.73E-08	2.06E+01	2.86E-01	4.11E-06	1.79E-07	7.73E-13	7.78E-11	1.65E-10	3.63E-11	8.93E-13
10098-91-6	Yttrium-90	3.59E+06	9.48E+00	1.25E+01	2.11E+05	2.11E+03	6.34E-03	3.41E+06	3.41E+04	6.83E-01	2.15E-02	6.77E-08	1.25E-05	2.40E-05	4.35E-06	1.07E-07
13967-48-1	Ruthenium-106	3.10E+02	1.29E-03	8.61E-04	2.02E+02	5.18E+01	6.37E-06	1.68E+02	4.31E+01	3.39E-05	2.07E-05	9.22E-12	8.61E-10	1.80E-05	3.32E-08	1.04E-10
13967-70-9	Cesium-134	4.83E+03	1.31E-02	1.07E-02	3.90E-01	1.95E-01	1.44E-08	5.00E+03	1.88E+02	1.00E-03	1.05E-04	9.35E-11	1.07E-08	1.35E-08	1.31E-07	5.27E-10
13981-97-0	Barium-137m	1.61E+07	4.34E+01	3.57E+01	1.29E+03	6.47E+02	4.78E-05	1.66E+07	6.24E+05	3.33E+00	3.50E-01	3.10E-07	3.57E-05	4.49E-05	4.34E-04	1.75E-06
13982-10-0	Plutonium-242	2.74E-01	6.59E-07	9.55E-07	1.11E-02	5.57E-05	3.35E-10	2.63E-01	3.65E-03	5.26E-08	1.67E-10	4.71E-15	9.55E-13	6.34E-13	4.64E-13	0.00E+00
13982-63-3	Radium-226	1.10E-03	5.43E-09	3.95E-09	7.99E-05	1.33E-05	4.41E-10	1.10E-03	8.43E-06	2.57E-10	4.25E-12	0.00E+00	3.95E-15	2.04E-14	0.00E+00	0.00E+00
14158-29-3	Uranium-232	1.18E+00	5.00E-06	4.27E-06	9.09E-03	4.54E-05	2.73E-10	1.19E+00	9.16E-03	2.38E-07	1.04E-08	3.57E-14	4.27E-12	5.18E-13	1.17E-12	5.20E-14
14331-85-2	Protactinium-231	7.77E-01	3.84E-06	2.79E-06	5.65E-02	4.13E-05	3.12E-07	7.76E-01	5.97E-03	1.82E-07	3.00E-09	2.74E-14	2.79E-12	1.62E-12	9.36E-15	1.50E-14
14336-70-0	Nickel-59	2.47E+02	1.02E-03	5.18E-04	1.77E+02	1.99E+00	5.34E-06	7.16E+01	9.39E-01	1.43E-05	5.07E-07	7.31E-12	5.18E-10	8.44E-08	4.43E-10	2.54E-12
14952-40-0	Actinium-227	1.05E+00	5.17E-06	3.76E-06	7.61E-02	5.56E-05	4.20E-07	1.04E+00	8.03E-03	2.44E-07	4.05E-09	3.70E-14	3.76E-12	2.18E-12	1.26E-14	2.02E-14
14993-75-0	Americium-243	2.93E+01	8.32E-05	9.75E-05	4.31E+00	5.38E-02	1.30E-07	2.55E+01	4.40E-01	5.10E-06	2.77E-07	5.94E-13	9.75E-11	6.13E-10	5.58E-11	1.38E-12
15262-20-1	Radium-228	1.72E+00	8.53E-06	6.20E-06	1.26E-01	2.09E-02	6.92E-07	1.72E+00	1.32E-02	4.03E-07	6.67E-09	6.09E-14	6.20E-12	3.21E-11	2.08E-14	3.34E-14
15510-73-3	Curium-242	3.76E+01	1.58E-04	1.36E-04	6.54E-02	3.27E-04	1.96E-09	3.80E+01	2.93E-01	7.61E-06	3.32E-07	1.13E-12	1.36E-10	3.72E-12	3.74E-11	1.66E-12
15594-54-4	Thorium-229	3.01E-01	1.28E-06	1.08E-06	6.85E-03	2.74E-05	3.67E-08	3.00E-01	2.30E-03	6.00E-08	2.60E-09	9.17E-15	1.08E-12	2.21E-13	3.51E-15	1.30E-14
15751-77-6	Zirconium-93	7.49E+02	3.71E-03	2.69E-03	5.45E+01	1.82E-01	3.01E-04	7.48E+02	9.24E+00	1.75E-04	2.90E-06	2.65E-11	2.69E-09	6.85E-09	1.72E-09	1.45E-11
7440-03-1	Niobium-93m	4.54E+02	2.25E-03	1.63E-03	3.31E+01	3.31E-02	1.82E-04	4.54E+02	3.49E+00	1.06E-04	1.76E-06	1.61E-11	1.63E-09	9.57E-10	9.47E-12	8.79E-12
14336-66-4	Cadmium-113m	6.29E+02	1.86E-03	2.41E-03	5.27E+01	5.27E+00	1.59E-06	6.54E+02	6.54E+01	1.31E-04	4.15E-05	1.33E-11	2.41E-09	2.06E-07	2.32E-08	2.08E-10
15758-45-9	Selenium-79	1.37E+01	5.72E-05	3.82E-05	8.96E+00	5.27E+00	2.83E-07	7.45E+00	3.55E+00	1.50E-06	9.19E-07	4.09E-13	3.82E-11	3.29E-08	3.07E-11	4.60E-12
	Total	1.04E+08	4.91E+02	1.38E+02	2.72E+06	3.21E+04	5.86E-02	1.04E+08	2.39E+06	2.51E+01	7.81E+01	1.82E+00	5.86E-03	4.02E+02	5.18E+02	1.70E-03

Table 20 WTP PIC Emissions

CAS Registry Number	Compound	PT Stack Flowrate (g/sec)	LAW Stack Flowrate (g/sec)	HLW Stack Flowrate (g/sec)
1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	3.31E-11	4.58E-11	3.38E-11
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	2.81E-11	3.90E-11	2.87E-11
3268-87-9	Octachlorodibenzo(p)dioxin	1.41E-10	1.95E-10	1.44E-10
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	5.63E-11	7.79E-11	5.74E-11
39001-02-0	Octachlorodibenzofuran	5.25E-10	7.27E-10	5.36E-10
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	2.81E-11	3.90E-11	2.87E-11
40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	2.81E-11	3.90E-11	2.87E-11
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	2.24E-09	3.10E-09	2.29E-09
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.02E-10	2.80E-10	2.06E-10
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	2.89E-09	4.00E-09	2.95E-09
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	3.14E-09	4.34E-09	3.20E-09
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	1.42E-09	1.97E-09	1.45E-09
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	2.81E-11	3.90E-11	2.87E-11
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	7.30E-10	1.01E-09	7.44E-10
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.16E-09	5.76E-09	4.24E-09
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	2.90E-09	4.01E-09	2.96E-09
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	6.40E-11	8.86E-11	6.53E-11
192-97-2	Benzo(e)pyrene	5.40E-06	7.48E-06	5.51E-06
205-82-3	Benzo(j)fluoranthene	5.40E-06	7.48E-06	5.51E-06
205-99-2	Benzo(b)fluoranthene	5.40E-06	7.48E-06	5.51E-06
207-08-9	Benzo(k)fluoranthene	5.40E-06	7.48E-06	5.51E-06
218-01-9	Chrysene	5.40E-06	7.48E-06	5.51E-06
5385-75-1	Dibenzo(a,e)fluoranthene	5.40E-06	7.48E-06	5.51E-06
56-55-3	Benzo(a)anthracene	5.40E-06	7.48E-06	5.51E-06
91-57-6	2-Methylnaphthalene	5.40E-06	7.48E-06	5.51E-06
100-02-7	4-Nitrophenol	2.70E-05	3.74E-05	2.75E-05
100-25-4	1,4-Dinitrobenzene	2.70E-05	3.74E-05	2.75E-05
100-51-6	Benzyl alcohol	2.70E-05	3.74E-05	2.75E-05
100-52-7	Benzaldehyde	2.70E-05	3.74E-05	2.75E-05
101-77-9	4,4-Methylenedianiline	2.70E-05	3.74E-05	2.75E-05
103-33-3	Azobenzene	2.70E-05	3.74E-05	2.75E-05
105-67-9	2,4-Dimethylphenol	2.70E-05	3.74E-05	2.75E-05
106-44-5	p-Cresol (4-Methyl phenol)	2.70E-05	3.74E-05	2.75E-05
106-47-8	p-Chloroaniline	2.70E-05	3.74E-05	2.75E-05
106-49-0	p-Toluidine	2.70E-05	3.74E-05	2.75E-05
106-51-4	Quinone	2.70E-05	3.74E-05	2.75E-05
107-98-2	Propylene gylcol monomethyl ether	2.70E-05	3.74E-05	2.75E-05
108-60-1	Dichloroisopropyl ether	2.70E-05	3.74E-05	2.75E-05
109-86-4	2-Methoxyethanol	2.70E-05	3.74E-05	2.75E-05
110-80-5	2-Ethoxyethanol	2.70E-05	3.74E-05	2.75E-05
111-15-9	Ethylene glycol monoethyl ether acetate	2.70E-05	3.74E-05	2.75E-05
111-44-4	Bis(2-chloroethyl) ether	2.70E-05	3.74E-05	2.75E-05
111-91-1	Bis(2-chloroethoxy)methane	2.70E-05	3.74E-05	2.75E-05
1120-71-4	1,3-Propane sultone	2.70E-05	3.74E-05	2.75E-05
118-74-1	Hexachlorobenzene	2.70E-05	3.74E-05	2.75E-05
119-90-4	3,3'-Dimethoxybenzidine (ortol-dianisidine)	2.70E-05	3.74E-05	2.75E-05
121-14-2	2,4-Dinitrotoluene	2.70E-05	3.74E-05	2.75E-05
122-66-7	1,2-Diphenylhydrazine	2.70E-05	3.74E-05	2.75E-05

Table 20 WTP PIC Emissions

CAS Registry Number	Compound	PT Stack Flowrate (g/sec)	LAW Stack Flowrate (g/sec)	HLW Stack Flowrate (g/sec)
123-33-1	Maleic hydrazide	2.70E-05	3.74E-05	2.75E-05
131-11-3	Dimethylphthalate	2.70E-05	3.74E-05	2.75E-05
131-89-5	2-Cyclohexyl-4,6-dinitrophenol	2.70E-05	3.74E-05	2.75E-05
133-06-2	Captan	2.70E-05	3.74E-05	2.75E-05
145-73-3	Endothall	2.70E-05	3.74E-05	2.75E-05
23950-58-5	Pronamide	2.70E-05	3.74E-05	2.75E-05
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	2.70E-05	3.74E-05	2.75E-05
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	2.70E-05	3.74E-05	2.75E-05
506-68-3	Cyanogen bromide	2.70E-05	3.74E-05	2.75E-05
510-15-6	Chlorobenzilate	2.70E-05	3.74E-05	2.75E-05
51-28-5	2,4-Dinitrophenol	2.70E-05	3.74E-05	2.75E-05
51-79-6	Ethyl Carbamate (urethane)	2.70E-05	3.74E-05	2.75E-05
528-29-0	o-Dinitrobenzene	2.70E-05	3.74E-05	2.75E-05
532-27-4	2-Chloroacetophenone	2.70E-05	3.74E-05	2.75E-05
534-52-1	4,6-Dinitro-o-cresol	5.31E-04	7.36E-04	5.42E-04
57-24-9	Strychnine	2.70E-05	3.74E-05	2.75E-05
57-74-9	Chlordane	2.70E-05	3.74E-05	2.75E-05
584-84-9	2,4-Toluene diisocyante	2.70E-05	3.74E-05	2.75E-05
58-89-9	gamma-BHC (Lindane)	2.70E-05	3.74E-05	2.75E-05
60-11-7	Dimethyl aminoazobenzene	2.70E-05	3.74E-05	2.75E-05
606-20-2	2,6-Dinitrotoluene	2.70E-05	3.74E-05	2.75E-05
608-93-5	Pentachlorobenzene	2.70E-05	3.74E-05	2.75E-05
62-50-0	Ethyl methanesulfonate	2.70E-05	3.74E-05	2.75E-05
62-53-3	Aniline	2.70E-05	3.74E-05	2.75E-05
65-85-0	Benzoic acid	2.70E-05	3.74E-05	2.75E-05
70-30-4	Hexachlorophene	2.70E-05	3.74E-05	2.75E-05
72-43-5	Methoxychlor	2.70E-05	3.74E-05	2.75E-05
72-55-9	4,4'-DDE	2.70E-05	3.74E-05	2.75E-05
76-44-8	Heptachlor	2.70E-05	3.74E-05	2.75E-05
765-34-4	Glycidylaldehyde	2.70E-05	3.74E-05	2.75E-05
77-47-4	Hexachlorocyclopentadiene	2.70E-05	3.74E-05	2.75E-05
77-78-1	Dimethyl sulfate	2.70E-05	3.74E-05	2.75E-05
822-06-0	Hexamethylene-1,5-diisocyanate	2.70E-05	3.74E-05	2.75E-05
823-40-5	Toluene-2,6-diamine	2.70E-05	3.74E-05	2.75E-05
82-68-8	Pentachloronitrobenzene (PCBN)	2.70E-05	3.74E-05	2.75E-05
85-44-9	Phthalic anhydride	2.70E-05	3.74E-05	2.75E-05
87-86-5	Pentachlorophenol	2.70E-05	3.74E-05	2.75E-05
88-74-4	o-Nitroaniline (2-Nitroaniline)	2.70E-05	3.74E-05	2.75E-05
90-04-0	o-Anisidine	2.70E-05	3.74E-05	2.75E-05
91-94-1	3,3'-Dichlorobenzidine	2.70E-05	3.74E-05	2.75E-05
94-59-7	Safrole	2.70E-05	3.74E-05	2.75E-05
94-75-7	2,4-D and esters (!60C typed)	2.70E-05	3.74E-05	2.75E-05
95-94-3	1,2,4,5-Tetrachlorobenzene	2.70E-05	3.74E-05	2.75E-05
96-12-8	1,2-Dibromo-3-chloropropane	2.70E-05	3.74E-05	2.75E-05
96-45-7	Ethylene thiourea	2.70E-05	3.74E-05	2.75E-05
98-01-1	Furfural	2.70E-05	3.74E-05	2.75E-05
98-07-7	Benzotrichloride	2.70E-05	3.74E-05	2.75E-05
99-35-4	1,3,5-Trinitrobenzene	2.70E-05	3.74E-05	2.75E-05

Table 20 WTP PIC Emissions

CAS Registry Number	Compound	PT Stack Flowrate (g/sec)	LAW Stack Flowrate (g/sec)	HLW Stack Flowrate (g/sec)
99-65-0	1,3-Dinitrobenzene	2.70E-05	3.74E-05	2.75E-05
100-44-7	Benzyl chloride	3.60E-06	4.98E-06	3.67E-06
103-65-1	n-Propyl benzene (Isocumene)	3.60E-06	4.98E-06	3.67E-06
104-51-8	n-Butylbenzene	3.60E-06	4.98E-06	3.67E-06
106-43-4	4-Chlorotoluene (p-Tolyl chloride)	3.60E-06	4.98E-06	3.67E-06
106-89-8	Epichlorohydrin (1-chloro-2,3-epoxypropane)	3.60E-06	4.98E-06	3.67E-06
107-19-7	Propargyl alcohol	3.60E-06	4.98E-06	3.67E-06
107-21-1	Ethylene glycol	3.60E-06	4.98E-06	3.67E-06
108-67-8	1,3,5-Trimethyl benzene	3.60E-06	4.98E-06	3.67E-06
108-86-1	Bromobenzene (Phenyl bromide)	3.60E-06	4.98E-06	3.67E-06
109-77-3	Malononitrile	3.60E-06	4.98E-06	3.67E-06
124-48-1	Chlorodibromomethane	3.60E-06	4.98E-06	3.67E-06
135-98-8	sec-Butylbenzene	3.60E-06	4.98E-06	3.67E-06
156-59-2	cis-1,2-Dichloroethene	3.60E-06	4.98E-06	3.67E-06
25013-15-4	Methyl styrene (mixed isomers)	3.60E-06	4.98E-06	3.67E-06
41851-50-7	Chlorocyclopentadiene	3.60E-06	4.98E-06	3.67E-06
460-19-5	Cyanogen	3.60E-06	4.98E-06	3.67E-06
506-77-4	Cyanogen chloride	3.60E-06	4.98E-06	3.67E-06
540-73-8	1,2-Dimethylhydrazine	3.60E-06	4.98E-06	3.67E-06
542-75-6	1,3-Dichloropropene	3.60E-06	4.98E-06	3.67E-06
542-88-1	Dichloromethyl ether	3.60E-06	4.98E-06	3.67E-06
593-60-2	Bromoethene	3.60E-06	4.98E-06	3.67E-06
61626-71-9	Dichloropentadiene	3.60E-06	4.98E-06	3.67E-06
74-88-4	Iodomethane (Methyl iodide)	3.60E-06	4.98E-06	3.67E-06
74-95-3	Methylene bromide	3.60E-06	4.98E-06	3.67E-06
75-25-2	Bromoform	3.60E-06	4.98E-06	3.67E-06
75-29-6	2-Chloropropane	3.60E-06	4.98E-06	3.67E-06
75-44-5	Phosgene	3.60E-06	4.98E-06	3.67E-06
76-01-7	Pentachloroethane	3.60E-06	4.98E-06	3.67E-06
764-41-0	1,4-Dichloro-2-butene	3.60E-06	4.98E-06	3.67E-06
80-62-6	Methyl methacrylate	3.60E-06	4.98E-06	3.67E-06
87-61-6	1,2,3-Trichlorobenzene	3.60E-06	4.98E-06	3.67E-06
924-16-3	N-Nitrosodi-n-butylamine	3.60E-06	4.98E-06	3.67E-06
95-53-4	o-Toluidine	3.60E-06	4.98E-06	3.67E-06
95-63-6	1,2,4-Trimethyl benzene	3.60E-06	4.98E-06	3.67E-06
96-18-4	1,2,3-Trichloropropane	3.60E-06	4.98E-06	3.67E-06
97-63-2	Ethyl methacrylate	3.60E-06	4.98E-06	3.67E-06
98-06-6	tert-Butyl benzene	3.60E-06	4.98E-06	3.67E-06
99-87-6	p-Cymene	3.60E-06	4.98E-06	3.67E-06

Table 21 Air Emissions for Additional Organic COPCs

CAS #	COPC	Feed	Unabated Streams					Abated Streams				
		FRP01 + FRP14	PVP01	PJV04	LMP06	HMP06	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
		WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD
		g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
100-40-3	4-Ethenylcyclohexene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	5.73E-08	1.66E-09	0.00E+00	0.00E+00	0.00E+00
104-76-7	2-Ethyl-1-hexanol	7.14E-03	1.42E-03	5.73E-09	1.23E-05	4.26E-06	0.00E+00	7.12E-09	5.73E-09	6.48E-07	2.40E-07	0.00E+00
10595-95-6	N-Nitrosomethylethylamine	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	7.20E-09	4.47E-08	1.51E-04	2.97E-05	0.00E+00
109-74-0	Butanenitrile	1.43E-02	5.94E-03	1.03E-08	1.07E-06	5.50E-07	1.24E-13	1.19E-07	1.03E-08	6.23E-08	3.93E-08	1.24E-13
110-59-8	Pentanenitrile	1.43E-02	5.94E-03	1.03E-08	1.07E-06	5.50E-07	1.24E-13	1.19E-07	1.03E-08	6.23E-08	3.93E-08	1.24E-13
123-72-8	Butanal	7.14E-03	6.33E-03	4.36E-09	4.38E-10	6.95E-10	0.00E+00	3.17E-07	4.36E-09	4.42E-11	1.46E-10	0.00E+00
134-32-7	alpha-Napthylamine	7.14E-03	6.97E-03	4.21E-09	2.59E-12	1.23E-12	0.00E+00	1.39E-08	4.21E-09	1.19E-12	2.05E-12	0.00E+00
589-38-8	3-Hexanone	2.86E-03	2.53E-03	1.74E-09	1.75E-10	2.78E-10	0.00E+00	1.27E-08	1.74E-09	1.77E-11	5.85E-11	0.00E+00
628-73-9	Hexanenitrile	1.43E-02	1.16E-02	8.95E-09	1.44E-08	1.36E-08	0.00E+00	5.82E-08	8.95E-09	1.08E-09	1.66E-09	0.00E+00
75-02-5	Fluoroethene	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.15E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00
79-46-9	2-Nitropropane	4.29E-02	3.80E-02	2.61E-08	2.63E-09	4.17E-09	0.00E+00	7.60E-07	2.61E-08	2.65E-10	8.78E-10	0.00E+00

Table 22 Radionuclide COPC Air Emissions Comparison

CAS Number	Compound	PVP12 - PT Vessel Vent					PJV11 - PT PJM/RFD				
		Avg Feed	Envelope A	Envelope B	Envelope C	MAX	Avg Feed	Envelope A	Envelope B	Envelope C	MAX
		Ci/yr					Ci/yr				
14596-10-2	Americium-241	5.81E-09	6.71E-11	1.82E-10	3.41E-12	Avg Feed	1.13E-06	7.41E-09	1.08E-07	9.90E-10	Avg Feed
14762-75-5	Carbon-14	1.17E-03	6.61E-05	1.26E-04	1.01E-04	Avg Feed	2.90E-04	1.07E-05	4.48E-05	3.48E-05	Avg Feed
10198-40-0	Cobalt-60	1.08E-09	2.80E-13	5.16E-12	9.02E-13	Avg Feed	1.25E-07	6.19E-12	2.04E-09	5.07E-11	Avg Feed
15757-87-6	Curium-243	1.30E-11	1.34E-14	5.03E-14	0.00E+00	Avg Feed	1.57E-09	1.04E-12	4.50E-12	1.93E-13	Avg Feed
13981-15-2	Curium-244	2.96E-10	2.84E-13	1.04E-12	4.60E-15	Avg Feed	3.57E-08	2.27E-11	9.31E-11	1.35E-12	Avg Feed
10045-97-3	Cesium-137	1.04E-06	1.04E-08	4.70E-08	7.18E-09	Avg Feed	1.20E-04	5.71E-07	7.81E-06	8.56E-07	Avg Feed
14683-23-9	Europium-152	3.14E-11	5.25E-13	1.27E-12	1.67E-14	Avg Feed	6.05E-09	4.49E-11	3.65E-10	5.05E-12	Avg Feed
15585-10-1	Europium-154	3.56E-09	3.32E-11	6.42E-11	2.07E-12	Avg Feed	6.63E-07	3.48E-09	3.81E-08	6.34E-10	Avg Feed
14391-16-3	Europium-155	5.76E-10	1.69E-11	5.66E-11	3.60E-13	Avg Feed	1.00E-07	1.78E-09	3.35E-08	1.14E-10	Avg Feed
10028-17-8	Tritium	8.07E-01	1.62E-01	5.88E-01	5.23E-02	Avg Feed	3.34E-03	3.81E-04	8.24E-04	8.96E-05	Avg Feed
15046-84-1	Iodine-129	1.46E-05	7.45E-06	3.79E-06	3.59E-06	Avg Feed	1.06E-05	2.55E-06	2.59E-06	2.48E-06	Avg Feed
13981-37-8	Nickel-63	6.55E-10	1.05E-10	1.78E-11	1.19E-12	Avg Feed	4.64E-08	1.02E-08	1.07E-08	1.28E-10	Avg Feed
13994-20-2	Neptunium-237	7.90E-12	6.54E-14	9.96E-14	1.78E-14	Avg Feed	9.27E-10	4.09E-12	5.37E-11	3.82E-12	Avg Feed
13981-16-3	Plutonium-238	2.27E-11	4.31E-12	8.69E-13	2.72E-14	Avg Feed	4.41E-09	4.75E-10	4.67E-10	8.90E-12	Avg Feed
15117-48-3	Plutonium-239	2.06E-10	1.22E-11	7.81E-12	1.48E-13	Avg Feed	3.93E-08	1.34E-09	4.19E-09	4.19E-11	Avg Feed
14119-33-6	Plutonium-240	5.43E-11	2.25E-12	2.39E-12	2.62E-14	Avg Feed	1.04E-08	2.47E-10	1.28E-09	7.41E-12	Avg Feed
14119-32-5	Plutonium-241	1.44E-09	2.96E-11	5.31E-11	1.65E-13	Avg Feed	2.77E-07	3.26E-09	2.86E-08	4.68E-11	Avg Feed
14234-35-6	Antimony-125	2.19E-09	1.10E-12	2.42E-11	6.17E-14	Avg Feed	4.06E-07	3.60E-11	4.97E-09	4.73E-12	Avg Feed
15715-94-3	Samarium-151	2.68E-08	4.78E-10	1.05E-09	1.37E-10	Avg Feed	4.94E-06	1.61E-08	5.28E-07	1.13E-08	Avg Feed
15832-50-5	Tin-126	1.26E-11	8.80E-14	5.33E-13	2.45E-14	Avg Feed	2.01E-09	2.95E-12	2.76E-10	2.01E-12	Avg Feed
10098-97-2	Strontium-90	6.83E-07	3.57E-08	3.16E-08	1.16E-09	Avg Feed	1.26E-04	3.90E-06	1.87E-05	3.85E-07	Avg Feed
14133-76-7	Technetium-99	3.42E-09	8.14E-12	2.13E-11	6.74E-12	Avg Feed	3.12E-07	1.87E-10	8.80E-10	3.00E-10	Avg Feed
7440-29-1	Thorium-232	2.61E-13	2.75E-15	0.00E+00	0.00E+00	Avg Feed	3.06E-11	9.87E-14	3.57E-14	1.43E-14	Avg Feed
13968-55-3	Uranium-233	2.09E-11	7.87E-15	0.00E+00	5.03E-15	Avg Feed	2.50E-09	1.83E-13	5.03E-13	1.27E-12	Avg Feed
13966-29-5	Uranium-234	1.29E-12	2.04E-14	6.35E-15	1.04E-15	Avg Feed	1.35E-10	1.21E-12	3.54E-12	2.64E-13	Avg Feed
15117-96-1	Uranium-235	3.63E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed	3.34E-12	2.86E-14	1.44E-13	1.11E-14	Avg Feed
13982-70-2	Uranium-236	5.28E-14	1.55E-15	0.00E+00	0.00E+00	Avg Feed	4.67E-12	7.68E-14	4.14E-13	9.46E-15	Avg Feed
7440-61-1	Uranium-238	7.73E-13	1.64E-14	4.46E-15	0.00E+00	Avg Feed	7.78E-11	9.48E-13	2.49E-12	2.36E-13	Avg Feed
10098-91-6	Yttrium-90	6.77E-08	7.57E-09	4.21E-09	1.76E-09	Avg Feed	1.25E-05	8.28E-07	2.50E-06	5.86E-07	Avg Feed

Table 22 Radionuclide COPC Air Emissions Comparison

CAS Number	Compound	LVP18 - LAW Melter					HOP31 - HLW Melter				
		Avg Feed	Envelope A	Envelope B	Envelope C	MAX	Avg Feed	Envelope A	Envelope B	Envelope C	MAX
		Ci/yr					Ci/yr				
14596-10-2	Americium-241	9.42E-07	3.94E-13	1.31E-11	5.01E-13	Avg Feed	6.88E-07	2.01E-13	5.58E-13	1.35E-14	Avg Feed
14762-75-5	Carbon-14	1.33E+02	5.60E+00	1.46E+01	1.19E+01	Avg Feed	2.56E+01	1.74E-01	1.03E-01	2.13E-01	Avg Feed
10198-40-0	Cobalt-60	3.44E-07	2.01E-12	2.35E-12	5.62E-13	Avg Feed	3.77E-07	0.00E+00	4.25E-14	0.00E+00	Avg Feed
15757-87-6	Curium-243	4.30E-11	0.00E+00	4.86E-14	0.00E+00	Avg Feed	7.75E-10	0.00E+00	0.00E+00	0.00E+00	Avg Feed
13981-15-2	Curium-244	1.02E-09	5.07E-15	1.00E-12	0.00E+00	Avg Feed	1.76E-08	0.00E+00	0.00E+00	0.00E+00	Avg Feed
10045-97-3	Cesium-137	1.51E-04	2.84E-10	9.92E-11	5.26E-10	Avg Feed	1.29E-03	2.38E-10	1.11E-09	1.78E-10	Avg Feed
14683-23-9	Europium-152	2.81E-09	1.61E-12	1.47E-12	1.87E-15	Avg Feed	2.95E-09	1.08E-15	1.68E-15	0.00E+00	Avg Feed
15585-10-1	Europium-154	5.82E-07	2.09E-11	3.98E-12	2.12E-13	Avg Feed	3.20E-07	9.29E-14	1.97E-13	8.73E-15	Avg Feed
14391-16-3	Europium-155	1.68E-07	1.03E-11	3.52E-12	2.68E-14	Avg Feed	4.74E-08	4.76E-14	1.74E-13	1.58E-15	Avg Feed
10028-17-8	Tritium	2.73E+01	5.31E+00	1.83E+01	1.78E+00	Avg Feed	3.08E+02	1.85E+01	9.03E+00	2.24E+00	Avg Feed
15046-84-1	Iodine-129	3.28E-02	4.33E-05	1.98E-05	1.92E-05	Avg Feed	9.91E-04	2.39E-05	3.45E-06	2.01E-05	Avg Feed
13981-37-8	Nickel-63	1.12E-05	1.64E-10	1.43E-13	4.06E-13	Avg Feed	3.40E-08	3.41E-13	5.23E-14	1.01E-15	Avg Feed
13994-20-2	Neptunium-237	2.96E-10	1.26E-13	8.36E-15	4.50E-15	Avg Feed	4.54E-10	0.00E+00	0.00E+00	0.00E+00	Avg Feed
13981-16-3	Plutonium-238	1.67E-09	1.24E-13	1.84E-13	1.23E-15	Avg Feed	2.15E-09	1.29E-14	2.39E-15	0.00E+00	Avg Feed
15117-48-3	Plutonium-239	2.31E-08	8.11E-13	1.66E-12	2.44E-14	Avg Feed	1.91E-08	3.64E-14	2.15E-14	0.00E+00	Avg Feed
14119-33-6	Plutonium-240	5.99E-09	1.69E-13	5.07E-13	4.32E-15	Avg Feed	5.04E-09	6.68E-15	6.58E-15	0.00E+00	Avg Feed
14119-32-5	Plutonium-241	1.26E-07	1.52E-12	1.13E-11	2.75E-14	Avg Feed	1.35E-07	8.81E-14	1.46E-13	0.00E+00	Avg Feed
14234-35-6	Antimony-125	8.64E-06	2.24E-11	4.05E-11	1.44E-13	Avg Feed	1.39E-06	0.00E+00	1.27E-14	0.00E+00	Avg Feed
15715-94-3	Samarium-151	9.80E-08	4.50E-09	4.04E-10	9.73E-11	Avg Feed	1.58E-08	6.68E-14	2.68E-12	6.46E-14	Avg Feed
15832-50-5	Tin-126	5.51E-09	8.26E-13	1.81E-13	1.75E-14	Avg Feed	5.56E-10	0.00E+00	1.41E-15	0.00E+00	Avg Feed
10098-97-2	Strontium-90	2.42E-04	2.50E-09	9.37E-10	4.12E-11	Avg Feed	4.39E-05	1.39E-10	7.00E-11	3.88E-12	Avg Feed
14133-76-7	Technetium-99	6.29E-04	9.56E-09	3.33E-08	1.03E-08	Avg Feed	1.85E-05	1.65E-13	3.93E-14	1.29E-13	Avg Feed
7440-29-1	Thorium-232	1.09E-12	1.53E-14	0.00E+00	0.00E+00	Avg Feed	1.65E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
13968-55-3	Uranium-233	3.03E-10	5.45E-14	0.00E+00	0.00E+00	Avg Feed	1.23E-09	0.00E+00	0.00E+00	0.00E+00	Avg Feed
13966-29-5	Uranium-234	2.12E-10	4.68E-14	0.00E+00	0.00E+00	Avg Feed	6.41E-11	0.00E+00	0.00E+00	0.00E+00	Avg Feed
15117-96-1	Uranium-235	8.35E-12	1.89E-15	0.00E+00	0.00E+00	Avg Feed	1.54E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
13982-70-2	Uranium-236	1.43E-11	2.73E-15	0.00E+00	0.00E+00	Avg Feed	2.12E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-61-1	Uranium-238	1.65E-10	3.88E-14	0.00E+00	0.00E+00	Avg Feed	3.63E-11	0.00E+00	0.00E+00	0.00E+00	Avg Feed
10098-91-6	Yttrium-90	2.40E-05	5.30E-10	1.25E-10	6.27E-11	Avg Feed	4.35E-06	2.94E-11	9.32E-12	5.91E-12	Avg Feed

Table 22 Radionuclide COPC Air Emissions Comparison

CAS Number	Compound	PJV34 - HLW PJM/RFD				
		Avg Feed	Envelope A	Envelope B	Envelope C	MAX
		Ci/yr				
14596-10-2	Americium-241	1.70E-08	3.90E-11	6.94E-09	1.29E-11	Avg Feed
14762-75-5	Carbon-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
10198-40-0	Cobalt-60	1.52E-09	3.72E-15	1.27E-10	1.75E-13	Avg Feed
15757-87-6	Curium-243	1.92E-11	5.87E-15	1.50E-13	1.35E-15	Avg Feed
13981-15-2	Curium-244	4.36E-10	1.19E-13	3.04E-12	1.49E-14	Avg Feed
10045-97-3	Cesium-137	5.89E-06	1.91E-08	6.66E-06	8.24E-08	Env B
14683-23-9	Europium-152	7.30E-11	2.10E-13	2.10E-11	6.63E-14	Avg Feed
15585-10-1	Europium-154	7.92E-09	1.80E-11	2.45E-09	8.34E-12	Avg Feed
14391-16-3	Europium-155	1.17E-09	9.23E-12	2.16E-09	1.51E-12	Env B
10028-17-8	Tritium	1.98E-04	1.34E-05	1.70E-05	1.47E-06	Avg Feed
15046-84-1	Iodine-129	6.26E-08	1.00E-08	1.23E-07	5.53E-08	Env B
13981-37-8	Nickel-63	2.27E-10	7.56E-11	7.30E-10	1.08E-12	Env B
13994-20-2	Neptunium-237	1.12E-11	1.98E-14	3.47E-12	4.73E-14	Avg Feed
13981-16-3	Plutonium-238	5.33E-11	2.50E-12	2.98E-11	1.19E-13	Avg Feed
15117-48-3	Plutonium-239	4.73E-10	7.06E-12	2.67E-10	5.42E-13	Avg Feed
14119-33-6	Plutonium-240	1.25E-10	1.30E-12	8.18E-11	9.58E-14	Avg Feed
14119-32-5	Plutonium-241	3.35E-09	1.71E-11	1.82E-09	6.06E-13	Avg Feed
14234-35-6	Antimony-125	3.51E-09	1.40E-14	1.81E-10	1.28E-14	Avg Feed
15715-94-3	Samarium-151	3.26E-08	1.30E-11	3.34E-08	6.17E-11	Env B
15832-50-5	Tin-126	1.37E-11	2.49E-15	1.75E-11	1.06E-14	Env B
10098-97-2	Strontium-90	1.08E-06	2.66E-08	7.77E-07	3.31E-09	Avg Feed
14133-76-7	Technetium-99	8.20E-08	1.33E-11	2.41E-10	6.06E-11	Avg Feed
7440-29-1	Thorium-232	3.69E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
13968-55-3	Uranium-233	3.04E-11	0.00E+00	1.15E-15	1.37E-14	Avg Feed
13966-29-5	Uranium-234	1.59E-12	6.08E-15	2.33E-13	1.79E-15	Avg Feed
15117-96-1	Uranium-235	3.57E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed
13982-70-2	Uranium-236	4.90E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-61-1	Uranium-238	8.93E-13	4.74E-15	1.63E-13	1.60E-15	Avg Feed
10098-91-6	Yttrium-90	1.07E-07	5.65E-09	1.04E-07	5.04E-09	Avg Feed

Table 23 Inorganic COPCs Air Emissions Comparison

CAS Number	Compound	PVP12 - PT Vessel Vent				
		Avg Feed	Envelope A	Envelope B	Envelope C	MAX
		g/sec				
7440-22-4	Silver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7429-90-5	Aluminum	4.29E-13	4.22E-14	2.03E-14	1.78E-14	Avg Feed
7440-38-2	Arsenic	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-42-8	Boron	1.92E-14	2.49E-15	0.00E+00	0.00E+00	Avg Feed
7440-39-3	Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-69-9	Bismuth	1.76E-15	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-70-2	Calcium	1.98E-13	3.48E-14	2.92E-15	3.29E-15	Avg Feed
7440-43-9	Cadmium	1.40E-15	0.00E+00	0.00E+00	0.00E+00	Avg Feed
16887-00-6	Chloride	6.26E-14	8.67E-15	0.00E+00	5.72E-15	Avg Feed
18540-29-9	Chromium (hexavalent)	1.24E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-50-8	Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
16984-48-8	Flouride	2.11E-14	9.68E-15	2.61E-15	1.72E-15	Avg Feed
7439-89-6	Iron	9.69E-14	3.87E-14	6.40E-15	0.00E+00	Avg Feed
7439-97-6	Mercury	2.92E-07	6.56E-08	3.24E-10	0.00E+00	Avg Feed
7440-09-7	Potassium	1.49E-13	1.08E-13	6.14E-15	2.53E-15	Avg Feed
7439-93-2	Lithium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-95-4	Magnesium	1.83E-14	5.80E-15	0.00E+00	0.00E+00	Avg Feed
7439-96-5	Manganese	8.67E-15	4.45E-15	0.00E+00	2.77E-15	Avg Feed
7440-23-5	Sodium	2.40E-12	5.42E-13	1.65E-13	3.32E-13	Avg Feed
7440-02-0	Nickel	3.12E-15	0.00E+00	0.00E+00	0.00E+00	Avg Feed
14797-65-0	Nitrite	9.33E-13	1.33E-13	8.58E-14	9.30E-14	Avg Feed
14797-55-8	Nitrate	2.51E-12	5.87E-13	1.25E-13	3.81E-13	Avg Feed
14280-30-9	Hydroxide	1.89E-12	2.56E-13	4.53E-14	6.82E-14	Avg Feed
7723-14-0	Phosphorous	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-92-1	Lead	3.56E-15	2.61E-15	0.00E+00	0.00E+00	Avg Feed
14265-44-2	Phosphate	7.99E-14	1.45E-14	1.92E-15	7.34E-15	Avg Feed
63705-05-5	Total Sulfur	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-21-3	Silicon	8.19E-14	5.23E-15	1.28E-15	0.00E+00	Avg Feed
14808-79-8	Sulfate	9.69E-14	1.62E-14	2.28E-14	2.11E-14	Avg Feed
7440-24-6	Strontium (total)	0.00E+00	0.00E+00	0.00E+00	1.30E-14	Env C
7440-66-6	Zinc	4.41E-15	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-67-7	Zirconium	2.32E-14	0.00E+00	2.05E-15	0.00E+00	Avg Feed
630-08-0	Carbon monoxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
10102-43-9	Nitric Oxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
10102-44-0	Nitrogen dioxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7446-09-5	Sulfur dioxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7664-41-7	Ammonia/Ammonium	2.81E-06	7.26E-06	2.12E-04	6.07E-05	Env B
7647-01-0	Hydrochloric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7664-39-3	Hydrofluoric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7697-37-2	Nitric Acid	0.00E+00	4.45E-06	3.42E-06	4.28E-06	Env A

Table 23 Inorganic COPCs Air Emissions Comparison

CAS Number	Compound	PJV11 - PT RFD/PJM				
		Avg Feed	Envelope A	Envelope B	Envelope C	MAX
		g/sec				
7440-22-4	Silver	7.19E-14	0.00E+00	8.19E-15	0.00E+00	Avg Feed
7429-90-5	Aluminum	2.08E-11	1.90E-12	1.74E-12	9.19E-13	Avg Feed
7440-38-2	Arsenic	1.63E-14	0.00E+00	2.84E-15	0.00E+00	Avg Feed
7440-42-8	Boron	4.80E-13	5.87E-14	3.69E-14	1.08E-14	Avg Feed
7440-39-3	Barium	6.51E-14	2.40E-14	7.93E-15	1.86E-15	Avg Feed
7440-69-9	Bismuth	3.26E-13	4.69E-15	2.35E-15	3.64E-15	Avg Feed
7440-70-2	Calcium	5.15E-13	1.70E-13	7.24E-14	7.82E-14	Avg Feed
7440-43-9	Cadmium	2.53E-13	3.55E-15	2.61E-14	3.83E-15	Avg Feed
16887-00-6	Chloride	2.59E-12	2.35E-13	3.54E-14	2.48E-13	Avg Feed
18540-29-9	Chromium (hexavalent)	7.21E-13	5.29E-14	5.27E-14	4.90E-14	Avg Feed
7440-50-8	Copper	2.95E-14	6.23E-15	9.28E-15	2.11E-15	Avg Feed
16984-48-8	Flouride	1.97E-12	3.06E-13	1.55E-13	9.66E-14	Avg Feed
7439-89-6	Iron	9.78E-12	2.84E-12	3.52E-12	3.57E-14	Avg Feed
7439-97-6	Mercury	1.65E-07	3.96E-08	7.51E-10	0.00E+00	Avg Feed
7440-09-7	Potassium	5.89E-12	3.13E-12	3.48E-13	1.44E-13	Avg Feed
7439-93-2	Lithium	4.36E-14	5.50E-15	2.59E-14	2.21E-15	Avg Feed
7439-95-4	Magnesium	9.58E-14	5.49E-14	2.90E-14	5.68E-15	Avg Feed
7439-96-5	Manganese	9.18E-13	3.50E-13	4.36E-14	8.10E-13	Avg Feed
7440-23-5	Sodium	1.21E-10	1.71E-11	9.73E-12	1.65E-11	Avg Feed
7440-02-0	Nickel	4.46E-13	8.71E-14	2.00E-13	2.88E-14	Avg Feed
14797-65-0	Nitrite	4.58E-11	4.27E-12	4.99E-12	5.29E-12	Avg Feed
14797-55-8	Nitrate	1.03E-10	1.64E-11	7.11E-12	1.87E-11	Avg Feed
14280-30-9	Hydroxide	7.97E-11	1.01E-11	7.69E-12	1.92E-12	Avg Feed
7723-14-0	Phosphorous	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-92-1	Lead	5.65E-13	2.78E-13	1.27E-14	1.42E-14	Avg Feed
14265-44-2	Phosphate	3.98E-12	3.52E-13	9.25E-14	3.43E-13	Avg Feed
63705-05-5	Total Sulfur	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-21-3	Silicon	2.54E-12	7.92E-14	7.04E-14	5.31E-14	Avg Feed
14808-79-8	Sulfate	4.79E-12	4.83E-13	1.25E-12	1.15E-12	Avg Feed
7440-24-6	Strontium (total)	3.47E-14	9.32E-15	8.01E-15	3.83E-12	Env C
7440-66-6	Zinc	1.12E-13	1.46E-14	1.01E-14	4.30E-15	Avg Feed
7440-67-7	Zirconium	2.36E-12	2.42E-15	1.15E-12	8.01E-15	Avg Feed
630-08-0	Carbon monoxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
10102-43-9	Nitric Oxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
10102-44-0	Nitrogen dioxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7446-09-5	Sulfur dioxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7664-41-7	Ammonia/Ammonium	5.34E-08	4.86E-09	4.78E-07	2.50E-08	Env B
7647-01-0	Hydrochloric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7664-39-3	Hydrofluoric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7697-37-2	Nitric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed

Table 23 Inorganic COPCs Air Emissions Comparison

CAS Number	Compound	LVP18 - LAW Melter				
		Avg Feed	Envelope A	Envelope B	Envelope C	MAX
		g/sec				
7440-22-4	Silver	4.54E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7429-90-5	Aluminum	2.17E-09	5.77E-13	5.82E-14	3.09E-14	Avg Feed
7440-38-2	Arsenic	7.53E-11	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-42-8	Boron	1.68E-08	8.47E-11	2.28E-12	3.67E-12	Avg Feed
7440-39-3	Barium	1.30E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-69-9	Bismuth	4.05E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-70-2	Calcium	5.14E-09	1.88E-12	2.33E-13	4.27E-14	Avg Feed
7440-43-9	Cadmium	2.17E-11	3.15E-15	2.38E-15	2.82E-15	Avg Feed
16887-00-6	Chloride	2.88E-13	3.21E-15	0.00E+00	2.56E-15	Avg Feed
18540-29-9	Chromium (hexavalent)	1.03E-09	5.87E-14	2.39E-14	2.59E-14	Avg Feed
7440-50-8	Copper	6.81E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
16984-48-8	Flouride	7.30E-14	2.84E-15	0.00E+00	0.00E+00	Avg Feed
7439-89-6	Iron	1.36E-09	5.54E-13	1.57E-13	6.87E-14	Avg Feed
7439-97-6	Mercury	7.77E-05	5.72E-08	1.51E-08	3.52E-14	Avg Feed
7440-09-7	Potassium	9.28E-09	1.59E-11	1.08E-13	1.61E-13	Avg Feed
7439-93-2	Lithium	2.81E-09	6.62E-13	2.14E-13	1.22E-13	Avg Feed
7439-95-4	Magnesium	4.32E-09	5.13E-13	4.74E-14	2.15E-14	Avg Feed
7439-96-5	Manganese	1.93E-11	5.44E-15	7.37E-15	6.69E-15	Avg Feed
7440-23-5	Sodium	4.33E-08	1.03E-11	8.15E-13	2.04E-12	Avg Feed
7440-02-0	Nickel	6.59E-11	1.24E-15	0.00E+00	0.00E+00	Avg Feed
14797-65-0	Nitrite	3.99E-12	3.07E-14	2.41E-14	2.63E-14	Avg Feed
14797-55-8	Nitrate	9.82E-12	1.33E-13	3.35E-14	1.04E-13	Avg Feed
14280-30-9	Hydroxide	1.49E-12	4.38E-14	8.82E-14	7.66E-14	Avg Feed
7723-14-0	Phosphorous	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-92-1	Lead	2.12E-11	2.47E-15	0.00E+00	3.47E-15	Avg Feed
14265-44-2	Phosphate	4.35E-09	1.60E-12	2.05E-14	2.62E-13	Avg Feed
63705-05-5	Total Sulfur	7.79E-03	2.04E-06	4.61E-05	2.03E-05	Avg Feed
7440-21-3	Silicon	1.36E-08	1.72E-15	0.00E+00	0.00E+00	Avg Feed
14808-79-8	Sulfate	3.81E-13	3.70E-15	8.68E-15	6.95E-15	Avg Feed
7440-24-6	Strontium (total)	5.54E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-66-6	Zinc	3.65E-09	2.02E-12	4.59E-13	1.36E-13	Avg Feed
7440-67-7	Zirconium	1.31E-09	2.17E-12	1.47E-13	8.28E-14	Avg Feed
630-08-0	Carbon monoxide	2.47E-02	2.24E-03	1.93E-03	2.54E-03	Avg Feed
10102-43-9	Nitric Oxide	1.17E+00	3.71E-01	1.40E-01	2.96E-01	Avg Feed
10102-44-0	Nitrogen dioxide	1.64E-01	5.47E-02	2.09E-02	4.36E-02	Avg Feed
7446-09-5	Sulfur dioxide	2.34E-03	1.63E-05	3.69E-04	1.62E-04	Avg Feed
7664-41-7	Ammonia/Ammonium	1.04E-01	1.51E+00	5.73E-01	1.21E+00	Env A
7647-01-0	Hydrochloric Acid	2.02E-02	1.40E-04	8.59E-06	1.12E-04	Avg Feed
7664-39-3	Hydrofluoric Acid	1.46E-03	2.85E-05	5.13E-06	1.93E-06	Avg Feed
7697-37-2	Nitric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed

Table 23 Inorganic COPCs Air Emissions Comparison

CAS Number	Compound	HOP31 - HLW Melter				
		Avg Feed	Envelope A	Envelope B	Envelope C	MAX
		g/sec				
7440-22-4	Silver	3.54E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7429-90-5	Aluminum	4.26E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-38-2	Arsenic	3.89E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-42-8	Boron	1.00E-11	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-39-3	Barium	3.31E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-69-9	Bismuth	9.87E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-70-2	Calcium	3.55E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-43-9	Cadmium	2.44E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
16887-00-6	Chloride	7.56E-15	0.00E+00	0.00E+00	0.00E+00	Avg Feed
18540-29-9	Chromium (hexavalent)	7.76E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-50-8	Copper	2.46E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed
16984-48-8	Flouride	4.32E-15	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-89-6	Iron	3.25E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-97-6	Mercury	1.07E-05	2.24E-06	2.16E-08	4.27E-14	Avg Feed
7440-09-7	Potassium	3.77E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-93-2	Lithium	4.40E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-95-4	Magnesium	1.14E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-96-5	Manganese	6.19E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-23-5	Sodium	4.32E-11	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-02-0	Nickel	5.93E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
14797-65-0	Nitrite	1.92E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed
14797-55-8	Nitrate	1.37E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
14280-30-9	Hydroxide	3.98E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7723-14-0	Phosphorous	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-92-1	Lead	1.11E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
14265-44-2	Phosphate	2.61E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
63705-05-5	Total Sulfur	6.29E-03	2.49E-04	1.15E-04	2.77E-04	Avg Feed
7440-21-3	Silicon	2.46E-11	0.00E+00	0.00E+00	0.00E+00	Avg Feed
14808-79-8	Sulfate	3.39E-15	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-24-6	Strontium (total)	1.21E-14	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-66-6	Zinc	2.05E-12	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-67-7	Zirconium	7.57E-13	0.00E+00	0.00E+00	0.00E+00	Avg Feed
630-08-0	Carbon monoxide	1.49E-03	4.56E-05	3.01E-05	2.02E-04	Avg Feed
10102-43-9	Nitric Oxide	1.04E-01	3.68E-02	1.05E-02	1.91E-02	Avg Feed
10102-44-0	Nitrogen dioxide	1.49E-02	5.83E-03	1.89E-03	3.13E-03	Avg Feed
7446-09-5	Sulfur dioxide	6.28E-02	1.99E-03	9.17E-04	2.22E-03	Avg Feed
7664-41-7	Ammonia/Ammonium	9.15E-03	4.30E-02	1.25E-02	2.25E-02	Env A
7647-01-0	Hydrochloric Acid	2.60E-05	2.74E-08	5.24E-09	1.58E-08	Avg Feed
7664-39-3	Hydrofluoric Acid	2.22E-05	8.27E-08	7.90E-09	1.02E-08	Avg Feed
7697-37-2	Nitric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed

Table 23 Inorganic COPCs Air Emissions Comparison

CAS Number	Compound	PJV34 - HLW PJM/RFD				
		Avg Feed	Envelope A	Envelope B	Envelope C	MAX
		g/sec				
7440-22-4	Silver	2.02E-15	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7429-90-5	Aluminum	1.05E-13	8.37E-15	7.12E-15	3.02E-15	Avg Feed
7440-38-2	Arsenic	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-42-8	Boron	1.87E-13	2.51E-14	1.79E-14	1.72E-14	Avg Feed
7440-39-3	Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-69-9	Bismuth	4.87E-15	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-70-2	Calcium	4.41E-15	1.46E-15	6.27E-16	3.91E-15	Avg Feed
7440-43-9	Cadmium	2.18E-14	0.00E+00	2.39E-15	0.00E+00	Avg Feed
16887-00-6	Chloride	3.80E-14	7.43E-15	9.08E-15	2.24E-14	Avg Feed
18540-29-9	Chromium (hexavalent)	5.18E-15	0.00E+00	1.14E-16	1.53E-15	Avg Feed
7440-50-8	Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
16984-48-8	Flouride	2.38E-13	7.07E-15	5.17E-15	5.14E-15	Avg Feed
7439-89-6	Iron	9.21E-14	1.90E-14	2.76E-14	4.90E-15	Avg Feed
7439-97-6	Mercury	1.81E-08	1.55E-09	3.27E-11	0.00E+00	Avg Feed
7440-09-7	Potassium	2.69E-14	6.12E-15	3.50E-16	0.00E+00	Avg Feed
7439-93-2	Lithium	2.34E-14	2.87E-15	1.97E-15	2.26E-15	Avg Feed
7439-95-4	Magnesium	1.29E-15	0.00E+00	4.37E-16	1.79E-16	Avg Feed
7439-96-5	Manganese	1.05E-14	3.19E-15	1.18E-16	5.49E-15	Avg Feed
7440-23-5	Sodium	1.53E-12	1.55E-13	5.21E-14	2.22E-13	Avg Feed
7440-02-0	Nickel	5.68E-15	0.00E+00	1.40E-15	0.00E+00	Avg Feed
14797-65-0	Nitrite	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
14797-55-8	Nitrate	2.34E-12	3.03E-13	1.82E-13	5.19E-13	Avg Feed
14280-30-9	Hydroxide	3.84E-13	3.97E-14	8.47E-15	5.49E-14	Avg Feed
7723-14-0	Phosphorous	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7439-92-1	Lead	5.79E-15	1.92E-15	1.04E-16	0.00E+00	Avg Feed
14265-44-2	Phosphate	5.37E-14	1.77E-15	0.00E+00	0.00E+00	Avg Feed
63705-05-5	Total Sulfur	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7440-21-3	Silicon	4.53E-13	0.00E+00	1.26E-16	0.00E+00	Avg Feed
14808-79-8	Sulfate	0.00E+00	9.19E-15	3.24E-14	6.03E-14	Env C
7440-24-6	Strontium (total)	0.00E+00	0.00E+00	0.00E+00	3.94E-14	Env C
7440-66-6	Zinc	2.54E-14	3.25E-15	3.92E-15	4.67E-15	Avg Feed
7440-67-7	Zirconium	1.27E-14	0.00E+00	5.38E-15	1.01E-15	Avg Feed
630-08-0	Carbon monoxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
10102-43-9	Nitric Oxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
10102-44-0	Nitrogen dioxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7446-09-5	Sulfur dioxide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7664-41-7	Ammonia/Ammonium	3.54E-11	0.00E+00	0.00E+00	5.59E-10	Env C
7647-01-0	Hydrochloric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7664-39-3	Hydrofluoric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed
7697-37-2	Nitric Acid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Avg Feed

Figure 1 Simplified WTP Process Overview

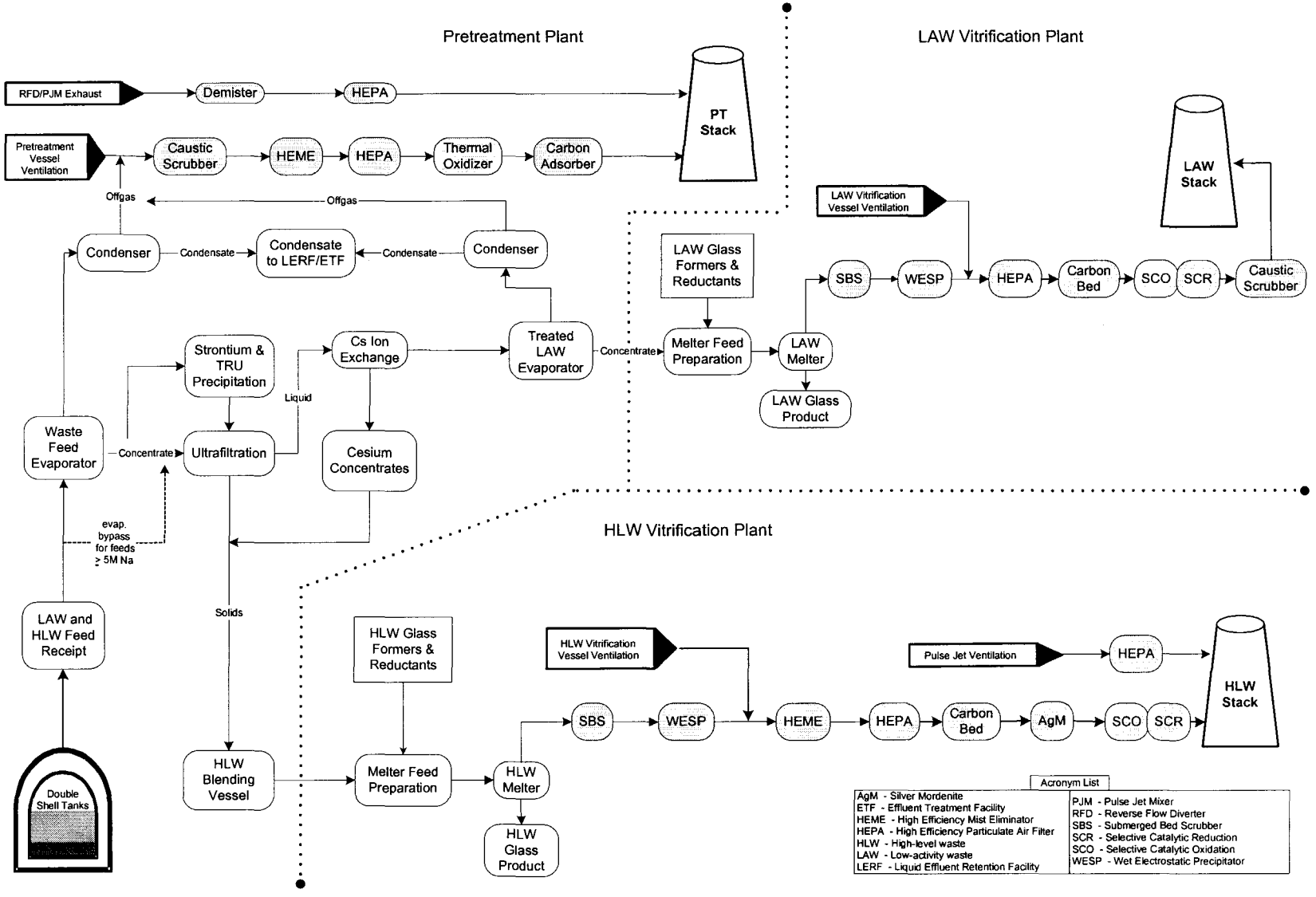


Figure 2 Simplified Pretreatment Process Flowsheet
(sheet 1 of 2)

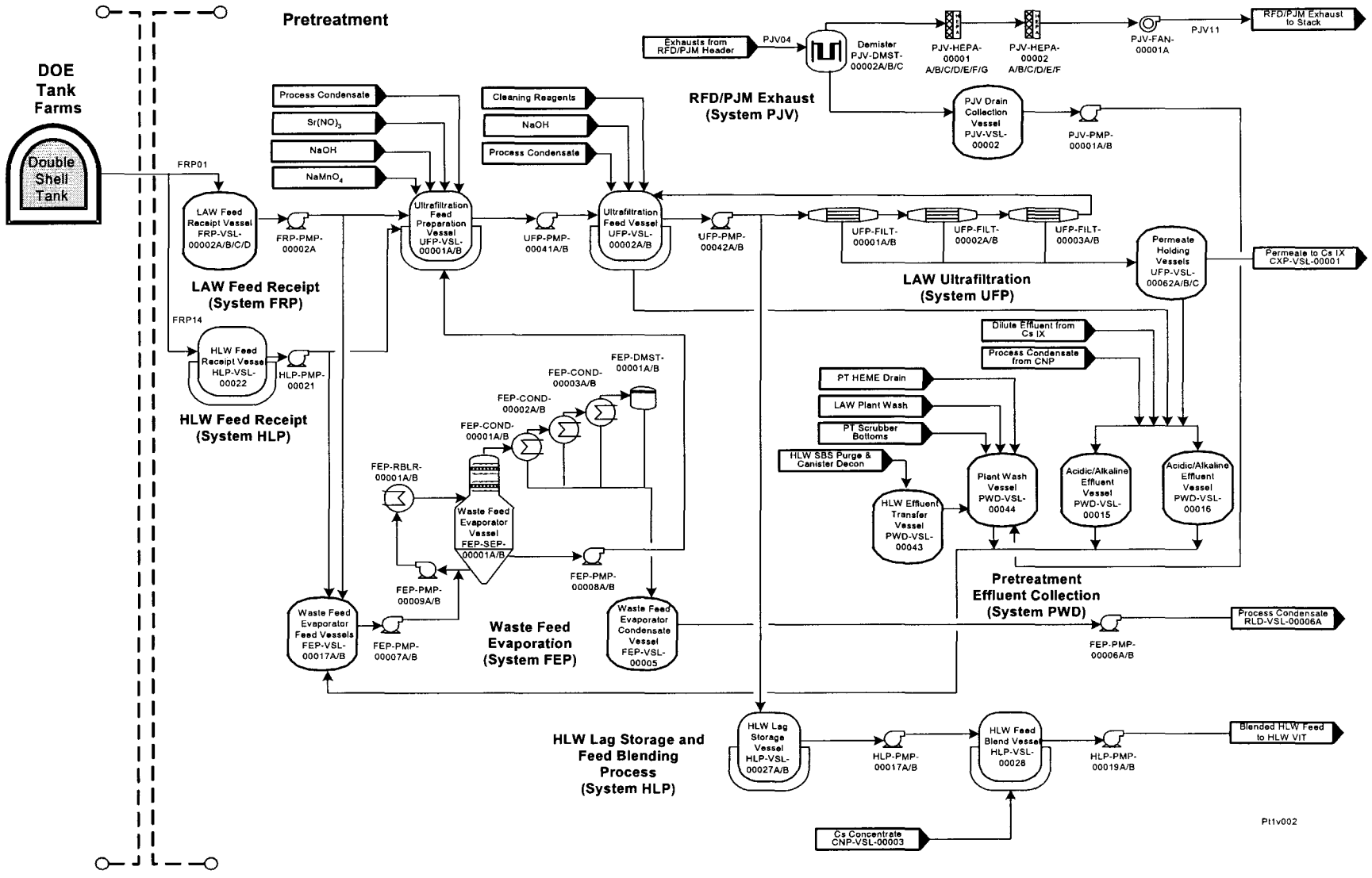


Figure 3 Simplified Pretreatment Process Flowsheet
(sheet 2 of 2)

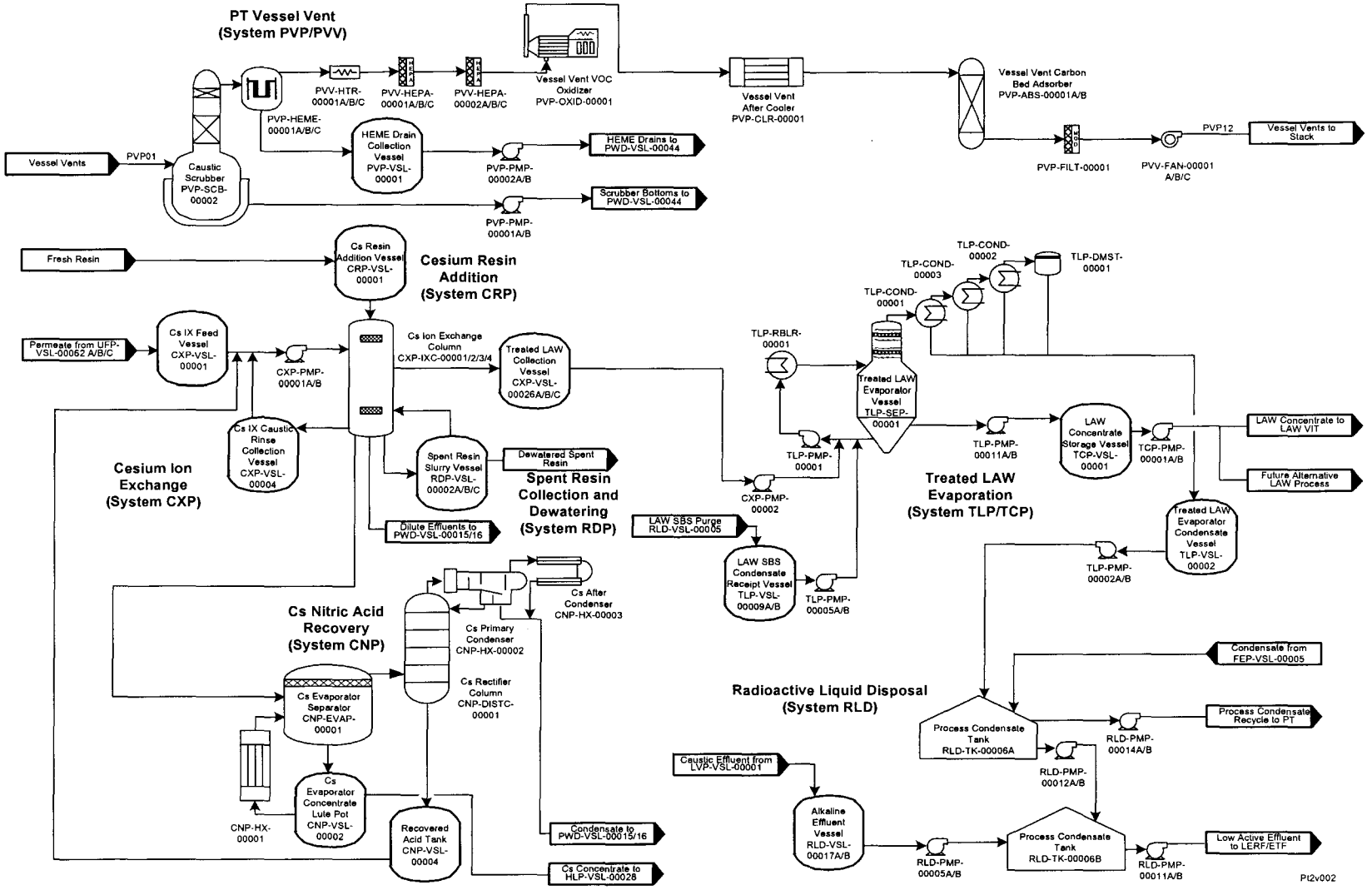
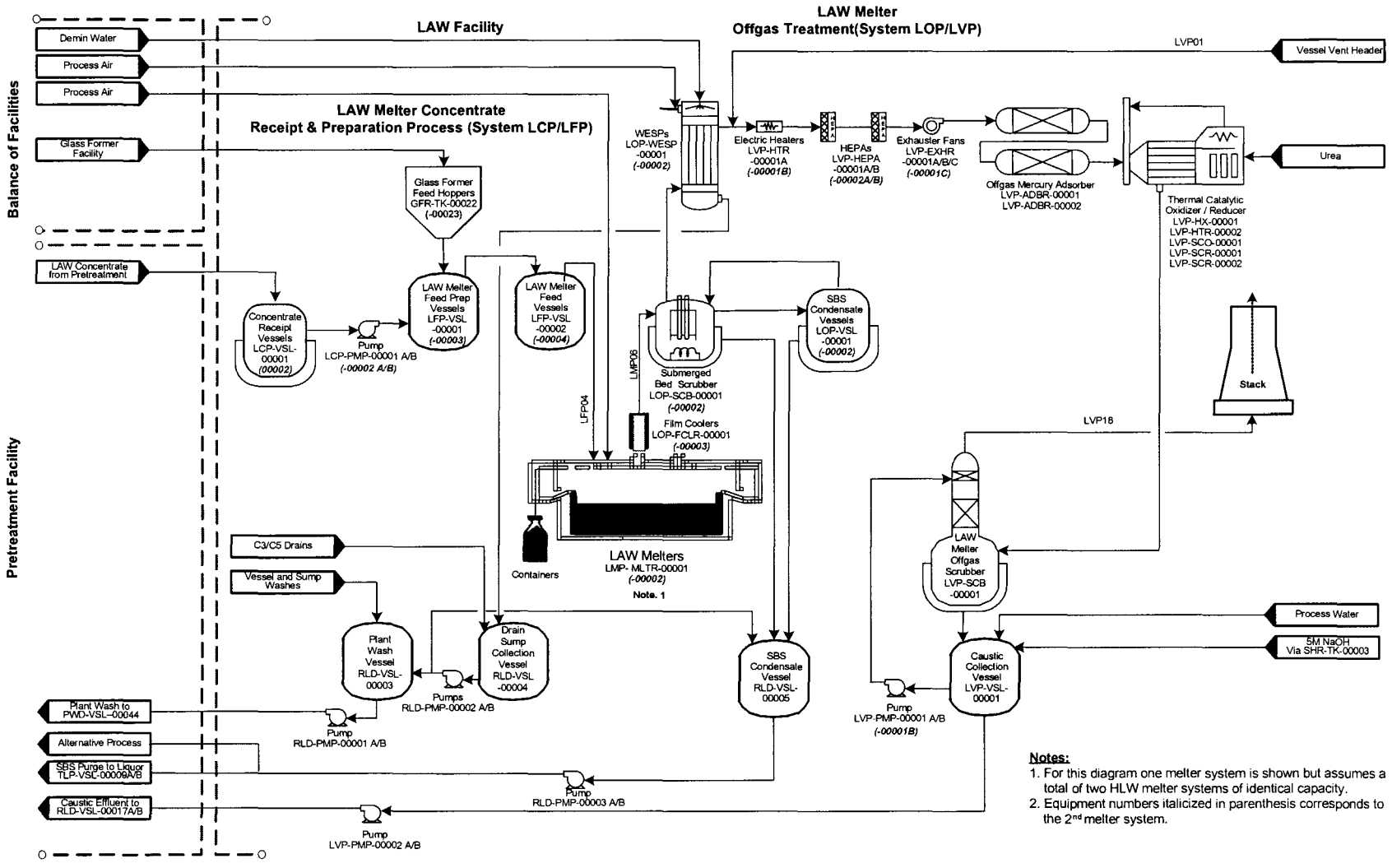


Figure 4 Simplified LAW Vitrification Process Flowsheet



Notes:
1. For this diagram one melter system is shown but assumes a total of two HLW melter systems of identical capacity.
2. Equipment numbers italicized in parenthesis corresponds to the 2nd melter system.

Figure 5 Simplified HLW Vitrification Process Flowsheet

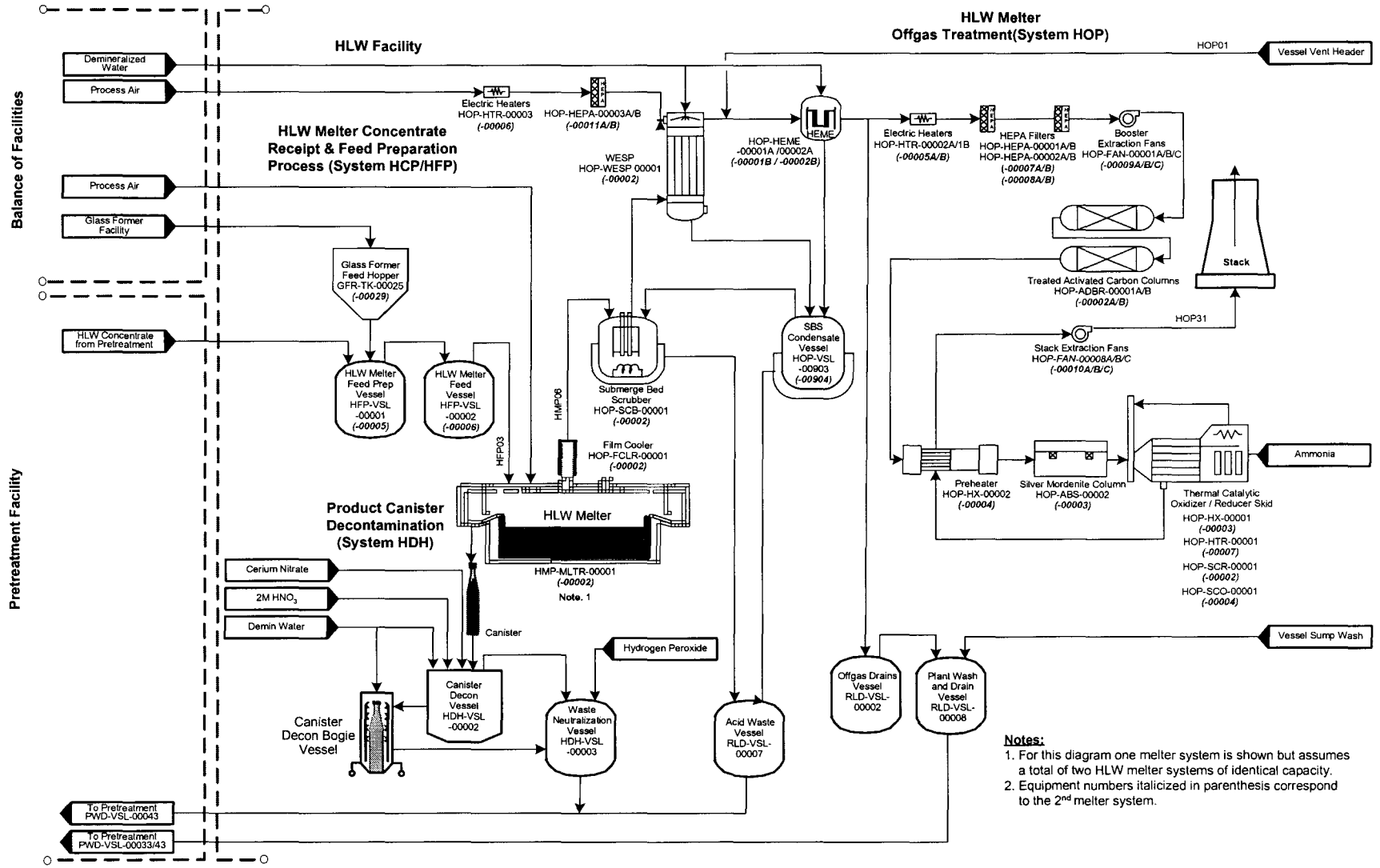
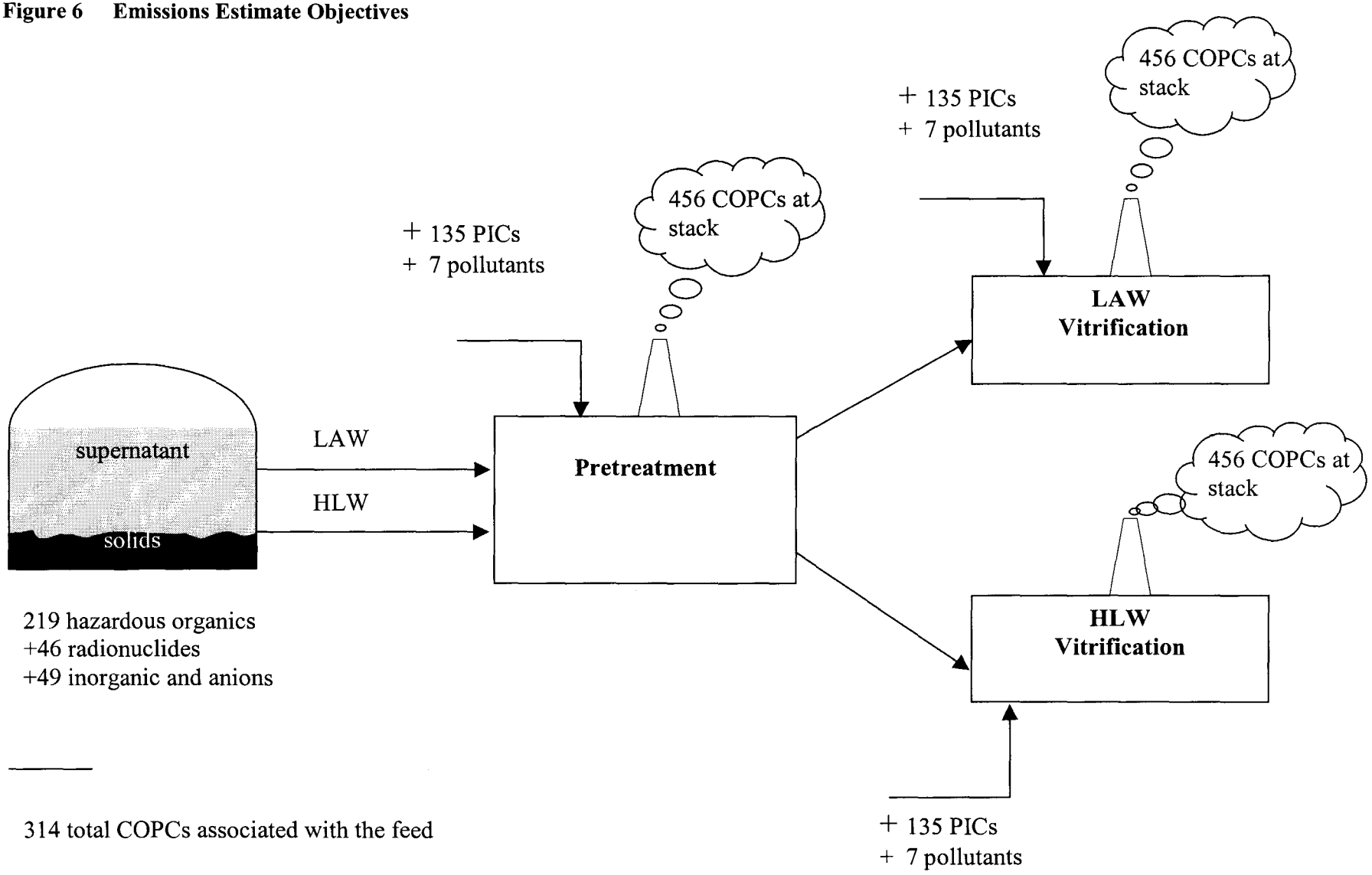


Figure 6 Emissions Estimate Objectives



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Appendix A

Selected Stream-Specific Reports from the Steady State Flowsheet Model

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Appendix A
Selected Stream-Specific Reports from the Steady State Flowsheet Model

Appendix A contains stream-specific output from the steady state flowsheet model (SSFM) for unabated, abated, and feed points in the Hanford Tank Waste Treatment and Immobilization Plant (WTP) process. These stream-specific reports contain mass flow rate information for each of the inorganic, radionuclide, and organic constituents of potential concern (COPCs) included in the SSFM. Mass flow rates for COPCs not included directly in the SSFM are described in separate calculations. These calculations are included in Appendices B and C.

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Stream Number: FRP14
Stream Name: Waste feed from DOE to HLW Feed Receipt
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	1.25E+00	g/cm^3	(does not include solid phase)
Enthalpy	-2.66E+07	BTU/hr	
Mass Flow	4.76E+03	Lb/hr	
	1.14E+05	Lb/day	
Volumetric Flow	7.21E+00	GPM	(does not include solid phase)
	9.63E-01	ft^3/min	(does not include solid phase)
Molar Flow	2.22E+02	Lbmol/hr	
Molecular Weight	1.99E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	4.90E+01	C	
Na Molarity	4.00E+00	mol/L	
pH	1.44E+01	pH	
Total TRU	2.90E-02	Ci/L	
Total Activity	5.16E+00	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	6.14E+01	1.02E+01	1.06E+05	5.05E+03	0.00E+00	0.00E+00	1.11E+05	5.04E+01	5.83E+02
Ag^+	3.17E-05	2.85E-05	2.96E-01	3.50E+00	0.00E+00	0.00E+00	3.80E+00	1.73E-03	2.00E-02
Al^{+3}	3.84E-01	8.64E-02	8.97E+02	4.93E+02	0.00E+00	0.00E+00	1.39E+03	6.32E-01	7.31E+00
As^{+3}	1.40E-04	8.73E-05	9.06E-01	2.20E-01	0.00E+00	0.00E+00	1.13E+00	5.12E-04	5.92E-03
B^{+3}	2.32E-03	2.09E-04	2.17E+00	3.00E+00	0.00E+00	0.00E+00	5.17E+00	2.35E-03	2.72E-02
Ba^{+2}	2.91E-05	3.34E-05	3.46E-01	3.20E+00	0.00E+00	0.00E+00	3.55E+00	1.61E-03	1.87E-02
Bi^{+3}	3.43E-05	5.99E-05	6.21E-01	1.67E+01	0.00E+00	0.00E+00	1.73E+01	7.85E-03	9.09E-02
Ca^{+2}	1.98E-03	6.61E-04	6.86E+00	1.92E+01	0.00E+00	0.00E+00	2.60E+01	1.18E-02	1.37E-01
Cd^{+2}	5.41E-05	5.07E-05	5.27E-01	1.17E+01	0.00E+00	0.00E+00	1.23E+01	5.58E-03	6.45E-02
Ce^{+3}	6.69E-05	7.83E-05	8.12E-01	4.01E+00	0.00E+00	0.00E+00	4.82E+00	2.19E-03	2.53E-02
Cl^-	6.17E-02	1.82E-02	1.89E+02	3.93E+00	0.00E+00	0.00E+00	1.93E+02	8.79E-02	1.02E+00
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_3^{-2}	3.07E-01	1.54E-01	1.59E+03	4.40E+02	0.00E+00	0.00E+00	2.03E+03	9.24E-01	1.07E+01
Cr^{+3}	9.19E-03	3.99E-03	4.14E+01	9.96E+00	0.00E+00	0.00E+00	5.13E+01	2.33E-02	2.70E-01
Cu^{+2}	5.35E-05	2.84E-05	2.95E-01	1.36E+00	0.00E+00	0.00E+00	1.66E+00	7.53E-04	8.72E-03
F^-	2.47E-02	3.91E-03	4.06E+01	7.13E+01	0.00E+00	0.00E+00	1.12E+02	5.08E-02	5.88E-01
Fe^{+3}	1.39E-03	6.48E-04	6.72E+00	5.09E+02	0.00E+00	0.00E+00	5.15E+02	2.34E-01	2.71E+00
H_2O	5.20E+01	7.81E+00	8.11E+04	0.00E+00	0.00E+00	0.00E+00	8.11E+04	3.68E+01	4.26E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	5.60E-05	9.38E-05	9.74E-01	1.99E+00	0.00E+00	0.00E+00	2.97E+00	1.35E-03	1.56E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	1.31E-01	4.28E-02	4.44E+02	1.01E+01	0.00E+00	0.00E+00	4.54E+02	2.07E-01	2.39E+00
La^{+3}	1.48E-05	1.72E-05	1.79E-01	5.94E+00	0.00E+00	0.00E+00	6.12E+00	2.78E-03	3.22E-02
Li^+	4.20E-04	2.43E-05	2.52E-01	4.18E-01	0.00E+00	0.00E+00	6.71E-01	3.05E-04	3.53E-03
Mg^{+2}	4.42E-04	8.96E-05	9.29E-01	3.93E+00	0.00E+00	0.00E+00	4.86E+00	2.21E-03	2.56E-02
Mn^{+3}	4.79E-04	2.20E-04	2.28E+00	4.67E+01	0.00E+00	0.00E+00	4.90E+01	2.23E-02	2.58E-01
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na^+	4.00E+00	7.67E-01	7.96E+03	7.92E+02	0.00E+00	0.00E+00	8.76E+03	3.98E+00	4.61E+01
NH3	2.82E-03	4.01E-04	4.16E+00	0.00E+00	0.00E+00	0.00E+00	4.16E+00	1.89E-03	2.19E-02
NH4+	0.00E+00	4.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni^{+2}	7.32E-04	3.59E-04	3.72E+00	2.09E+01	0.00E+00	0.00E+00	2.46E+01	1.12E-02	1.29E-01
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	8.34E-01	3.20E-01	3.32E+03	1.99E+02	0.00E+00	0.00E+00	3.52E+03	1.60E+00	1.85E+01
NO_3^-	1.13E+00	5.83E-01	6.05E+03	1.53E+02	0.00E+00	0.00E+00	6.21E+03	2.82E+00	3.27E+01
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O^{--}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OH^-	2.53E+00	3.59E-01	3.73E+03	1.82E+03	0.00E+00	0.00E+00	5.54E+03	2.52E+00	2.92E+01
$OH(b)^-$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	1.96E-04	3.39E-04	3.52E+00	2.74E+01	0.00E+00	0.00E+00	3.09E+01	1.40E-02	1.62E-01
Pd^{+2}	1.52E-05	1.35E-05	1.40E-01	1.13E+00	0.00E+00	0.00E+00	1.27E+00	5.78E-04	6.69E-03
PO_4^{-3}	1.57E-02	1.24E-02	1.29E+02	1.21E+02	0.00E+00	0.00E+00	2.50E+02	1.14E-01	1.32E+00
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	1.47E-05	1.26E-05	1.31E-01	3.58E-01	0.00E+00	0.00E+00	4.88E-01	2.22E-04	2.57E-03
Ru^{+3}	2.18E-05	1.84E-05	1.91E-01	2.50E+00	0.00E+00	0.00E+00	2.70E+00	1.23E-03	1.42E-02
S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	2.96E-03	1.48E-03	1.54E+01	8.20E+01	0.00E+00	0.00E+00	9.75E+01	4.43E-02	5.13E-01
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	3.74E-02	3.00E-02	3.11E+02	4.50E+01	0.00E+00	0.00E+00	3.56E+02	1.62E-01	1.88E+00
Sr^{+2}	6.95E-06	5.08E-06	5.28E-02	1.80E+00	0.00E+00	0.00E+00	1.85E+00	8.41E-04	9.74E-03
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	2.44E-05	9.75E-06	1.01E-01	7.23E-01	0.00E+00	0.00E+00	8.24E-01	3.74E-04	4.33E-03
Zn^{+2}	9.13E-05	4.98E-05	5.17E-01	1.81E+00	0.00E+00	0.00E+00	2.33E+00	1.06E-03	1.23E-02
Zr^{+4}	6.74E-05	5.13E-05	5.32E-01	1.24E+02	0.00E+00	0.00E+00	1.25E+02	5.66E-02	6.55E-01

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	1.58E-02	1.16E-02	1.20E+02	5.95E+01	0.00E+00	0.00E+00	1.80E+02	8.18E-02	9.47E-01
$C_2O_4^{-2}$	1.58E-02	1.16E-02	1.20E+02	5.95E+01	0.00E+00	0.00E+00	1.80E+02	8.18E-02	9.47E-01
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	2.26E+00	8.88E+04	4.64E+01	2.90E+00	1.14E+05	8.52E+02	5.16E+00	2.03E+05	8.98E+02
^{241}Am	2.98E-04	1.17E+01	7.53E-03	2.15E-02	8.46E+02	5.44E-01	2.18E-02	8.58E+02	5.52E-01
^{243}Am	1.95E-07	7.65E-03	8.45E-05	1.74E-06	6.84E-02	7.55E-04	1.94E-06	7.60E-02	8.40E-04
^{14}C	6.09E-06	2.39E-01	1.18E-04	1.55E-06	6.08E-02	3.00E-05	7.64E-06	3.00E-01	1.48E-04
^{60}Co	4.00E-05	1.57E+00	3.06E-06	2.39E-03	9.39E+01	1.83E-04	2.43E-03	9.54E+01	1.86E-04
^{243}Cm	3.22E-08	1.26E-03	5.51E-08	3.02E-05	1.19E+00	5.18E-05	3.03E-05	1.19E+00	5.19E-05
^{244}Cm	7.61E-07	2.99E-02	8.14E-07	6.87E-04	2.70E+01	7.36E-04	6.88E-04	2.70E+01	7.36E-04
^{137}Cs	2.17E+00	8.52E+04	2.16E+00	3.58E-01	1.41E+04	3.58E-01	2.53E+00	9.92E+04	2.52E+00
^{152}Eu	2.24E-06	8.81E-02	1.12E-06	1.15E-04	4.51E+00	5.73E-05	1.17E-04	4.60E+00	5.84E-05
^{154}Eu	4.65E-04	1.83E+01	1.49E-04	1.24E-02	4.89E+02	3.99E-03	1.29E-02	5.07E+02	4.14E-03
^{155}Eu	1.34E-04	5.28E+00	2.40E-05	1.84E-03	7.24E+01	3.29E-04	1.98E-03	7.77E+01	3.53E-04
^{3}H	5.19E-05	2.04E+00	4.68E-07	1.55E-05	6.08E-01	1.40E-07	6.74E-05	2.65E+00	6.08E-07
^{129}I	1.86E-07	7.30E-03	9.11E-02	6.95E-08	2.73E-03	3.41E-02	2.55E-07	1.00E-02	1.25E-01
^{63}Ni	7.20E-04	2.83E+01	1.10E-03	4.14E-04	1.63E+01	6.32E-04	1.13E-03	4.46E+01	1.73E-03
^{237}Np	2.36E-07	9.27E-03	2.90E-02	1.77E-05	6.95E-01	2.18E+00	1.79E-05	7.05E-01	2.20E+00
^{238}Pu	1.33E-06	5.24E-02	6.74E-06	8.39E-05	3.30E+00	4.24E-04	8.53E-05	3.35E+00	4.31E-04
^{239}Pu	1.84E-05	7.24E-01	2.57E-02	7.43E-04	2.92E+01	1.04E+00	7.62E-04	2.99E+01	1.06E+00
^{240}Pu	4.78E-06	1.88E-01	1.82E-03	1.96E-04	7.71E+00	7.48E-02	2.01E-04	7.89E+00	7.67E-02
^{241}Pu	1.00E-04	3.94E+00	8.43E-05	5.27E-03	2.07E+02	4.43E-03	5.37E-03	2.11E+02	4.51E-03
^{242}Pu	5.06E-10	1.99E-05	1.11E-05	1.83E-08	7.18E-04	4.02E-04	1.88E-08	7.38E-04	4.13E-04
^{125}Sb	2.77E-04	1.09E+01	2.31E-05	7.67E-03	3.01E+02	6.40E-04	7.95E-03	3.12E+02	6.63E-04
^{151}Sm	3.89E-03	1.53E+02	1.28E-02	9.31E-02	3.66E+03	3.06E-01	9.70E-02	3.81E+03	3.19E-01
^{126}Sn	4.41E-06	1.73E-01	3.36E-02	3.60E-05	1.41E+00	2.74E-01	4.04E-05	1.59E+00	3.08E-01
^{90}Sr	8.64E-02	3.40E+03	5.42E-02	2.39E+00	9.39E+04	1.50E+00	2.48E+00	9.73E+04	1.55E+00
^{99}Tc	7.67E-04	3.01E+01	3.92E+00	3.60E-03	1.41E+02	1.84E+01	4.37E-03	1.71E+02	2.23E+01
^{232}Th	7.17E-09	2.82E-04	5.64E+00	5.86E-07	2.30E-02	4.61E+02	5.93E-07	2.33E-02	4.66E+02
^{233}U	2.39E-07	9.39E-03	2.15E-03	4.79E-05	1.88E+00	4.31E-01	4.82E-05	1.89E+00	4.33E-01
^{234}U	1.70E-07	6.66E-03	2.37E-03	2.49E-06	9.79E-02	3.48E-02	2.66E-06	1.05E-01	3.71E-02
^{235}U	6.68E-09	2.62E-04	2.68E-01	5.99E-08	2.35E-03	2.40E+00	6.66E-08	2.61E-03	2.67E+00
^{236}U	1.14E-08	4.50E-04	1.53E-02	8.23E-08	3.23E-03	1.10E-01	9.37E-08	3.68E-03	1.26E-01
^{238}U	1.32E-07	5.20E-03	3.41E+01	1.41E-06	5.54E-02	3.63E+02	1.54E-06	6.06E-02	3.98E+02

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	4.06E-01	2.20E-01	2.28E+03	1.04E+00	1.20E+01
50-32-8	1.51E-04	3.18E-04	3.30E+00	1.50E-03	1.74E-02
56-23-5	2.60E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
57-14-7	9.98E-04	5.01E-04	5.19E+00	2.36E-03	2.73E-02
58-90-2	2.59E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
59-89-2	5.17E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
60-35-5	1.69E-04	8.33E-05	8.65E-01	3.93E-04	4.55E-03
62-75-9	8.10E-04	5.01E-04	5.20E+00	2.36E-03	2.73E-02
64-19-7	3.61E-01	1.81E-01	1.88E+03	8.53E-01	9.88E+00
71-43-2	5.12E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
75-05-8	2.44E-04	8.36E-05	8.67E-01	3.94E-04	4.56E-03
75-12-7	1.33E-03	5.00E-04	5.19E+00	2.36E-03	2.73E-02
76-15-3	6.47E-05	8.34E-05	8.66E-01	3.93E-04	4.55E-03
79-01-6	7.61E-05	8.35E-05	8.66E-01	3.94E-04	4.56E-03
83-32-9	3.89E-04	5.01E-04	5.20E+00	2.36E-03	2.73E-02
84-66-2	2.70E-04	5.01E-04	5.20E+00	2.36E-03	2.73E-02
84-74-2	2.16E-04	5.02E-04	5.21E+00	2.37E-03	2.74E-02
87-68-3	3.83E-05	8.33E-05	8.65E-01	3.93E-04	4.55E-03
88-89-1	2.62E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
91-20-3	1.56E-05	1.67E-05	1.73E-01	7.87E-05	9.11E-04
95-50-1	2.72E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
98-86-2	3.32E-04	3.34E-04	3.46E+00	1.57E-03	1.82E-02
100-21-0	3.61E-04	5.00E-04	5.19E+00	2.36E-03	2.73E-02
101-84-8	5.88E-05	8.35E-05	8.67E-01	3.94E-04	4.56E-03
106-93-4	2.13E-05	3.34E-05	3.47E-01	1.58E-04	1.82E-03
106-97-8	1.72E-04	8.34E-05	8.66E-01	3.94E-04	4.56E-03
106-99-0	7.39E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
108-87-2	1.02E-04	8.36E-05	8.67E-01	3.94E-04	4.56E-03
108-88-3	4.34E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
108-95-2	6.38E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
110-54-3	1.16E-04	8.34E-05	8.66E-01	3.94E-04	4.55E-03
110-82-7	1.19E-04	8.36E-05	8.67E-01	3.94E-04	4.56E-03
111-84-2	7.80E-05	8.35E-05	8.66E-01	3.94E-04	4.56E-03
120-12-7	3.37E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
120-82-1	5.51E-05	8.34E-05	8.66E-01	3.94E-04	4.56E-03
122-39-4	1.18E-04	1.67E-04	1.73E+00	7.86E-04	9.10E-03
126-73-8	1.50E-04	3.33E-04	3.46E+00	1.57E-03	1.82E-02
127-18-4	2.41E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
129-00-0	2.97E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
132-64-9	3.57E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
144-62-7	3.33E-02	2.50E-02	2.60E+02	1.18E-01	1.37E+00
193-39-5	2.17E-04	5.00E-04	5.19E+00	2.36E-03	2.73E-02
206-44-0	2.97E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
208-96-8	3.94E-04	5.00E-04	5.19E+00	2.36E-03	2.73E-02
603-34-9	2.45E-04	5.02E-04	5.21E+00	2.37E-03	2.74E-02
621-64-7	4.61E-04	5.01E-04	5.20E+00	2.36E-03	2.73E-02
1321-64-8	2.00E-04	5.01E-04	5.20E+00	2.37E-03	2.74E-02
1336-36-3	1.07E-05	2.87E-05	2.98E-01	1.35E-04	1.57E-03
3697-24-3	2.48E-04	5.02E-04	5.20E+00	2.37E-03	2.74E-02
4170-30-3	1.43E-04	8.36E-05	8.68E-01	3.95E-04	4.57E-03
10061-01-5	3.60E-05	3.33E-05	3.46E-01	1.57E-04	1.82E-03
26140-60-3	2.61E-04	5.02E-04	5.21E+00	2.37E-03	2.74E-02

Stream Number: FRP01
Stream Name: Waste feed from DOE to LAW Feed Receipt
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	1.26E+00	g/cm^3	(does not include solid phase)
Enthalpy	-1.54E+07	BTU/hr	
Mass Flow	2.60E+03	Lb/hr	
	6.23E+04	Lb/day	
Volumetric Flow	4.12E+00	GPM	(does not include solid phase)
	5.50E-01	ft^3/min	(does not include solid phase)
Molar Flow	1.28E+02	Lbmol/hr	
Molecular Weight	1.99E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	2.50E+01	C	
Na Molarity	4.00E+00	mol/L	
pH	1.44E+01	pH	
Total TRU	4.24E-04	Ci/L	
Total Activity	2.26E+00	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	6.19E+01	1.03E+01	6.09E+04	0.00E+00	0.00E+00	0.00E+00	6.09E+04	2.77E+01	3.20E+02
Ag^{+}	3.17E-05	2.85E-05	1.69E-01	0.00E+00	0.00E+00	0.00E+00	1.69E-01	7.69E-05	8.89E-04
Al^{+3}	3.84E-01	8.64E-02	5.12E+02	0.00E+00	0.00E+00	0.00E+00	5.12E+02	2.33E-01	2.70E+00
As^{+3}	1.40E-04	8.73E-05	5.18E-01	0.00E+00	0.00E+00	0.00E+00	5.18E-01	2.35E-04	2.72E-03
B^{+3}	2.32E-03	2.09E-04	1.24E+00	0.00E+00	0.00E+00	0.00E+00	1.24E+00	5.64E-04	6.52E-03
Ba^{+2}	2.91E-05	3.34E-05	1.98E-01	0.00E+00	0.00E+00	0.00E+00	1.98E-01	8.99E-05	1.04E-03
Bi^{+3}	3.43E-05	5.99E-05	3.55E-01	0.00E+00	0.00E+00	0.00E+00	3.55E-01	1.61E-04	1.87E-03
Ca^{+2}	1.98E-03	6.61E-04	3.92E+00	0.00E+00	0.00E+00	0.00E+00	3.92E+00	1.78E-03	2.06E-02
Cd^{+2}	5.41E-05	5.07E-05	3.01E-01	0.00E+00	0.00E+00	0.00E+00	3.01E-01	1.37E-04	1.58E-03
Ce^{+3}	6.69E-05	7.83E-05	4.64E-01	0.00E+00	0.00E+00	0.00E+00	4.64E-01	2.11E-04	2.44E-03
Cl^{-}	6.17E-02	1.82E-02	1.08E+02	0.00E+00	0.00E+00	0.00E+00	1.08E+02	4.92E-02	5.69E-01
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_3^{-2}	3.07E-01	1.54E-01	9.10E+02	0.00E+00	0.00E+00	0.00E+00	9.10E+02	4.14E-01	4.79E+00
Cr^{+3}	9.19E-03	3.99E-03	2.36E+01	0.00E+00	0.00E+00	0.00E+00	2.36E+01	1.07E-02	1.24E-01
Cu^{+2}	5.35E-05	2.84E-05	1.68E-01	0.00E+00	0.00E+00	0.00E+00	1.68E-01	7.65E-05	8.85E-04
F^{-}	2.47E-02	3.91E-03	2.32E+01	0.00E+00	0.00E+00	0.00E+00	2.32E+01	1.05E-02	1.22E-01
Fe^{+3}	1.39E-03	6.48E-04	3.84E+00	0.00E+00	0.00E+00	0.00E+00	3.84E+00	1.75E-03	2.02E-02
H_2O	5.24E+01	7.88E+00	4.68E+04	0.00E+00	0.00E+00	0.00E+00	4.68E+04	2.13E+01	2.46E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	5.60E-05	9.38E-05	5.56E-01	0.00E+00	0.00E+00	0.00E+00	5.56E-01	2.53E-04	2.93E-03
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	1.31E-01	4.28E-02	2.54E+02	0.00E+00	0.00E+00	0.00E+00	2.54E+02	1.15E-01	1.34E+00
La^{+3}	1.48E-05	1.72E-05	1.02E-01	0.00E+00	0.00E+00	0.00E+00	1.02E-01	4.64E-05	5.37E-04
Li^{+}	4.20E-04	2.43E-05	1.44E-01	0.00E+00	0.00E+00	0.00E+00	1.44E-01	6.55E-05	7.59E-04
Mg^{+2}	4.42E-04	8.96E-05	5.31E-01	0.00E+00	0.00E+00	0.00E+00	5.31E-01	2.41E-04	2.79E-03
Mn^{+3}	4.79E-04	2.20E-04	1.30E+00	0.00E+00	0.00E+00	0.00E+00	1.30E+00	5.92E-04	6.85E-03
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na^{+}	4.00E+00	7.67E-01	4.55E+03	0.00E+00	0.00E+00	0.00E+00	4.55E+03	2.07E+00	2.39E+01
NH3	2.82E-03	4.01E-04	2.38E+00	0.00E+00	0.00E+00	0.00E+00	2.38E+00	1.08E-03	1.25E-02
NH4+	0.00E+00	4.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni^{+2}	7.32E-04	3.59E-04	2.13E+00	0.00E+00	0.00E+00	0.00E+00	2.13E+00	9.66E-04	1.12E-02
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^{-}	8.34E-01	3.20E-01	1.90E+03	0.00E+00	0.00E+00	0.00E+00	1.90E+03	8.63E-01	9.99E+00
NO_3^{-}	1.13E+00	5.83E-01	3.46E+03	0.00E+00	0.00E+00	0.00E+00	3.46E+03	1.57E+00	1.82E+01
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OH^{-}	2.53E+00	3.59E-01	2.13E+03	0.00E+00	0.00E+00	0.00E+00	2.13E+03	9.68E-01	1.12E+01
$OH(b)^{-}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	1.96E-04	3.39E-04	2.01E+00	0.00E+00	0.00E+00	0.00E+00	2.01E+00	9.15E-04	1.06E-02
Pd^{+2}	1.52E-05	1.35E-05	8.00E-02	0.00E+00	0.00E+00	0.00E+00	8.00E-02	3.64E-05	4.21E-04
PO_4^{-3}	1.57E-02	1.24E-02	7.37E+01	0.00E+00	0.00E+00	0.00E+00	7.37E+01	3.35E-02	3.88E-01
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	1.47E-05	1.26E-05	7.48E-02	0.00E+00	0.00E+00	0.00E+00	7.48E-02	3.40E-05	3.94E-04
Ru^{+3}	2.18E-05	1.84E-05	1.09E-01	0.00E+00	0.00E+00	0.00E+00	1.09E-01	4.96E-05	5.74E-04
S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	2.96E-03	1.48E-03	8.80E+00	0.00E+00	0.00E+00	0.00E+00	8.80E+00	4.00E-03	4.63E-02
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	3.74E-02	3.00E-02	1.78E+02	0.00E+00	0.00E+00	0.00E+00	1.78E+02	8.09E-02	9.36E-01
Sr^{+2}	6.95E-06	5.08E-06	3.01E-02	0.00E+00	0.00E+00	0.00E+00	3.01E-02	1.37E-05	1.59E-04
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	2.44E-05	9.75E-06	5.78E-02	0.00E+00	0.00E+00	0.00E+00	5.78E-02	2.63E-05	3.04E-04
Zn^{+2}	9.13E-05	4.98E-05	2.95E-01	0.00E+00	0.00E+00	0.00E+00	2.95E-01	1.34E-04	1.55E-03
Zr^{+4}	6.74E-05	5.13E-05	3.04E-01	0.00E+00	0.00E+00	0.00E+00	3.04E-01	1.38E-04	1.60E-03

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	1.58E-02	1.16E-02	6.88E+01	0.00E+00	0.00E+00	0.00E+00	6.88E+01	3.13E-02	3.62E-01
$C_2O_4^{-2}$	1.58E-02	1.16E-02	6.88E+01	0.00E+00	0.00E+00	0.00E+00	6.88E+01	3.13E-02	3.62E-01
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	2.26E+00	5.08E+04	2.65E+01	0.00E+00	0.00E+00	0.00E+00	2.26E+00	5.08E+04	2.65E+01
^{241}Am	2.98E-04	6.69E+00	4.30E-03	0.00E+00	0.00E+00	0.00E+00	2.98E-04	6.69E+00	4.30E-03
^{243}Am	1.95E-07	4.37E-03	4.83E-05	0.00E+00	0.00E+00	0.00E+00	1.95E-07	4.37E-03	4.83E-05
^{14}C	6.09E-06	1.37E-01	6.75E-05	0.00E+00	0.00E+00	0.00E+00	6.09E-06	1.37E-01	6.75E-05
^{60}Co	4.00E-05	8.97E-01	1.75E-06	0.00E+00	0.00E+00	0.00E+00	4.00E-05	8.97E-01	1.75E-06
^{243}Cm	3.22E-08	7.22E-04	3.15E-08	0.00E+00	0.00E+00	0.00E+00	3.22E-08	7.22E-04	3.15E-08
^{244}Cm	7.61E-07	1.71E-02	4.65E-07	0.00E+00	0.00E+00	0.00E+00	7.61E-07	1.71E-02	4.65E-07
^{137}Cs	2.17E+00	4.87E+04	1.24E+00	0.00E+00	0.00E+00	0.00E+00	2.17E+00	4.87E+04	1.24E+00
^{152}Eu	2.24E-06	5.03E-02	6.38E-07	0.00E+00	0.00E+00	0.00E+00	2.24E-06	5.03E-02	6.38E-07
^{154}Eu	4.65E-04	1.04E+01	8.51E-05	0.00E+00	0.00E+00	0.00E+00	4.65E-04	1.04E+01	8.51E-05
^{155}Eu	1.34E-04	3.02E+00	1.37E-05	0.00E+00	0.00E+00	0.00E+00	1.34E-04	3.02E+00	1.37E-05
^{3}H	5.19E-05	1.17E+00	2.67E-07	0.00E+00	0.00E+00	0.00E+00	5.19E-05	1.17E+00	2.67E-07
^{129}I	1.86E-07	4.17E-03	5.21E-02	0.00E+00	0.00E+00	0.00E+00	1.86E-07	4.17E-03	5.21E-02
^{63}Ni	7.20E-04	1.62E+01	6.27E-04	0.00E+00	0.00E+00	0.00E+00	7.20E-04	1.62E+01	6.27E-04
^{237}Np	2.36E-07	5.30E-03	1.66E-02	0.00E+00	0.00E+00	0.00E+00	2.36E-07	5.30E-03	1.66E-02
^{238}Pu	1.33E-06	2.99E-02	3.85E-06	0.00E+00	0.00E+00	0.00E+00	1.33E-06	2.99E-02	3.85E-06
^{239}Pu	1.84E-05	4.14E-01	1.47E-02	0.00E+00	0.00E+00	0.00E+00	1.84E-05	4.14E-01	1.47E-02
^{240}Pu	4.78E-06	1.07E-01	1.04E-03	0.00E+00	0.00E+00	0.00E+00	4.78E-06	1.07E-01	1.04E-03
^{241}Pu	1.00E-04	2.25E+00	4.82E-05	0.00E+00	0.00E+00	0.00E+00	1.00E-04	2.25E+00	4.82E-05
^{242}Pu	5.06E-10	1.14E-05	6.36E-06	0.00E+00	0.00E+00	0.00E+00	5.06E-10	1.14E-05	6.36E-06
^{125}Sb	2.77E-04	6.22E+00	1.32E-05	0.00E+00	0.00E+00	0.00E+00	2.77E-04	6.22E+00	1.32E-05
^{151}Sm	3.89E-03	8.74E+01	7.32E-03	0.00E+00	0.00E+00	0.00E+00	3.89E-03	8.74E+01	7.32E-03
^{126}Sn	4.41E-06	9.90E-02	1.92E-02	0.00E+00	0.00E+00	0.00E+00	4.41E-06	9.90E-02	1.92E-02
^{90}Sr	8.64E-02	1.94E+03	3.10E-02	0.00E+00	0.00E+00	0.00E+00	8.64E-02	1.94E+03	3.10E-02
^{99}Tc	7.67E-04	1.72E+01	2.24E+00	0.00E+00	0.00E+00	0.00E+00	7.67E-04	1.72E+01	2.24E+00
^{232}Th	7.17E-09	1.61E-04	3.22E+00	0.00E+00	0.00E+00	0.00E+00	7.17E-09	1.61E-04	3.22E+00
^{233}U	2.39E-07	5.36E-03	1.23E-03	0.00E+00	0.00E+00	0.00E+00	2.39E-07	5.36E-03	1.23E-03
^{234}U	1.70E-07	3.81E-03	1.35E-03	0.00E+00	0.00E+00	0.00E+00	1.70E-07	3.81E-03	1.35E-03
^{235}U	6.68E-09	1.50E-04	1.53E-01	0.00E+00	0.00E+00	0.00E+00	6.68E-09	1.50E-04	1.53E-01
^{236}U	1.14E-08	2.57E-04	8.76E-03	0.00E+00	0.00E+00	0.00E+00	1.14E-08	2.57E-04	8.76E-03
^{238}U	1.32E-07	2.97E-03	1.95E+01	0.00E+00	0.00E+00	0.00E+00	1.32E-07	2.97E-03	1.95E+01

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	4.06E-01	2.19E-01	1.30E+03	5.92E-01	6.85E+00
50-32-8	1.51E-04	3.18E-04	1.89E+00	8.57E-04	9.92E-03
56-23-5	2.60E-05	3.34E-05	1.98E-01	9.00E-05	1.04E-03
57-14-7	9.98E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
58-90-2	2.59E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
59-89-2	5.17E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
60-35-5	1.69E-04	8.33E-05	4.94E-01	2.25E-04	2.60E-03
62-75-9	8.10E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
64-19-7	3.61E-01	1.81E-01	1.07E+03	4.88E-01	5.64E+00
71-43-2	5.12E-05	3.34E-05	1.98E-01	9.00E-05	1.04E-03
75-05-8	2.44E-04	8.36E-05	4.96E-01	2.25E-04	2.61E-03
75-12-7	1.33E-03	5.00E-04	2.96E+00	1.35E-03	1.56E-02
76-15-3	6.47E-05	8.34E-05	4.95E-01	2.25E-04	2.60E-03
79-01-6	7.61E-05	8.35E-05	4.95E-01	2.25E-04	2.60E-03
83-32-9	3.89E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
84-66-2	2.70E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
84-74-2	2.16E-04	5.02E-04	2.98E+00	1.35E-03	1.57E-02
87-68-3	3.83E-05	8.33E-05	4.94E-01	2.25E-04	2.60E-03
88-89-1	2.62E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
91-20-3	1.56E-05	1.67E-05	9.89E-02	4.50E-05	5.20E-04
95-50-1	2.72E-05	3.34E-05	1.98E-01	8.99E-05	1.04E-03
98-86-2	3.32E-04	3.34E-04	1.98E+00	9.00E-04	1.04E-02
100-21-0	3.61E-04	5.00E-04	2.97E+00	1.35E-03	1.56E-02
101-84-8	5.88E-05	8.35E-05	4.95E-01	2.25E-04	2.61E-03
106-93-4	2.13E-05	3.34E-05	1.98E-01	9.00E-05	1.04E-03
106-97-8	1.72E-04	8.34E-05	4.95E-01	2.25E-04	2.60E-03
106-99-0	7.39E-05	3.34E-05	1.98E-01	8.99E-05	1.04E-03
108-87-2	1.02E-04	8.36E-05	4.96E-01	2.25E-04	2.61E-03
108-88-3	4.34E-05	3.34E-05	1.98E-01	8.99E-05	1.04E-03
108-95-2	6.38E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
110-54-3	1.16E-04	8.34E-05	4.95E-01	2.25E-04	2.60E-03
110-82-7	1.19E-04	8.36E-05	4.96E-01	2.25E-04	2.61E-03
111-84-2	7.80E-05	8.35E-05	4.95E-01	2.25E-04	2.60E-03
120-12-7	3.37E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
120-82-1	5.51E-05	8.34E-05	4.95E-01	2.25E-04	2.60E-03
122-39-4	1.18E-04	1.67E-04	9.88E-01	4.49E-04	5.20E-03
126-73-8	1.50E-04	3.33E-04	1.98E+00	8.99E-04	1.04E-02
127-18-4	2.41E-05	3.34E-05	1.98E-01	8.99E-05	1.04E-03
129-00-0	2.97E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
132-64-9	3.57E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
144-62-7	3.33E-02	2.50E-02	1.48E+02	6.74E-02	7.81E-01
193-39-5	2.17E-04	5.00E-04	2.97E+00	1.35E-03	1.56E-02
206-44-0	2.97E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
208-96-8	3.94E-04	5.00E-04	2.97E+00	1.35E-03	1.56E-02
603-34-9	2.45E-04	5.02E-04	2.97E+00	1.35E-03	1.56E-02
621-64-7	4.61E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
1321-64-8	2.00E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
1336-36-3	2.01E-06	5.40E-06	3.20E-02	1.46E-05	1.68E-04
3697-24-3	2.48E-04	5.02E-04	2.97E+00	1.35E-03	1.56E-02
4170-30-3	1.43E-04	8.36E-05	4.96E-01	2.25E-04	2.61E-03
10061-01-5	3.60E-05	3.33E-05	1.98E-01	8.99E-05	1.04E-03
26140-60-3	2.61E-04	5.02E-04	2.97E+00	1.35E-03	1.56E-02

Stream Number:	PVP01
Stream Name:	Pretreatment vessel vents feed to caustic scrubber
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	1.10E-03	g/cm^3	(does not include solid phase)
Enthalpy	-4.75E+06	BTU/hr	
Mass Flow	3.28E+04	Lb/hr	
	7.87E+05	Lb/day	
Volumetric Flow	5.95E+04	GPM	(does not include solid phase)
	7.96E+03	ft^3/min	(does not include solid phase)
Molar Flow	1.15E+03	Lbmol/hr	
Molecular Weight	2.84E+01	Lb/Lbmol	
Pressure	9.68E+02	mbar	
Temperature	2.89E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	5.55E+00	pH	
Total TRU	9.27E-12	Ci/L	
Total Activity	2.10E-09	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	1.69E-07	2.65E-08	2.27E+00	2.59E-02	3.86E-02	7.84E+05	7.84E+05	3.56E+02	4.13E+03
Ag^+	5.18E-14	4.66E-14	3.99E-06	1.64E-05	0.00E+00	0.00E+00	2.04E-05	9.25E-09	1.07E-07
Al^{+3}	4.93E-10	1.11E-10	9.52E-03	1.90E-03	0.00E+00	0.00E+00	1.14E-02	5.19E-06	6.01E-05
As^{+3}	2.09E-13	1.30E-13	1.12E-05	1.92E-06	0.00E+00	0.00E+00	1.31E-05	5.96E-09	6.89E-08
B^{+3}	3.68E-12	3.32E-13	2.85E-05	4.82E-04	0.00E+00	0.00E+00	5.10E-04	2.32E-07	2.68E-06
Ba^{+2}	4.91E-14	5.63E-14	4.83E-06	1.51E-05	0.00E+00	0.00E+00	1.99E-05	9.04E-09	1.05E-07
Bi^{+3}	3.00E-14	5.23E-14	4.49E-06	4.24E-05	0.00E+00	0.00E+00	4.68E-05	2.13E-08	2.46E-07
Ca^{+2}	7.54E-11	2.52E-11	2.16E-03	3.10E-03	0.00E+00	0.00E+00	5.26E-03	2.39E-06	2.77E-05
Cd^{+2}	4.86E-14	4.56E-14	3.91E-06	3.34E-05	0.00E+00	0.00E+00	3.73E-05	1.69E-08	1.96E-07
Ce^{+3}	1.89E-12	2.21E-12	1.89E-04	1.71E-05	0.00E+00	0.00E+00	2.07E-04	9.39E-08	1.09E-06
Cl^-	6.53E-11	1.93E-11	1.66E-03	1.08E-05	0.00E+00	0.00E+00	1.67E-03	7.57E-07	8.77E-06
CO	4.90E-35	1.15E-35	9.82E-28	0.00E+00	1.36E-71	2.73E-64	9.82E-28	4.46E-31	5.17E-30
CO_2	8.00E-15	2.94E-15	2.52E-07	0.00E+00	1.45E-12	4.56E-05	4.59E-05	2.08E-08	2.41E-07
CO_3^{-2}	4.60E-10	2.30E-10	1.97E-02	1.82E-03	0.00E+00	0.00E+00	2.16E-02	9.80E-06	1.13E-04
Cr^{+3}	8.09E-12	3.51E-12	3.01E-04	2.85E-05	0.00E+00	0.00E+00	3.29E-04	1.50E-07	1.73E-06
Cu^{+2}	8.75E-14	4.64E-14	3.98E-06	6.19E-06	0.00E+00	0.00E+00	1.02E-05	4.62E-09	5.35E-08
F^-	2.82E-11	4.47E-12	3.83E-04	1.79E-04	0.00E+00	0.00E+00	5.62E-04	2.56E-07	2.96E-06
Fe^{+3}	2.83E-12	1.32E-12	1.13E-04	2.47E-03	0.00E+00	0.00E+00	2.58E-03	1.17E-06	1.36E-05
H_2O	1.58E-07	2.38E-08	2.04E+00	0.00E+00	1.55E-03	2.00E+04	2.00E+04	9.08E+00	1.05E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	7.69E-11	6.47E-13	5.55E-05	0.00E+00	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.61E-35	2.25E-27	2.25E-27	1.02E-30	1.18E-29
HCO3-	4.08E-16	2.08E-16	1.78E-08	0.00E+00	0.00E+00	0.00E+00	1.78E-08	8.10E-12	9.38E-11
H2CO3	8.00E-28	4.14E-28	3.55E-20	0.00E+00	0.00E+00	0.00E+00	3.55E-20	1.61E-23	1.87E-22
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-35	1.62E-28	1.62E-28	7.35E-32	8.51E-31
Hg^{+2}	8.38E-14	1.40E-13	1.20E-05	4.34E-05	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-33	4.72E-26	4.72E-26	2.15E-29	2.48E-28
K^+	1.41E-10	4.60E-11	3.95E-03	2.99E-05	0.00E+00	0.00E+00	3.98E-03	1.81E-06	2.09E-05
La^{+3}	2.22E-14	2.57E-14	2.21E-06	2.51E-05	0.00E+00	0.00E+00	2.73E-05	1.24E-08	1.44E-07
Li^+	2.95E-12	1.71E-13	1.47E-05	1.12E-05	0.00E+00	0.00E+00	2.59E-05	1.18E-08	1.36E-07
Mg^{+2}	6.64E-12	1.35E-12	1.16E-04	3.70E-04	0.00E+00	0.00E+00	4.86E-04	2.21E-07	2.56E-06
Mn^{+3}	7.36E-13	3.37E-13	2.89E-05	2.02E-04	0.00E+00	0.00E+00	2.31E-04	1.05E-07	1.21E-06
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	3.18E-12	7.42E-13	6.37E-05	0.00E+00	2.92E-02	5.86E+05	5.86E+05	2.66E+02	3.08E+03
Na^+	3.77E-09	7.23E-10	6.20E-02	2.02E-03	0.00E+00	0.00E+00	6.40E-02	2.91E-05	3.37E-04
NH3	5.47E-12	7.78E-13	6.67E-05	0.00E+00	1.26E-10	1.53E-03	1.60E-03	7.28E-07	8.42E-06
NH4+	3.02E-15	7.78E-13	3.90E-08	0.00E+00	0.00E+00	0.00E+00	3.90E-08	1.77E-11	2.05E-10
Ni^{+2}	6.88E-13	3.37E-13	2.89E-05	5.41E-05	0.00E+00	0.00E+00	8.30E-05	3.77E-08	4.37E-07
NO	3.98E-34	9.97E-35	8.54E-27	0.00E+00	0.00E+00	0.00E+00	8.54E-27	3.88E-30	4.50E-29
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.65E-50	2.85E-42	2.85E-42	1.29E-45	1.50E-44
NO_2^-	7.39E-10	2.84E-10	2.43E-02	5.04E-04	0.00E+00	0.00E+00	2.48E-02	1.13E-05	1.31E-04
NO_3^-	1.49E-09	7.73E-10	6.63E-02	4.10E-04	0.00E+00	0.00E+00	6.67E-02	3.03E-05	3.51E-04
O_2	1.02E-12	2.73E-13	2.34E-05	0.00E+00	7.77E-03	1.78E+05	1.78E+05	8.09E+01	9.36E+02
O^{--}	0.00E+00	0.00E+00	0.00E+00	1.33E-03	0.00E+00	0.00E+00	1.33E-03	6.02E-07	6.97E-06
OH^-	3.52E-09	5.00E-10	4.29E-02	7.51E-03	0.00E+00	0.00E+00	5.04E-02	2.29E-05	2.65E-04
$OH(b)^-$	5.30E-17	7.52E-18	6.45E-10	1.98E-19	0.00E+00	0.00E+00	6.45E-10	2.93E-13	3.39E-12
Pb^{+2}	1.72E-13	2.97E-13	2.54E-05	6.94E-05	0.00E+00	0.00E+00	9.48E-05	4.31E-08	4.99E-07
Pd^{+2}	1.35E-14	1.20E-14	1.03E-06	2.90E-06	0.00E+00	0.00E+00	3.93E-06	1.79E-09	2.07E-08
PO_4^{-3}	2.34E-11	1.86E-11	1.59E-03	5.34E-04	0.00E+00	0.00E+00	2.13E-03	9.66E-07	1.12E-05
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	1.28E-14	1.10E-14	9.41E-07	9.21E-07	0.00E+00	0.00E+00	1.86E-06	8.47E-10	9.80E-09
Ru^{+3}	1.90E-14	1.60E-14	1.37E-06	8.34E-06	0.00E+00	0.00E+00	9.72E-06	4.42E-09	5.11E-08
S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.44E-20	0.00E+00	0.00E+00	3.44E-20	1.56E-23	1.81E-22
SiO2	7.83E-12	3.92E-12	3.36E-04	1.84E-03	0.00E+00	0.00E+00	2.18E-03	9.91E-07	1.15E-05
SiO_4^{-4}	4.31E-19	3.31E-19	2.84E-11	2.77E-10	0.00E+00	0.00E+00	3.05E-10	1.39E-13	1.60E-12
SO_2	1.57E-37	8.39E-38	7.19E-30	0.00E+00	0.00E+00	0.00E+00	7.19E-30	3.27E-33	3.78E-32
SO_4^{-2}	3.58E-11	2.87E-11	2.46E-03	1.20E-04	0.00E+00	0.00E+00	2.58E-03	1.17E-06	1.36E-05
Sr^{+2}	6.86E-15	5.02E-15	4.30E-07	4.50E-06	0.00E+00	0.00E+00	4.93E-06	2.24E-09	2.59E-08
Sucrose	0.00E+00	0.00E+00	0.00E+00	4.32E-37	0.00E+00	0.00E+00	4.32E-37	1.96E-40	2.27E-39
Ti^{+4}	4.10E-14	1.64E-14	1.40E-06	5.43E-06	0.00E+00	0.00E+00	6.84E-06	3.11E-09	3.60E-08
Zn^{+2}	1.39E-13	7.61E-14	6.52E-06	1.11E-04	0.00E+00	0.00E+00	1.17E-04	5.33E-08	6.17E-07
Zr^{+4}	1.13E-13	8.61E-14	7.38E-06	6.10E-04	0.00E+00	0.00E+00	6.18E-04	2.81E-07	3.25E-06

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	1.46E-11	1.07E-11	9.18E-04	3.46E-03	0.00E+00	0.00E+00	4.38E-03	1.99E-06	2.30E-05
$C_2O_4^{-2}$	1.46E-11	1.07E-11	9.18E-04	3.46E-03	0.00E+00	0.00E+00	4.38E-03	1.99E-06	2.30E-05
Formate	1.98E-18	7.46E-19	6.39E-11	7.80E-10	0.00E+00	0.00E+00	8.44E-10	3.84E-13	4.44E-12
Acetate	1.54E-18	7.58E-19	6.50E-11	7.93E-10	0.00E+00	0.00E+00	8.58E-10	3.90E-13	4.51E-12
Glycolate	1.02E-17	6.41E-18	5.50E-10	7.85E-10	0.00E+00	0.00E+00	1.33E-09	6.06E-13	7.02E-12
IDA	5.17E-18	5.75E-18	4.93E-10	2.45E-10	0.00E+00	0.00E+00	7.38E-10	3.35E-13	3.88E-12
Citrate	4.73E-19	7.58E-19	6.50E-11	3.14E-10	0.00E+00	0.00E+00	3.79E-10	1.72E-13	2.00E-12
HEDTA	2.21E-18	5.14E-18	4.41E-10	2.95E-10	0.00E+00	0.00E+00	7.36E-10	3.35E-13	3.87E-12
EDTA	2.66E-19	6.49E-19	5.57E-11	3.01E-10	0.00E+00	0.00E+00	3.57E-10	1.62E-13	1.88E-12

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	1.18E-09	3.83E-01	5.54E-04	9.23E-10	3.00E-01	3.61E-03	2.10E-09	6.83E-01	4.17E-03
^{241}Am	2.59E-13	8.41E-05	5.41E-08	6.60E-12	2.14E-03	1.38E-06	6.86E-12	2.23E-03	1.43E-06
^{243}Am	1.69E-16	5.49E-08	6.07E-10	5.33E-16	1.73E-07	1.91E-09	7.02E-16	2.28E-07	2.52E-09
^{14}C	9.10E-15	2.95E-06	1.46E-09	7.76E-16	2.52E-07	1.24E-10	9.88E-15	3.21E-06	1.58E-09
^{60}Co	5.97E-14	1.94E-05	3.78E-11	1.21E-12	3.94E-04	7.67E-10	1.27E-12	4.13E-04	8.05E-10
^{243}Cm	4.80E-17	1.56E-08	6.79E-13	1.53E-14	4.98E-06	2.17E-10	1.54E-14	5.00E-06	2.18E-10
^{244}Cm	1.14E-15	3.69E-07	1.00E-11	3.49E-13	1.13E-04	3.09E-09	3.50E-13	1.14E-04	3.10E-09
^{137}Cs	1.09E-09	3.54E-01	8.99E-06	1.43E-10	4.64E-02	1.18E-06	1.23E-09	4.00E-01	1.02E-05
^{152}Eu	1.95E-15	6.33E-07	8.03E-12	3.51E-14	1.14E-05	1.45E-10	3.71E-14	1.20E-05	1.53E-10
^{154}Eu	4.04E-13	1.31E-04	1.07E-09	3.81E-12	1.24E-03	1.01E-08	4.21E-12	1.37E-03	1.11E-08
^{155}Eu	1.17E-13	3.80E-05	1.72E-10	5.64E-13	1.83E-04	8.30E-10	6.81E-13	2.21E-04	1.00E-09
^{3}H	4.51E-14	1.46E-05	3.36E-12	8.22E-12	2.67E-03	6.12E-10	8.26E-12	2.68E-03	6.15E-10
^{129}I	3.54E-16	1.15E-07	1.44E-06	7.66E-17	2.49E-08	3.10E-07	4.31E-16	1.40E-07	1.75E-06
^{63}Ni	6.42E-13	2.08E-04	8.08E-09	1.32E-13	4.30E-05	1.67E-09	7.74E-13	2.51E-04	9.75E-09
^{237}Np	3.52E-16	1.14E-07	3.57E-07	8.99E-15	2.92E-06	9.12E-06	9.34E-15	3.03E-06	9.48E-06
^{238}Pu	1.16E-15	3.76E-07	4.84E-11	2.57E-14	8.32E-06	1.07E-09	2.68E-14	8.70E-06	1.12E-09
^{239}Pu	1.60E-14	5.21E-06	1.85E-07	2.27E-13	7.37E-05	2.62E-06	2.43E-13	7.90E-05	2.81E-06
^{240}Pu	4.16E-15	1.35E-06	1.31E-08	6.00E-14	1.95E-05	1.89E-07	6.41E-14	2.08E-05	2.02E-07
^{241}Pu	8.73E-14	2.83E-05	6.06E-10	1.61E-12	5.22E-04	1.12E-08	1.70E-12	5.51E-04	1.18E-08
^{242}Pu	3.15E-20	1.02E-11	5.73E-12	5.53E-18	1.80E-09	1.01E-09	5.56E-18	1.81E-09	1.01E-09
^{125}Sb	2.42E-13	7.86E-05	1.67E-10	2.35E-12	7.61E-04	1.62E-09	2.59E-12	8.40E-04	1.78E-09
^{151}Sm	3.39E-12	1.10E-03	9.21E-08	2.83E-11	9.18E-03	7.69E-07	3.17E-11	1.03E-02	8.61E-07
^{126}Sn	3.85E-15	1.25E-06	2.43E-07	1.10E-14	3.57E-06	6.93E-07	1.48E-14	4.82E-06	9.36E-07
^{90}Sr	8.35E-11	2.71E-02	4.32E-07	7.24E-10	2.35E-01	3.75E-06	8.07E-10	2.62E-01	4.18E-06
^{99}Tc	1.15E-12	3.72E-04	4.84E-05	2.89E-12	9.39E-04	1.22E-04	4.04E-12	1.31E-03	1.70E-04
^{232}Th	1.07E-17	3.47E-09	6.96E-05	2.97E-16	9.64E-08	1.93E-03	3.08E-16	9.99E-08	2.00E-03
^{233}U	3.57E-16	1.16E-07	2.65E-08	2.44E-14	7.90E-06	1.81E-06	2.47E-14	8.02E-06	1.83E-06
^{234}U	2.53E-16	8.21E-08	2.92E-08	1.27E-15	4.11E-07	1.46E-07	1.52E-15	4.93E-07	1.75E-07
^{235}U	9.97E-18	3.23E-09	3.30E-06	3.04E-17	9.88E-09	1.01E-05	4.04E-17	1.31E-08	1.34E-05
^{236}U	1.71E-17	5.54E-09	1.89E-07	4.18E-17	1.36E-08	4.63E-07	5.89E-17	1.91E-08	6.52E-07
^{238}U	1.98E-16	6.42E-08	4.21E-04	7.16E-16	2.32E-07	1.53E-03	9.14E-16	2.97E-07	1.95E-03

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	6.81E-05	3.53E-05	3.03E+03	1.38E+00	1.59E+01
50-32-8	1.48E-09	3.11E-09	2.66E-01	1.21E-04	1.40E-03
56-23-5	4.95E-09	6.35E-09	5.44E-01	2.47E-04	2.86E-03
57-14-7	3.78E-08	1.89E-08	1.62E+00	7.38E-04	8.54E-03
58-90-2	8.16E-09	1.58E-08	1.35E+00	6.15E-04	7.12E-03
59-89-2	9.58E-08	9.28E-08	7.96E+00	3.62E-03	4.19E-02
60-35-5	3.80E-11	1.87E-11	1.61E-03	7.31E-07	8.46E-06
62-75-9	1.29E-08	7.98E-09	6.84E-01	3.11E-04	3.60E-03
64-19-7	6.69E-05	3.35E-05	2.87E+03	1.31E+00	1.51E+01
71-43-2	9.74E-09	6.35E-09	5.44E-01	2.47E-04	2.86E-03
75-05-8	1.67E-08	5.72E-09	4.91E-01	2.23E-04	2.58E-03
75-12-7	3.74E-11	1.41E-11	1.21E-03	5.48E-07	6.34E-06
76-15-3	1.23E-08	1.59E-08	1.36E+00	6.18E-04	7.16E-03
79-01-6	1.45E-08	1.59E-08	1.36E+00	6.19E-04	7.16E-03
83-32-9	7.21E-08	9.28E-08	7.95E+00	3.61E-03	4.18E-02
84-66-2	2.45E-09	4.55E-09	3.90E-01	1.77E-04	2.05E-03
84-74-2	3.90E-09	9.06E-09	7.77E-01	3.53E-04	4.09E-03
87-68-3	7.28E-09	1.59E-08	1.36E+00	6.18E-04	7.15E-03
88-89-1	8.99E-14	1.72E-13	1.47E-05	6.70E-09	7.76E-08
91-20-3	2.70E-09	2.89E-09	2.48E-01	1.13E-04	1.30E-03
95-50-1	5.04E-09	6.18E-09	5.30E-01	2.41E-04	2.79E-03
98-86-2	1.14E-08	1.14E-08	9.80E-01	4.46E-04	5.16E-03
100-21-0	3.81E-15	5.28E-15	4.53E-07	2.06E-10	2.38E-09
101-84-8	1.09E-08	1.55E-08	1.33E+00	6.03E-04	6.98E-03
106-93-4	3.85E-09	6.04E-09	5.18E-01	2.35E-04	2.72E-03
106-97-8	3.27E-08	1.59E-08	1.36E+00	6.18E-04	7.16E-03
106-99-0	1.41E-08	6.35E-09	5.44E-01	2.47E-04	2.86E-03
108-87-2	1.94E-08	1.59E-08	1.36E+00	6.20E-04	7.17E-03
108-88-3	8.25E-09	6.35E-09	5.44E-01	2.47E-04	2.86E-03
108-95-2	3.70E-09	2.91E-09	2.49E-01	1.13E-04	1.31E-03
110-54-3	2.21E-08	1.59E-08	1.36E+00	6.18E-04	7.16E-03
110-82-7	2.26E-08	1.59E-08	1.36E+00	6.20E-04	7.17E-03
111-84-2	1.48E-08	1.59E-08	1.36E+00	6.19E-04	7.16E-03
120-12-7	3.01E-08	4.47E-08	3.83E+00	1.74E-03	2.02E-02
120-82-1	1.03E-08	1.57E-08	1.34E+00	6.11E-04	7.07E-03
122-39-4	2.46E-09	3.47E-09	2.98E-01	1.35E-04	1.57E-03
126-73-8	4.55E-10	1.01E-09	8.66E-02	3.94E-05	4.56E-04
127-18-4	4.58E-09	6.34E-09	5.44E-01	2.47E-04	2.86E-03
129-00-0	1.23E-08	2.07E-08	1.78E+00	8.08E-04	9.35E-03
132-64-9	5.39E-08	7.57E-08	6.49E+00	2.95E-03	3.41E-02
144-62-7	9.64E-11	7.24E-11	6.21E-03	2.82E-06	3.27E-05
193-39-5	2.82E-07	6.49E-07	5.57E+01	2.53E-02	2.93E-01
206-44-0	5.50E-08	9.29E-08	7.96E+00	3.62E-03	4.19E-02
208-96-8	4.87E-08	6.18E-08	5.30E+00	2.41E-03	2.79E-02
603-34-9	6.12E-09	1.25E-08	1.07E+00	4.88E-04	5.65E-03
621-64-7	8.54E-08	9.28E-08	7.96E+00	3.62E-03	4.19E-02
1321-64-8	3.71E-08	9.29E-08	7.97E+00	3.62E-03	4.19E-02
1336-36-3	3.55E-09	9.55E-09	8.19E-01	3.72E-04	4.31E-03
3697-24-3	4.60E-08	9.29E-08	7.97E+00	3.62E-03	4.19E-02
4170-30-3	4.72E-09	2.76E-09	2.37E-01	1.08E-04	1.25E-03
10061-01-5	6.83E-09	6.32E-09	5.42E-01	2.46E-04	2.85E-03
26140-60-3	4.84E-08	9.30E-08	7.97E+00	3.62E-03	4.19E-02

Stream Number:	PJV04
Stream Name:	Vapor feed to demister
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	1.15E-03	g/cm^3	(does not include solid phase)
Enthalpy	-8.69E+06	BTU/hr	
Mass Flow	1.71E+05	Lb/hr	
	4.10E+06	Lb/day	
Volumetric Flow	2.96E+05	GPM	(does not include solid phase)
	3.96E+04	ft^3/min	(does not include solid phase)
Molar Flow	5.95E+03	Lbmol/hr	
Molecular Weight	2.87E+01	Lb/Lbmol	
Pressure	9.93E+02	mbar	
Temperature	2.50E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	4.16E+00	pH	
Total TRU	2.55E-12	Ci/L	
Total Activity	4.31E-10	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	5.86E-09	9.45E-10	4.03E-01	1.86E-02	4.01E-02	4.10E+06	4.10E+06	1.86E+03	2.16E+04
Ag^{+}	1.85E-15	1.67E-15	7.13E-07	1.30E-05	0.00E+00	0.00E+00	1.37E-05	6.21E-09	7.19E-08
Al^{+3}	2.25E-11	5.06E-12	2.16E-03	1.79E-03	0.00E+00	0.00E+00	3.95E-03	1.80E-06	2.08E-05
As^{+3}	8.18E-15	5.11E-15	2.18E-06	9.12E-07	0.00E+00	0.00E+00	3.09E-06	1.41E-09	1.63E-08
B^{+3}	1.36E-13	1.22E-14	5.23E-06	8.60E-05	0.00E+00	0.00E+00	9.12E-05	4.14E-08	4.80E-07
Ba^{+2}	1.71E-15	1.95E-15	8.34E-07	1.15E-05	0.00E+00	0.00E+00	1.24E-05	5.63E-09	6.51E-08
Bi^{+3}	2.01E-15	3.51E-15	1.50E-06	6.05E-05	0.00E+00	0.00E+00	6.20E-05	2.82E-08	3.26E-07
Ca^{+2}	1.42E-13	4.76E-14	2.03E-05	7.75E-05	0.00E+00	0.00E+00	9.78E-05	4.45E-08	5.15E-07
Cd^{+2}	3.17E-15	2.97E-15	1.27E-06	4.69E-05	0.00E+00	0.00E+00	4.82E-05	2.19E-08	2.53E-07
Ce^{+3}	6.75E-14	7.90E-14	3.37E-05	1.44E-05	0.00E+00	0.00E+00	4.81E-05	2.19E-08	2.53E-07
Cl^{-}	3.79E-12	1.12E-12	4.79E-04	1.40E-05	0.00E+00	0.00E+00	4.92E-04	2.24E-07	2.59E-06
CO	1.10E-111	2.57E-112	1.10E-103	0.00E+00	0.00E+00	0.00E+00	1.10E-103	4.99E-107	5.78E-106
CO_2	1.36E-16	4.99E-17	2.13E-08	0.00E+00	4.20E-16	6.58E-08	8.71E-08	3.96E-11	4.58E-10
CO_3^{-2}	1.80E-11	9.01E-12	3.84E-03	1.57E-03	0.00E+00	0.00E+00	5.42E-03	2.46E-06	2.85E-05
Cr^{+3}	5.43E-13	2.36E-13	1.01E-04	3.65E-05	0.00E+00	0.00E+00	1.37E-04	6.23E-08	7.21E-07
Cu^{+2}	3.13E-15	1.66E-15	7.10E-07	4.89E-06	0.00E+00	0.00E+00	5.60E-06	2.55E-09	2.95E-08
F^{-}	1.78E-12	2.83E-13	1.21E-04	2.54E-04	0.00E+00	0.00E+00	3.75E-04	1.71E-07	1.97E-06
Fe^{+3}	9.72E-14	4.53E-14	1.93E-05	1.84E-03	0.00E+00	0.00E+00	1.86E-03	8.45E-07	9.78E-06
H_2O	5.28E-09	7.93E-10	3.39E-01	0.00E+00	5.63E-04	3.61E+04	3.61E+04	1.64E+01	1.90E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	3.79E-12	3.19E-14	1.36E-05	0.00E+00	0.00E+00	0.00E+00	1.36E-05	6.19E-09	7.17E-08
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	1.87E-15	9.51E-16	4.06E-07	9.36E-22	0.00E+00	0.00E+00	4.06E-07	1.84E-10	2.14E-09
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	3.28E-15	5.49E-15	2.35E-06	2.90E-05	0.00E+00	0.00E+00	3.14E-05	1.43E-08	1.65E-07
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	7.79E-12	2.54E-12	1.08E-03	3.59E-05	0.00E+00	0.00E+00	1.12E-03	5.09E-07	5.89E-06
La^{+3}	8.70E-16	1.01E-15	4.30E-07	2.17E-05	0.00E+00	0.00E+00	2.21E-05	1.00E-08	1.16E-07
Li^{+}	1.18E-13	6.81E-15	2.91E-06	5.37E-06	0.00E+00	0.00E+00	8.28E-06	3.76E-09	4.36E-08
Mg^{+2}	2.59E-14	5.24E-15	2.24E-06	1.60E-05	0.00E+00	0.00E+00	1.82E-05	8.28E-09	9.58E-08
Mn^{+3}	2.80E-14	1.29E-14	5.49E-06	1.69E-04	0.00E+00	0.00E+00	1.75E-04	7.93E-08	9.18E-07
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	5.53E-14	1.29E-14	5.51E-06	0.00E+00	3.12E-02	3.12E+06	3.12E+06	1.42E+03	1.64E+04
Na^{+}	2.45E-10	4.71E-11	2.01E-02	2.83E-03	0.00E+00	0.00E+00	2.29E-02	1.04E-05	1.21E-04
NH3	1.67E-13	2.38E-14	1.01E-05	0.00E+00	0.00E+00	0.00E+00	1.01E-05	4.61E-09	5.34E-08
NH4+	1.25E-14	2.38E-14	8.01E-07	4.12E-23	0.00E+00	0.00E+00	8.01E-07	3.64E-10	4.21E-09
Ni^{+2}	4.50E-14	2.20E-14	9.41E-06	7.54E-05	0.00E+00	0.00E+00	8.48E-05	3.86E-08	4.46E-07
NO	6.65E-37	1.67E-37	7.11E-29	0.00E+00	0.00E+00	0.00E+00	7.11E-29	3.23E-32	3.74E-31
NO_2	9.76E-50	3.75E-50	1.60E-41	0.00E+00	0.00E+00	0.00E+00	1.60E-41	7.27E-45	8.42E-44
NO_2^{-}	4.88E-11	1.87E-11	8.00E-03	7.09E-04	0.00E+00	0.00E+00	8.71E-03	3.96E-06	4.58E-05
NO_3^{-}	8.58E-11	4.44E-11	1.90E-02	5.47E-04	0.00E+00	0.00E+00	1.95E-02	8.87E-06	1.03E-04
O_2	1.78E-14	4.76E-15	2.03E-06	0.00E+00	8.30E-03	9.46E+05	9.46E+05	4.30E+02	4.98E+03
O^{-}	0.00E+00	0.00E+00	0.00E+00	2.62E-04	0.00E+00	0.00E+00	2.62E-04	1.19E-07	1.38E-06
OH^{-}	1.43E-10	2.03E-11	8.68E-03	6.48E-03	0.00E+00	0.00E+00	1.52E-02	6.89E-06	7.97E-05
$OH(b)^{-}$	2.16E-19	3.07E-20	1.31E-11	6.92E-25	0.00E+00	0.00E+00	1.31E-11	5.96E-15	6.90E-14
Pb^{+2}	1.15E-14	1.99E-14	8.49E-06	9.90E-05	0.00E+00	0.00E+00	1.07E-04	4.88E-08	5.65E-07
Pd^{+2}	8.90E-16	7.90E-16	3.37E-07	4.06E-06	0.00E+00	0.00E+00	4.40E-06	2.00E-09	2.31E-08
PO_4^{-3}	9.18E-13	7.28E-13	3.11E-04	4.47E-04	0.00E+00	0.00E+00	7.57E-04	3.44E-07	3.98E-06
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	8.60E-16	7.39E-16	3.16E-07	1.32E-06	0.00E+00	0.00E+00	1.63E-06	7.41E-10	8.58E-09
Ru^{+3}	1.28E-15	1.08E-15	4.61E-07	1.23E-05	0.00E+00	0.00E+00	1.27E-05	5.78E-09	6.69E-08
S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.67E-22	0.00E+00	0.00E+00	3.67E-22	1.67E-25	1.93E-24
SiO2	1.73E-13	8.69E-14	3.71E-05	4.46E-04	0.00E+00	0.00E+00	4.83E-04	2.19E-07	2.54E-06
SiO_4^{-4}	9.10E-26	7.00E-26	2.99E-17	7.91E-12	0.00E+00	0.00E+00	7.91E-12	3.59E-15	4.16E-14
SO_2	1.40E-52	7.48E-53	3.19E-44	0.00E+00	0.00E+00	0.00E+00	3.19E-44	1.45E-47	1.68E-46
SO_4^{-2}	2.19E-12	1.76E-12	7.50E-04	1.61E-04	0.00E+00	0.00E+00	9.11E-04	4.14E-07	4.79E-06
Sr^{+2}	4.57E-16	3.34E-16	1.43E-07	6.44E-06	0.00E+00	0.00E+00	6.59E-06	2.99E-09	3.47E-08
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	1.43E-15	5.71E-16	2.44E-07	2.73E-06	0.00E+00	0.00E+00	2.98E-06	1.35E-09	1.57E-08
Zn^{+2}	5.35E-15	2.92E-15	1.25E-06	2.00E-05	0.00E+00	0.00E+00	2.13E-05	9.68E-09	1.12E-07
Zr^{+4}	3.94E-15	3.00E-15	1.28E-06	4.48E-04	0.00E+00	0.00E+00	4.49E-04	2.04E-07	2.36E-06

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	9.07E-13	6.66E-13	2.84E-04	2.24E-03	0.00E+00	0.00E+00	2.52E-03	1.15E-06	1.33E-05
$C_2O_4^{-2}$	9.07E-13	6.66E-13	2.84E-04	2.24E-03	0.00E+00	0.00E+00	2.52E-03	1.15E-06	1.33E-05
Formate	4.02E-25	1.51E-25	6.44E-17	3.08E-13	0.00E+00	0.00E+00	3.08E-13	1.40E-16	1.62E-15
Acetate	3.11E-25	1.53E-25	6.55E-17	3.13E-13	0.00E+00	0.00E+00	3.13E-13	1.42E-16	1.65E-15
Glycolate	2.07E-24	1.30E-24	5.54E-16	1.54E-13	0.00E+00	0.00E+00	1.54E-13	7.02E-17	8.13E-16
IDA	1.06E-24	1.18E-24	5.03E-16	3.93E-13	0.00E+00	0.00E+00	3.93E-13	1.79E-16	2.07E-15
Citrate	9.69E-26	1.55E-25	6.64E-17	3.37E-13	0.00E+00	0.00E+00	3.37E-13	1.53E-16	1.77E-15
HEDTA	4.54E-25	1.05E-24	4.50E-16	2.76E-13	0.00E+00	0.00E+00	2.77E-13	1.26E-16	1.46E-15
EDTA	5.46E-26	1.33E-25	5.68E-17	2.97E-13	0.00E+00	0.00E+00	2.97E-13	1.35E-16	1.56E-15

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	1.66E-10	2.69E-01	1.13E-04	2.65E-10	4.28E-01	3.12E-03	4.31E-10	6.96E-01	3.23E-03
^{241}Am	1.75E-14	2.82E-05	1.81E-08	1.90E-12	3.08E-03	1.98E-06	1.92E-12	3.10E-03	2.00E-06
^{243}Am	1.14E-17	1.84E-08	2.04E-10	1.54E-16	2.49E-07	2.75E-09	1.65E-16	2.67E-07	2.95E-09
^{14}C	3.57E-16	5.76E-07	2.85E-10	1.34E-16	2.17E-07	1.07E-10	4.91E-16	7.93E-07	3.92E-10
^{60}Co	2.34E-15	3.78E-06	7.37E-12	2.10E-13	3.40E-04	6.62E-10	2.13E-13	3.44E-04	6.69E-10
^{243}Cm	1.88E-18	3.04E-09	1.33E-13	2.66E-15	4.30E-06	1.88E-10	2.66E-15	4.30E-06	1.88E-10
^{244}Cm	4.46E-17	7.20E-08	1.96E-12	6.05E-14	9.77E-05	2.66E-09	6.05E-14	9.78E-05	2.66E-09
^{137}Cs	1.60E-10	2.59E-01	6.58E-06	4.31E-11	6.96E-02	1.77E-06	2.03E-10	3.29E-01	8.34E-06
^{152}Eu	1.31E-16	2.12E-07	2.69E-12	1.01E-14	1.64E-05	2.07E-10	1.03E-14	1.66E-05	2.10E-10
^{154}Eu	2.72E-14	4.40E-05	3.59E-10	1.10E-12	1.77E-03	1.45E-08	1.12E-12	1.82E-03	1.48E-08
^{155}Eu	7.87E-15	1.27E-05	5.77E-11	1.62E-13	2.62E-04	1.19E-09	1.70E-13	2.75E-04	1.25E-09
^{3}H	2.18E-15	3.53E-06	8.10E-13	3.48E-15	5.63E-06	1.29E-12	5.67E-15	9.16E-06	2.10E-12
^{129}I	1.09E-17	1.76E-08	2.19E-07	7.02E-18	1.13E-08	1.42E-07	1.79E-17	2.89E-08	3.61E-07
^{63}Ni	4.22E-14	6.81E-05	2.64E-09	3.65E-14	5.90E-05	2.29E-09	7.87E-14	1.27E-04	4.93E-09
^{237}Np	1.38E-17	2.23E-08	6.99E-08	1.56E-15	2.52E-06	7.87E-06	1.57E-15	2.54E-06	7.94E-06
^{238}Pu	7.81E-17	1.26E-07	1.62E-11	7.39E-15	1.19E-05	1.54E-09	7.47E-15	1.21E-05	1.55E-09
^{239}Pu	1.08E-15	1.75E-06	6.20E-08	6.55E-14	1.06E-04	3.76E-06	6.66E-14	1.08E-04	3.82E-06
^{240}Pu	2.80E-16	4.52E-07	4.39E-09	1.73E-14	2.79E-05	2.71E-07	1.76E-14	2.84E-05	2.76E-07
^{241}Pu	5.87E-15	9.49E-06	2.03E-10	4.64E-13	7.49E-04	1.60E-08	4.70E-13	7.59E-04	1.62E-08
^{242}Pu	2.96E-20	4.79E-11	2.68E-11	1.59E-18	2.57E-09	1.44E-09	1.62E-18	2.62E-09	1.47E-09
^{125}Sb	1.62E-14	2.62E-05	5.58E-11	6.73E-13	1.09E-03	2.31E-09	6.89E-13	1.11E-03	2.37E-09
^{151}Sm	2.28E-13	3.69E-04	3.09E-08	8.14E-12	1.32E-02	1.10E-06	8.37E-12	1.35E-02	1.13E-06
^{126}Sn	2.58E-16	4.17E-07	8.10E-08	3.15E-15	5.09E-06	9.88E-07	3.41E-15	5.51E-06	1.07E-06
^{90}Sr	5.57E-12	9.00E-03	1.44E-07	2.08E-10	3.36E-01	5.37E-06	2.14E-10	3.45E-01	5.51E-06
^{99}Tc	4.49E-14	7.26E-05	9.44E-06	4.83E-13	7.81E-04	1.02E-04	5.28E-13	8.54E-04	1.11E-04
^{232}Th	4.20E-19	6.78E-10	1.36E-05	5.15E-17	8.33E-08	1.67E-03	5.20E-17	8.40E-08	1.68E-03
^{233}U	1.40E-17	2.26E-08	5.17E-09	4.22E-15	6.82E-06	1.56E-06	4.23E-15	6.84E-06	1.56E-06
^{234}U	9.93E-18	1.61E-08	5.70E-09	2.19E-16	3.54E-07	1.26E-07	2.29E-16	3.71E-07	1.32E-07
^{235}U	3.91E-19	6.32E-10	6.45E-07	5.27E-18	8.52E-09	8.69E-06	5.66E-18	9.15E-09	9.34E-06
^{236}U	6.70E-19	1.08E-09	3.69E-08	7.24E-18	1.17E-08	3.99E-07	7.91E-18	1.28E-08	4.36E-07
^{238}U	7.76E-18	1.25E-08	8.22E-05	1.24E-16	2.01E-07	1.32E-03	1.32E-16	2.13E-07	1.40E-03

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	1.06E-11	6.12E-12	2.61E-03	1.19E-06	1.37E-05
50-32-8	1.00E-14	2.11E-14	9.00E-06	4.09E-09	4.73E-08
56-23-5	5.75E-16	7.38E-16	3.15E-07	1.43E-10	1.66E-09
57-14-7	3.05E-14	1.53E-14	6.54E-06	2.97E-09	3.44E-08
58-90-2	8.19E-15	1.58E-14	6.76E-06	3.07E-09	3.56E-08
59-89-2	1.16E-14	1.12E-14	4.80E-06	2.18E-09	2.53E-08
60-35-5	1.02E-14	5.02E-15	2.14E-06	9.75E-10	1.13E-08
62-75-9	3.22E-14	1.99E-14	8.49E-06	3.86E-09	4.47E-08
64-19-7	8.10E-12	4.06E-12	1.73E-03	7.88E-07	9.12E-06
71-43-2	1.13E-15	7.39E-16	3.15E-07	1.43E-10	1.66E-09
75-05-8	6.86E-15	2.35E-15	1.00E-06	4.56E-10	5.28E-09
75-12-7	8.06E-14	3.03E-14	1.29E-05	5.88E-09	6.80E-08
76-15-3	1.43E-15	1.84E-15	7.87E-07	3.58E-10	4.14E-09
79-01-6	1.68E-15	1.85E-15	7.88E-07	3.58E-10	4.15E-09
83-32-9	8.73E-15	1.12E-14	4.80E-06	2.18E-09	2.52E-08
84-66-2	1.31E-14	2.43E-14	1.04E-05	4.72E-09	5.46E-08
84-74-2	9.45E-15	2.20E-14	9.37E-06	4.26E-09	4.93E-08
87-68-3	8.47E-16	1.84E-15	7.87E-07	3.58E-10	4.14E-09
88-89-1	1.59E-14	3.04E-14	1.30E-05	5.89E-09	6.82E-08
91-20-3	3.59E-16	3.84E-16	1.64E-07	7.46E-11	8.63E-10
95-50-1	6.10E-16	7.49E-16	3.20E-07	1.45E-10	1.68E-09
98-86-2	1.03E-14	1.04E-14	4.44E-06	2.02E-09	2.33E-08
100-21-0	6.11E-14	8.47E-14	3.61E-05	1.64E-08	1.90E-07
101-84-8	1.32E-15	1.87E-15	8.00E-07	3.64E-10	4.21E-09
106-93-4	4.83E-16	7.57E-16	3.23E-07	1.47E-10	1.70E-09
106-97-8	3.80E-15	1.84E-15	7.87E-07	3.58E-10	4.14E-09
106-99-0	1.63E-15	7.37E-16	3.15E-07	1.43E-10	1.66E-09
108-87-2	2.25E-15	1.85E-15	7.89E-07	3.58E-10	4.15E-09
108-88-3	9.60E-16	7.38E-16	3.15E-07	1.43E-10	1.66E-09
108-95-2	3.37E-14	2.64E-14	1.13E-05	5.13E-09	5.94E-08
110-54-3	2.56E-15	1.84E-15	7.87E-07	3.58E-10	4.14E-09
110-82-7	2.63E-15	1.85E-15	7.89E-07	3.58E-10	4.15E-09
111-84-2	1.72E-15	1.85E-15	7.88E-07	3.58E-10	4.14E-09
120-12-7	9.09E-15	1.35E-14	5.77E-06	2.62E-09	3.04E-08
120-82-1	1.23E-15	1.86E-15	7.95E-07	3.61E-10	4.18E-09
122-39-4	4.27E-15	6.03E-15	2.58E-06	1.17E-09	1.36E-08
126-73-8	8.88E-15	1.97E-14	8.43E-06	3.83E-09	4.43E-08
127-18-4	5.33E-16	7.38E-16	3.15E-07	1.43E-10	1.66E-09
129-00-0	1.00E-14	1.69E-14	7.20E-06	3.27E-09	3.79E-08
132-64-9	8.58E-15	1.20E-14	5.14E-06	2.34E-09	2.71E-08
144-62-7	2.02E-12	1.52E-12	6.48E-04	2.94E-07	3.41E-06
193-39-5	1.33E-14	3.06E-14	1.30E-05	5.93E-09	6.86E-08
206-44-0	6.67E-15	1.13E-14	4.80E-06	2.18E-09	2.53E-08
208-96-8	9.97E-15	1.27E-14	5.41E-06	2.46E-09	2.85E-08
603-34-9	8.20E-15	1.68E-14	7.16E-06	3.26E-09	3.77E-08
621-64-7	1.03E-14	1.12E-14	4.80E-06	2.18E-09	2.53E-08
1321-64-8	4.49E-15	1.13E-14	4.80E-06	2.18E-09	2.53E-08
1336-36-3	2.27E-16	6.11E-16	2.61E-07	1.19E-10	1.37E-09
3697-24-3	5.57E-15	1.13E-14	4.81E-06	2.18E-09	2.53E-08
4170-30-3	4.48E-15	2.62E-15	1.12E-06	5.08E-10	5.88E-09
10061-01-5	7.99E-16	7.40E-16	3.16E-07	1.44E-10	1.66E-09
26140-60-3	5.86E-15	1.13E-14	4.81E-06	2.19E-09	2.53E-08

Stream Number:	LMP06
Stream Name:	Melter offgas (primary)
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties			
Variable	Value	Units	
Density	4.01E-04	g/cm^3	(does not include solid phase)
Enthalpy	-2.53E+07	BTU/hr	
Mass Flow	8.97E+03	Lb/hr	
	2.15E+05	Lb/day	
Volumetric Flow	4.43E+04	GPM	(does not include solid phase)
	5.92E+03	ft^3/min	(does not include solid phase)
Molar Flow	3.90E+02	Lbmol/hr	
Molecular Weight	2.28E+01	Lb/Lbmol	
Pressure	9.83E+02	mbar	
Temperature	4.00E+02	C	
Na Molarity	0.00E+00	mol/L	
pH	0.00E+00	pH	
Total TRU	1.10E-09	Ci/L	
Total Activity	3.68E-07	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	1.01E+03	1.76E-02	2.13E+05	2.14E+05	9.72E+01	1.13E+03
Ag^{+}	0.00E+00	0.00E+00	0.00E+00	1.55E-02	0.00E+00	0.00E+00	1.55E-02	7.06E-06	8.17E-05
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	3.63E+01	0.00E+00	0.00E+00	3.63E+01	1.65E-02	1.91E-01
As^{+3}	0.00E+00	0.00E+00	0.00E+00	2.75E-01	0.00E+00	0.00E+00	2.75E-01	1.25E-04	1.45E-03
B^{+3}	0.00E+00	0.00E+00	0.00E+00	1.13E+02	0.00E+00	0.00E+00	1.13E+02	5.14E-02	5.95E-01
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	5.32E-03	0.00E+00	0.00E+00	5.32E-03	2.42E-06	2.80E-05
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	1.20E-02	0.00E+00	0.00E+00	1.20E-02	5.45E-06	6.31E-05
Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	4.30E+01	0.00E+00	0.00E+00	4.30E+01	1.95E-02	2.26E-01
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.05E-01	0.00E+00	0.00E+00	1.05E-01	4.79E-05	5.54E-04
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	1.20E-01	0.00E+00	0.00E+00	1.20E-01	5.45E-05	6.31E-04
Cl^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.30E-06	9.39E+01	9.39E+01	4.27E-02	4.94E-01
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.30E-04	1.48E+04	1.48E+04	6.71E+00	7.76E+01
CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	1.72E+00	0.00E+00	0.00E+00	1.72E+00	7.83E-04	9.07E-03
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	2.25E-03	0.00E+00	0.00E+00	2.25E-03	1.02E-06	1.18E-05
F^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	2.28E+01	0.00E+00	0.00E+00	2.28E+01	1.04E-02	1.20E-01
H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-02	1.05E+05	1.05E+05	4.78E+01	5.53E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.41E-06	1.83E+02	1.83E+02	8.30E-02	9.61E-01
HCO3-	0.00E+00	0.00E+00	0.00E+00	3.26E-15	0.00E+00	0.00E+00	3.26E-15	1.48E-18	1.71E-17
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.17E-06	2.32E+01	2.32E+01	1.05E-02	1.22E-01
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	5.47E+00	0.00E+00	0.00E+00	5.47E+00	2.48E-03	2.88E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	0.00E+00	0.00E+00	0.00E+00	3.60E+01	0.00E+00	0.00E+00	3.60E+01	1.64E-02	1.89E-01
La^{+3}	0.00E+00	0.00E+00	0.00E+00	5.56E-03	0.00E+00	0.00E+00	5.56E-03	2.53E-06	2.92E-05
Li^{+}	0.00E+00	0.00E+00	0.00E+00	8.98E+00	0.00E+00	0.00E+00	8.98E+00	4.08E-03	4.72E-02
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	5.91E+00	0.00E+00	0.00E+00	5.91E+00	2.69E-03	3.11E-02
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	2.20E-01	0.00E+00	0.00E+00	2.20E-01	1.00E-04	1.16E-03
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.12E-03	6.15E+04	6.15E+04	2.80E+01	3.24E+02
Na^{+}	0.00E+00	0.00E+00	0.00E+00	1.28E+02	0.00E+00	0.00E+00	1.28E+02	5.84E-02	6.76E-01
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06	1.12E+01	1.12E+01	5.09E-03	5.90E-02
NH4+	0.00E+00	0.00E+00	0.00E+00	1.44E-16	0.00E+00	0.00E+00	1.44E-16	6.55E-20	7.58E-19
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	2.00E-01	0.00E+00	0.00E+00	2.00E-01	9.10E-05	1.05E-03
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.07E-04	4.91E+03	4.91E+03	2.23E+00	2.58E+01
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.81E-05	6.87E+02	6.87E+02	3.12E-01	3.62E+00
NO_2^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-03	2.56E+04	2.56E+04	1.16E+01	1.35E+02
O^{-}	0.00E+00	0.00E+00	0.00E+00	3.92E+02	0.00E+00	0.00E+00	3.92E+02	1.78E-01	2.06E+00
OH^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
$OH(b)^{-}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	6.66E-02	0.00E+00	0.00E+00	6.66E-02	3.03E-05	3.50E-04
Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.07E-03	0.00E+00	0.00E+00	1.07E-03	4.87E-07	5.64E-06
PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	5.62E+00	0.00E+00	0.00E+00	5.62E+00	2.55E-03	2.96E-02
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	3.84E-03	0.00E+00	0.00E+00	3.84E-03	1.74E-06	2.02E-05
Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	9.81E-02	0.00E+00	0.00E+00	9.81E-02	4.46E-05	5.16E-04
S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	0.00E+00	0.00E+00	0.00E+00	1.70E+02	0.00E+00	0.00E+00	1.70E+02	7.74E-02	8.95E-01
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	9.15E-14	0.00E+00	0.00E+00	9.15E-14	4.16E-17	4.81E-16
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.20E-07	1.77E+01	1.77E+01	8.06E-03	9.33E-02
SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	9.26E-04	0.00E+00	0.00E+00	9.26E-04	4.21E-07	4.87E-06
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	5.23E-01	0.00E+00	0.00E+00	5.23E-01	2.38E-04	2.75E-03
Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	2.70E+01	0.00E+00	0.00E+00	2.70E+01	1.23E-02	1.42E-01
Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	8.32E+00	0.00E+00	0.00E+00	8.32E+00	3.78E-03	4.38E-02

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	9.71E+02	0.00E+00	0.00E+00	9.71E+02	4.41E-01	5.11E+00
$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	9.71E+02	0.00E+00	0.00E+00	9.71E+02	4.41E-01	5.11E+00
Formate	0.00E+00	0.00E+00	0.00E+00	4.79E-11	0.00E+00	0.00E+00	4.79E-11	2.18E-14	2.52E-13
Acetate	0.00E+00	0.00E+00	0.00E+00	4.87E-11	0.00E+00	0.00E+00	4.87E-11	2.21E-14	2.56E-13
Glycolate	0.00E+00	0.00E+00	0.00E+00	4.12E-10	0.00E+00	0.00E+00	4.12E-10	1.87E-13	2.17E-12
IDA	0.00E+00	0.00E+00	0.00E+00	3.88E-10	0.00E+00	0.00E+00	3.88E-10	1.76E-13	2.04E-12
Citrate	0.00E+00	0.00E+00	0.00E+00	5.11E-11	0.00E+00	0.00E+00	5.11E-11	2.32E-14	2.69E-13
HEDTA	0.00E+00	0.00E+00	0.00E+00	3.47E-10	0.00E+00	0.00E+00	3.47E-10	1.58E-13	1.82E-12
EDTA	0.00E+00	0.00E+00	0.00E+00	4.38E-11	0.00E+00	0.00E+00	4.38E-11	1.99E-14	2.30E-13

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	0.00E+00	0.00E+00	0.00E+00	3.68E-07	8.90E+01	3.41E+00	3.68E-07	8.90E+01	3.41E+00
^{241}Am	0.00E+00	0.00E+00	0.00E+00	9.39E-10	2.27E-01	1.46E-04	9.39E-10	2.27E-01	1.46E-04
^{243}Am	0.00E+00	0.00E+00	0.00E+00	6.11E-13	1.48E-04	1.63E-06	6.11E-13	1.48E-04	1.63E-06
^{14}C	0.00E+00	0.00E+00	0.00E+00	1.51E-09	3.64E-01	1.80E-04	1.51E-09	3.64E-01	1.80E-04
^{60}Co	0.00E+00	0.00E+00	0.00E+00	4.99E-11	1.21E-02	2.35E-08	4.99E-11	1.21E-02	2.35E-08
^{243}Cm	0.00E+00	0.00E+00	0.00E+00	4.28E-14	1.03E-05	4.51E-10	4.28E-14	1.03E-05	4.51E-10
^{244}Cm	0.00E+00	0.00E+00	0.00E+00	1.01E-12	2.44E-04	6.65E-09	1.01E-12	2.44E-04	6.65E-09
^{137}Cs	0.00E+00	0.00E+00	0.00E+00	2.47E-08	5.96E+00	1.51E-04	2.47E-08	5.96E+00	1.51E-04
^{152}Eu	0.00E+00	0.00E+00	0.00E+00	2.80E-12	6.77E-04	8.58E-09	2.80E-12	6.77E-04	8.58E-09
^{154}Eu	0.00E+00	0.00E+00	0.00E+00	5.80E-10	1.40E-01	1.14E-06	5.80E-10	1.40E-01	1.14E-06
^{155}Eu	0.00E+00	0.00E+00	0.00E+00	1.67E-10	4.04E-02	1.84E-07	1.67E-10	4.04E-02	1.84E-07
^{3}H	0.00E+00	0.00E+00	0.00E+00	1.62E-09	3.92E-01	8.99E-08	1.62E-09	3.92E-01	8.99E-08
^{129}I	0.00E+00	0.00E+00	0.00E+00	4.91E-11	1.19E-02	1.48E-01	4.91E-11	1.19E-02	1.48E-01
^{63}Ni	0.00E+00	0.00E+00	0.00E+00	2.03E-09	4.89E-01	1.90E-05	2.03E-09	4.89E-01	1.90E-05
^{237}Np	0.00E+00	0.00E+00	0.00E+00	2.95E-13	7.12E-05	2.23E-04	2.95E-13	7.12E-05	2.23E-04
^{238}Pu	0.00E+00	0.00E+00	0.00E+00	1.67E-12	4.03E-04	5.19E-08	1.67E-12	4.03E-04	5.19E-08
^{239}Pu	0.00E+00	0.00E+00	0.00E+00	2.30E-11	5.56E-03	1.98E-04	2.30E-11	5.56E-03	1.98E-04
^{240}Pu	0.00E+00	0.00E+00	0.00E+00	5.97E-12	1.44E-03	1.40E-05	5.97E-12	1.44E-03	1.40E-05
^{241}Pu	0.00E+00	0.00E+00	0.00E+00	1.25E-10	3.03E-02	6.48E-07	1.25E-10	3.03E-02	6.48E-07
^{242}Pu	0.00E+00	0.00E+00	0.00E+00	6.31E-16	1.52E-07	8.54E-08	6.31E-16	1.52E-07	8.54E-08
^{125}Sb	0.00E+00	0.00E+00	0.00E+00	8.71E-10	2.10E-01	4.47E-07	8.71E-10	2.10E-01	4.47E-07
^{151}Sm	0.00E+00	0.00E+00	0.00E+00	7.06E-10	1.70E-01	1.43E-05	7.06E-10	1.70E-01	1.43E-05
^{126}Sn	0.00E+00	0.00E+00	0.00E+00	5.49E-12	1.33E-03	2.57E-04	5.49E-12	1.33E-03	2.57E-04
^{90}Sr	0.00E+00	0.00E+00	0.00E+00	2.41E-07	5.82E+01	9.29E-04	2.41E-07	5.82E+01	9.29E-04
^{99}Tc	0.00E+00	0.00E+00	0.00E+00	9.41E-08	2.27E+01	2.96E+00	9.41E-08	2.27E+01	2.96E+00
^{232}Th	0.00E+00	0.00E+00	0.00E+00	8.83E-15	2.13E-06	4.27E-02	8.83E-15	2.13E-06	4.27E-02
^{233}U	0.00E+00	0.00E+00	0.00E+00	3.01E-13	7.28E-05	1.67E-05	3.01E-13	7.28E-05	1.67E-05
^{234}U	0.00E+00	0.00E+00	0.00E+00	2.11E-13	5.10E-05	1.81E-05	2.11E-13	5.10E-05	1.81E-05
^{235}U	0.00E+00	0.00E+00	0.00E+00	8.31E-15	2.01E-06	2.05E-03	8.31E-15	2.01E-06	2.05E-03
^{236}U	0.00E+00	0.00E+00	0.00E+00	1.42E-14	3.44E-06	1.17E-04	1.42E-14	3.44E-06	1.17E-04
^{238}U	0.00E+00	0.00E+00	0.00E+00	1.65E-13	3.98E-05	2.61E-01	1.65E-13	3.98E-05	2.61E-01

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	8.70E-06	7.16E-06	4.57E+02	2.08E-01	2.40E+00
50-32-8	3.34E-08	7.02E-08	4.48E+00	2.04E-03	2.36E-02
56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57-14-7	4.40E-10	2.21E-10	1.41E-02	6.40E-06	7.41E-05
58-90-2	2.47E-10	4.77E-10	3.05E-02	1.38E-05	1.60E-04
59-89-2	4.78E-17	4.63E-17	2.95E-09	1.34E-12	1.55E-11
60-35-5	3.58E-08	1.77E-08	1.13E+00	5.12E-04	5.93E-03
62-75-9	1.44E-08	8.92E-09	5.69E-01	2.59E-04	3.00E-03
64-19-7	3.33E-14	1.67E-14	1.06E-06	4.84E-10	5.60E-09
71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-05-8	7.57E-12	2.59E-12	1.65E-04	7.52E-08	8.70E-07
75-12-7	2.89E-07	1.09E-07	6.93E+00	3.15E-03	3.65E-02
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83-32-9	5.68E-18	7.31E-18	4.66E-10	2.12E-13	2.45E-12
84-66-2	1.80E-08	3.34E-08	2.13E+00	9.69E-04	1.12E-02
84-74-2	5.85E-09	1.36E-08	8.68E-01	3.94E-04	4.56E-03
87-68-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88-89-1	5.71E-08	1.09E-07	6.97E+00	3.17E-03	3.67E-02
91-20-3	9.18E-18	9.82E-18	6.26E-10	2.85E-13	3.29E-12
95-50-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98-86-2	2.22E-10	2.23E-10	1.42E-02	6.48E-06	7.50E-05
100-21-0	8.90E-07	1.23E-06	7.87E+01	3.58E-02	4.14E-01
101-84-8	5.70E-19	8.09E-19	5.16E-11	2.35E-14	2.72E-13
106-93-4	8.40E-19	1.32E-18	8.40E-11	3.82E-14	4.42E-13
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-95-2	6.77E-08	5.32E-08	3.39E+00	1.54E-03	1.78E-02
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	2.38E-12	3.54E-12	2.26E-04	1.03E-07	1.19E-06
120-82-1	4.00E-25	6.05E-25	3.86E-17	1.76E-20	2.03E-19
122-39-4	9.00E-10	1.27E-09	8.11E-02	3.68E-05	4.26E-04
126-73-8	2.42E-08	5.38E-08	3.43E+00	1.56E-03	1.81E-02
127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129-00-0	1.87E-10	3.16E-10	2.02E-02	9.18E-06	1.06E-04
132-64-9	1.12E-14	1.57E-14	9.98E-07	4.54E-10	5.25E-09
144-62-7	7.26E-06	5.46E-06	3.48E+02	1.58E-01	1.83E+00
193-39-5	7.64E-16	1.76E-15	1.12E-07	5.11E-11	5.91E-10
206-44-0	2.25E-17	3.79E-17	2.42E-09	1.10E-12	1.27E-11
208-96-8	2.03E-13	2.58E-13	1.64E-05	7.48E-09	8.65E-08
603-34-9	6.48E-10	1.33E-09	8.47E-02	3.85E-05	4.46E-04
621-64-7	3.75E-17	4.08E-17	2.60E-09	1.18E-12	1.37E-11
1321-64-8	3.27E-18	8.21E-18	5.24E-10	2.38E-13	2.76E-12
1336-36-3	6.52E-17	1.75E-16	1.12E-08	5.08E-12	5.88E-11
3697-24-3	2.01E-17	4.07E-17	2.60E-09	1.18E-12	1.37E-11
4170-30-3	1.11E-10	6.51E-11	4.15E-03	1.89E-06	2.19E-05
10061-01-5	5.00E-26	4.63E-26	2.95E-18	1.34E-21	1.55E-20
26140-60-3	1.33E-17	2.56E-17	1.63E-09	7.41E-13	8.58E-12

Stream Number:	HMP06
Stream Name:	Melter offgas (primary)
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties			
Variable	Value	Units	
Density	4.13E-04	g/cm^3	(does not include solid phase)
Enthalpy	-4.44E+06	BTU/hr	
Mass Flow	2.21E+03	Lb/hr	
	5.31E+04	Lb/day	
Volumetric Flow	1.06E+04	GPM	(does not include solid phase)
	1.42E+03	ft^3/min	(does not include solid phase)
Molar Flow	9.24E+01	Lbmol/hr	
Molecular Weight	2.36E+01	Lb/Lbmol	
Pressure	9.76E+02	mbar	
Temperature	4.00E+02	C	
Na Molarity	0.00E+00	mol/L	
pH	0.00E+00	pH	
Total TRU	3.25E-07	Ci/L	
Total Activity	1.07E-04	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	1.33E+02	1.74E-02	5.25E+04	5.26E+04	2.39E+01	2.77E+02
Ag^+	0.00E+00	0.00E+00	0.00E+00	1.21E-01	0.00E+00	0.00E+00	1.21E-01	5.50E-05	6.37E-04
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	6.36E+00	0.00E+00	0.00E+00	6.36E+00	2.89E-03	3.34E-02
As^{+3}	0.00E+00	0.00E+00	0.00E+00	1.28E-02	0.00E+00	0.00E+00	1.28E-02	5.80E-06	6.72E-05
B^{+3}	0.00E+00	0.00E+00	0.00E+00	1.13E+01	0.00E+00	0.00E+00	1.13E+01	5.13E-03	5.93E-02
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	3.24E-02	0.00E+00	0.00E+00	3.24E-02	1.47E-05	1.71E-04
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	2.92E-01	0.00E+00	0.00E+00	2.92E-01	1.33E-04	1.54E-03
Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	2.67E-01	0.00E+00	0.00E+00	2.67E-01	1.21E-04	1.40E-03
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.31E+00	0.00E+00	0.00E+00	1.31E+00	5.94E-04	6.88E-03
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	2.32E-02	0.00E+00	0.00E+00	2.32E-02	1.05E-05	1.22E-04
Cl^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-06	5.65E+00	5.65E+00	2.57E-03	2.97E-02
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04	8.88E+02	8.88E+02	4.03E-01	4.67E+00
CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	1.17E-01	0.00E+00	0.00E+00	1.17E-01	5.32E-05	6.16E-04
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	8.13E-03	0.00E+00	0.00E+00	8.13E-03	3.69E-06	4.27E-05
F^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	4.83E+00	0.00E+00	0.00E+00	4.83E+00	2.20E-03	2.54E-02
H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.70E-03	1.99E+04	1.99E+04	9.07E+00	1.05E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-06	6.43E+00	6.43E+00	2.92E-03	3.38E-02
HCO3-	0.00E+00	0.00E+00	0.00E+00	7.99E-21	0.00E+00	0.00E+00	7.99E-21	3.63E-24	4.21E-23
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.57E-06	1.93E+01	1.93E+01	8.76E-03	1.01E-01
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	7.49E+00	0.00E+00	0.00E+00	7.49E+00	3.41E-03	3.94E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	0.00E+00	0.00E+00	0.00E+00	1.61E+00	0.00E+00	0.00E+00	1.61E+00	7.31E-04	8.47E-03
La^{+3}	0.00E+00	0.00E+00	0.00E+00	1.21E-01	0.00E+00	0.00E+00	1.21E-01	5.51E-05	6.38E-04
Li^+	0.00E+00	0.00E+00	0.00E+00	1.40E+00	0.00E+00	0.00E+00	1.40E+00	6.38E-04	7.38E-03
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	7.81E-02	0.00E+00	0.00E+00	7.81E-02	3.55E-05	4.11E-04
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	6.33E-01	0.00E+00	0.00E+00	6.33E-01	2.88E-04	3.33E-03
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.45E-03	2.30E+04	2.30E+04	1.05E+01	1.21E+02
Na^+	0.00E+00	0.00E+00	0.00E+00	1.26E+01	0.00E+00	0.00E+00	1.26E+01	5.72E-03	6.62E-02
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-06	2.51E+00	2.51E+00	1.14E-03	1.32E-02
NH4+	0.00E+00	0.00E+00	0.00E+00	1.23E-17	0.00E+00	0.00E+00	1.23E-17	5.58E-21	6.46E-20
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	2.39E-01	0.00E+00	0.00E+00	2.39E-01	1.08E-04	1.26E-03
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-04	3.96E+02	3.96E+02	1.80E-01	2.08E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.70E-06	5.68E+01	5.68E+01	2.58E-02	2.99E-01
NO_2^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-03	8.14E+03	8.14E+03	3.70E+00	4.28E+01
O^{--}	0.00E+00	0.00E+00	0.00E+00	4.98E+01	0.00E+00	0.00E+00	4.98E+01	2.27E-02	2.62E-01
OH^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
$OH(b)^-$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	3.48E-01	0.00E+00	0.00E+00	3.48E-01	1.58E-04	1.83E-03
Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	5.71E-03	0.00E+00	0.00E+00	5.71E-03	2.60E-06	3.01E-05
PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	3.24E+00	0.00E+00	0.00E+00	3.24E+00	1.47E-03	1.71E-02
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	1.01E-02	0.00E+00	0.00E+00	1.01E-02	4.58E-06	5.30E-05
Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	8.66E-01	0.00E+00	0.00E+00	8.66E-01	3.94E-04	4.56E-03
S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	0.00E+00	0.00E+00	0.00E+00	2.74E+01	0.00E+00	0.00E+00	2.74E+01	1.24E-02	1.44E-01
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	9.04E-09	0.00E+00	0.00E+00	9.04E-09	4.11E-12	4.76E-11
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-06	1.43E+01	1.43E+01	6.52E-03	7.54E-02
SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	1.81E-02	0.00E+00	0.00E+00	1.81E-02	8.21E-06	9.51E-05
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	1.65E-03	0.00E+00	0.00E+00	1.65E-03	7.51E-07	8.69E-06
Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	1.53E+00	0.00E+00	0.00E+00	1.53E+00	6.97E-04	8.07E-03
Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	7.68E-01	0.00E+00	0.00E+00	7.68E-01	3.49E-04	4.04E-03

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	4.79E+02	0.00E+00	0.00E+00	4.79E+02	2.18E-01	2.52E+00
$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	4.79E+02	0.00E+00	0.00E+00	4.79E+02	2.18E-01	2.52E+00
Formate	0.00E+00	0.00E+00	0.00E+00	9.17E-08	0.00E+00	0.00E+00	9.17E-08	4.17E-11	4.82E-10
Acetate	0.00E+00	0.00E+00	0.00E+00	9.32E-08	0.00E+00	0.00E+00	9.32E-08	4.23E-11	4.90E-10
Glycolate	0.00E+00	0.00E+00	0.00E+00	4.58E-08	0.00E+00	0.00E+00	4.58E-08	2.08E-11	2.41E-10
IDA	0.00E+00	0.00E+00	0.00E+00	1.17E-07	0.00E+00	0.00E+00	1.17E-07	5.31E-11	6.15E-10
Citrate	0.00E+00	0.00E+00	0.00E+00	1.00E-07	0.00E+00	0.00E+00	1.00E-07	4.56E-11	5.28E-10
HEDTA	0.00E+00	0.00E+00	0.00E+00	8.22E-08	0.00E+00	0.00E+00	8.22E-08	3.74E-11	4.33E-10
EDTA	0.00E+00	0.00E+00	0.00E+00	8.84E-08	0.00E+00	0.00E+00	8.84E-08	4.02E-11	4.65E-10

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	0.00E+00	0.00E+00	0.00E+00	1.07E-04	6.18E+03	2.12E+01	1.07E-04	6.18E+03	2.12E+01
^{241}Am	0.00E+00	0.00E+00	0.00E+00	2.57E-07	1.48E+01	9.55E-03	2.57E-07	1.48E+01	9.55E-03
^{243}Am	0.00E+00	0.00E+00	0.00E+00	2.09E-11	1.20E-03	1.33E-05	2.09E-11	1.20E-03	1.33E-05
^{14}C	0.00E+00	0.00E+00	0.00E+00	1.22E-09	7.01E-02	3.46E-05	1.22E-09	7.01E-02	3.46E-05
^{60}Co	0.00E+00	0.00E+00	0.00E+00	2.29E-08	1.32E+00	2.58E-06	2.29E-08	1.32E+00	2.58E-06
^{243}Cm	0.00E+00	0.00E+00	0.00E+00	2.90E-10	1.67E-02	7.29E-07	2.90E-10	1.67E-02	7.29E-07
^{244}Cm	0.00E+00	0.00E+00	0.00E+00	6.58E-09	3.80E-01	1.04E-05	6.58E-09	3.80E-01	1.04E-05
^{137}Cs	0.00E+00	0.00E+00	0.00E+00	8.84E-05	5.10E+03	1.30E-01	8.84E-05	5.10E+03	1.30E-01
^{152}Eu	0.00E+00	0.00E+00	0.00E+00	1.10E-09	6.36E-02	8.07E-07	1.10E-09	6.36E-02	8.07E-07
^{154}Eu	0.00E+00	0.00E+00	0.00E+00	1.20E-07	6.90E+00	5.63E-05	1.20E-07	6.90E+00	5.63E-05
^{155}Eu	0.00E+00	0.00E+00	0.00E+00	1.77E-08	1.02E+00	4.64E-06	1.77E-08	1.02E+00	4.64E-06
^{3}H	0.00E+00	0.00E+00	0.00E+00	2.96E-08	1.71E+00	3.91E-07	2.96E-08	1.71E+00	3.91E-07
^{129}I	0.00E+00	0.00E+00	0.00E+00	5.18E-11	2.99E-03	3.73E-02	5.18E-11	2.99E-03	3.73E-02
^{63}Ni	0.00E+00	0.00E+00	0.00E+00	3.42E-09	1.98E-01	7.66E-06	3.42E-09	1.98E-01	7.66E-06
^{237}Np	0.00E+00	0.00E+00	0.00E+00	1.70E-10	9.79E-03	3.06E-02	1.70E-10	9.79E-03	3.06E-02
^{238}Pu	0.00E+00	0.00E+00	0.00E+00	8.05E-10	4.65E-02	5.98E-06	8.05E-10	4.65E-02	5.98E-06
^{239}Pu	0.00E+00	0.00E+00	0.00E+00	7.13E-09	4.12E-01	1.46E-02	7.13E-09	4.12E-01	1.46E-02
^{240}Pu	0.00E+00	0.00E+00	0.00E+00	1.88E-09	1.09E-01	1.06E-03	1.88E-09	1.09E-01	1.06E-03
^{241}Pu	0.00E+00	0.00E+00	0.00E+00	5.05E-08	2.92E+00	6.24E-05	5.05E-08	2.92E+00	6.24E-05
^{242}Pu	0.00E+00	0.00E+00	0.00E+00	1.73E-13	1.00E-05	5.60E-06	1.73E-13	1.00E-05	5.60E-06
^{125}Sb	0.00E+00	0.00E+00	0.00E+00	5.28E-08	3.05E+00	6.47E-06	5.28E-08	3.05E+00	6.47E-06
^{151}Sm	0.00E+00	0.00E+00	0.00E+00	4.92E-07	2.84E+01	2.38E-03	4.92E-07	2.84E+01	2.38E-03
^{126}Sn	0.00E+00	0.00E+00	0.00E+00	2.07E-10	1.19E-02	2.32E-03	2.07E-10	1.19E-02	2.32E-03
^{90}Sr	0.00E+00	0.00E+00	0.00E+00	1.64E-05	9.44E+02	1.51E-02	1.64E-05	9.44E+02	1.51E-02
^{99}Tc	0.00E+00	0.00E+00	0.00E+00	1.23E-06	7.12E+01	9.26E+00	1.23E-06	7.12E+01	9.26E+00
^{232}Th	0.00E+00	0.00E+00	0.00E+00	5.61E-12	3.24E-04	6.49E+00	5.61E-12	3.24E-04	6.49E+00
^{233}U	0.00E+00	0.00E+00	0.00E+00	4.59E-10	2.65E-02	6.06E-03	4.59E-10	2.65E-02	6.06E-03
^{234}U	0.00E+00	0.00E+00	0.00E+00	2.39E-11	1.38E-03	4.91E-04	2.39E-11	1.38E-03	4.91E-04
^{235}U	0.00E+00	0.00E+00	0.00E+00	5.76E-13	3.32E-05	3.39E-02	5.76E-13	3.32E-05	3.39E-02
^{236}U	0.00E+00	0.00E+00	0.00E+00	7.93E-13	4.57E-05	1.56E-03	7.93E-13	4.57E-05	1.56E-03
^{238}U	0.00E+00	0.00E+00	0.00E+00	1.36E-11	7.82E-04	5.13E+00	1.36E-11	7.82E-04	5.13E+00

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	1.99E-06	1.54E-06	2.34E+01	1.07E-02	1.23E-01
50-32-8	9.41E-09	1.98E-08	3.02E-01	1.37E-04	1.59E-03
56-23-5	6.24E-29	8.01E-29	1.22E-21	5.55E-25	6.42E-24
57-14-7	6.36E-10	3.19E-10	4.86E-03	2.21E-06	2.56E-05
58-90-2	3.23E-10	6.25E-10	9.52E-03	4.33E-06	5.01E-05
59-89-2	9.53E-17	9.24E-17	1.41E-09	6.40E-13	7.41E-12
60-35-5	9.14E-09	4.51E-09	6.87E-02	3.12E-05	3.61E-04
62-75-9	1.17E-08	7.27E-09	1.11E-01	5.03E-05	5.83E-04
64-19-7	6.65E-14	3.33E-14	5.08E-07	2.31E-10	2.67E-09
71-43-2	2.84E-22	1.85E-22	2.82E-15	1.28E-18	1.48E-17
75-05-8	1.56E-11	5.35E-12	8.16E-05	3.71E-08	4.29E-07
75-12-7	7.17E-08	2.69E-08	4.11E-01	1.87E-04	2.16E-03
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	8.12E-24	8.90E-24	1.36E-16	6.17E-20	7.14E-19
83-32-9	7.11E-17	9.16E-17	1.40E-09	6.34E-13	7.34E-12
84-66-2	1.05E-08	1.95E-08	2.97E-01	1.35E-04	1.56E-03
84-74-2	3.71E-09	8.63E-09	1.31E-01	5.98E-05	6.92E-04
87-68-3	2.84E-24	6.19E-24	9.44E-17	4.29E-20	4.96E-19
88-89-1	1.41E-08	2.70E-08	4.11E-01	1.87E-04	2.16E-03
91-20-3	1.51E-16	1.61E-16	2.45E-09	1.12E-12	1.29E-11
95-50-1	4.97E-18	6.10E-18	9.29E-11	4.22E-14	4.89E-13
98-86-2	3.04E-10	3.06E-10	4.66E-03	2.12E-06	2.45E-05
100-21-0	2.05E-08	2.84E-08	4.33E-01	1.97E-04	2.28E-03
101-84-8	1.07E-17	1.53E-17	2.33E-10	1.06E-13	1.22E-12
106-93-4	2.86E-17	4.49E-17	6.84E-10	3.11E-13	3.60E-12
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	7.01E-23	5.39E-23	8.22E-16	3.74E-19	4.32E-18
108-95-2	3.10E-08	2.44E-08	3.71E-01	1.69E-04	1.95E-03
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	6.09E-12	9.06E-12	1.38E-04	6.28E-08	7.26E-07
120-82-1	1.39E-18	2.11E-18	3.21E-11	1.46E-14	1.69E-13
122-39-4	7.67E-10	1.08E-09	1.65E-02	7.50E-06	8.68E-05
126-73-8	8.48E-09	1.89E-08	2.87E-01	1.31E-04	1.51E-03
127-18-4	1.07E-28	1.49E-28	2.27E-21	1.03E-24	1.19E-23
129-00-0	2.56E-10	4.31E-10	6.58E-03	2.99E-06	3.46E-05
132-64-9	7.40E-14	1.04E-13	1.58E-06	7.20E-10	8.33E-09
144-62-7	1.79E-06	1.35E-06	2.05E+01	9.34E-03	1.08E-01
193-39-5	1.53E-15	3.54E-15	5.40E-08	2.45E-11	2.84E-10
206-44-0	5.46E-17	9.21E-17	1.40E-09	6.38E-13	7.39E-12
208-96-8	8.00E-13	1.02E-12	1.55E-05	7.04E-09	8.15E-08
603-34-9	7.38E-10	1.51E-09	2.30E-02	1.05E-05	1.21E-04
621-64-7	8.48E-17	9.21E-17	1.40E-09	6.38E-13	7.39E-12
1321-64-8	3.66E-17	9.17E-17	1.40E-09	6.35E-13	7.35E-12
1336-36-3	9.75E-16	2.62E-15	3.99E-08	1.82E-11	2.10E-10
3697-24-3	4.56E-17	9.22E-17	1.41E-09	6.39E-13	7.40E-12
4170-30-3	1.50E-10	8.75E-11	1.33E-03	6.06E-07	7.02E-06
10061-01-5	2.04E-20	1.89E-20	2.87E-13	1.31E-16	1.51E-15
26140-60-3	4.79E-17	9.20E-17	1.40E-09	6.37E-13	7.38E-12

Stream Number: PJV32
Stream Name: HLW pulse ventilation header offgas
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	1.03E-03	g/cm^3	(does not include solid phase)
Enthalpy	-7.39E+05	BTU/hr	
Mass Flow	2.11E+04	Lb/hr	
	5.06E+05	Lb/day	
Volumetric Flow	4.08E+04	GPM	(does not include solid phase)
	5.45E+03	ft^3/min	(does not include solid phase)
Molar Flow	7.34E+02	Lbmol/hr	
Molecular Weight	2.87E+01	Lb/Lbmol	
Pressure	8.91E+02	mbar	
Temperature	2.52E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	2.24E+00	pH	
Total TRU	5.30E-14	Ci/L	
Total Activity	1.76E-11	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	2.94E-09	4.43E-10	2.60E-02	6.92E-05	3.59E-02	5.06E+05	5.06E+05	2.30E+02	2.66E+03
Ag^+	2.76E-23	2.49E-23	1.46E-15	7.67E-08	0.00E+00	0.00E+00	7.67E-08	3.49E-11	4.04E-10
Al^{+3}	3.34E-19	7.52E-20	4.42E-12	4.00E-06	0.00E+00	0.00E+00	4.00E-06	1.82E-09	2.10E-08
As^{+3}	1.22E-22	7.61E-23	4.47E-15	8.05E-09	0.00E+00	0.00E+00	8.05E-09	3.66E-12	4.24E-11
B^{+3}	1.87E-19	1.69E-20	9.91E-13	7.10E-06	0.00E+00	0.00E+00	7.10E-06	3.23E-09	3.73E-08
Ba^{+2}	2.54E-23	2.91E-23	1.71E-15	2.04E-08	0.00E+00	0.00E+00	2.04E-08	9.28E-12	1.07E-10
Bi^{+3}	2.99E-23	5.21E-23	3.06E-15	1.85E-07	0.00E+00	0.00E+00	1.85E-07	8.41E-11	9.73E-10
Ca^{+2}	6.08E-15	2.03E-15	1.19E-07	4.83E-08	0.00E+00	0.00E+00	1.68E-07	7.63E-11	8.83E-10
Cd^{+2}	4.71E-23	4.42E-23	2.59E-15	8.30E-07	0.00E+00	0.00E+00	8.30E-07	3.77E-10	4.37E-09
Ce^{+3}	6.78E-14	7.93E-14	4.66E-06	1.46E-08	0.00E+00	0.00E+00	4.67E-06	2.12E-09	2.46E-08
Cl^-	8.32E-14	2.46E-14	1.45E-06	3.73E-15	0.00E+00	0.00E+00	1.45E-06	6.57E-10	7.60E-09
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	7.01E-18	2.58E-18	1.51E-10	0.00E+00	4.76E-15	1.03E-07	1.03E-07	4.67E-11	5.41E-10
CO_3^{-2}	4.07E-16	2.04E-16	1.20E-08	1.38E-10	0.00E+00	0.00E+00	1.21E-08	5.50E-12	6.37E-11
Cr^{+3}	4.83E-15	2.10E-15	1.23E-07	7.39E-08	0.00E+00	0.00E+00	1.97E-07	8.96E-11	1.04E-09
Cu^{+2}	4.67E-23	2.48E-23	1.45E-15	5.14E-09	0.00E+00	0.00E+00	5.14E-09	2.34E-12	2.70E-11
F^-	9.70E-13	1.54E-13	9.03E-06	6.78E-14	0.00E+00	0.00E+00	9.03E-06	4.11E-09	4.75E-08
Fe^{+3}	1.68E-14	7.84E-15	4.60E-07	3.04E-06	0.00E+00	0.00E+00	3.50E-06	1.59E-09	1.84E-08
H_2O	2.93E-09	4.40E-10	2.59E-02	0.00E+00	3.48E-04	3.07E+03	3.07E+03	1.40E+00	1.62E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	4.00E-15	3.37E-17	1.98E-09	0.00E+00	0.00E+00	0.00E+00	1.98E-09	8.99E-13	1.04E-11
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	2.12E-14	1.08E-14	6.33E-07	7.68E-29	0.00E+00	0.00E+00	6.33E-07	2.88E-10	3.33E-09
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	3.44E-06	0.00E+00	0.00E+00	3.44E-06	1.56E-09	1.81E-08
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	5.33E-14	1.74E-14	1.02E-06	2.45E-23	0.00E+00	0.00E+00	1.02E-06	4.64E-10	5.37E-09
La^{+3}	1.31E-23	1.51E-23	8.89E-16	7.63E-08	0.00E+00	0.00E+00	7.63E-08	3.47E-11	4.01E-10
Li^+	1.29E-13	7.47E-15	4.39E-07	4.49E-07	0.00E+00	0.00E+00	8.88E-07	4.04E-10	4.67E-09
Mg^{+2}	3.85E-22	7.81E-23	4.59E-15	4.91E-08	0.00E+00	0.00E+00	4.91E-08	2.23E-11	2.59E-10
Mn^{+3}	4.17E-22	1.91E-22	1.12E-14	3.98E-07	0.00E+00	0.00E+00	3.98E-07	1.81E-10	2.10E-09
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.81E-02	3.86E+05	3.86E+05	1.75E+02	2.03E+03
Na^+	5.15E-12	9.87E-13	5.80E-05	7.31E-12	0.00E+00	0.00E+00	5.80E-05	2.64E-08	3.05E-07
NH3	8.07E-16	1.15E-16	6.74E-09	0.00E+00	0.00E+00	0.00E+00	6.74E-09	3.06E-12	3.54E-11
NH4+	1.41E-13	1.15E-16	1.25E-06	0.00E+00	0.00E+00	0.00E+00	1.25E-06	5.68E-10	6.57E-09
Ni^{+2}	2.28E-15	1.12E-15	6.55E-08	1.50E-07	0.00E+00	0.00E+00	2.16E-07	9.82E-11	1.14E-09
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	7.25E-19	2.78E-19	1.64E-11	2.12E-11	0.00E+00	0.00E+00	3.75E-11	1.71E-14	1.97E-13
NO_3^-	2.93E-12	1.52E-12	8.91E-05	1.63E-11	0.00E+00	0.00E+00	8.91E-05	4.05E-08	4.69E-07
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.47E-03	1.17E+05	1.17E+05	5.33E+01	6.17E+02
O^-	0.00E+00	0.00E+00	0.00E+00	2.77E-05	0.00E+00	0.00E+00	2.77E-05	1.26E-08	1.46E-07
OH^-	1.75E-12	2.49E-13	1.46E-05	3.97E-10	0.00E+00	0.00E+00	1.46E-05	6.64E-09	7.68E-08
$OH(b)^-$	7.40E-19	1.05E-19	6.17E-12	3.76E-34	0.00E+00	0.00E+00	6.17E-12	2.80E-15	3.24E-14
Pb^{+2}	1.71E-22	2.95E-22	1.73E-14	2.20E-07	0.00E+00	0.00E+00	2.20E-07	1.00E-10	1.16E-09
Pd^{+2}	1.33E-23	1.18E-23	6.95E-16	3.59E-09	0.00E+00	0.00E+00	3.59E-09	1.63E-12	1.89E-11
PO_4^{-3}	1.37E-20	1.08E-20	6.36E-13	2.04E-06	0.00E+00	0.00E+00	2.04E-06	9.28E-10	1.07E-08
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	1.29E-23	1.11E-23	6.50E-16	6.35E-09	0.00E+00	0.00E+00	6.35E-09	2.89E-12	3.34E-11
Ru^{+3}	1.90E-23	1.60E-23	9.39E-16	5.47E-07	0.00E+00	0.00E+00	5.47E-07	2.49E-10	2.88E-09
S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.08E-29	0.00E+00	0.00E+00	1.08E-29	4.89E-33	5.66E-32
SiO2	2.58E-21	1.29E-21	7.60E-14	1.72E-05	0.00E+00	0.00E+00	1.72E-05	7.83E-09	9.06E-08
SiO_4^{-4}	1.97E-33	1.52E-33	8.90E-26	1.32E-12	0.00E+00	0.00E+00	1.32E-12	5.98E-16	6.92E-15
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	3.26E-20	2.61E-20	1.53E-12	1.93E-13	0.00E+00	0.00E+00	1.73E-12	7.85E-16	9.09E-15
Sr^{+2}	1.68E-16	1.23E-16	7.20E-09	4.17E-09	0.00E+00	0.00E+00	1.14E-08	5.17E-12	5.98E-11
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	2.15E-23	8.58E-24	5.04E-16	1.04E-09	0.00E+00	0.00E+00	1.04E-09	4.73E-13	5.47E-12
Zn^{+2}	7.96E-23	4.34E-23	2.55E-15	9.66E-07	0.00E+00	0.00E+00	9.66E-07	4.39E-10	5.08E-09
Zr^{+4}	5.87E-23	4.47E-23	2.63E-15	4.83E-07	0.00E+00	0.00E+00	4.83E-07	2.20E-10	2.54E-09

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	1.72E-20	1.26E-20	7.42E-13	3.01E-04	0.00E+00	0.00E+00	3.01E-04	1.37E-07	1.59E-06
$C_2O_4^{-2}$	1.72E-20	1.26E-20	7.42E-13	3.01E-04	0.00E+00	0.00E+00	3.01E-04	1.37E-07	1.59E-06
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	1.89E-26	0.00E+00	0.00E+00	1.89E-26	8.59E-30	9.94E-29
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	5.15E-27	0.00E+00	0.00E+00	5.15E-27	2.34E-30	2.71E-29
HEDTA	0.00E+00	0.00E+00	0.00E+00	6.87E-27	0.00E+00	0.00E+00	6.87E-27	3.12E-30	3.61E-29
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	1.69E-12	3.76E-04	6.00E-09	1.59E-11	3.53E-03	1.33E-05	1.76E-11	3.90E-03	1.33E-05
^{241}Am	2.59E-22	5.75E-14	3.70E-17	4.20E-14	9.34E-06	6.01E-09	4.20E-14	9.34E-06	6.01E-09
^{243}Am	1.69E-25	3.76E-17	4.15E-19	3.41E-18	7.58E-10	8.37E-12	3.41E-18	7.58E-10	8.37E-12
^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{60}Co	3.49E-23	7.76E-15	1.51E-20	3.75E-15	8.35E-07	1.63E-12	3.75E-15	8.35E-07	1.63E-12
^{243}Cm	2.80E-26	6.23E-18	2.72E-22	4.73E-17	1.05E-08	4.59E-13	4.73E-17	1.05E-08	4.59E-13
^{244}Cm	6.63E-25	1.48E-16	4.02E-21	1.07E-15	2.39E-07	6.51E-12	1.07E-15	2.39E-07	6.51E-12
^{137}Cs	7.61E-17	1.69E-08	4.30E-13	1.45E-11	3.23E-03	8.19E-08	1.45E-11	3.23E-03	8.19E-08
^{152}Eu	1.95E-24	4.33E-16	5.49E-21	1.80E-16	4.00E-08	5.08E-13	1.80E-16	4.00E-08	5.08E-13
^{154}Eu	4.03E-22	8.97E-14	7.32E-19	1.95E-14	4.34E-06	3.54E-11	1.95E-14	4.34E-06	3.54E-11
^{155}Eu	1.17E-22	2.59E-14	1.18E-19	2.89E-15	6.44E-07	2.92E-12	2.89E-15	6.44E-07	2.92E-12
^{3}H	2.11E-23	4.68E-15	1.07E-21	2.44E-15	5.43E-07	1.25E-13	2.44E-15	5.43E-07	1.25E-13
^{129}I	0.00E+00	0.00E+00	0.00E+00	7.71E-19	1.72E-10	2.14E-09	7.71E-19	1.72E-10	2.14E-09
^{63}Ni	6.25E-22	1.39E-13	5.39E-18	5.60E-16	1.25E-07	4.83E-12	5.60E-16	1.25E-07	4.83E-12
^{237}Np	2.06E-25	4.57E-17	1.43E-16	2.77E-17	6.16E-09	1.93E-08	2.77E-17	6.16E-09	1.93E-08
^{238}Pu	1.16E-24	2.57E-16	3.31E-20	1.31E-16	2.92E-08	3.76E-12	1.31E-16	2.92E-08	3.76E-12
^{239}Pu	1.60E-23	3.56E-15	1.26E-16	1.16E-15	2.59E-07	9.20E-09	1.16E-15	2.59E-07	9.20E-09
^{240}Pu	4.15E-24	9.23E-16	8.96E-18	3.07E-16	6.83E-08	6.64E-10	3.07E-16	6.83E-08	6.64E-10
^{241}Pu	8.71E-23	1.94E-14	4.15E-19	8.25E-15	1.83E-06	3.93E-11	8.25E-15	1.83E-06	3.93E-11
^{242}Pu	4.39E-28	9.77E-20	5.47E-20	2.06E-21	4.59E-13	2.57E-13	2.06E-21	4.59E-13	2.57E-13
^{125}Sb	2.41E-22	5.36E-14	1.14E-19	8.65E-15	1.92E-06	4.09E-12	8.65E-15	1.92E-06	4.09E-12
^{151}Sm	3.41E-21	7.59E-13	6.35E-17	8.03E-14	1.79E-05	1.50E-09	8.03E-14	1.79E-05	1.50E-09
^{126}Sn	3.83E-24	8.52E-16	1.65E-16	3.38E-17	7.51E-09	1.46E-09	3.38E-17	7.51E-09	1.46E-09
^{90}Sr	1.69E-12	3.76E-04	6.00E-09	9.78E-13	2.18E-04	3.47E-09	2.67E-12	5.94E-04	9.47E-09
^{99}Tc	6.69E-22	1.49E-13	1.93E-14	2.02E-13	4.49E-05	5.84E-06	2.02E-13	4.49E-05	5.84E-06
^{232}Th	6.30E-27	1.40E-18	2.81E-14	9.09E-19	2.02E-10	4.05E-06	9.09E-19	2.02E-10	4.05E-06
^{233}U	2.08E-25	4.63E-17	1.06E-17	7.50E-17	1.67E-08	3.82E-09	7.50E-17	1.67E-08	3.82E-09
^{234}U	1.48E-25	3.29E-17	1.17E-17	3.91E-18	8.69E-10	3.08E-10	3.91E-18	8.69E-10	3.08E-10
^{235}U	5.82E-27	1.30E-18	1.32E-15	8.79E-20	1.96E-11	2.00E-08	8.79E-20	1.96E-11	2.00E-08
^{236}U	9.98E-27	2.22E-18	7.56E-17	1.21E-19	2.69E-11	9.16E-10	1.21E-19	2.69E-11	9.16E-10
^{238}U	1.15E-25	2.57E-17	1.68E-13	2.20E-18	4.89E-10	3.21E-06	2.20E-18	4.89E-10	3.21E-06

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	7.22E-15	1.30E-14	7.62E-07	3.46E-10	4.01E-09
50-32-8	1.54E-15	3.25E-15	1.91E-07	8.68E-11	1.00E-09
56-23-5	1.64E-62	2.11E-62	1.24E-54	5.63E-58	6.52E-57
57-14-7	1.27E-44	6.38E-45	3.75E-37	1.70E-40	1.97E-39
58-90-2	2.56E-31	4.96E-31	2.91E-23	1.32E-26	1.53E-25
59-89-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60-35-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62-75-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64-19-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71-43-2	3.15E-56	2.05E-56	1.20E-48	5.48E-52	6.34E-51
75-05-8	1.48E-45	5.06E-46	2.98E-38	1.35E-41	1.57E-40
75-12-7	1.67E-29	6.28E-30	3.69E-22	1.68E-25	1.94E-24
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	2.21E-58	2.42E-58	1.42E-50	6.46E-54	7.47E-53
83-32-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84-66-2	7.44E-30	1.38E-29	8.10E-22	3.68E-25	4.26E-24
84-74-2	6.17E-16	1.43E-15	8.43E-08	3.83E-11	4.43E-10
87-68-3	7.94E-60	1.73E-59	1.01E-51	4.61E-55	5.34E-54
88-89-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91-20-3	6.46E-50	6.91E-50	4.06E-42	1.84E-45	2.14E-44
95-50-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98-86-2	9.09E-31	9.14E-31	5.37E-23	2.44E-26	2.82E-25
100-21-0	3.34E-15	4.63E-15	2.72E-07	1.24E-10	1.43E-09
101-84-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-93-4	2.72E-49	4.27E-49	2.51E-41	1.14E-44	1.32E-43
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	2.69E-56	2.07E-56	1.21E-48	5.52E-52	6.39E-51
108-95-2	1.91E-29	1.50E-29	8.83E-22	4.01E-25	4.65E-24
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	1.62E-18	2.41E-18	1.42E-10	6.44E-14	7.45E-13
120-82-1	5.74E-52	8.69E-52	5.11E-44	2.32E-47	2.69E-46
122-39-4	1.29E-16	1.83E-16	1.07E-08	4.88E-12	5.65E-11
126-73-8	1.41E-15	3.13E-15	1.84E-07	8.35E-11	9.66E-10
127-18-4	2.92E-61	4.05E-61	2.38E-53	1.08E-56	1.25E-55
129-00-0	4.69E-17	7.92E-17	4.65E-09	2.11E-12	2.45E-11
132-64-9	2.02E-47	2.83E-47	1.66E-39	7.57E-43	8.76E-42
144-62-7	3.13E-32	2.35E-32	1.38E-24	6.28E-28	7.27E-27
193-39-5	8.36E-21	1.93E-20	1.13E-12	5.15E-16	5.96E-15
206-44-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
208-96-8	8.02E-34	1.02E-33	5.98E-26	2.72E-29	3.15E-28
603-34-9	1.29E-16	2.64E-16	1.55E-08	7.04E-12	8.15E-11
621-64-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1321-64-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1336-36-3	1.45E-21	3.91E-21	2.29E-13	1.04E-16	1.21E-15
3697-24-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4170-30-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10061-01-5	1.82E-53	1.69E-53	9.91E-46	4.50E-49	5.21E-48
26140-60-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Stream Number: PVP12
Stream Name: Carbon bed adsorber discharge
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	9.01E-04	g/cm^3	(does not include solid phase)
Enthalpy	-3.82E+06	BTU/hr	
Mass Flow	3.25E+04	Lb/hr	
	7.81E+05	Lb/day	
Volumetric Flow	7.21E+04	GPM	(does not include solid phase)
	9.64E+03	ft^3/min	(does not include solid phase)
Molar Flow	1.14E+03	Lbmol/hr	
Molecular Weight	2.85E+01	Lb/Lbmol	
Pressure	8.10E+02	mbar	
Temperature	3.49E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	1.02E+01	pH	
Total TRU	5.47E-20	Ci/L	
Total Activity	5.64E-12	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	6.85E-11	1.92E-12	1.77E-04	4.34E-05	3.16E-02	7.81E+05	7.81E+05	3.55E+02	4.11E+03
Ag^+	3.05E-22	2.75E-22	2.85E-14	1.17E-13	0.00E+00	0.00E+00	1.45E-13	6.61E-17	7.65E-16
Al^{+3}	2.91E-18	6.55E-19	6.80E-11	1.36E-11	0.00E+00	0.00E+00	8.15E-11	3.71E-14	4.29E-13
As^{+3}	1.23E-21	7.69E-22	7.99E-14	1.37E-14	0.00E+00	0.00E+00	9.36E-14	4.25E-17	4.92E-16
B^{+3}	2.17E-20	1.96E-21	2.03E-13	3.44E-12	0.00E+00	0.00E+00	3.64E-12	1.66E-15	1.92E-14
Ba^{+2}	2.90E-22	3.32E-22	3.45E-14	1.08E-13	0.00E+00	0.00E+00	1.42E-13	6.45E-17	7.47E-16
Bi^{+3}	1.77E-22	3.09E-22	3.20E-14	3.03E-13	0.00E+00	0.00E+00	3.35E-13	1.52E-16	1.76E-15
Ca^{+2}	4.45E-19	1.49E-19	1.54E-11	2.21E-11	0.00E+00	0.00E+00	3.76E-11	1.71E-14	1.98E-13
Cd^{+2}	2.87E-22	2.69E-22	2.79E-14	2.38E-13	0.00E+00	0.00E+00	2.66E-13	1.21E-16	1.40E-15
Ce^{+3}	1.11E-20	1.30E-20	1.35E-12	1.22E-13	0.00E+00	0.00E+00	1.48E-12	6.71E-16	7.76E-15
Cl^-	3.85E-19	1.14E-19	1.18E-11	7.73E-14	0.00E+00	0.00E+00	1.19E-11	5.41E-15	6.26E-14
CO	1.30E-38	3.04E-39	3.15E-31	0.00E+00	1.13E-71	2.73E-64	3.15E-31	1.43E-34	1.66E-33
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.12E-12	4.28E-05	4.28E-05	1.95E-08	2.25E-07
CO_3^{-2}	2.71E-18	1.36E-18	1.41E-10	1.30E-11	0.00E+00	0.00E+00	1.54E-10	7.00E-14	8.10E-13
Cr^{+3}	4.77E-20	2.07E-20	2.15E-12	2.04E-13	0.00E+00	0.00E+00	2.35E-12	1.07E-15	1.24E-14
Cu^{+2}	5.16E-22	2.74E-22	2.84E-14	4.42E-14	0.00E+00	0.00E+00	7.26E-14	3.30E-17	3.82E-16
F^-	1.66E-19	2.63E-20	2.74E-12	1.28E-12	0.00E+00	0.00E+00	4.02E-12	1.83E-15	2.11E-14
Fe^{+3}	1.67E-20	7.79E-21	8.09E-13	1.76E-11	0.00E+00	0.00E+00	1.84E-11	8.37E-15	9.69E-14
H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-03	1.65E+04	1.65E+04	7.49E+00	8.67E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	6.35E-11	5.34E-13	5.55E-05	0.00E+00	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-35	7.49E-28	7.49E-28	3.40E-31	3.94E-30
HCO3-	2.41E-24	1.23E-24	1.27E-16	0.00E+00	0.00E+00	0.00E+00	1.27E-16	5.79E-20	6.70E-19
H2CO3	6.60E-28	3.42E-28	3.55E-20	0.00E+00	0.00E+00	0.00E+00	3.55E-20	1.61E-23	1.87E-22
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.11E-36	5.39E-29	5.39E-29	2.45E-32	2.84E-31
Hg^{+2}	6.92E-14	1.16E-13	1.20E-05	4.34E-05	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.88E-34	1.57E-26	1.57E-26	7.15E-30	8.28E-29
K^+	8.32E-19	2.72E-19	2.82E-11	2.14E-13	0.00E+00	0.00E+00	2.84E-11	1.29E-14	1.49E-13
La^{+3}	1.31E-22	1.52E-22	1.58E-14	1.79E-13	0.00E+00	0.00E+00	1.95E-13	8.86E-17	1.03E-15
Li^+	1.74E-20	1.01E-21	1.05E-13	8.02E-14	0.00E+00	0.00E+00	1.85E-13	8.40E-17	9.72E-16
Mg^{+2}	3.92E-20	7.95E-21	8.25E-13	2.65E-12	0.00E+00	0.00E+00	3.47E-12	1.58E-15	1.83E-14
Mn^{+3}	4.34E-21	1.99E-21	2.07E-13	1.44E-12	0.00E+00	0.00E+00	1.65E-12	7.49E-16	8.67E-15
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	2.62E-12	6.13E-13	6.37E-05	0.00E+00	2.41E-02	5.86E+05	5.86E+05	2.66E+02	3.08E+03
Na^+	2.22E-17	4.26E-18	4.43E-10	1.44E-11	0.00E+00	0.00E+00	4.57E-10	2.08E-13	2.40E-12
NH3	1.51E-12	2.14E-13	2.22E-05	0.00E+00	3.47E-11	5.12E-04	5.34E-04	2.43E-07	2.81E-06
NH4+	8.31E-16	2.14E-13	1.30E-08	0.00E+00	0.00E+00	0.00E+00	1.30E-08	5.91E-12	6.83E-11
Ni^{+2}	4.06E-21	1.99E-21	2.06E-13	3.87E-13	0.00E+00	0.00E+00	5.93E-13	2.70E-16	3.12E-15
NO	7.86E-36	1.97E-36	2.04E-28	0.00E+00	0.00E+00	0.00E+00	2.04E-28	9.29E-32	1.07E-30
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.97E-50	1.58E-42	1.58E-42	7.19E-46	8.32E-45
NO_2^-	4.36E-18	1.67E-18	1.74E-10	3.60E-12	0.00E+00	0.00E+00	1.77E-10	8.06E-14	9.33E-13
NO_3^-	8.81E-18	4.56E-18	4.73E-10	2.93E-12	0.00E+00	0.00E+00	4.76E-10	2.16E-13	2.51E-12
O_2	8.45E-13	2.26E-13	2.34E-05	0.00E+00	6.42E-03	1.78E+05	1.78E+05	8.09E+01	9.36E+02
O^{--}	0.00E+00	0.00E+00	0.00E+00	1.51E-11	0.00E+00	0.00E+00	1.51E-11	6.87E-15	7.95E-14
OH^-	2.08E-17	2.95E-18	3.06E-10	5.37E-11	0.00E+00	0.00E+00	3.60E-10	1.64E-13	1.89E-12
$OH(b)^-$	3.28E-25	4.66E-26	4.84E-18	1.49E-27	0.00E+00	0.00E+00	4.84E-18	2.20E-21	2.55E-20
Pb^{+2}	1.01E-21	1.75E-21	1.82E-13	4.96E-13	0.00E+00	0.00E+00	6.77E-13	3.08E-16	3.56E-15
Pd^{+2}	7.99E-23	7.09E-23	7.37E-15	2.07E-14	0.00E+00	0.00E+00	2.81E-14	1.28E-17	1.48E-16
PO_4^{-3}	1.38E-19	1.10E-19	1.14E-11	3.81E-12	0.00E+00	0.00E+00	1.52E-11	6.90E-15	7.99E-14
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	7.54E-23	6.48E-23	6.72E-15	6.58E-15	0.00E+00	0.00E+00	1.33E-14	6.05E-18	7.00E-17
Ru^{+3}	1.12E-22	9.45E-23	9.81E-15	5.96E-14	0.00E+00	0.00E+00	6.94E-14	3.16E-17	3.65E-16
S^{+6}	0.00E+00	0.00E+00	0.00E+00	2.46E-28	0.00E+00	0.00E+00	2.46E-28	1.12E-31	1.29E-30
SiO2	4.61E-20	2.31E-20	2.40E-12	1.32E-11	0.00E+00	0.00E+00	1.56E-11	7.08E-15	8.19E-14
SiO_4^{-4}	2.54E-27	1.95E-27	2.03E-19	1.98E-18	0.00E+00	0.00E+00	2.18E-18	9.90E-22	1.15E-20
SO_2	7.59E-38	4.06E-38	4.21E-30	0.00E+00	0.00E+00	0.00E+00	4.21E-30	1.91E-33	2.22E-32
SO_4^{-2}	2.11E-19	1.69E-19	1.76E-11	8.60E-13	0.00E+00	0.00E+00	1.84E-11	8.37E-15	9.69E-14
Sr^{+2}	4.05E-23	2.96E-23	3.07E-15	3.21E-14	0.00E+00	0.00E+00	3.52E-14	1.60E-17	1.85E-16
Sucrose	0.00E+00	0.00E+00	0.00E+00	3.09E-45	0.00E+00	0.00E+00	3.09E-45	1.40E-48	1.62E-47
Ti^{+4}	2.42E-22	9.66E-23	1.00E-14	3.88E-14	0.00E+00	0.00E+00	4.88E-14	2.22E-17	2.57E-16
Zn^{+2}	8.22E-22	4.49E-22	4.66E-14	7.91E-13	0.00E+00	0.00E+00	8.38E-13	3.81E-16	4.41E-15
Zr^{+4}	6.67E-22	5.08E-22	5.27E-14	4.36E-12	0.00E+00	0.00E+00	4.41E-12	2.01E-15	2.32E-14

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	4.30E-22	3.16E-22	3.28E-14	1.24E-13	0.00E+00	0.00E+00	1.56E-13	7.10E-17	8.22E-16
$C_2O_4^{-2}$	4.30E-22	3.16E-22	3.28E-14	1.24E-13	0.00E+00	0.00E+00	1.56E-13	7.10E-17	8.22E-16
Formate	6.83E-29	2.57E-29	2.66E-21	3.25E-20	0.00E+00	0.00E+00	3.52E-20	1.60E-23	1.85E-22
Acetate	5.29E-29	2.61E-29	2.71E-21	3.30E-20	0.00E+00	0.00E+00	3.57E-20	1.62E-23	1.88E-22
Glycolate	3.52E-28	2.21E-28	2.29E-20	3.27E-20	0.00E+00	0.00E+00	5.56E-20	2.53E-23	2.92E-22
IDA	1.78E-28	1.98E-28	2.05E-20	1.02E-20	0.00E+00	0.00E+00	3.07E-20	1.40E-23	1.62E-22
Citrate	1.63E-29	2.61E-29	2.71E-21	1.31E-20	0.00E+00	0.00E+00	1.58E-20	7.18E-24	8.31E-23
HEDTA	7.62E-29	1.77E-28	1.84E-20	1.23E-20	0.00E+00	0.00E+00	3.07E-20	1.39E-23	1.61E-22
EDTA	9.15E-30	2.23E-29	2.32E-21	1.25E-20	0.00E+00	0.00E+00	1.49E-20	6.76E-24	7.82E-23

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	3.83E-14	1.50E-05	4.12E-07	5.60E-12	2.20E-03	8.93E-08	5.64E-12	2.22E-03	5.01E-07
^{241}Am	1.53E-21	6.01E-13	3.87E-16	3.89E-20	1.53E-11	9.85E-15	4.05E-20	1.59E-11	1.02E-14
^{243}Am	9.98E-25	3.92E-16	4.33E-18	3.14E-24	1.24E-15	1.37E-17	4.14E-24	1.63E-15	1.80E-17
^{14}C	7.51E-15	2.95E-06	1.46E-09	6.41E-16	2.52E-07	1.24E-10	8.15E-15	3.21E-06	1.58E-09
^{60}Co	3.52E-22	1.38E-13	2.70E-19	7.15E-21	2.81E-12	5.48E-18	7.51E-21	2.95E-12	5.75E-18
^{243}Cm	3.00E-25	1.18E-16	5.14E-21	9.05E-23	3.56E-14	1.55E-18	9.08E-23	3.57E-14	1.56E-18
^{244}Cm	6.70E-24	2.63E-15	7.17E-20	2.06E-21	8.09E-13	2.20E-17	2.06E-21	8.12E-13	2.21E-17
^{137}Cs	6.43E-18	2.53E-09	6.42E-14	8.43E-19	3.31E-10	8.42E-15	7.27E-18	2.86E-09	7.26E-14
^{152}Eu	1.15E-23	4.52E-15	5.74E-20	2.07E-22	8.14E-14	1.03E-18	2.19E-22	8.59E-14	1.09E-18
^{154}Eu	2.38E-21	9.37E-13	7.65E-18	2.24E-20	8.82E-12	7.20E-17	2.48E-20	9.76E-12	7.96E-17
^{155}Eu	6.90E-22	2.71E-13	1.23E-18	3.32E-21	1.31E-12	5.93E-18	4.01E-21	1.58E-12	7.16E-18
^{3}H	3.07E-14	1.21E-05	2.77E-12	5.60E-12	2.20E-03	5.05E-10	5.63E-12	2.21E-03	5.08E-10
^{129}I	8.36E-17	3.29E-08	4.10E-07	1.81E-17	7.10E-09	8.87E-08	1.02E-16	4.00E-08	4.99E-07
^{63}Ni	3.78E-21	1.49E-12	5.77E-17	7.81E-22	3.07E-13	1.19E-17	4.56E-21	1.79E-12	6.96E-17
^{237}Np	2.08E-24	8.16E-16	2.55E-15	5.30E-23	2.08E-14	6.52E-14	5.51E-23	2.16E-14	6.77E-14
^{238}Pu	6.84E-24	2.69E-15	3.46E-19	1.51E-22	5.95E-14	7.66E-18	1.58E-22	6.22E-14	8.00E-18
^{239}Pu	9.46E-23	3.72E-14	1.32E-15	1.34E-21	5.27E-13	1.87E-14	1.43E-21	5.64E-13	2.00E-14
^{240}Pu	2.45E-23	9.64E-15	9.36E-17	3.54E-22	1.39E-13	1.35E-15	3.78E-22	1.49E-13	1.44E-15
^{241}Pu	5.15E-22	2.02E-13	4.33E-18	9.49E-21	3.73E-12	7.99E-17	1.00E-20	3.93E-12	8.42E-17
^{242}Pu	1.97E-28	7.76E-20	4.34E-20	3.26E-26	1.28E-17	7.18E-18	3.28E-26	1.29E-17	7.22E-18
^{125}Sb	1.43E-21	5.62E-13	1.19E-18	1.38E-20	5.44E-12	1.16E-17	1.53E-20	6.00E-12	1.27E-17
^{151}Sm	2.00E-20	7.85E-12	6.58E-16	1.67E-19	6.56E-11	5.49E-15	1.87E-19	7.34E-11	6.15E-15
^{126}Sn	2.27E-23	8.93E-15	1.73E-15	6.48E-23	2.55E-14	4.95E-15	8.76E-23	3.44E-14	6.68E-15
^{90}Sr	4.92E-19	1.94E-10	3.09E-15	4.27E-18	1.68E-09	2.68E-14	4.76E-18	1.87E-09	2.99E-14
^{99}Tc	6.76E-21	2.66E-12	3.46E-13	1.71E-20	6.71E-12	8.72E-13	2.38E-20	9.36E-12	1.22E-12
^{232}Th	6.69E-26	2.63E-17	5.27E-13	1.75E-24	6.89E-16	1.38E-11	1.82E-24	7.15E-16	1.43E-11
^{233}U	2.10E-24	8.27E-16	1.89E-16	1.44E-22	5.64E-14	1.29E-14	1.46E-22	5.73E-14	1.31E-14
^{234}U	1.49E-24	5.87E-16	2.08E-16	7.47E-24	2.93E-15	1.04E-15	8.96E-24	3.52E-15	1.25E-15
^{235}U	6.23E-26	2.45E-17	2.50E-14	1.90E-25	7.49E-17	7.64E-14	2.53E-25	9.94E-17	1.01E-13
^{236}U	1.07E-25	4.20E-17	1.43E-15	2.61E-25	1.03E-16	3.50E-15	3.68E-25	1.45E-16	4.94E-15
^{238}U	1.17E-24	4.58E-16	3.01E-12	4.22E-24	1.66E-15	1.09E-11	5.39E-24	2.12E-15	1.39E-11

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	1.96E-08	2.18E-08	2.26E+00	1.03E-03	1.19E-02
50-32-8	5.22E-20	1.10E-19	1.14E-11	5.19E-15	6.00E-14
56-23-5	8.17E-10	1.05E-09	1.09E-01	4.95E-05	5.73E-04
57-14-7	3.12E-12	1.56E-12	1.62E-04	7.38E-08	8.54E-07
58-90-2	2.02E-10	3.91E-10	4.06E-02	1.85E-05	2.14E-04
59-89-2	3.95E-12	3.83E-12	3.98E-04	1.81E-07	2.09E-06
60-35-5	1.57E-15	7.74E-16	8.04E-08	3.65E-11	4.23E-10
62-75-9	1.07E-12	6.59E-13	6.84E-05	3.11E-08	3.60E-07
64-19-7	5.52E-09	2.77E-09	2.87E-01	1.31E-04	1.51E-03
71-43-2	8.04E-11	5.24E-11	5.44E-03	2.47E-06	2.86E-05
75-05-8	1.38E-11	4.73E-12	4.91E-04	2.23E-07	2.58E-06
75-12-7	3.09E-15	1.16E-15	1.21E-07	5.48E-11	6.34E-10
76-15-3	1.02E-08	1.31E-08	1.36E+00	6.18E-04	7.16E-03
79-01-6	1.20E-12	1.31E-12	1.36E-04	6.19E-08	7.16E-07
83-32-9	3.57E-10	4.60E-10	4.77E-02	2.17E-05	2.51E-04
84-66-2	4.05E-14	7.52E-14	7.80E-06	3.55E-09	4.11E-08
84-74-2	4.60E-22	1.07E-21	1.11E-13	5.05E-17	5.84E-16
87-68-3	2.41E-11	5.24E-11	5.44E-03	2.47E-06	2.86E-05
88-89-1	1.49E-18	2.84E-18	2.95E-10	1.34E-13	1.55E-12
91-20-3	1.11E-12	1.19E-12	1.24E-04	5.63E-08	6.51E-07
95-50-1	4.16E-11	5.11E-11	5.30E-03	2.41E-06	2.79E-05
98-86-2	4.69E-11	4.72E-11	4.90E-03	2.23E-06	2.58E-05
100-21-0	3.14E-18	4.36E-18	4.53E-10	2.06E-13	2.38E-12
101-84-8	3.60E-11	5.11E-11	5.31E-03	2.41E-06	2.79E-05
106-93-4	3.18E-10	4.98E-10	5.18E-02	2.35E-05	2.72E-04
106-97-8	2.70E-12	1.31E-12	1.36E-04	6.18E-08	7.16E-07
106-99-0	1.16E-12	5.24E-13	5.44E-05	2.47E-08	2.86E-07
108-87-2	1.60E-12	1.31E-12	1.36E-04	6.20E-08	7.17E-07
108-88-3	6.81E-13	5.24E-13	5.44E-05	2.47E-08	2.86E-07
108-95-2	7.64E-12	6.00E-12	6.23E-04	2.83E-07	3.28E-06
110-54-3	1.82E-12	1.31E-12	1.36E-04	6.18E-08	7.16E-07
110-82-7	1.87E-12	1.31E-12	1.36E-04	6.20E-08	7.17E-07
111-84-2	6.12E-13	6.56E-13	6.81E-05	3.09E-08	3.58E-07
120-12-7	4.96E-12	7.38E-12	7.66E-04	3.48E-07	4.03E-06
120-82-1	1.71E-11	2.59E-11	2.69E-03	1.22E-06	1.41E-05
122-39-4	8.12E-12	1.15E-11	1.19E-03	5.41E-07	6.27E-06
126-73-8	7.51E-15	1.67E-14	1.73E-06	7.88E-10	9.12E-09
127-18-4	3.78E-10	5.24E-10	5.44E-02	2.47E-05	2.86E-04
129-00-0	4.34E-19	7.33E-19	7.61E-11	3.46E-14	4.01E-13
132-64-9	2.67E-10	3.75E-10	3.89E-02	1.77E-05	2.05E-04
144-62-7	3.98E-13	2.99E-13	3.10E-05	1.41E-08	1.63E-07
193-39-5	9.96E-18	2.30E-17	2.39E-09	1.08E-12	1.26E-11
206-44-0	2.73E-10	4.60E-10	4.78E-02	2.17E-05	2.51E-04
208-96-8	2.41E-10	3.06E-10	3.18E-02	1.45E-05	1.67E-04
603-34-9	3.03E-11	6.20E-11	6.44E-03	2.93E-06	3.39E-05
621-64-7	3.53E-12	3.83E-12	3.98E-04	1.81E-07	2.09E-06
1321-64-8	1.84E-10	4.60E-10	4.78E-02	2.17E-05	2.51E-04
1336-36-3	1.26E-19	3.38E-19	3.51E-11	1.59E-14	1.85E-13
3697-24-3	2.28E-10	4.60E-10	4.78E-02	2.17E-05	2.51E-04
4170-30-3	3.90E-13	2.28E-13	2.37E-05	1.08E-08	1.25E-07
10061-01-5	5.64E-11	5.22E-11	5.42E-03	2.46E-06	2.85E-05
26140-60-3	2.40E-10	4.60E-10	4.78E-02	2.17E-05	2.52E-04

Stream Number:	PJV11
Stream Name:	HEPA discharge
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties			
Variable	Value	Units	
Density	1.07E-03	g/cm^3	(does not include solid phase)
Enthalpy	-9.30E+06	BTU/hr	
Mass Flow	1.85E+05	Lb/hr	
	4.44E+06	Lb/day	
Volumetric Flow	3.44E+05	GPM	(does not include solid phase)
	4.59E+04	ft^3/min	(does not include solid phase)
Molar Flow	6.44E+03	Lbmol/hr	
Molecular Weight	2.87E+01	Lb/Lbmol	
Pressure	9.33E+02	mbar	
Temperature	2.64E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	1.15E+01	pH	
Total TRU	2.20E-18	Ci/L	
Total Activity	5.70E-15	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	4.56E-09	6.84E-10	3.39E-01	2.90E-05	3.74E-02	4.44E+06	4.44E+06	2.02E+03	2.34E+04
Ag^+	1.60E-21	1.44E-21	7.13E-13	1.30E-11	0.00E+00	0.00E+00	1.37E-11	6.21E-15	7.19E-14
Al^{+3}	1.94E-17	4.36E-18	2.16E-09	1.79E-09	0.00E+00	0.00E+00	3.95E-09	1.80E-12	2.08E-11
As^{+3}	7.05E-21	4.41E-21	2.18E-12	9.12E-13	0.00E+00	0.00E+00	3.09E-12	1.41E-15	1.63E-14
B^{+3}	1.17E-19	1.06E-20	5.23E-12	8.60E-11	0.00E+00	0.00E+00	9.12E-11	4.14E-14	4.80E-13
Ba^{+2}	1.47E-21	1.69E-21	8.34E-13	1.15E-11	0.00E+00	0.00E+00	1.24E-11	5.63E-15	6.51E-14
Bi^{+3}	1.73E-21	3.03E-21	1.50E-12	6.05E-11	0.00E+00	0.00E+00	6.20E-11	2.82E-14	3.26E-13
Ca^{+2}	1.23E-19	4.11E-20	2.03E-11	7.75E-11	0.00E+00	0.00E+00	9.78E-11	4.45E-14	5.15E-13
Cd^{+2}	2.73E-21	2.56E-21	1.27E-12	4.69E-11	0.00E+00	0.00E+00	4.82E-11	2.19E-14	2.53E-13
Ce^{+3}	5.83E-20	6.81E-20	3.37E-11	1.44E-11	0.00E+00	0.00E+00	4.81E-11	2.19E-14	2.53E-13
Cl^-	3.27E-18	9.67E-19	4.79E-10	1.40E-11	0.00E+00	0.00E+00	4.92E-10	2.24E-13	2.59E-12
CO	9.50E-112	2.22E-112	1.10E-103	0.00E+00	0.00E+00	0.00E+00	1.10E-103	4.99E-107	5.78E-106
CO_2	1.17E-16	4.31E-17	2.13E-08	0.00E+00	3.62E-16	6.58E-08	8.71E-08	3.96E-11	4.58E-10
CO_3^{-2}	1.55E-17	7.77E-18	3.84E-09	1.57E-09	0.00E+00	0.00E+00	5.42E-09	2.46E-12	2.85E-11
Cr^{+3}	4.68E-19	2.03E-19	1.01E-10	3.65E-11	0.00E+00	0.00E+00	1.37E-10	6.23E-14	7.21E-13
Cu^{+2}	2.70E-21	1.43E-21	7.10E-13	4.89E-12	0.00E+00	0.00E+00	5.60E-12	2.55E-15	2.95E-14
F^-	1.54E-18	2.44E-19	1.21E-10	2.54E-10	0.00E+00	0.00E+00	3.75E-10	1.71E-13	1.97E-12
Fe^{+3}	8.38E-20	3.91E-20	1.93E-11	1.84E-09	0.00E+00	0.00E+00	1.86E-09	8.45E-13	9.78E-12
H_2O	4.55E-09	6.84E-10	3.39E-01	0.00E+00	5.26E-04	3.91E+04	3.91E+04	1.78E+01	2.06E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	3.27E-12	2.75E-14	1.36E-05	0.00E+00	0.00E+00	0.00E+00	1.36E-05	6.19E-09	7.17E-08
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	1.61E-21	8.20E-22	4.06E-13	9.36E-28	0.00E+00	0.00E+00	4.06E-13	1.84E-16	2.14E-15
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	2.83E-15	4.74E-15	2.35E-06	2.90E-05	0.00E+00	0.00E+00	3.14E-05	1.43E-08	1.65E-07
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	6.72E-18	2.19E-18	1.08E-09	3.59E-11	0.00E+00	0.00E+00	1.12E-09	5.09E-13	5.89E-12
La^{+3}	7.50E-22	8.70E-22	4.30E-13	2.17E-11	0.00E+00	0.00E+00	2.21E-11	1.00E-14	1.16E-13
Li^+	1.01E-19	5.88E-21	2.91E-12	5.37E-12	0.00E+00	0.00E+00	8.28E-12	3.76E-15	4.36E-14
Mg^{+2}	2.23E-20	4.52E-21	2.24E-12	1.60E-11	0.00E+00	0.00E+00	1.82E-11	8.28E-15	9.58E-14
Mn^{+3}	2.42E-20	1.11E-20	5.49E-12	1.69E-10	0.00E+00	0.00E+00	1.75E-10	7.93E-14	9.18E-13
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	4.77E-14	1.11E-14	5.51E-06	0.00E+00	2.92E-02	3.37E+06	3.37E+06	1.53E+03	1.78E+04
Na^+	2.12E-16	4.06E-17	2.01E-08	2.83E-09	0.00E+00	0.00E+00	2.29E-08	1.04E-11	1.21E-10
NH3	1.44E-13	2.05E-14	1.01E-05	0.00E+00	0.00E+00	0.00E+00	1.01E-05	4.61E-09	5.34E-08
NH4+	1.07E-14	2.05E-14	8.01E-07	4.12E-23	0.00E+00	0.00E+00	8.01E-07	3.64E-10	4.21E-09
Ni^{+2}	3.88E-20	1.90E-20	9.41E-12	7.54E-11	0.00E+00	0.00E+00	8.48E-11	3.86E-14	4.46E-13
NO	5.74E-37	1.44E-37	7.11E-29	0.00E+00	0.00E+00	0.00E+00	7.11E-29	3.23E-32	3.74E-31
NO_2	8.42E-50	3.23E-50	1.60E-41	0.00E+00	0.00E+00	0.00E+00	1.60E-41	7.27E-45	8.42E-44
NO_2^-	4.21E-17	1.62E-17	8.00E-09	7.09E-10	0.00E+00	0.00E+00	8.71E-09	3.96E-12	4.58E-11
NO_3^-	7.40E-17	3.83E-17	1.90E-08	5.47E-10	0.00E+00	0.00E+00	1.95E-08	8.87E-12	1.03E-10
O_2	1.54E-14	4.11E-15	2.03E-06	0.00E+00	7.75E-03	1.02E+06	1.02E+06	4.66E+02	5.39E+03
O^{--}	0.00E+00	0.00E+00	0.00E+00	2.62E-10	0.00E+00	0.00E+00	2.62E-10	1.19E-13	1.38E-12
OH^-	1.24E-16	1.75E-17	8.68E-09	6.48E-09	0.00E+00	0.00E+00	1.52E-08	6.89E-12	7.97E-11
$OH(b)^-$	1.87E-25	2.65E-26	1.31E-17	6.92E-31	0.00E+00	0.00E+00	1.31E-17	5.96E-21	6.90E-20
Pb^{+2}	9.92E-21	1.71E-20	8.49E-12	9.90E-11	0.00E+00	0.00E+00	1.07E-10	4.88E-14	5.65E-13
Pd^{+2}	7.68E-22	6.82E-22	3.37E-13	4.06E-12	0.00E+00	0.00E+00	4.40E-12	2.00E-15	2.31E-14
PO_4^{-3}	7.92E-19	6.28E-19	3.11E-10	4.47E-10	0.00E+00	0.00E+00	7.57E-10	3.44E-13	3.98E-12
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	7.42E-22	6.38E-22	3.16E-13	1.32E-12	0.00E+00	0.00E+00	1.63E-12	7.41E-16	8.58E-15
Ru^{+3}	1.10E-21	9.31E-22	4.61E-13	1.23E-11	0.00E+00	0.00E+00	1.27E-11	5.78E-15	6.69E-14
S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.67E-28	0.00E+00	0.00E+00	3.67E-28	1.67E-31	1.93E-30
SiO2	1.50E-19	7.50E-20	3.71E-11	4.46E-10	0.00E+00	0.00E+00	4.83E-10	2.19E-13	2.54E-12
SiO_4^{-4}	7.85E-32	6.04E-32	2.99E-23	7.91E-18	0.00E+00	0.00E+00	7.91E-18	3.59E-21	4.16E-20
SO_2	1.21E-52	6.45E-53	3.19E-44	0.00E+00	0.00E+00	0.00E+00	3.19E-44	1.45E-47	1.68E-46
SO_4^{-2}	1.89E-18	1.52E-18	7.50E-10	1.61E-10	0.00E+00	0.00E+00	9.11E-10	4.14E-13	4.79E-12
Sr^{+2}	3.95E-22	2.89E-22	1.43E-13	6.44E-12	0.00E+00	0.00E+00	6.59E-12	2.99E-15	3.47E-14
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	1.23E-21	4.93E-22	2.44E-13	2.73E-12	0.00E+00	0.00E+00	2.98E-12	1.35E-15	1.57E-14
Zn^{+2}	4.61E-21	2.52E-21	1.25E-12	2.00E-11	0.00E+00	0.00E+00	2.13E-11	9.68E-15	1.12E-13
Zr^{+4}	3.40E-21	2.59E-21	1.28E-12	4.48E-10	0.00E+00	0.00E+00	4.49E-10	2.04E-13	2.36E-12

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	7.82E-19	5.75E-19	2.84E-10	2.24E-09	0.00E+00	0.00E+00	2.52E-09	1.15E-12	1.33E-11
$C_2O_4^{-2}$	7.82E-19	5.75E-19	2.84E-10	2.24E-09	0.00E+00	0.00E+00	2.52E-09	1.15E-12	1.33E-11
Formate	3.47E-31	1.30E-31	6.44E-23	3.08E-19	0.00E+00	0.00E+00	3.08E-19	1.40E-22	1.62E-21
Acetate	2.69E-31	1.32E-31	6.55E-23	3.13E-19	0.00E+00	0.00E+00	3.13E-19	1.42E-22	1.65E-21
Glycolate	1.79E-30	1.12E-30	5.54E-22	1.54E-19	0.00E+00	0.00E+00	1.54E-19	7.02E-23	8.13E-22
IDA	9.15E-31	1.02E-30	5.03E-22	3.93E-19	0.00E+00	0.00E+00	3.93E-19	1.79E-22	2.07E-21
Citrate	8.36E-32	1.34E-31	6.64E-23	3.37E-19	0.00E+00	0.00E+00	3.37E-19	1.53E-22	1.77E-21
HEDTA	3.92E-31	9.10E-31	4.50E-22	2.76E-19	0.00E+00	0.00E+00	2.77E-19	1.26E-22	1.46E-21
EDTA	4.71E-32	1.15E-31	5.68E-23	2.97E-19	0.00E+00	0.00E+00	2.97E-19	1.35E-22	1.56E-21

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	2.35E-15	4.39E-06	2.20E-07	3.35E-15	6.28E-06	1.45E-07	5.70E-15	1.07E-05	3.65E-07
^{241}Am	1.51E-20	2.82E-11	1.81E-14	1.64E-18	3.08E-09	1.98E-12	1.66E-18	3.10E-09	2.00E-12
^{243}Am	9.84E-24	1.84E-14	2.04E-16	1.33E-22	2.49E-13	2.75E-15	1.43E-22	2.67E-13	2.95E-15
^{14}C	3.08E-16	5.76E-07	2.85E-10	1.16E-16	2.17E-07	1.07E-10	4.24E-16	7.93E-07	3.92E-10
^{60}Co	2.02E-21	3.78E-12	7.37E-18	1.81E-19	3.40E-10	6.62E-16	1.83E-19	3.44E-10	6.69E-16
^{243}Cm	1.62E-24	3.04E-15	1.33E-19	2.30E-21	4.30E-12	1.88E-16	2.30E-21	4.30E-12	1.88E-16
^{244}Cm	3.84E-23	7.20E-14	1.96E-18	5.22E-20	9.77E-11	2.66E-15	5.22E-20	9.78E-11	2.66E-15
^{137}Cs	1.38E-16	2.59E-07	6.58E-12	3.72E-17	6.96E-08	1.77E-12	1.75E-16	3.29E-07	8.34E-12
^{152}Eu	1.13E-22	2.12E-13	2.69E-18	8.73E-21	1.64E-11	2.07E-16	8.84E-21	1.66E-11	2.10E-16
^{154}Eu	2.35E-20	4.40E-11	3.59E-16	9.46E-19	1.77E-09	1.45E-14	9.69E-19	1.82E-09	1.48E-14
^{155}Eu	6.79E-21	1.27E-11	5.77E-17	1.40E-19	2.62E-10	1.19E-15	1.47E-19	2.75E-10	1.25E-15
^{3}H	1.88E-15	3.53E-06	8.10E-13	3.00E-15	5.63E-06	1.29E-12	4.89E-15	9.16E-06	2.10E-12
^{129}I	9.38E-18	1.76E-08	2.19E-07	6.05E-18	1.13E-08	1.42E-07	1.54E-17	2.89E-08	3.61E-07
^{63}Ni	3.64E-20	6.81E-11	2.64E-15	3.15E-20	5.90E-11	2.29E-15	6.79E-20	1.27E-10	4.93E-15
^{237}Np	1.19E-23	2.23E-14	6.99E-14	1.34E-21	2.52E-12	7.87E-12	1.36E-21	2.54E-12	7.94E-12
^{238}Pu	6.74E-23	1.26E-13	1.62E-17	6.38E-21	1.19E-11	1.54E-15	6.44E-21	1.21E-11	1.55E-15
^{239}Pu	9.32E-22	1.75E-12	6.20E-14	5.65E-20	1.06E-10	3.76E-12	5.74E-20	1.08E-10	3.82E-12
^{240}Pu	2.41E-22	4.52E-13	4.39E-15	1.49E-20	2.79E-11	2.71E-13	1.51E-20	2.84E-11	2.76E-13
^{241}Pu	5.07E-21	9.49E-12	2.03E-16	4.00E-19	7.49E-10	1.60E-14	4.05E-19	7.59E-10	1.62E-14
^{242}Pu	2.56E-26	4.79E-17	2.68E-17	1.37E-24	2.57E-15	1.44E-15	1.40E-24	2.62E-15	1.47E-15
^{125}Sb	1.40E-20	2.62E-11	5.58E-17	5.80E-19	1.09E-09	2.31E-15	5.94E-19	1.11E-09	2.37E-15
^{151}Sm	1.97E-19	3.69E-10	3.09E-14	7.02E-18	1.32E-08	1.10E-12	7.22E-18	1.35E-08	1.13E-12
^{126}Sn	2.23E-22	4.17E-13	8.10E-14	2.72E-21	5.09E-12	9.88E-13	2.94E-21	5.51E-12	1.07E-12
^{90}Sr	4.81E-18	9.00E-09	1.44E-13	1.80E-16	3.36E-07	5.37E-12	1.84E-16	3.45E-07	5.51E-12
^{99}Tc	3.87E-20	7.26E-11	9.44E-12	4.17E-19	7.81E-10	1.02E-10	4.56E-19	8.54E-10	1.11E-10
^{232}Th	3.62E-25	6.78E-16	1.36E-11	4.45E-23	8.33E-14	1.67E-09	4.48E-23	8.40E-14	1.68E-09
^{233}U	1.21E-23	2.26E-14	5.17E-15	3.64E-21	6.82E-12	1.56E-12	3.65E-21	6.84E-12	1.56E-12
^{234}U	8.57E-24	1.61E-14	5.70E-15	1.89E-22	3.54E-13	1.26E-13	1.98E-22	3.71E-13	1.32E-13
^{235}U	3.38E-25	6.32E-16	6.45E-13	4.55E-24	8.52E-15	8.69E-12	4.88E-24	9.15E-15	9.34E-12
^{236}U	5.78E-25	1.08E-15	3.69E-14	6.25E-24	1.17E-14	3.99E-13	6.83E-24	1.28E-14	4.36E-13
^{238}U	6.69E-24	1.25E-14	8.22E-11	1.07E-22	2.01E-13	1.32E-09	1.14E-22	2.13E-13	1.40E-09

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	9.11E-12	5.20E-12	2.57E-03	1.17E-06	1.35E-05
50-32-8	8.64E-21	1.82E-20	9.00E-12	4.09E-15	4.73E-14
56-23-5	4.96E-16	6.37E-16	3.15E-07	1.43E-10	1.66E-09
57-14-7	2.63E-14	1.32E-14	6.54E-06	2.97E-09	3.44E-08
58-90-2	7.06E-15	1.37E-14	6.76E-06	3.07E-09	3.56E-08
59-89-2	1.00E-14	9.70E-15	4.80E-06	2.18E-09	2.53E-08
60-35-5	8.79E-15	4.33E-15	2.14E-06	9.75E-10	1.13E-08
62-75-9	2.77E-14	1.72E-14	8.49E-06	3.86E-09	4.47E-08
64-19-7	6.99E-12	3.50E-12	1.73E-03	7.88E-07	9.12E-06
71-43-2	9.78E-16	6.37E-16	3.15E-07	1.43E-10	1.66E-09
75-05-8	5.92E-15	2.03E-15	1.00E-06	4.56E-10	5.28E-09
75-12-7	6.95E-14	2.61E-14	1.29E-05	5.88E-09	6.80E-08
76-15-3	1.23E-15	1.59E-15	7.87E-07	3.58E-10	4.14E-09
79-01-6	1.45E-15	1.59E-15	7.88E-07	3.58E-10	4.15E-09
83-32-9	7.53E-15	9.69E-15	4.80E-06	2.18E-09	2.52E-08
84-66-2	1.13E-14	2.10E-14	1.04E-05	4.72E-09	5.46E-08
84-74-2	8.15E-21	1.89E-20	9.37E-12	4.26E-15	4.93E-14
87-68-3	7.31E-16	1.59E-15	7.87E-07	3.58E-10	4.14E-09
88-89-1	1.37E-14	2.62E-14	1.30E-05	5.89E-09	6.82E-08
91-20-3	3.10E-16	3.32E-16	1.64E-07	7.46E-11	8.63E-10
95-50-1	5.27E-16	6.46E-16	3.20E-07	1.45E-10	1.68E-09
98-86-2	8.91E-15	8.96E-15	4.44E-06	2.02E-09	2.33E-08
100-21-0	5.27E-14	7.30E-14	3.61E-05	1.64E-08	1.90E-07
101-84-8	1.14E-15	1.62E-15	8.00E-07	3.64E-10	4.21E-09
106-93-4	4.17E-16	6.53E-16	3.23E-07	1.47E-10	1.70E-09
106-97-8	3.28E-15	1.59E-15	7.87E-07	3.58E-10	4.14E-09
106-99-0	1.41E-15	6.36E-16	3.15E-07	1.43E-10	1.66E-09
108-87-2	1.94E-15	1.59E-15	7.89E-07	3.58E-10	4.15E-09
108-88-3	8.28E-16	6.37E-16	3.15E-07	1.43E-10	1.66E-09
108-95-2	2.90E-14	2.28E-14	1.13E-05	5.13E-09	5.94E-08
110-54-3	2.21E-15	1.59E-15	7.87E-07	3.58E-10	4.14E-09
110-82-7	2.27E-15	1.59E-15	7.89E-07	3.58E-10	4.15E-09
111-84-2	1.49E-15	1.59E-15	7.88E-07	3.58E-10	4.14E-09
120-12-7	7.85E-15	1.17E-14	5.77E-06	2.62E-09	3.04E-08
120-82-1	1.06E-15	1.61E-15	7.95E-07	3.61E-10	4.18E-09
122-39-4	3.69E-15	5.21E-15	2.58E-06	1.17E-09	1.36E-08
126-73-8	7.66E-15	1.70E-14	8.43E-06	3.83E-09	4.43E-08
127-18-4	4.60E-16	6.36E-16	3.15E-07	1.43E-10	1.66E-09
129-00-0	8.62E-21	1.46E-20	7.20E-12	3.27E-15	3.79E-14
132-64-9	7.41E-15	1.04E-14	5.14E-06	2.34E-09	2.71E-08
144-62-7	1.74E-12	1.31E-12	6.48E-04	2.94E-07	3.41E-06
193-39-5	1.14E-20	2.64E-20	1.30E-11	5.93E-15	6.86E-14
206-44-0	5.75E-15	9.71E-15	4.80E-06	2.18E-09	2.53E-08
208-96-8	8.60E-15	1.09E-14	5.41E-06	2.46E-09	2.85E-08
603-34-9	7.07E-15	1.45E-14	7.16E-06	3.26E-09	3.77E-08
621-64-7	8.93E-15	9.70E-15	4.80E-06	2.18E-09	2.53E-08
1321-64-8	3.87E-15	9.71E-15	4.80E-06	2.18E-09	2.53E-08
1336-36-3	1.96E-22	5.27E-22	2.61E-13	1.19E-16	1.37E-15
3697-24-3	4.80E-15	9.71E-15	4.81E-06	2.18E-09	2.53E-08
4170-30-3	3.86E-15	2.26E-15	1.12E-06	5.08E-10	5.88E-09
10061-01-5	6.89E-16	6.38E-16	3.16E-07	1.44E-10	1.66E-09
26140-60-3	5.05E-15	9.71E-15	4.81E-06	2.19E-09	2.53E-08

Stream Number:	LVP18
Stream Name:	Caustic scrubber offgas discharge to stack
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties			
Variable	Value	Units	
Density	1.02E-03	g/cm^3	(does not include solid phase)
Enthalpy	-1.40E+07	BTU/hr	
Mass Flow	1.83E+04	Lb/hr	
	4.40E+05	Lb/day	
Volumetric Flow	3.59E+04	GPM	(does not include solid phase)
	4.79E+03	ft^3/min	(does not include solid phase)
Molar Flow	6.70E+02	Lbmol/hr	
Molecular Weight	2.74E+01	Lb/Lbmol	
Pressure	1.02E+03	mbar	
Temperature	5.72E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	-2.41E+00	pH	
Total TRU	1.54E-17	Ci/L	
Total Activity	2.24E-09	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	1.68E-14	4.74E-15	1.27E-07	3.71E+00	3.73E-02	4.40E+05	4.40E+05	2.00E+02	2.31E+03
Ag^+	1.45E-21	1.31E-21	6.75E-14	8.62E-10	0.00E+00	0.00E+00	8.62E-10	3.92E-13	4.54E-12
Al^{+3}	1.76E-17	3.96E-18	2.05E-10	4.13E-07	0.00E+00	0.00E+00	4.13E-07	1.88E-10	2.17E-09
As^{+3}	6.40E-21	4.00E-21	2.07E-13	1.43E-08	0.00E+00	0.00E+00	1.43E-08	6.51E-12	7.53E-11
B^{+3}	7.05E-17	6.36E-18	3.28E-10	3.19E-06	0.00E+00	0.00E+00	3.19E-06	1.45E-09	1.68E-08
Ba^{+2}	1.33E-21	1.53E-21	7.90E-14	2.46E-11	0.00E+00	0.00E+00	2.47E-11	1.12E-14	1.30E-13
Bi^{+3}	1.58E-21	2.75E-21	1.42E-13	7.69E-10	0.00E+00	0.00E+00	7.69E-10	3.50E-13	4.05E-12
Ca^{+2}	2.34E-19	7.83E-20	4.04E-12	9.78E-07	0.00E+00	0.00E+00	9.78E-07	4.44E-10	5.14E-09
Cd^{+2}	2.48E-21	2.33E-21	1.20E-13	4.12E-09	0.00E+00	0.00E+00	4.12E-09	1.87E-12	2.17E-11
Ce^{+3}	5.93E-20	6.93E-20	3.58E-12	9.09E-11	0.00E+00	0.00E+00	9.45E-11	4.29E-14	4.97E-13
Cl^-	3.57E-18	1.06E-18	5.46E-11	7.97E-14	0.00E+00	0.00E+00	5.47E-11	2.48E-14	2.88E-13
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.89E-07	4.70E+00	4.70E+00	2.13E-03	2.47E-02
CO_2	5.77E-17	2.12E-17	1.09E-09	0.00E+00	7.85E-04	1.49E+04	1.49E+04	6.76E+00	7.83E+01
CO_3^{-2}	1.42E-17	7.12E-18	3.68E-10	3.87E-10	0.00E+00	0.00E+00	7.54E-10	3.43E-13	3.97E-12
Cr^{+3}	4.26E-19	1.85E-19	9.54E-12	1.95E-07	0.00E+00	0.00E+00	1.95E-07	8.86E-11	1.03E-09
Cu^{+2}	2.45E-21	1.30E-21	6.72E-14	1.29E-10	0.00E+00	0.00E+00	1.29E-10	5.88E-14	6.81E-13
F^-	1.70E-18	2.69E-19	1.39E-11	1.22E-15	0.00E+00	0.00E+00	1.39E-11	6.31E-15	7.30E-14
Fe^{+3}	7.76E-20	3.62E-20	1.87E-12	2.59E-07	0.00E+00	0.00E+00	2.59E-07	1.18E-10	1.36E-09
H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.37E-03	4.94E+04	4.94E+04	2.25E+01	2.60E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	8.08E-30	6.80E-32	3.51E-24	0.00E+00	0.00E+00	0.00E+00	3.51E-24	1.60E-27	1.85E-26
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.44E-07	3.83E+00	3.83E+00	1.74E-03	2.02E-02
HCO3-	7.93E-41	4.04E-41	2.09E-33	3.16E-23	0.00E+00	0.00E+00	3.16E-23	1.44E-26	1.66E-25
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.22E-08	2.77E-01	2.77E-01	1.26E-04	1.46E-03
Hg^{+2}	5.14E-18	8.60E-18	4.44E-10	1.48E-02	0.00E+00	0.00E+00	1.48E-02	6.72E-06	7.77E-05
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	6.49E-18	2.12E-18	1.09E-10	1.76E-06	0.00E+00	0.00E+00	1.76E-06	8.02E-10	9.28E-09
La^{+3}	6.81E-22	7.89E-22	4.07E-14	9.94E-13	0.00E+00	0.00E+00	1.03E-12	4.70E-16	5.44E-15
Li^+	3.68E-19	2.13E-20	1.10E-12	5.34E-07	0.00E+00	0.00E+00	5.34E-07	2.43E-10	2.81E-09
Mg^{+2}	2.02E-20	4.10E-21	2.12E-13	8.21E-07	0.00E+00	0.00E+00	8.21E-07	3.73E-10	4.32E-09
Mn^{+3}	2.19E-20	1.01E-20	5.20E-13	3.67E-09	0.00E+00	0.00E+00	3.67E-09	1.67E-12	1.93E-11
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	8.70E-35	2.03E-35	1.05E-27	0.00E+00	2.35E-02	2.84E+05	2.84E+05	1.29E+02	1.49E+03
Na^+	1.95E-16	3.75E-17	1.94E-09	8.24E-06	0.00E+00	0.00E+00	8.24E-06	3.74E-09	4.33E-08
NH3	1.60E-14	2.28E-15	1.18E-07	0.00E+00	2.70E-06	1.98E+01	1.98E+01	8.99E-03	1.04E-01
NH4+	3.84E-18	2.28E-15	2.99E-11	1.44E-18	0.00E+00	0.00E+00	2.99E-11	1.36E-14	1.57E-13
Ni^{+2}	3.55E-20	1.74E-20	8.98E-13	1.25E-08	0.00E+00	0.00E+00	1.25E-08	5.69E-12	6.59E-11
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.73E-05	2.23E+02	2.23E+02	1.01E-01	1.17E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.58E-06	3.12E+01	3.12E+01	1.42E-02	1.64E-01
NO_2^-	3.82E-17	1.47E-17	7.58E-10	3.41E-15	0.00E+00	0.00E+00	7.58E-10	3.45E-13	3.99E-12
NO_3^-	6.99E-17	3.61E-17	1.87E-09	2.62E-15	0.00E+00	0.00E+00	1.87E-09	8.49E-13	9.82E-12
O_2	4.61E-37	1.23E-37	6.36E-30	0.00E+00	6.65E-03	9.17E+04	9.17E+04	4.17E+01	4.82E+02
O^-	0.00E+00	0.00E+00	0.00E+00	2.22E+00	0.00E+00	0.00E+00	2.22E+00	1.01E-03	1.17E-02
OH^-	3.88E-17	5.50E-18	2.84E-10	1.04E-14	0.00E+00	0.00E+00	2.84E-10	1.29E-13	1.49E-12
$OH(b)^-$	2.81E-16	3.99E-17	2.06E-09	0.00E+00	0.00E+00	0.00E+00	2.06E-09	9.38E-13	1.09E-11
Pb^{+2}	9.01E-21	1.56E-20	8.04E-13	4.02E-09	0.00E+00	0.00E+00	4.02E-09	1.83E-12	2.12E-11
Pd^{+2}	6.97E-22	6.19E-22	3.20E-14	1.19E-12	0.00E+00	0.00E+00	1.22E-12	5.56E-16	6.44E-15
PO_4^{-3}	7.19E-19	5.70E-19	2.94E-11	8.26E-07	0.00E+00	0.00E+00	8.26E-07	3.76E-10	4.35E-09
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	6.74E-22	5.79E-22	2.99E-14	1.21E-11	0.00E+00	0.00E+00	1.21E-11	5.52E-15	6.39E-14
Ru^{+3}	1.00E-21	8.45E-22	4.37E-14	3.41E-08	0.00E+00	0.00E+00	3.41E-08	1.55E-11	1.79E-10
S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.48E+00	0.00E+00	0.00E+00	1.48E+00	6.73E-04	7.79E-03
SiO2	1.36E-19	6.80E-20	3.51E-12	2.58E-06	0.00E+00	0.00E+00	2.58E-06	1.17E-09	1.36E-08
SiO_4^{-4}	1.04E-31	7.97E-32	4.12E-24	1.39E-21	0.00E+00	0.00E+00	1.39E-21	6.32E-25	7.31E-24
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-08	4.44E-01	4.44E-01	2.02E-04	2.34E-03
SO_4^{-2}	1.72E-18	1.38E-18	7.11E-11	1.33E-12	0.00E+00	0.00E+00	7.24E-11	3.29E-14	3.81E-13
Sr^{+2}	3.66E-22	2.67E-22	1.38E-14	1.05E-11	0.00E+00	0.00E+00	1.05E-11	4.79E-15	5.54E-14
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	1.12E-21	4.47E-22	2.31E-14	2.87E-10	0.00E+00	0.00E+00	2.87E-10	1.31E-13	1.51E-12
Zn^{+2}	4.18E-21	2.28E-21	1.18E-13	6.95E-07	0.00E+00	0.00E+00	6.95E-07	3.16E-10	3.65E-09
Zr^{+4}	3.09E-21	2.35E-21	1.21E-13	2.49E-07	0.00E+00	0.00E+00	2.49E-07	1.13E-10	1.31E-09

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	3.24E-20	2.38E-20	1.23E-12	6.07E-07	0.00E+00	0.00E+00	6.07E-07	2.76E-10	3.19E-09
$C_2O_4^{-2}$	3.24E-20	2.38E-20	1.23E-12	6.07E-07	0.00E+00	0.00E+00	6.07E-07	2.76E-10	3.19E-09
Formate	4.08E-27	1.53E-27	7.91E-20	2.40E-12	0.00E+00	0.00E+00	2.40E-12	1.09E-15	1.26E-14
Acetate	3.16E-27	1.56E-27	8.04E-20	2.44E-12	0.00E+00	0.00E+00	2.44E-12	1.11E-15	1.28E-14
Glycolate	2.10E-26	1.32E-26	6.80E-19	2.06E-11	0.00E+00	0.00E+00	2.06E-11	9.37E-15	1.08E-13
IDA	1.11E-26	1.24E-26	6.39E-19	1.94E-11	0.00E+00	0.00E+00	1.94E-11	8.81E-15	1.02E-13
Citrate	1.02E-27	1.63E-27	8.44E-20	2.56E-12	0.00E+00	0.00E+00	2.56E-12	1.16E-15	1.34E-14
HEDTA	9.54E-26	2.22E-25	1.14E-17	3.47E-10	0.00E+00	0.00E+00	3.47E-10	1.58E-13	1.82E-12
EDTA	1.15E-26	2.80E-26	1.44E-18	4.38E-11	0.00E+00	0.00E+00	4.38E-11	1.99E-14	2.30E-13

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	1.01E-16	1.98E-08	5.32E-11	2.24E-09	4.39E-01	1.30E-03	2.24E-09	4.39E-01	1.30E-03
^{241}Am	1.37E-20	2.67E-12	1.72E-15	1.32E-17	2.58E-09	1.66E-12	1.32E-17	2.58E-09	1.66E-12
^{243}Am	8.94E-24	1.75E-15	1.93E-17	8.58E-21	1.68E-12	1.85E-14	8.58E-21	1.68E-12	1.85E-14
^{14}C	5.58E-17	1.09E-08	5.39E-12	1.86E-09	3.64E-01	1.80E-04	1.86E-09	3.64E-01	1.80E-04
^{60}Co	1.83E-21	3.58E-13	6.98E-19	4.82E-18	9.41E-10	1.83E-15	4.82E-18	9.42E-10	1.84E-15
^{243}Cm	1.47E-24	2.88E-16	1.26E-20	6.01E-22	1.18E-13	5.13E-18	6.03E-22	1.18E-13	5.14E-18
^{244}Cm	3.49E-23	6.82E-15	1.86E-19	1.42E-20	2.77E-12	7.56E-17	1.42E-20	2.78E-12	7.58E-17
^{137}Cs	2.96E-21	5.78E-13	1.47E-17	2.12E-15	4.14E-07	1.05E-11	2.12E-15	4.14E-07	1.05E-11
^{152}Eu	1.03E-22	2.01E-14	2.55E-19	3.93E-20	7.69E-12	9.75E-17	3.94E-20	7.71E-12	9.78E-17
^{154}Eu	2.13E-20	4.17E-12	3.40E-17	8.14E-18	1.59E-09	1.30E-14	8.16E-18	1.59E-09	1.30E-14
^{155}Eu	6.17E-21	1.21E-12	5.47E-18	2.35E-18	4.60E-10	2.09E-15	2.36E-18	4.61E-10	2.09E-15
^{3}H	4.06E-17	7.93E-09	1.82E-15	3.82E-10	7.47E-02	1.71E-08	3.82E-10	7.47E-02	1.71E-08
^{129}I	1.55E-20	3.02E-12	3.77E-11	4.60E-13	8.99E-05	1.12E-03	4.60E-13	8.99E-05	1.12E-03
^{63}Ni	3.30E-20	6.46E-12	2.51E-16	1.56E-16	3.06E-08	1.19E-12	1.56E-16	3.06E-08	1.19E-12
^{237}Np	1.08E-23	2.11E-15	6.61E-15	4.14E-21	8.10E-13	2.53E-12	4.15E-21	8.12E-13	2.54E-12
^{238}Pu	6.12E-23	1.20E-14	1.54E-18	2.34E-20	4.58E-12	5.89E-16	2.35E-20	4.59E-12	5.91E-16
^{239}Pu	8.46E-22	1.65E-13	5.88E-15	3.23E-19	6.32E-11	2.24E-12	3.24E-19	6.33E-11	2.25E-12
^{240}Pu	2.19E-22	4.29E-14	4.16E-16	8.38E-20	1.64E-11	1.59E-13	8.40E-20	1.64E-11	1.59E-13
^{241}Pu	4.60E-21	9.00E-13	1.93E-17	1.76E-18	3.44E-10	7.36E-15	1.76E-18	3.45E-10	7.38E-15
^{242}Pu	2.32E-26	4.54E-18	2.54E-18	8.86E-24	1.73E-15	9.70E-16	8.89E-24	1.74E-15	9.73E-16
^{125}Sb	1.27E-20	2.49E-12	5.28E-18	1.21E-16	2.37E-08	5.03E-14	1.21E-16	2.37E-08	5.03E-14
^{151}Sm	1.79E-19	3.49E-11	2.93E-15	1.19E-18	2.34E-10	1.96E-14	1.37E-18	2.69E-10	2.25E-14
^{126}Sn	2.02E-22	3.96E-14	7.68E-15	7.71E-20	1.51E-11	2.93E-12	7.73E-20	1.51E-11	2.93E-12
^{90}Sr	4.44E-18	8.68E-10	1.39E-14	3.38E-15	6.61E-07	1.06E-11	3.39E-15	6.62E-07	1.06E-11
^{99}Tc	3.51E-20	6.87E-12	8.94E-13	8.81E-15	1.72E-06	2.24E-07	8.81E-15	1.72E-06	2.24E-07
^{232}Th	3.29E-25	6.42E-17	1.29E-12	1.50E-23	2.93E-15	5.87E-11	1.53E-23	3.00E-15	6.00E-11
^{233}U	1.10E-23	2.14E-15	4.90E-16	4.23E-21	8.27E-13	1.89E-13	4.24E-21	8.30E-13	1.90E-13
^{234}U	7.77E-24	1.52E-15	5.40E-16	2.96E-21	5.79E-13	2.06E-13	2.97E-21	5.81E-13	2.06E-13
^{235}U	3.06E-25	5.99E-17	6.11E-14	1.17E-22	2.28E-14	2.33E-11	1.17E-22	2.29E-14	2.33E-11
^{236}U	5.25E-25	1.03E-16	3.50E-15	2.00E-22	3.91E-14	1.33E-12	2.00E-22	3.92E-14	1.34E-12
^{238}U	6.07E-24	1.19E-15	7.79E-12	2.31E-21	4.52E-13	2.97E-09	2.32E-21	4.53E-13	2.97E-09

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	4.80E-07	3.61E-07	1.86E+01	8.47E-03	9.81E-02
50-32-8	4.97E-17	1.05E-16	5.41E-09	2.46E-12	2.85E-11
56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57-14-7	2.85E-11	1.43E-11	7.39E-04	3.36E-07	3.89E-06
58-90-2	1.58E-11	3.05E-11	1.58E-03	7.17E-07	8.30E-06
59-89-2	2.71E-17	2.63E-17	1.36E-09	6.17E-13	7.14E-12
60-35-5	2.21E-09	1.09E-09	5.64E-02	2.56E-05	2.97E-04
62-75-9	8.98E-10	5.55E-10	2.87E-02	1.30E-05	1.51E-04
64-19-7	1.89E-14	9.47E-15	4.89E-07	2.22E-10	2.57E-09
71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-05-8	5.33E-13	1.83E-13	9.44E-06	4.29E-09	4.96E-08
75-12-7	1.79E-08	6.71E-09	3.47E-01	1.58E-04	1.82E-03
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83-32-9	3.22E-18	4.15E-18	2.14E-10	9.74E-14	1.13E-12
84-66-2	1.12E-09	2.07E-09	1.07E-01	4.86E-05	5.62E-04
84-74-2	2.11E-17	4.91E-17	2.53E-09	1.15E-12	1.33E-11
87-68-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88-89-1	3.53E-09	6.75E-09	3.49E-01	1.58E-04	1.83E-03
91-20-3	1.99E-18	2.12E-18	1.10E-10	4.99E-14	5.77E-13
95-50-1	1.47E-20	1.80E-20	9.31E-13	4.23E-16	4.90E-15
98-86-2	1.43E-11	1.44E-11	7.42E-04	3.37E-07	3.90E-06
100-21-0	6.87E-16	9.53E-16	4.92E-08	2.24E-11	2.59E-10
101-84-8	3.23E-19	4.59E-19	2.37E-11	1.08E-14	1.25E-13
106-93-4	2.84E-19	4.45E-19	2.30E-11	1.05E-14	1.21E-13
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-95-2	4.19E-09	3.29E-09	1.70E-01	7.72E-05	8.93E-04
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	2.05E-19	3.04E-19	1.57E-11	7.14E-15	8.27E-14
120-82-1	6.20E-21	9.39E-21	4.85E-13	2.20E-16	2.55E-15
122-39-4	5.47E-18	7.72E-18	3.99E-10	1.81E-13	2.10E-12
126-73-8	1.50E-09	3.32E-09	1.72E-01	7.81E-05	9.03E-04
127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129-00-0	3.62E-18	6.11E-18	3.16E-10	1.44E-13	1.66E-12
132-64-9	1.39E-15	1.95E-15	1.01E-07	4.57E-11	5.29E-10
144-62-7	4.49E-07	3.37E-07	1.74E+01	7.91E-03	9.16E-02
193-39-5	2.01E-21	4.63E-21	2.39E-13	1.09E-16	1.26E-15
206-44-0	1.27E-17	2.15E-17	1.11E-09	5.05E-13	5.85E-12
208-96-8	1.88E-14	2.39E-14	1.23E-06	5.60E-10	6.48E-09
603-34-9	4.09E-11	8.38E-11	4.33E-03	1.97E-06	2.28E-05
621-64-7	2.13E-17	2.32E-17	1.20E-09	5.44E-13	6.29E-12
1321-64-8	1.86E-18	4.66E-18	2.41E-10	1.09E-13	1.27E-12
1336-36-3	5.03E-23	1.35E-22	6.98E-15	3.17E-18	3.67E-17
3697-24-3	1.14E-17	2.31E-17	1.19E-09	5.43E-13	6.28E-12
4170-30-3	7.14E-12	4.18E-12	2.16E-04	9.81E-08	1.14E-06
10061-01-5	3.48E-23	3.22E-23	1.66E-15	7.56E-19	8.75E-18
26140-60-3	7.55E-18	1.45E-17	7.49E-10	3.41E-13	3.94E-12

Stream Number: HOP31
Stream Name: Stack extraction fan discharge to stack
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties			
Variable	Value	Units	
Density	7.88E-04	g/cm^3	(does not include solid phase)
Enthalpy	-3.70E+06	BTU/hr	
Mass Flow	1.19E+04	Lb/hr	
	2.85E+05	Lb/day	
Volumetric Flow	3.01E+04	GPM	(does not include solid phase)
	4.02E+03	ft^3/min	(does not include solid phase)
Molar Flow	4.26E+02	Lbmol/hr	
Molecular Weight	2.79E+01	Lb/Lbmol	
Pressure	9.86E+02	mbar	
Temperature	1.46E+02	C	
Na Molarity	0.00E+00	mol/L	
pH	-3.18E+00	pH	
Total TRU	1.45E-17	Ci/L	
Total Activity	5.58E-09	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	6.89E-14	1.83E-14	5.57E-07	2.99E+00	2.83E-02	2.85E+05	2.85E+05	1.29E+02	1.50E+03
Ag^{+}	2.97E-24	2.67E-24	1.16E-16	6.73E-11	0.00E+00	0.00E+00	6.73E-11	3.06E-14	3.54E-13
Al^{+3}	3.99E-20	8.98E-21	3.89E-13	8.09E-10	0.00E+00	0.00E+00	8.10E-10	3.68E-13	4.26E-12
As^{+3}	1.45E-23	9.09E-24	3.93E-16	7.39E-12	0.00E+00	0.00E+00	7.39E-12	3.36E-15	3.89E-14
B^{+3}	2.23E-20	2.01E-21	8.72E-14	1.90E-09	0.00E+00	0.00E+00	1.90E-09	8.65E-13	1.00E-11
Ba^{+2}	3.03E-24	3.47E-24	1.50E-16	6.29E-12	0.00E+00	0.00E+00	6.29E-12	2.86E-15	3.31E-14
Bi^{+3}	3.21E-24	5.59E-24	2.42E-16	1.88E-10	0.00E+00	0.00E+00	1.88E-10	8.53E-14	9.87E-13
Ca^{+2}	2.17E-22	7.27E-23	3.14E-15	6.76E-11	0.00E+00	0.00E+00	6.76E-11	3.07E-14	3.55E-13
Cd^{+2}	4.59E-24	4.31E-24	1.86E-16	4.64E-10	0.00E+00	0.00E+00	4.64E-10	2.11E-13	2.44E-12
Ce^{+3}	4.93E-20	5.77E-20	2.50E-12	8.33E-14	0.00E+00	0.00E+00	2.58E-12	1.17E-15	1.36E-14
Cl^{-}	1.09E-19	3.23E-20	1.40E-12	3.92E-14	0.00E+00	0.00E+00	1.44E-12	6.54E-16	7.56E-15
CO	6.50E-112	1.52E-112	6.57E-105	0.00E+00	2.79E-08	2.82E-01	2.82E-01	1.28E-04	1.49E-03
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.63E-05	8.95E+02	8.95E+02	4.07E-01	4.71E+00
CO_3^{-2}	5.87E-21	2.94E-21	1.27E-13	2.23E-12	0.00E+00	0.00E+00	2.36E-12	1.07E-15	1.24E-14
Cr^{+3}	1.93E-20	8.37E-21	3.62E-13	1.47E-10	0.00E+00	0.00E+00	1.48E-10	6.71E-14	7.76E-13
Cu^{+2}	5.02E-24	2.66E-24	1.15E-16	4.68E-12	0.00E+00	0.00E+00	4.68E-12	2.13E-15	2.46E-14
F^{-}	4.29E-21	6.80E-22	2.94E-14	7.92E-13	0.00E+00	0.00E+00	8.21E-13	3.73E-16	4.32E-15
Fe^{+3}	6.40E-20	2.98E-20	1.29E-12	6.17E-10	0.00E+00	0.00E+00	6.18E-10	2.81E-13	3.25E-12
H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E-03	1.75E+04	1.75E+04	7.96E+00	9.21E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	1.93E-21	1.62E-23	7.02E-16	0.00E+00	0.00E+00	0.00E+00	7.02E-16	3.19E-19	3.69E-18
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.75E-10	4.94E-03	4.94E-03	2.25E-06	2.60E-05
HCO3-	5.53E-22	2.82E-22	1.22E-14	4.03E-29	0.00E+00	0.00E+00	1.22E-14	5.54E-18	6.41E-17
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.85E-10	4.23E-03	4.23E-03	1.92E-06	2.22E-05
Hg^{+2}	1.05E-19	1.76E-19	7.61E-12	2.03E-03	0.00E+00	0.00E+00	2.03E-03	9.20E-07	1.07E-05
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	1.36E-20	4.45E-21	1.92E-13	7.17E-10	0.00E+00	0.00E+00	7.17E-10	3.26E-13	3.77E-12
La^{+3}	3.03E-25	3.51E-25	1.52E-17	1.09E-13	0.00E+00	0.00E+00	1.09E-13	4.94E-17	5.72E-16
Li^{+}	2.47E-22	1.43E-23	6.20E-16	8.36E-10	0.00E+00	0.00E+00	8.36E-10	3.80E-13	4.40E-12
Mg^{+2}	4.60E-23	9.32E-24	4.03E-16	2.17E-11	0.00E+00	0.00E+00	2.17E-11	9.88E-15	1.14E-13
Mn^{+3}	4.99E-23	2.29E-23	9.89E-16	1.18E-10	0.00E+00	0.00E+00	1.18E-10	5.35E-14	6.19E-13
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	2.33E-14	5.45E-15	2.36E-07	0.00E+00	2.01E-02	2.03E+05	2.03E+05	9.24E+01	1.07E+03
Na^{+}	1.56E-17	3.00E-18	1.30E-10	8.08E-09	0.00E+00	0.00E+00	8.20E-09	3.73E-12	4.32E-11
NH3	3.80E-14	5.40E-15	2.34E-07	0.00E+00	2.83E-07	1.74E+00	1.74E+00	7.91E-04	9.15E-03
NH4+	1.52E-20	5.40E-15	9.93E-14	1.54E-23	0.00E+00	0.00E+00	9.93E-14	4.51E-17	5.22E-16
Ni^{+2}	8.72E-21	4.27E-21	1.85E-13	1.13E-10	0.00E+00	0.00E+00	1.13E-10	5.13E-14	5.93E-13
NO	4.09E-37	1.03E-37	4.44E-30	0.00E+00	1.83E-06	1.98E+01	1.98E+01	9.00E-03	1.04E-01
NO_2	5.77E-50	2.22E-50	9.59E-43	0.00E+00	1.71E-07	2.84E+00	2.84E+00	1.29E-03	1.49E-02
NO_2^{-}	8.66E-20	3.33E-20	1.44E-12	2.21E-12	0.00E+00	0.00E+00	3.65E-12	1.66E-15	1.92E-14
NO_3^{-}	1.16E-17	6.00E-18	2.60E-10	1.70E-12	0.00E+00	0.00E+00	2.61E-10	1.19E-13	1.37E-12
O_2	7.52E-15	2.01E-15	8.69E-08	0.00E+00	5.43E-03	6.28E+04	6.28E+04	2.85E+01	3.30E+02
O^{-}	0.00E+00	0.00E+00	0.00E+00	1.79E+00	0.00E+00	0.00E+00	1.79E+00	8.15E-04	9.43E-03
OH^{-}	6.63E-18	9.42E-19	4.07E-11	3.49E-11	0.00E+00	0.00E+00	7.56E-11	3.44E-14	3.98E-13
$OH(b)^{-}$	8.84E-20	1.25E-20	5.43E-13	2.20E-33	0.00E+00	0.00E+00	5.43E-13	2.47E-16	2.85E-15
Pb^{+2}	1.83E-23	3.17E-23	1.37E-15	2.10E-10	0.00E+00	0.00E+00	2.10E-10	9.56E-14	1.11E-12
Pd^{+2}	3.02E-25	2.68E-25	1.16E-17	6.89E-15	0.00E+00	0.00E+00	6.90E-15	3.14E-18	3.63E-17
PO_4^{-3}	1.63E-21	1.29E-21	5.60E-14	4.97E-10	0.00E+00	0.00E+00	4.97E-10	2.26E-13	2.61E-12
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	2.74E-25	2.36E-25	1.02E-17	3.19E-14	0.00E+00	0.00E+00	3.19E-14	1.45E-17	1.68E-16
Ru^{+3}	2.26E-24	1.91E-24	8.27E-17	6.68E-10	0.00E+00	0.00E+00	6.68E-10	3.04E-13	3.52E-12
S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.20E+00	0.00E+00	0.00E+00	1.20E+00	5.43E-04	6.29E-03
SiO2	3.08E-22	1.55E-22	6.69E-15	4.68E-09	0.00E+00	0.00E+00	4.68E-09	2.13E-12	2.46E-11
SiO_4^{-4}	2.36E-34	1.81E-34	7.84E-27	1.55E-18	0.00E+00	0.00E+00	1.55E-18	7.03E-22	8.14E-21
SO_2	6.22E-53	3.32E-53	1.44E-45	0.00E+00	5.16E-07	1.19E+01	1.19E+01	5.43E-03	6.28E-02
SO_4^{-2}	3.89E-21	3.12E-21	1.35E-13	5.10E-13	0.00E+00	0.00E+00	6.45E-13	2.93E-16	3.39E-15
Sr^{+2}	1.02E-24	7.47E-25	3.23E-17	2.30E-12	0.00E+00	0.00E+00	2.30E-12	1.05E-15	1.21E-14
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	4.58E-25	1.83E-25	7.91E-18	6.27E-15	0.00E+00	0.00E+00	6.28E-15	2.85E-18	3.30E-17
Zn^{+2}	9.51E-24	5.19E-24	2.24E-16	3.89E-10	0.00E+00	0.00E+00	3.89E-10	1.77E-13	2.05E-12
Zr^{+4}	7.01E-24	5.34E-24	2.31E-16	1.44E-10	0.00E+00	0.00E+00	1.44E-10	6.54E-14	7.57E-13

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	2.05E-17	1.51E-17	6.53E-10	6.66E-04	0.00E+00	0.00E+00	6.66E-04	3.03E-07	3.50E-06
$C_2O_4^{-2}$	2.05E-17	1.51E-17	6.53E-10	6.65E-04	0.00E+00	0.00E+00	6.65E-04	3.02E-07	3.50E-06
Formate	1.31E-27	4.94E-28	2.14E-20	4.58E-09	0.00E+00	0.00E+00	4.58E-09	2.08E-12	2.41E-11
Acetate	1.02E-27	5.02E-28	2.17E-20	4.66E-09	0.00E+00	0.00E+00	4.66E-09	2.12E-12	2.45E-11
Glycolate	6.78E-27	4.25E-27	1.84E-19	2.29E-09	0.00E+00	0.00E+00	2.29E-09	1.04E-12	1.20E-11
IDA	6.35E-26	7.06E-26	3.05E-18	1.17E-07	0.00E+00	0.00E+00	1.17E-07	5.31E-11	6.15E-10
Citrate	2.90E-28	4.65E-28	2.01E-20	5.02E-09	0.00E+00	0.00E+00	5.02E-09	2.28E-12	2.64E-11
HEDTA	1.36E-27	3.16E-27	1.37E-19	4.11E-09	0.00E+00	0.00E+00	4.11E-09	1.87E-12	2.16E-11
EDTA	1.63E-28	3.98E-28	1.72E-20	4.42E-09	0.00E+00	0.00E+00	4.42E-09	2.01E-12	2.32E-11

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	2.20E-16	3.60E-08	1.70E-12	5.58E-09	9.15E-01	6.87E-05	5.58E-09	9.15E-01	6.87E-05
^{241}Am	3.09E-23	5.06E-15	3.26E-18	1.15E-17	1.88E-09	1.21E-12	1.15E-17	1.88E-09	1.21E-12
^{243}Am	2.02E-26	3.31E-18	3.65E-20	9.33E-22	1.53E-13	1.69E-15	9.33E-22	1.53E-13	1.69E-15
^{14}C	1.14E-17	1.87E-09	9.23E-13	4.28E-10	7.01E-02	3.46E-05	4.28E-10	7.01E-02	3.46E-05
^{60}Co	3.75E-24	6.14E-16	1.20E-21	6.31E-18	1.03E-09	2.01E-15	6.31E-18	1.03E-09	2.01E-15
^{243}Cm	3.35E-27	5.48E-19	2.39E-23	1.30E-20	2.12E-12	9.26E-17	1.30E-20	2.12E-12	9.26E-17
^{244}Cm	7.92E-26	1.30E-17	3.54E-22	2.95E-19	4.83E-11	1.32E-15	2.95E-19	4.83E-11	1.32E-15
^{137}Cs	8.17E-18	1.34E-09	3.40E-14	2.16E-14	3.54E-06	8.99E-11	2.16E-14	3.54E-06	9.00E-11
^{152}Eu	2.33E-25	3.81E-17	4.83E-22	4.93E-20	8.08E-12	1.03E-16	4.93E-20	8.08E-12	1.03E-16
^{154}Eu	4.82E-23	7.89E-15	6.44E-20	5.35E-18	8.76E-10	7.15E-15	5.35E-18	8.76E-10	7.15E-15
^{155}Eu	1.39E-23	2.28E-15	1.04E-20	7.93E-19	1.30E-10	5.90E-16	7.93E-19	1.30E-10	5.90E-16
^{3}H	2.00E-16	3.28E-08	7.52E-15	5.16E-09	8.45E-01	1.94E-07	5.16E-09	8.45E-01	1.94E-07
^{129}I	3.50E-22	5.73E-14	7.16E-13	1.66E-14	2.72E-06	3.39E-05	1.66E-14	2.72E-06	3.39E-05
^{63}Ni	7.47E-23	1.22E-14	4.75E-19	5.69E-19	9.32E-11	3.62E-15	5.69E-19	9.32E-11	3.62E-15
^{237}Np	2.46E-26	4.02E-18	1.26E-17	7.59E-21	1.24E-12	3.89E-12	7.59E-21	1.24E-12	3.89E-12
^{238}Pu	1.38E-25	2.27E-17	2.92E-21	3.60E-20	5.90E-12	7.60E-16	3.60E-20	5.90E-12	7.60E-16
^{239}Pu	1.91E-24	3.13E-16	1.11E-17	3.19E-19	5.23E-11	1.86E-12	3.19E-19	5.23E-11	1.86E-12
^{240}Pu	4.96E-25	8.12E-17	7.89E-19	8.43E-20	1.38E-11	1.34E-13	8.43E-20	1.38E-11	1.34E-13
^{241}Pu	1.04E-23	1.70E-15	3.65E-20	2.26E-18	3.70E-10	7.93E-15	2.26E-18	3.70E-10	7.93E-15
^{242}Pu	5.25E-29	8.60E-21	4.81E-21	7.76E-24	1.27E-15	7.12E-16	7.76E-24	1.27E-15	7.12E-16
^{125}Sb	2.88E-23	4.72E-15	1.00E-20	2.33E-17	3.82E-09	8.11E-15	2.33E-17	3.82E-09	8.11E-15
^{151}Sm	7.73E-23	1.27E-14	1.06E-18	2.64E-19	4.32E-11	3.62E-15	2.64E-19	4.32E-11	3.62E-15
^{126}Sn	4.58E-25	7.50E-17	1.46E-17	9.30E-21	1.52E-12	2.96E-13	9.30E-21	1.52E-12	2.96E-13
^{90}Sr	1.20E-20	1.97E-12	3.14E-17	7.34E-16	1.20E-07	1.92E-12	7.34E-16	1.20E-07	1.92E-12
^{99}Tc	7.99E-23	1.31E-14	1.70E-15	3.10E-16	5.07E-08	6.59E-09	3.10E-16	5.07E-08	6.59E-09
^{232}Th	1.43E-28	2.34E-20	4.69E-16	2.77E-24	4.53E-16	9.08E-12	2.77E-24	4.53E-16	9.08E-12
^{233}U	2.49E-26	4.08E-18	9.32E-19	2.06E-20	3.37E-12	7.70E-13	2.06E-20	3.37E-12	7.70E-13
^{234}U	1.77E-26	2.89E-18	1.03E-18	1.07E-21	1.76E-13	6.23E-14	1.07E-21	1.76E-13	6.23E-14
^{235}U	6.96E-28	1.14E-19	1.16E-16	2.58E-23	4.22E-15	4.31E-12	2.58E-23	4.22E-15	4.31E-12
^{236}U	1.19E-27	1.95E-19	6.65E-18	3.55E-23	5.81E-15	1.98E-13	3.55E-23	5.81E-15	1.98E-13
^{238}U	1.38E-26	2.26E-18	1.48E-14	6.07E-22	9.94E-14	6.52E-10	6.07E-22	9.94E-14	6.52E-10

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	3.42E-08	2.57E-08	1.11E+00	5.05E-04	5.85E-03
50-32-8	6.53E-20	1.38E-19	5.95E-12	2.70E-15	3.13E-14
56-23-5	9.73E-28	1.25E-27	5.41E-20	2.46E-23	2.84E-22
57-14-7	1.26E-11	6.34E-12	2.74E-04	1.25E-07	1.44E-06
58-90-2	6.20E-12	1.20E-11	5.19E-04	2.36E-07	2.73E-06
59-89-2	5.58E-17	5.41E-17	2.34E-09	1.06E-12	1.23E-11
60-35-5	1.61E-10	7.94E-11	3.44E-03	1.56E-06	1.81E-05
62-75-9	2.11E-10	1.30E-10	5.64E-03	2.56E-06	2.97E-05
64-19-7	3.90E-14	1.95E-14	8.45E-07	3.84E-10	4.44E-09
71-43-2	3.81E-21	2.48E-21	1.08E-13	4.89E-17	5.66E-16
75-05-8	3.78E-13	1.29E-13	5.60E-06	2.55E-09	2.95E-08
75-12-7	1.26E-09	4.74E-10	2.05E-02	9.33E-06	1.08E-04
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	3.27E-22	3.58E-22	1.55E-14	7.05E-18	8.15E-17
83-32-9	4.16E-17	5.36E-17	2.32E-09	1.05E-12	1.22E-11
84-66-2	1.86E-10	3.46E-10	1.50E-02	6.80E-06	7.87E-05
84-74-2	7.53E-20	1.75E-19	7.57E-12	3.44E-15	3.98E-14
87-68-3	1.26E-22	2.75E-22	1.19E-14	5.40E-18	6.25E-17
88-89-1	2.49E-10	4.75E-10	2.06E-02	9.35E-06	1.08E-04
91-20-3	2.62E-17	2.80E-17	1.21E-09	5.50E-13	6.37E-12
95-50-1	2.91E-18	3.57E-18	1.54E-10	7.02E-14	8.13E-13
98-86-2	5.93E-12	5.96E-12	2.58E-04	1.17E-07	1.36E-06
100-21-0	5.01E-20	6.94E-20	3.00E-12	1.37E-15	1.58E-14
101-84-8	6.29E-18	8.94E-18	3.87E-10	1.76E-13	2.03E-12
106-93-4	9.02E-18	1.41E-17	6.12E-10	2.78E-13	3.22E-12
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	1.33E-21	1.02E-21	4.43E-14	2.02E-17	2.33E-16
108-95-2	5.48E-10	4.31E-10	1.86E-02	8.47E-06	9.80E-05
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	3.76E-21	5.59E-21	2.42E-13	1.10E-16	1.27E-15
120-82-1	1.51E-18	2.29E-18	9.89E-11	4.50E-14	5.20E-13
122-39-4	2.76E-20	3.89E-20	1.68E-12	7.66E-16	8.86E-15
126-73-8	8.55E-14	1.90E-13	8.22E-06	3.74E-09	4.33E-08
127-18-4	5.60E-26	7.75E-26	3.35E-18	1.52E-21	1.76E-20
129-00-0	3.14E-20	5.31E-20	2.30E-12	1.04E-15	1.21E-14
132-64-9	5.45E-15	7.66E-15	3.31E-07	1.51E-10	1.74E-09
144-62-7	3.16E-08	2.37E-08	1.03E+00	4.67E-04	5.40E-03
193-39-5	4.84E-23	1.12E-22	4.83E-15	2.20E-18	2.54E-17
206-44-0	3.20E-17	5.39E-17	2.33E-09	1.06E-12	1.23E-11
208-96-8	3.43E-14	4.36E-14	1.89E-06	8.57E-10	9.92E-09
603-34-9	1.52E-14	3.10E-14	1.34E-06	6.11E-10	7.07E-09
621-64-7	4.96E-17	5.39E-17	2.33E-09	1.06E-12	1.23E-11
1321-64-8	2.14E-17	5.37E-17	2.32E-09	1.06E-12	1.22E-11
1336-36-3	7.73E-24	2.08E-23	8.99E-16	4.09E-19	4.73E-18
3697-24-3	2.67E-17	5.40E-17	2.34E-09	1.06E-12	1.23E-11
4170-30-3	2.90E-12	1.69E-12	7.33E-05	3.33E-08	3.86E-07
10061-01-5	7.07E-20	6.55E-20	2.83E-12	1.29E-15	1.49E-14
26140-60-3	2.80E-17	5.39E-17	2.33E-09	1.06E-12	1.23E-11

Stream Number: PJV34
Stream Name: Pulse vent HEPA discharge offgas
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	9.73E-04	g/cm^3	(does not include solid phase)
Enthalpy	-6.84E+05	BTU/hr	
Mass Flow	2.11E+04	Lb/hr	
	5.06E+05	Lb/day	
Volumetric Flow	4.33E+04	GPM	(does not include solid phase)
	5.79E+03	ft^3/min	(does not include solid phase)
Molar Flow	7.34E+02	Lbmol/hr	
Molecular Weight	2.87E+01	Lb/Lbmol	
Pressure	8.56E+02	mbar	
Temperature	3.10E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	1.44E+01	pH	
Total TRU	2.50E-19	Ci/L	
Total Activity	2.39E-15	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	2.76E-09	4.15E-10	2.59E-02	3.44E-06	3.38E-02	5.06E+05	5.06E+05	2.30E+02	2.66E+03
Ag^+	1.30E-28	1.17E-28	7.31E-21	3.84E-13	0.00E+00	0.00E+00	3.84E-13	1.74E-16	2.02E-15
Al^{+3}	1.57E-24	3.54E-25	2.21E-17	2.00E-11	0.00E+00	0.00E+00	2.00E-11	9.09E-15	1.05E-13
As^{+3}	5.73E-28	3.59E-28	2.24E-20	4.03E-14	0.00E+00	0.00E+00	4.03E-14	1.83E-17	2.12E-16
B^{+3}	8.81E-25	7.95E-26	4.95E-18	3.55E-11	0.00E+00	0.00E+00	3.55E-11	1.61E-14	1.87E-13
Ba^{+2}	1.20E-28	1.37E-28	8.54E-21	1.02E-13	0.00E+00	0.00E+00	1.02E-13	4.64E-17	5.37E-16
Bi^{+3}	1.41E-28	2.45E-28	1.53E-20	9.25E-13	0.00E+00	0.00E+00	9.25E-13	4.20E-16	4.87E-15
Ca^{+2}	2.87E-20	9.58E-21	5.97E-13	2.42E-13	0.00E+00	0.00E+00	8.39E-13	3.81E-16	4.41E-15
Cd^{+2}	2.22E-28	2.08E-28	1.30E-20	4.15E-12	0.00E+00	0.00E+00	4.15E-12	1.89E-15	2.18E-14
Ce^{+3}	3.20E-19	3.74E-19	2.33E-11	7.29E-14	0.00E+00	0.00E+00	2.34E-11	1.06E-14	1.23E-13
Cl^-	3.92E-19	1.16E-19	7.23E-12	1.87E-20	0.00E+00	0.00E+00	7.23E-12	3.28E-15	3.80E-14
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	6.61E-18	2.43E-18	1.51E-10	0.00E+00	4.48E-15	1.03E-07	1.03E-07	4.67E-11	5.41E-10
CO_3^{-2}	1.92E-21	9.59E-22	5.98E-14	6.91E-16	0.00E+00	0.00E+00	6.05E-14	2.75E-17	3.18E-16
Cr^{+3}	2.28E-20	9.88E-21	6.16E-13	3.69E-13	0.00E+00	0.00E+00	9.85E-13	4.48E-16	5.18E-15
Cu^{+2}	2.20E-28	1.17E-28	7.27E-21	2.57E-14	0.00E+00	0.00E+00	2.57E-14	1.17E-17	1.35E-16
F^-	4.57E-18	7.24E-19	4.52E-11	3.39E-19	0.00E+00	0.00E+00	4.52E-11	2.05E-14	2.38E-13
Fe^{+3}	7.92E-20	3.69E-20	2.30E-12	1.52E-11	0.00E+00	0.00E+00	1.75E-11	7.96E-15	9.21E-14
H_2O	2.76E-09	4.15E-10	2.59E-02	0.00E+00	3.28E-04	3.07E+03	3.07E+03	1.40E+00	1.62E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	3.77E-15	3.17E-17	1.98E-09	0.00E+00	0.00E+00	0.00E+00	1.98E-09	8.99E-13	1.04E-11
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	9.97E-20	5.08E-20	3.17E-12	3.84E-34	0.00E+00	0.00E+00	3.17E-12	1.44E-15	1.67E-14
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	3.44E-06	0.00E+00	0.00E+00	3.44E-06	1.56E-09	1.81E-08
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	2.51E-19	8.19E-20	5.10E-12	1.23E-28	0.00E+00	0.00E+00	5.10E-12	2.32E-15	2.69E-14
La^{+3}	6.15E-29	7.13E-29	4.45E-21	3.81E-13	0.00E+00	0.00E+00	3.81E-13	1.73E-16	2.01E-15
Li^+	6.08E-19	3.52E-20	2.19E-12	2.25E-12	0.00E+00	0.00E+00	4.44E-12	2.02E-15	2.34E-14
Mg^{+2}	1.81E-27	3.68E-28	2.29E-20	2.46E-13	0.00E+00	0.00E+00	2.46E-13	1.12E-16	1.29E-15
Mn^{+3}	1.97E-27	9.02E-28	5.62E-20	1.99E-12	0.00E+00	0.00E+00	1.99E-12	9.05E-16	1.05E-14
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-02	3.86E+05	3.86E+05	1.75E+02	2.03E+03
Na^+	2.42E-17	4.65E-18	2.90E-10	3.65E-17	0.00E+00	0.00E+00	2.90E-10	1.32E-13	1.53E-12
NH3	7.60E-16	1.08E-16	6.74E-09	0.00E+00	0.00E+00	0.00E+00	6.74E-09	3.06E-12	3.54E-11
NH4+	6.65E-19	1.08E-16	6.24E-12	0.00E+00	0.00E+00	0.00E+00	6.24E-12	2.84E-15	3.28E-14
Ni^{+2}	1.07E-20	5.25E-21	3.28E-13	7.52E-13	0.00E+00	0.00E+00	1.08E-12	4.91E-16	5.68E-15
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	3.42E-24	1.31E-24	8.18E-17	1.06E-16	0.00E+00	0.00E+00	1.88E-16	8.53E-20	9.87E-19
NO_3^-	1.38E-17	7.14E-18	4.45E-10	8.16E-17	0.00E+00	0.00E+00	4.45E-10	2.02E-13	2.34E-12
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.04E-03	1.17E+05	1.17E+05	5.33E+01	6.17E+02
O^-	0.00E+00	0.00E+00	0.00E+00	1.39E-10	0.00E+00	0.00E+00	1.39E-10	6.31E-14	7.30E-13
OH^-	8.25E-18	1.17E-18	7.30E-11	1.98E-15	0.00E+00	0.00E+00	7.30E-11	3.32E-14	3.84E-13
$OH(b)^-$	3.48E-24	4.95E-25	3.08E-17	1.88E-39	0.00E+00	0.00E+00	3.08E-17	1.40E-20	1.62E-19
Pb^{+2}	8.05E-28	1.39E-27	8.67E-20	1.10E-12	0.00E+00	0.00E+00	1.10E-12	5.00E-16	5.79E-15
Pd^{+2}	6.27E-29	5.57E-29	3.47E-21	1.80E-14	0.00E+00	0.00E+00	1.80E-14	8.17E-18	9.45E-17
PO_4^{-3}	6.44E-26	5.10E-26	3.18E-18	1.02E-11	0.00E+00	0.00E+00	1.02E-11	4.64E-15	5.37E-14
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	6.07E-29	5.21E-29	3.25E-21	3.18E-14	0.00E+00	0.00E+00	3.18E-14	1.44E-17	1.67E-16
Ru^{+3}	8.93E-29	7.53E-29	4.70E-21	2.73E-12	0.00E+00	0.00E+00	2.73E-12	1.24E-15	1.44E-14
S^{+6}	0.00E+00	0.00E+00	0.00E+00	5.38E-35	0.00E+00	0.00E+00	5.38E-35	2.45E-38	2.83E-37
SiO2	1.22E-26	6.10E-27	3.80E-19	8.61E-11	0.00E+00	0.00E+00	8.61E-11	3.91E-14	4.53E-13
SiO_4^{-4}	9.29E-39	7.14E-39	4.45E-31	6.58E-18	0.00E+00	0.00E+00	6.58E-18	2.99E-21	3.46E-20
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	1.54E-25	1.23E-25	7.67E-18	9.63E-19	0.00E+00	0.00E+00	8.64E-18	3.93E-21	4.54E-20
Sr^{+2}	7.90E-22	5.78E-22	3.60E-14	2.08E-14	0.00E+00	0.00E+00	5.68E-14	2.58E-17	2.99E-16
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	1.01E-28	4.04E-29	2.52E-21	5.20E-15	0.00E+00	0.00E+00	5.20E-15	2.36E-18	2.73E-17
Zn^{+2}	3.75E-28	2.05E-28	1.28E-20	4.83E-12	0.00E+00	0.00E+00	4.83E-12	2.19E-15	2.54E-14
Zr^{+4}	2.77E-28	2.11E-28	1.31E-20	2.42E-12	0.00E+00	0.00E+00	2.42E-12	1.10E-15	1.27E-14

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	8.10E-26	5.95E-26	3.71E-18	1.51E-09	0.00E+00	0.00E+00	1.51E-09	6.85E-13	7.93E-12
$C_2O_4^{-2}$	8.10E-26	5.95E-26	3.71E-18	1.51E-09	0.00E+00	0.00E+00	1.51E-09	6.85E-13	7.93E-12
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	9.45E-32	0.00E+00	0.00E+00	9.45E-32	4.29E-35	4.97E-34
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	2.58E-32	0.00E+00	0.00E+00	2.58E-32	1.17E-35	1.36E-34
HEDTA	0.00E+00	0.00E+00	0.00E+00	3.44E-32	0.00E+00	0.00E+00	3.44E-32	1.56E-35	1.81E-34
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	7.97E-18	1.88E-09	3.00E-14	2.38E-15	5.61E-07	2.21E-09	2.39E-15	5.63E-07	2.21E-09
^{241}Am	1.22E-27	2.88E-19	1.85E-22	1.98E-19	4.67E-11	3.00E-14	1.98E-19	4.67E-11	3.00E-14
^{243}Am	7.96E-31	1.88E-22	2.08E-24	1.61E-23	3.79E-15	4.18E-17	1.61E-23	3.79E-15	4.18E-17
^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{60}Co	1.64E-28	3.88E-20	7.56E-26	1.77E-20	4.17E-12	8.13E-18	1.77E-20	4.17E-12	8.13E-18
^{243}Cm	1.32E-31	3.12E-23	1.36E-27	2.23E-22	5.26E-14	2.29E-18	2.23E-22	5.26E-14	2.29E-18
^{244}Cm	3.13E-30	7.38E-22	2.01E-26	5.06E-21	1.20E-12	3.26E-17	5.06E-21	1.20E-12	3.26E-17
^{137}Cs	3.58E-22	8.46E-14	2.15E-18	6.84E-17	1.61E-08	4.10E-13	6.84E-17	1.61E-08	4.10E-13
^{152}Eu	9.17E-30	2.16E-21	2.75E-26	8.48E-22	2.00E-13	2.54E-18	8.48E-22	2.00E-13	2.54E-18
^{154}Eu	1.90E-27	4.49E-19	3.66E-24	9.19E-20	2.17E-11	1.77E-16	9.19E-20	2.17E-11	1.77E-16
^{155}Eu	5.50E-28	1.30E-19	5.89E-25	1.36E-20	3.22E-12	1.46E-17	1.36E-20	3.22E-12	1.46E-17
^{3}H	1.98E-23	4.68E-15	1.07E-21	2.30E-15	5.43E-07	1.25E-13	2.30E-15	5.43E-07	1.25E-13
^{129}I	0.00E+00	0.00E+00	0.00E+00	7.27E-19	1.72E-10	2.14E-09	7.27E-19	1.72E-10	2.14E-09
^{63}Ni	2.94E-27	6.95E-19	2.70E-23	2.64E-21	6.23E-13	2.42E-17	2.64E-21	6.23E-13	2.42E-17
^{237}Np	9.69E-31	2.29E-22	7.15E-22	1.31E-22	3.08E-14	9.63E-14	1.31E-22	3.08E-14	9.63E-14
^{238}Pu	5.45E-30	1.29E-21	1.66E-25	6.19E-22	1.46E-13	1.88E-17	6.19E-22	1.46E-13	1.88E-17
^{239}Pu	7.54E-29	1.78E-20	6.32E-22	5.49E-21	1.29E-12	4.60E-14	5.49E-21	1.29E-12	4.60E-14
^{240}Pu	1.95E-29	4.61E-21	4.48E-23	1.45E-21	3.42E-13	3.32E-15	1.45E-21	3.42E-13	3.32E-15
^{241}Pu	4.10E-28	9.68E-20	2.07E-24	3.89E-20	9.17E-12	1.96E-16	3.89E-20	9.17E-12	1.96E-16
^{242}Pu	2.07E-33	4.88E-25	2.73E-25	9.72E-27	2.29E-18	1.28E-18	9.72E-27	2.29E-18	1.28E-18
^{125}Sb	1.14E-27	2.68E-19	5.69E-25	4.08E-20	9.62E-12	2.04E-17	4.08E-20	9.62E-12	2.04E-17
^{151}Sm	1.61E-26	3.79E-18	3.18E-22	3.78E-19	8.93E-11	7.48E-15	3.78E-19	8.93E-11	7.48E-15
^{126}Sn	1.81E-29	4.26E-21	8.27E-22	1.59E-22	3.75E-14	7.29E-15	1.59E-22	3.75E-14	7.29E-15
^{90}Sr	7.97E-18	1.88E-09	3.00E-14	4.61E-18	1.09E-09	1.74E-14	1.26E-17	2.97E-09	4.74E-14
^{99}Tc	3.15E-27	7.43E-19	9.67E-20	9.52E-19	2.25E-10	2.92E-11	9.52E-19	2.25E-10	2.92E-11
^{232}Th	2.97E-32	7.01E-24	1.40E-19	4.28E-24	1.01E-15	2.03E-11	4.28E-24	1.01E-15	2.03E-11
^{233}U	9.81E-31	2.32E-22	5.30E-23	3.53E-22	8.34E-14	1.91E-14	3.53E-22	8.34E-14	1.91E-14
^{234}U	6.97E-31	1.64E-22	5.84E-23	1.84E-23	4.34E-15	1.54E-15	1.84E-23	4.34E-15	1.54E-15
^{235}U	2.74E-32	6.48E-24	6.61E-21	4.14E-25	9.78E-17	9.98E-14	4.14E-25	9.78E-17	9.98E-14
^{236}U	4.70E-32	1.11E-23	3.78E-22	5.69E-25	1.34E-16	4.58E-15	5.69E-25	1.34E-16	4.58E-15
^{238}U	5.44E-31	1.28E-22	8.42E-19	1.04E-23	2.45E-15	1.60E-11	1.04E-23	2.45E-15	1.60E-11

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	4.72E-15	7.74E-15	4.82E-07	2.19E-10	2.54E-09
50-32-8	7.27E-21	1.53E-20	9.54E-13	4.34E-16	5.02E-15
56-23-5	1.55E-62	1.99E-62	1.24E-54	5.63E-58	6.52E-57
57-14-7	1.20E-44	6.01E-45	3.75E-37	1.70E-40	1.97E-39
58-90-2	2.41E-31	4.67E-31	2.91E-23	1.32E-26	1.53E-25
59-89-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60-35-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62-75-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64-19-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71-43-2	2.96E-56	1.93E-56	1.20E-48	5.48E-52	6.34E-51
75-05-8	1.39E-45	4.77E-46	2.98E-38	1.35E-41	1.57E-40
75-12-7	1.57E-29	5.91E-30	3.69E-22	1.68E-25	1.94E-24
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	2.08E-58	2.28E-58	1.42E-50	6.46E-54	7.47E-53
83-32-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84-66-2	7.01E-30	1.30E-29	8.10E-22	3.68E-25	4.26E-24
84-74-2	2.91E-21	6.76E-21	4.21E-13	1.91E-16	2.22E-15
87-68-3	7.48E-60	1.63E-59	1.01E-51	4.61E-55	5.34E-54
88-89-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91-20-3	6.09E-50	6.51E-50	4.06E-42	1.84E-45	2.14E-44
95-50-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98-86-2	8.56E-31	8.61E-31	5.37E-23	2.44E-26	2.82E-25
100-21-0	3.15E-15	4.37E-15	2.72E-07	1.24E-10	1.43E-09
101-84-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-93-4	2.56E-49	4.02E-49	2.51E-41	1.14E-44	1.32E-43
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	2.53E-56	1.95E-56	1.21E-48	5.52E-52	6.39E-51
108-95-2	1.80E-29	1.42E-29	8.83E-22	4.01E-25	4.65E-24
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	1.53E-18	2.27E-18	1.42E-10	6.44E-14	7.45E-13
120-82-1	5.41E-52	8.19E-52	5.11E-44	2.32E-47	2.69E-46
122-39-4	1.22E-16	1.72E-16	1.07E-08	4.88E-12	5.65E-11
126-73-8	1.33E-15	2.95E-15	1.84E-07	8.35E-11	9.66E-10
127-18-4	2.76E-61	3.81E-61	2.38E-53	1.08E-56	1.25E-55
129-00-0	2.21E-22	3.73E-22	2.32E-14	1.06E-17	1.22E-16
132-64-9	1.90E-47	2.67E-47	1.66E-39	7.57E-43	8.76E-42
144-62-7	2.95E-32	2.22E-32	1.38E-24	6.28E-28	7.27E-27
193-39-5	3.94E-26	9.08E-26	5.66E-18	2.57E-21	2.98E-20
206-44-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
208-96-8	7.56E-34	9.60E-34	5.98E-26	2.72E-29	3.15E-28
603-34-9	1.21E-16	2.49E-16	1.55E-08	7.04E-12	8.15E-11
621-64-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1321-64-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1336-36-3	6.85E-27	1.84E-26	1.15E-18	5.21E-22	6.04E-21
3697-24-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4170-30-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10061-01-5	1.72E-53	1.59E-53	9.91E-46	4.50E-49	5.21E-48
26140-60-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Stream Number:	LFP04
Stream Name:	Blended LAW melter feed to melter
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties			
Variable	Value	Units	
Density	1.21E+00	g/cm^3	(does not include solid phase)
Enthalpy	-3.75E+07	BTU/hr	
Mass Flow	1.03E+04	Lb/hr	
	2.46E+05	Lb/day	
Volumetric Flow	1.03E+01	GPM	(does not include solid phase)
	1.37E+00	ft^3/min	(does not include solid phase)
Molar Flow	3.11E+02	Lbmol/hr	
Molecular Weight	2.00E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	3.00E+01	C	
Na Molarity	4.53E+00	mol/L	
pH	1.28E+01	pH	
Total TRU	4.60E-04	Ci/L	
Total Activity	1.12E-01	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	6.05E+01	1.01E+01	1.49E+05	9.57E+04	0.00E+00	0.00E+00	2.45E+05	1.11E+02	1.29E+03
Ag^+	3.38E-05	3.04E-05	4.50E-01	1.57E-02	0.00E+00	0.00E+00	4.66E-01	2.12E-04	2.45E-03
Al^{+3}	4.10E-01	9.22E-02	1.36E+03	2.27E+03	0.00E+00	0.00E+00	3.63E+03	1.65E+00	1.91E+01
As^{+3}	1.49E-04	9.31E-05	1.38E+00	2.72E-01	0.00E+00	0.00E+00	1.65E+00	7.50E-04	8.68E-03
B^{+3}	2.46E+00	2.22E-01	3.28E+03	1.12E+02	0.00E+00	0.00E+00	3.39E+03	1.54E+00	1.79E+01
Ba^{+2}	3.11E-05	3.56E-05	5.27E-01	5.68E-03	0.00E+00	0.00E+00	5.32E-01	2.42E-04	2.80E-03
Bi^{+3}	3.67E-05	6.39E-05	9.46E-01	1.38E-02	0.00E+00	0.00E+00	9.60E-01	4.36E-04	5.05E-03
Ca^{+2}	4.62E-03	1.55E-03	2.29E+01	3.20E+03	0.00E+00	0.00E+00	3.23E+03	1.47E+00	1.70E+01
Cd^{+2}	5.78E-05	5.42E-05	8.02E-01	2.52E-01	0.00E+00	0.00E+00	1.05E+00	4.79E-04	5.54E-03
Ce^{+3}	1.38E-03	1.61E-03	2.39E+01	1.20E-01	0.00E+00	0.00E+00	2.40E+01	1.09E-02	1.26E-01
Cl^-	7.69E-02	2.28E-02	3.37E+02	7.97E-01	0.00E+00	0.00E+00	3.37E+02	1.53E-01	1.77E+00
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_3^{-2}	3.29E-01	1.65E-01	2.44E+03	3.87E+03	0.00E+00	0.00E+00	6.31E+03	2.87E+00	3.32E+01
Cr^{+3}	9.91E-03	4.30E-03	6.36E+01	7.04E+00	0.00E+00	0.00E+00	7.07E+01	3.21E-02	3.72E-01
Cu^{+2}	5.71E-05	3.03E-05	4.48E-01	2.38E-03	0.00E+00	0.00E+00	4.50E-01	2.05E-04	2.37E-03
F^-	3.75E-02	5.95E-03	8.80E+01	8.16E-03	0.00E+00	0.00E+00	8.80E+01	4.00E-02	4.63E-01
Fe^{+3}	1.81E-03	8.42E-04	1.25E+01	4.54E+03	0.00E+00	0.00E+00	4.56E+03	2.07E+00	2.40E+01
H_2O	4.00E+01	6.01E+00	8.90E+04	0.00E+00	0.00E+00	0.00E+00	8.90E+04	4.04E+01	4.68E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	1.50E-13	1.26E-15	1.86E-11	0.00E+00	0.00E+00	0.00E+00	1.86E-11	8.46E-15	9.79E-14
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	1.85E-24	9.40E-25	1.39E-20	3.26E-15	0.00E+00	0.00E+00	3.26E-15	1.48E-18	1.71E-17
H2CO3	1.17E-23	6.04E-24	8.93E-20	0.00E+00	0.00E+00	0.00E+00	8.93E-20	4.06E-23	4.70E-22
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	5.98E-05	1.00E-04	1.48E+00	3.99E+00	0.00E+00	0.00E+00	5.47E+00	2.48E-03	2.88E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	1.47E-01	4.80E-02	7.10E+02	1.00E+01	0.00E+00	0.00E+00	7.20E+02	3.27E-01	3.79E+00
La^{+3}	1.58E-05	1.84E-05	2.72E-01	6.24E-03	0.00E+00	0.00E+00	2.78E-01	1.26E-04	1.46E-03
Li^+	6.73E-03	3.90E-04	5.76E+00	8.92E+02	0.00E+00	0.00E+00	8.98E+02	4.08E-01	4.72E+00
Mg^{+2}	4.71E-04	9.55E-05	1.41E+00	1.18E+03	0.00E+00	0.00E+00	1.18E+03	5.37E-01	6.22E+00
Mn^{+3}	5.11E-04	2.34E-04	3.46E+00	1.31E+01	0.00E+00	0.00E+00	1.65E+01	7.51E-03	8.69E-02
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	1.01E-23	2.37E-24	3.50E-20	0.00E+00	0.00E+00	0.00E+00	3.50E-20	1.59E-23	1.84E-22
Na^+	4.53E+00	8.68E-01	1.28E+04	3.88E+00	0.00E+00	0.00E+00	1.28E+04	5.84E+00	6.76E+01
NH3	5.33E-04	7.58E-05	1.12E+00	0.00E+00	0.00E+00	0.00E+00	1.12E+00	5.09E-04	5.90E-03
NH4+	7.66E-23	7.58E-05	1.71E-19	1.44E-16	0.00E+00	0.00E+00	1.44E-16	6.55E-20	7.58E-19
Ni^{+2}	8.26E-04	4.05E-04	5.99E+00	1.18E+01	0.00E+00	0.00E+00	1.78E+01	8.10E-03	9.38E-02
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	8.90E-01	3.42E-01	5.06E+03	2.27E-02	0.00E+00	0.00E+00	5.06E+03	2.30E+00	2.66E+01
NO_3^-	1.63E+00	8.41E-01	1.24E+04	1.75E-02	0.00E+00	0.00E+00	1.24E+04	5.66E+00	6.55E+01
O_2	5.37E-26	1.43E-26	2.12E-22	0.00E+00	0.00E+00	0.00E+00	2.12E-22	9.63E-26	1.12E-24
O^-	0.00E+00	0.00E+00	0.00E+00	1.57E+04	0.00E+00	0.00E+00	1.57E+04	7.16E+00	8.28E+01
OH^-	6.69E-02	9.49E-03	1.40E+02	0.00E+00	0.00E+00	0.00E+00	1.40E+02	6.38E-02	7.39E-01
$OH(b)^-$	9.82E+00	1.39E+00	2.06E+04	0.00E+00	0.00E+00	0.00E+00	2.06E+04	9.38E+00	1.09E+02
Pb^{+2}	2.10E-04	3.62E-04	5.36E+00	9.99E-02	0.00E+00	0.00E+00	5.46E+00	2.48E-03	2.87E-02
Pd^{+2}	1.62E-05	1.44E-05	2.13E-01	1.20E-03	0.00E+00	0.00E+00	2.14E-01	9.75E-05	1.13E-03
PO_4^{-3}	1.67E-02	1.33E-02	1.96E+02	2.86E+01	0.00E+00	0.00E+00	2.25E+02	1.02E-01	1.18E+00
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	1.57E-05	1.35E-05	1.99E-01	3.87E-03	0.00E+00	0.00E+00	2.03E-01	9.24E-05	1.07E-03
Ru^{+3}	2.33E-05	1.97E-05	2.91E-01	9.17E-02	0.00E+00	0.00E+00	3.83E-01	1.74E-04	2.01E-03
S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.04E-15	0.00E+00	0.00E+00	1.04E-15	4.73E-19	5.48E-18
SiO2	3.16E-03	1.58E-03	2.34E+01	5.10E+04	0.00E+00	0.00E+00	5.11E+04	2.32E+01	2.69E+02
SiO_4^{-4}	2.41E-15	1.86E-15	2.74E-11	0.00E+00	0.00E+00	0.00E+00	2.74E-11	1.25E-14	1.44E-13
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	3.99E-02	3.20E-02	4.74E+02	1.33E+01	0.00E+00	0.00E+00	4.87E+02	2.21E-01	2.56E+00
Sr^{+2}	8.50E-06	6.21E-06	9.19E-02	6.79E-04	0.00E+00	0.00E+00	9.26E-02	4.21E-05	4.87E-04
Sucrose	0.00E+00	0.00E+00	0.00E+00	6.60E+03	0.00E+00	0.00E+00	6.60E+03	3.00E+00	3.47E+01
Ti^{+4}	2.60E-05	1.04E-05	1.54E-01	9.67E+02	0.00E+00	0.00E+00	9.67E+02	4.40E-01	5.09E+00
Zn^{+2}	9.74E-05	5.31E-05	7.86E-01	2.70E+03	0.00E+00	0.00E+00	2.70E+03	1.23E+00	1.42E+01
Zr^{+4}	7.18E-05	5.47E-05	8.09E-01	2.50E+03	0.00E+00	0.00E+00	2.50E+03	1.14E+00	1.31E+01

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	1.51E-02	1.11E-02	1.64E+02	9.04E+02	0.00E+00	0.00E+00	1.07E+03	4.85E-01	5.62E+00
$C_2O_4^{-2}$	1.51E-02	1.11E-02	1.64E+02	9.04E+02	0.00E+00	0.00E+00	1.07E+03	4.85E-01	5.62E+00
Formate	9.49E-15	3.56E-15	5.27E-11	0.00E+00	0.00E+00	0.00E+00	5.27E-11	2.40E-14	2.77E-13
Acetate	7.35E-15	3.62E-15	5.36E-11	0.00E+00	0.00E+00	0.00E+00	5.36E-11	2.44E-14	2.82E-13
Glycolate	4.89E-14	3.06E-14	4.53E-10	0.00E+00	0.00E+00	0.00E+00	4.53E-10	2.06E-13	2.38E-12
IDA	2.59E-14	2.88E-14	4.26E-10	0.00E+00	0.00E+00	0.00E+00	4.26E-10	1.94E-13	2.24E-12
Citrate	2.37E-15	3.80E-15	5.62E-11	0.00E+00	0.00E+00	0.00E+00	5.62E-11	2.56E-14	2.96E-13
HEDTA	1.11E-14	2.58E-14	3.82E-10	0.00E+00	0.00E+00	0.00E+00	3.82E-10	1.73E-13	2.01E-12
EDTA	1.33E-15	3.25E-15	4.81E-11	0.00E+00	0.00E+00	0.00E+00	4.81E-11	2.19E-14	2.53E-13

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	1.10E-01	6.19E+03	6.73E+01	1.30E-03	7.31E+01	5.34E+00	1.12E-01	6.26E+03	7.26E+01
^{241}Am	3.18E-04	1.78E+01	1.15E-02	5.80E-06	3.25E-01	2.09E-04	3.24E-04	1.81E+01	1.17E-02
^{243}Am	2.08E-07	1.16E-02	1.29E-04	2.77E-09	1.55E-04	1.71E-06	2.11E-07	1.18E-02	1.30E-04
^{14}C	6.50E-06	3.64E-01	1.80E-04	1.24E-10	6.96E-06	3.43E-09	6.50E-06	3.64E-01	1.80E-04
^{60}Co	4.26E-05	2.39E+00	4.65E-06	4.06E-07	2.27E-02	4.43E-08	4.30E-05	2.41E+00	4.70E-06
^{243}Cm	3.43E-08	1.92E-03	8.38E-08	2.64E-09	1.48E-04	6.45E-09	3.69E-08	2.07E-03	9.02E-08
^{244}Cm	8.12E-07	4.55E-02	1.24E-06	6.02E-08	3.37E-03	9.19E-08	8.72E-07	4.88E-02	1.33E-06
^{137}Cs	6.88E-05	3.85E+00	9.78E-05	1.44E-04	8.08E+00	2.05E-04	2.13E-04	1.19E+01	3.03E-04
^{152}Eu	2.40E-06	1.34E-01	1.70E-06	2.14E-08	1.20E-03	1.52E-08	2.42E-06	1.35E-01	1.72E-06
^{154}Eu	4.96E-04	2.78E+01	2.27E-04	3.51E-06	1.96E-01	1.60E-06	5.00E-04	2.80E+01	2.28E-04
^{155}Eu	1.44E-04	8.04E+00	3.65E-05	8.71E-07	4.88E-02	2.21E-07	1.44E-04	8.09E+00	3.67E-05
^{3}H	4.72E-06	2.64E-01	6.07E-08	2.27E-06	1.27E-01	2.92E-08	6.99E-06	3.92E-01	8.99E-08
^{129}I	1.98E-07	1.11E-02	1.38E-01	3.52E-08	1.97E-03	2.46E-02	2.33E-07	1.30E-02	1.63E-01
^{63}Ni	7.69E-04	4.31E+01	1.67E-03	8.66E-06	4.85E-01	1.88E-05	7.78E-04	4.35E+01	1.69E-03
^{237}Np	2.52E-07	1.41E-02	4.41E-02	2.71E-09	1.52E-04	4.74E-04	2.54E-07	1.42E-02	4.46E-02
^{238}Pu	1.42E-06	7.98E-02	1.03E-05	1.40E-08	7.85E-04	1.01E-07	1.44E-06	8.06E-02	1.04E-05
^{239}Pu	1.97E-05	1.10E+00	3.92E-02	1.60E-07	8.94E-03	3.18E-04	1.99E-05	1.11E+00	3.95E-02
^{240}Pu	5.11E-06	2.86E-01	2.78E-03	4.17E-08	2.33E-03	2.27E-05	5.15E-06	2.88E-01	2.80E-03
^{241}Pu	1.07E-04	6.00E+00	1.28E-04	9.68E-07	5.42E-02	1.16E-06	1.08E-04	6.05E+00	1.30E-04
^{242}Pu	5.40E-10	3.03E-05	1.69E-05	4.19E-12	2.35E-07	1.31E-07	5.45E-10	3.05E-05	1.71E-05
^{125}Sb	2.96E-04	1.66E+01	3.52E-05	4.29E-06	2.40E-01	5.11E-07	3.00E-04	1.68E+01	3.57E-05
^{151}Sm	4.16E-03	2.33E+02	1.95E-02	1.06E-05	5.92E-01	4.96E-05	4.17E-03	2.34E+02	1.96E-02
^{126}Sn	4.71E-06	2.64E-01	5.12E-02	2.65E-08	1.49E-03	2.88E-04	4.74E-06	2.65E-01	5.15E-02
^{90}Sr	1.03E-01	5.78E+03	9.22E-02	7.23E-04	4.05E+01	6.46E-04	1.04E-01	5.82E+03	9.29E-02
^{99}Tc	8.18E-04	4.58E+01	5.96E+00	4.00E-04	2.24E+01	2.91E+00	1.22E-03	6.82E+01	8.87E+00
^{232}Th	7.65E-09	4.28E-04	8.58E+00	1.87E-09	1.05E-04	2.10E+00	9.52E-09	5.33E-04	1.07E+01
^{233}U	2.55E-07	1.43E-02	3.27E-03	5.19E-09	2.91E-04	6.65E-05	2.60E-07	1.46E-02	3.33E-03
^{234}U	1.81E-07	1.01E-02	3.60E-03	1.11E-09	6.21E-05	2.21E-05	1.82E-07	1.02E-02	3.62E-03
^{235}U	7.13E-09	3.99E-04	4.07E-01	4.06E-11	2.27E-06	2.32E-03	7.17E-09	4.01E-04	4.10E-01
^{236}U	1.22E-08	6.84E-04	2.33E-02	6.79E-11	3.80E-06	1.30E-04	1.23E-08	6.87E-04	2.34E-02
^{238}U	1.41E-07	7.91E-03	5.19E+01	8.23E-10	4.61E-05	3.02E-01	1.42E-07	7.96E-03	5.22E+01

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	4.13E-02	3.40E-02	5.03E+02	2.28E-01	2.64E+00
50-32-8	1.58E-04	3.33E-04	4.93E+00	2.24E-03	2.59E-02
56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57-14-7	2.09E-06	1.05E-06	1.55E-02	7.04E-06	8.15E-05
58-90-2	1.17E-06	2.27E-06	3.35E-02	1.52E-05	1.76E-04
59-89-2	2.27E-13	2.20E-13	3.25E-09	1.48E-12	1.71E-11
60-35-5	1.70E-04	8.38E-05	1.24E+00	5.64E-04	6.52E-03
62-75-9	6.85E-05	4.23E-05	6.26E-01	2.85E-04	3.29E-03
64-19-7	1.58E-10	7.92E-11	1.17E-06	5.32E-10	6.16E-09
71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-05-8	3.59E-08	1.23E-08	1.82E-04	8.27E-08	9.57E-07
75-12-7	1.37E-03	5.16E-04	7.63E+00	3.47E-03	4.01E-02
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83-32-9	2.69E-14	3.47E-14	5.13E-10	2.33E-13	2.70E-12
84-66-2	8.55E-05	1.59E-04	2.35E+00	1.07E-03	1.23E-02
84-74-2	2.78E-05	6.45E-05	9.54E-01	4.34E-04	5.02E-03
87-68-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88-89-1	2.71E-04	5.18E-04	7.67E+00	3.49E-03	4.03E-02
91-20-3	4.35E-14	4.66E-14	6.89E-10	3.13E-13	3.62E-12
95-50-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98-86-2	1.05E-06	1.06E-06	1.57E-02	7.12E-06	8.25E-05
100-21-0	4.22E-03	5.85E-03	8.66E+01	3.94E-02	4.56E-01
101-84-8	2.70E-15	3.84E-15	5.68E-11	2.58E-14	2.99E-13
106-93-4	3.99E-15	6.25E-15	9.24E-11	4.20E-14	4.86E-13
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-95-2	3.21E-04	2.52E-04	3.73E+00	1.70E-03	1.96E-02
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	1.13E-08	1.68E-08	2.49E-04	1.13E-07	1.31E-06
120-82-1	1.90E-21	2.87E-21	4.25E-17	1.93E-20	2.23E-19
122-39-4	4.27E-06	6.03E-06	8.92E-02	4.05E-05	4.69E-04
126-73-8	1.15E-04	2.55E-04	3.78E+00	1.72E-03	1.99E-02
127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129-00-0	8.89E-07	1.50E-06	2.22E-02	1.01E-05	1.17E-04
132-64-9	5.29E-11	7.42E-11	1.10E-06	4.99E-10	5.78E-09
144-62-7	3.44E-02	2.59E-02	3.83E+02	1.74E-01	2.01E+00
193-39-5	3.62E-12	8.35E-12	1.24E-07	5.62E-11	6.50E-10
206-44-0	1.07E-13	1.80E-13	2.66E-09	1.21E-12	1.40E-11
208-96-8	9.63E-10	1.22E-09	1.81E-05	8.22E-09	9.52E-08
603-34-9	3.08E-06	6.30E-06	9.32E-02	4.23E-05	4.90E-04
621-64-7	1.78E-13	1.94E-13	2.86E-09	1.30E-12	1.51E-11
1321-64-8	1.55E-14	3.89E-14	5.76E-10	2.62E-13	3.03E-12
1336-36-3	3.09E-13	8.31E-13	1.23E-08	5.58E-12	6.46E-11
3697-24-3	9.55E-14	1.93E-13	2.86E-09	1.30E-12	1.50E-11
4170-30-3	5.28E-07	3.09E-07	4.57E-03	2.08E-06	2.40E-05
10061-01-5	2.37E-22	2.20E-22	3.25E-18	1.48E-21	1.71E-20
26140-60-3	6.31E-14	1.21E-13	1.79E-09	8.15E-13	9.43E-12

Stream Number:	HFP03
Stream Name:	Blended HLW melter feed to HLW melter
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties			
Variable	Value	Units	
Density	1.06E+00	g/cm^3	(does not include solid phase)
Enthalpy	-5.24E+06	BTU/hr	
Mass Flow	1.51E+03	Lb/hr	
	3.62E+04	Lb/day	
Volumetric Flow	1.54E+00	GPM	(does not include solid phase)
	2.05E-01	ft^3/min	(does not include solid phase)
Molar Flow	4.29E+01	Lbmol/hr	
Molecular Weight	1.89E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	3.00E+01	C	
Na Molarity	9.21E-01	mol/L	
pH	6.99E+00	pH	
Total TRU	1.36E-01	Ci/L	
Total Activity	3.03E+01	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	5.58E+01	8.81E+00	1.95E+04	1.52E+04	0.00E+00	0.00E+00	3.47E+04	1.58E+01	1.83E+02
Ag^{+}	5.81E-06	5.23E-06	1.16E-02	3.62E+00	0.00E+00	0.00E+00	3.63E+00	1.65E-03	1.91E-02
Al^{+3}	7.03E-02	1.58E-02	3.50E+01	6.01E+02	0.00E+00	0.00E+00	6.36E+02	2.89E-01	3.34E+00
As^{+3}	2.56E-05	1.60E-05	3.54E-02	2.33E-01	0.00E+00	0.00E+00	2.68E-01	1.22E-04	1.41E-03
B^{+3}	3.93E-02	3.55E-03	7.85E+00	3.31E+02	0.00E+00	0.00E+00	3.38E+02	1.54E-01	1.78E+00
Ba^{+2}	5.34E-06	6.12E-06	1.35E-02	3.23E+00	0.00E+00	0.00E+00	3.24E+00	1.47E-03	1.71E-02
Bi^{+3}	6.28E-06	1.09E-05	2.42E-02	1.69E+01	0.00E+00	0.00E+00	1.70E+01	7.71E-03	8.92E-02
Ca^{+2}	3.70E-04	1.24E-04	2.73E-01	1.97E+01	0.00E+00	0.00E+00	2.00E+01	9.09E-03	1.05E-01
Cd^{+2}	9.88E-06	9.27E-06	2.05E-02	1.31E+01	0.00E+00	0.00E+00	1.31E+01	5.94E-03	6.88E-02
Ce^{+3}	2.37E-04	2.77E-04	6.13E-01	4.02E+00	0.00E+00	0.00E+00	4.64E+00	2.11E-03	2.44E-02
Cl^{-}	1.22E-02	3.60E-03	7.95E+00	3.92E+00	0.00E+00	0.00E+00	1.19E+01	5.40E-03	6.25E-02
CO	6.36E-101	1.49E-101	3.29E-98	0.00E+00	0.00E+00	0.00E+00	3.29E-98	1.49E-101	1.73E-100
CO_2	4.90E-06	1.80E-06	3.98E-03	0.00E+00	0.00E+00	0.00E+00	3.98E-03	1.81E-06	2.09E-05
CO_3^{-2}	5.62E-02	2.82E-02	6.23E+01	1.09E+03	0.00E+00	0.00E+00	1.16E+03	5.26E-01	6.09E+00
Cr^{+3}	1.69E-03	7.35E-04	1.63E+00	1.01E+01	0.00E+00	0.00E+00	1.17E+01	5.32E-03	6.16E-02
Cu^{+2}	9.81E-06	5.20E-06	1.15E-02	1.37E+00	0.00E+00	0.00E+00	1.38E+00	6.28E-04	7.27E-03
F^{-}	5.51E-03	8.74E-04	1.93E+00	7.13E+01	0.00E+00	0.00E+00	7.32E+01	3.33E-02	3.85E-01
Fe^{+3}	3.11E-04	1.45E-04	3.20E-01	5.80E+02	0.00E+00	0.00E+00	5.80E+02	2.64E-01	3.05E+00
H_2O	5.35E+01	8.05E+00	1.78E+04	0.00E+00	0.00E+00	0.00E+00	1.78E+04	8.09E+00	9.36E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	1.38E+02	0.00E+00	0.00E+00	1.38E+02	6.27E-02	7.26E-01
H^{+}	1.01E-07	8.53E-10	1.89E-06	0.00E+00	0.00E+00	0.00E+00	1.89E-06	8.57E-10	9.92E-09
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	7.10E-24	3.61E-24	7.99E-21	0.00E+00	0.00E+00	0.00E+00	7.99E-21	3.63E-24	4.21E-23
H2CO3	7.66E-23	3.96E-23	8.77E-20	0.00E+00	0.00E+00	0.00E+00	8.77E-20	3.99E-23	4.61E-22
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	1.03E-05	1.72E-05	3.80E-02	7.45E+00	0.00E+00	0.00E+00	7.49E+00	3.41E-03	3.94E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	2.92E-02	9.53E-03	2.11E+01	1.11E+01	0.00E+00	0.00E+00	3.22E+01	1.46E-02	1.69E-01
La^{+3}	2.72E-06	3.16E-06	6.98E-03	6.06E+00	0.00E+00	0.00E+00	6.06E+00	2.76E-03	3.19E-02
Li^{+}	2.12E-04	1.23E-05	2.71E-02	1.40E+02	0.00E+00	0.00E+00	1.40E+02	6.38E-02	7.38E-01
Mg^{+2}	8.09E-05	1.64E-05	3.63E-02	4.88E+00	0.00E+00	0.00E+00	4.92E+00	2.24E-03	2.59E-02
Mn^{+3}	8.78E-05	4.03E-05	8.90E-02	4.74E+01	0.00E+00	0.00E+00	4.75E+01	2.16E-02	2.50E-01
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	2.28E-03	5.33E-04	1.18E+00	0.00E+00	0.00E+00	0.00E+00	1.18E+00	5.36E-04	6.20E-03
Na^{+}	9.21E-01	1.77E-01	3.91E+02	8.68E+02	0.00E+00	0.00E+00	1.26E+03	5.72E-01	6.62E+00
NH3	3.72E-03	5.28E-04	1.17E+00	0.00E+00	0.00E+00	0.00E+00	1.17E+00	5.31E-04	6.14E-03
NH4+	3.69E-20	5.28E-04	1.23E-17	0.00E+00	0.00E+00	0.00E+00	1.23E-17	5.58E-21	6.46E-20
Ni^{+2}	1.41E-04	6.92E-05	1.53E-01	2.11E+01	0.00E+00	0.00E+00	2.12E+01	9.65E-03	1.12E-01
NO	4.00E-26	1.00E-26	2.22E-23	0.00E+00	0.00E+00	0.00E+00	2.22E-23	1.01E-26	1.17E-25
NO_2	5.65E-39	2.17E-39	4.80E-36	0.00E+00	0.00E+00	0.00E+00	4.80E-36	2.18E-39	2.52E-38
NO_2^{-}	1.53E-01	5.86E-02	1.30E+02	1.99E+02	0.00E+00	0.00E+00	3.28E+02	1.49E-01	1.73E+00
NO_3^{-}	8.33E-01	4.31E-01	9.54E+02	1.53E+02	0.00E+00	0.00E+00	1.11E+03	5.03E-01	5.82E+00
O_2	7.36E-04	1.96E-04	4.34E-01	0.00E+00	0.00E+00	0.00E+00	4.34E-01	1.97E-04	2.29E-03
O^{-}	0.00E+00	0.00E+00	0.00E+00	9.53E+02	0.00E+00	0.00E+00	9.53E+02	4.33E-01	5.01E+00
OH^{-}	9.86E-08	1.40E-08	3.10E-05	3.14E+03	0.00E+00	0.00E+00	3.14E+03	1.43E+00	1.65E+01
$OH(b)^{-}$	1.56E-01	2.21E-02	4.88E+01	1.98E-19	0.00E+00	0.00E+00	4.88E+01	2.22E-02	2.57E-01
Pb^{+2}	3.59E-05	6.20E-05	1.37E-01	2.77E+01	0.00E+00	0.00E+00	2.78E+01	1.27E-02	1.46E-01
Pd^{+2}	2.78E-06	2.46E-06	5.45E-03	1.14E+00	0.00E+00	0.00E+00	1.14E+00	5.19E-04	6.01E-03
PO_4^{-3}	2.87E-03	2.28E-03	5.04E+00	1.25E+02	0.00E+00	0.00E+00	1.30E+02	5.90E-02	6.83E-01
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	2.68E-06	2.30E-06	5.10E-03	3.68E-01	0.00E+00	0.00E+00	3.73E-01	1.69E-04	1.96E-03
Ru^{+3}	3.99E-06	3.36E-06	7.44E-03	3.37E+00	0.00E+00	0.00E+00	3.38E+00	1.54E-03	1.78E-02
S^{+6}	0.00E+00	0.00E+00	0.00E+00	8.52E-17	0.00E+00	0.00E+00	8.52E-17	3.87E-20	4.48E-19
SiO2	5.43E-04	2.72E-04	6.02E-01	6.30E+03	0.00E+00	0.00E+00	6.30E+03	2.86E+00	3.31E+01
SiO_4^{-4}	4.15E-16	3.19E-16	7.05E-13	2.08E-06	0.00E+00	0.00E+00	2.08E-06	9.45E-10	1.09E-08
SO_2	6.08E-42	3.25E-42	7.19E-39	0.00E+00	0.00E+00	0.00E+00	7.19E-39	3.27E-42	3.78E-41
SO_4^{-2}	6.86E-03	5.50E-03	1.22E+01	4.59E+01	0.00E+00	0.00E+00	5.80E+01	2.64E-02	3.05E-01
Sr^{+2}	1.45E-06	1.06E-06	2.34E-03	1.80E+00	0.00E+00	0.00E+00	1.81E+00	8.21E-04	9.51E-03
Sucrose	0.00E+00	0.00E+00	0.00E+00	3.59E-36	0.00E+00	0.00E+00	3.59E-36	1.63E-39	1.89E-38
Ti^{+4}	4.48E-06	1.79E-06	3.95E-03	3.05E+00	0.00E+00	0.00E+00	3.06E+00	1.39E-03	1.61E-02
Zn^{+2}	1.67E-05	9.13E-06	2.02E-02	1.53E+02	0.00E+00	0.00E+00	1.53E+02	6.97E-02	8.07E-01
Zr^{+4}	1.23E-05	9.40E-06	2.08E-02	1.46E+02	0.00E+00	0.00E+00	1.46E+02	6.63E-02	7.67E-01

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	3.62E-03	2.66E-03	5.87E+00	5.21E+02	0.00E+00	0.00E+00	5.27E+02	2.40E-01	2.77E+00
$C_2O_4^{-2}$	3.62E-03	2.66E-03	5.87E+00	5.21E+02	0.00E+00	0.00E+00	5.27E+02	2.40E-01	2.77E+00
Formate	2.57E-15	9.66E-16	2.14E-12	1.01E-07	0.00E+00	0.00E+00	1.01E-07	4.58E-11	5.30E-10
Acetate	1.99E-15	9.82E-16	2.17E-12	1.02E-07	0.00E+00	0.00E+00	1.02E-07	4.66E-11	5.39E-10
Glycolate	1.33E-14	8.31E-15	1.84E-11	5.03E-08	0.00E+00	0.00E+00	5.03E-08	2.29E-11	2.65E-10
IDA	6.21E-15	6.90E-15	1.53E-11	1.28E-07	0.00E+00	0.00E+00	1.29E-07	5.84E-11	6.76E-10
Citrate	5.68E-16	9.11E-16	2.01E-12	1.10E-07	0.00E+00	0.00E+00	1.10E-07	5.02E-11	5.81E-10
HEDTA	2.66E-15	6.18E-15	1.37E-11	9.04E-08	0.00E+00	0.00E+00	9.04E-08	4.11E-11	4.76E-10
EDTA	3.20E-16	7.80E-16	1.72E-12	9.72E-08	0.00E+00	0.00E+00	9.72E-08	4.42E-11	5.11E-10

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	1.60E+01	1.34E+05	5.13E+00	1.43E+01	1.19E+05	8.72E+02	3.03E+01	2.53E+05	8.77E+02
^{241}Am	5.44E-05	4.56E-01	2.93E-04	1.03E-01	8.61E+02	5.54E-01	1.03E-01	8.61E+02	5.54E-01
^{243}Am	3.56E-08	2.98E-04	3.29E-06	8.31E-06	6.96E-02	7.69E-04	8.35E-06	6.99E-02	7.72E-04
^{14}C	1.12E-06	9.35E-03	4.62E-06	7.26E-06	6.08E-02	3.00E-05	8.38E-06	7.01E-02	3.46E-05
^{60}Co	7.33E-06	6.14E-02	1.20E-07	1.14E-02	9.51E+01	1.85E-04	1.14E-02	9.52E+01	1.85E-04
^{243}Cm	5.90E-09	4.94E-05	2.15E-09	1.44E-04	1.20E+00	5.25E-05	1.44E-04	1.20E+00	5.25E-05
^{244}Cm	1.40E-07	1.17E-03	3.18E-08	3.27E-03	2.74E+01	7.45E-04	3.27E-03	2.74E+01	7.45E-04
^{137}Cs	1.60E+01	1.34E+05	3.40E+00	2.29E+00	1.92E+04	4.87E-01	1.83E+01	1.53E+05	3.89E+00
^{152}Eu	4.09E-07	3.43E-03	4.35E-08	5.47E-04	4.58E+00	5.81E-05	5.47E-04	4.58E+00	5.81E-05
^{154}Eu	8.49E-05	7.10E-01	5.80E-06	5.92E-02	4.96E+02	4.05E-03	5.93E-02	4.97E+02	4.05E-03
^{155}Eu	2.45E-05	2.05E-01	9.33E-07	8.77E-03	7.34E+01	3.33E-04	8.80E-03	7.37E+01	3.34E-04
^{3}H	2.40E-05	2.01E-01	4.60E-08	1.80E-04	1.51E+00	3.45E-07	2.04E-04	1.71E+00	3.91E-07
^{129}I	3.42E-08	2.87E-04	3.58E-03	3.58E-07	3.00E-03	3.74E-02	3.93E-07	3.29E-03	4.10E-02
^{63}Ni	1.31E-04	1.10E+00	4.27E-05	1.97E-03	1.65E+01	6.39E-04	2.10E-03	1.76E+01	6.82E-04
^{237}Np	4.33E-08	3.62E-04	1.13E-03	8.41E-05	7.04E-01	2.20E+00	8.42E-05	7.05E-01	2.20E+00
^{238}Pu	2.44E-07	2.04E-03	2.62E-07	3.99E-04	3.34E+00	4.30E-04	4.00E-04	3.35E+00	4.31E-04
^{239}Pu	3.37E-06	2.82E-02	1.00E-03	3.54E-03	2.96E+01	1.05E+00	3.54E-03	2.96E+01	1.05E+00
^{240}Pu	8.73E-07	7.31E-03	7.10E-05	9.33E-04	7.81E+00	7.59E-02	9.34E-04	7.82E+00	7.60E-02
^{241}Pu	1.83E-05	1.53E-01	3.28E-06	2.51E-02	2.10E+02	4.49E-03	2.51E-02	2.10E+02	4.49E-03
^{242}Pu	9.24E-11	7.74E-07	4.33E-07	8.60E-08	7.20E-04	4.03E-04	8.61E-08	7.21E-04	4.03E-04
^{125}Sb	5.07E-05	4.24E-01	9.02E-07	3.63E-02	3.04E+02	6.46E-04	3.64E-02	3.05E+02	6.47E-04
^{151}Sm	7.11E-04	5.95E+00	4.99E-04	4.40E-01	3.68E+03	3.09E-01	4.41E-01	3.69E+03	3.09E-01
^{126}Sn	8.06E-07	6.75E-03	1.31E-03	1.70E-04	1.43E+00	2.77E-01	1.71E-04	1.43E+00	2.78E-01
^{90}Sr	1.76E-02	1.47E+02	2.35E-03	1.13E+01	9.42E+04	1.50E+00	1.13E+01	9.44E+04	1.51E+00
^{99}Tc	1.41E-04	1.18E+00	1.53E-01	2.54E-02	2.12E+02	2.76E+01	2.55E-02	2.14E+02	2.78E+01
^{232}Th	1.31E-09	1.10E-05	2.20E-01	2.78E-06	2.33E-02	4.67E+02	2.79E-06	2.33E-02	4.67E+02
^{233}U	4.38E-08	3.67E-04	8.39E-05	2.28E-04	1.91E+00	4.37E-01	2.28E-04	1.91E+00	4.37E-01
^{234}U	3.11E-08	2.60E-04	9.24E-05	1.18E-05	9.92E-02	3.52E-02	1.19E-05	9.95E-02	3.53E-02
^{235}U	1.23E-09	1.03E-05	1.05E-02	2.85E-07	2.38E-03	2.43E+00	2.86E-07	2.39E-03	2.44E+00
^{236}U	2.10E-09	1.76E-05	5.99E-04	3.91E-07	3.28E-03	1.12E-01	3.93E-07	3.29E-03	1.12E-01
^{238}U	2.43E-08	2.03E-04	1.33E+00	6.70E-06	5.61E-02	3.68E+02	6.73E-06	5.63E-02	3.70E+02

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	1.51E-02	1.17E-02	2.58E+01	1.17E-02	1.36E-01
50-32-8	7.13E-05	1.50E-04	3.32E-01	1.51E-04	1.75E-03
56-23-5	4.73E-25	6.07E-25	1.34E-21	6.10E-25	7.07E-24
57-14-7	4.82E-06	2.42E-06	5.35E-03	2.43E-06	2.81E-05
58-90-2	2.45E-06	4.74E-06	1.05E-02	4.76E-06	5.51E-05
59-89-2	7.23E-13	7.00E-13	1.55E-09	7.04E-13	8.15E-12
60-35-5	6.93E-05	3.42E-05	7.56E-02	3.44E-05	3.98E-04
62-75-9	8.91E-05	5.51E-05	1.22E-01	5.54E-05	6.41E-04
64-19-7	5.04E-10	2.53E-10	5.59E-07	2.54E-10	2.94E-09
71-43-2	2.15E-18	1.40E-18	3.10E-15	1.41E-18	1.63E-17
75-05-8	1.18E-07	4.06E-08	8.98E-05	4.08E-08	4.72E-07
75-12-7	5.43E-04	2.04E-04	4.52E-01	2.05E-04	2.38E-03
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	6.16E-20	6.75E-20	1.49E-16	6.79E-20	7.85E-19
83-32-9	5.39E-13	6.94E-13	1.54E-09	6.98E-13	8.08E-12
84-66-2	7.97E-05	1.48E-04	3.27E-01	1.49E-04	1.72E-03
84-74-2	2.82E-05	6.54E-05	1.45E-01	6.57E-05	7.61E-04
87-68-3	2.16E-20	4.69E-20	1.04E-16	4.72E-20	5.46E-19
88-89-1	1.07E-04	2.05E-04	4.52E-01	2.06E-04	2.38E-03
91-20-3	1.14E-12	1.22E-12	2.70E-09	1.23E-12	1.42E-11
95-50-1	3.77E-14	4.62E-14	1.02E-10	4.65E-14	5.38E-13
98-86-2	2.31E-06	2.32E-06	5.13E-03	2.33E-06	2.70E-05
100-21-0	1.55E-04	2.15E-04	4.76E-01	2.16E-04	2.50E-03
101-84-8	8.15E-14	1.16E-13	2.56E-10	1.16E-13	1.35E-12
106-93-4	2.17E-13	3.40E-13	7.52E-10	3.42E-13	3.96E-12
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	5.32E-19	4.09E-19	9.04E-16	4.11E-19	4.76E-18
108-95-2	2.35E-04	1.85E-04	4.09E-01	1.86E-04	2.15E-03
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	4.62E-08	6.87E-08	1.52E-04	6.90E-08	7.99E-07
120-82-1	1.06E-14	1.60E-14	3.53E-11	1.61E-14	1.86E-13
122-39-4	5.81E-06	8.21E-06	1.82E-02	8.25E-06	9.55E-05
126-73-8	6.43E-05	1.43E-04	3.16E-01	1.44E-04	1.66E-03
127-18-4	8.14E-25	1.13E-24	2.49E-21	1.13E-24	1.31E-23
129-00-0	1.94E-06	3.27E-06	7.23E-03	3.29E-06	3.81E-05
132-64-9	5.61E-10	7.88E-10	1.74E-06	7.92E-10	9.17E-09
144-62-7	1.36E-02	1.02E-02	2.26E+01	1.03E-02	1.19E-01
193-39-5	1.16E-11	2.68E-11	5.94E-08	2.70E-11	3.12E-10
206-44-0	4.14E-13	6.99E-13	1.54E-09	7.02E-13	8.13E-12
208-96-8	6.06E-09	7.70E-09	1.70E-05	7.74E-09	8.96E-08
603-34-9	5.59E-06	1.15E-05	2.53E-02	1.15E-05	1.33E-04
621-64-7	6.43E-13	6.98E-13	1.54E-09	7.02E-13	8.13E-12
1321-64-8	2.77E-13	6.95E-13	1.54E-09	6.99E-13	8.09E-12
1336-36-3	7.39E-12	1.99E-11	4.39E-08	2.00E-11	2.31E-10
3697-24-3	3.46E-13	6.99E-13	1.55E-09	7.03E-13	8.14E-12
4170-30-3	1.13E-06	6.63E-07	1.47E-03	6.67E-07	7.72E-06
10061-01-5	1.54E-16	1.43E-16	3.16E-13	1.44E-16	1.66E-15
26140-60-3	3.63E-13	6.98E-13	1.54E-09	7.01E-13	8.12E-12

Stream Number: HOP10
Stream Name: HLW vessel ventilation header offgas
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	1.15E-03	g/cm^3	(does not include solid phase)
Enthalpy	-1.25E+05	BTU/hr	
Mass Flow	1.15E+03	Lb/hr	
	2.76E+04	Lb/day	
Volumetric Flow	2.00E+03	GPM	(does not include solid phase)
	2.67E+02	ft^3/min	(does not include solid phase)
Molar Flow	4.03E+01	Lbmol/hr	
Molecular Weight	2.85E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	2.55E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	5.25E+00	pH	
Total TRU	2.10E-11	Ci/L	
Total Activity	4.66E-09	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	4.95E-07	7.58E-08	2.18E-01	3.02E-03	4.03E-02	2.76E+04	2.76E+04	1.25E+01	1.45E+02
Ag^{+}	8.93E-16	8.04E-16	2.31E-09	7.25E-07	0.00E+00	0.00E+00	7.27E-07	3.31E-10	3.83E-09
Al^{+3}	1.08E-11	2.43E-12	7.00E-06	1.20E-04	0.00E+00	0.00E+00	1.27E-04	5.78E-08	6.69E-07
As^{+3}	3.94E-15	2.46E-15	7.08E-09	4.67E-08	0.00E+00	0.00E+00	5.37E-08	2.44E-11	2.83E-10
B^{+3}	6.05E-12	5.46E-13	1.57E-06	6.62E-05	0.00E+00	0.00E+00	6.78E-05	3.08E-08	3.57E-07
Ba^{+2}	8.21E-16	9.41E-16	2.71E-09	6.46E-07	0.00E+00	0.00E+00	6.49E-07	2.95E-10	3.41E-09
Bi^{+3}	9.65E-16	1.68E-15	4.84E-09	3.39E-06	0.00E+00	0.00E+00	3.40E-06	1.54E-09	1.79E-08
Ca^{+2}	5.88E-14	1.97E-14	5.66E-08	3.95E-06	0.00E+00	0.00E+00	4.00E-06	1.82E-09	2.11E-08
Cd^{+2}	1.52E-15	1.43E-15	4.10E-09	2.62E-06	0.00E+00	0.00E+00	2.63E-06	1.19E-09	1.38E-08
Ce^{+3}	6.97E-11	8.15E-11	2.35E-04	8.05E-07	0.00E+00	0.00E+00	2.35E-04	1.07E-07	1.24E-06
Cl^{-}	3.29E-11	9.73E-12	2.80E-05	7.84E-07	0.00E+00	0.00E+00	2.88E-05	1.31E-08	1.51E-07
CO	9.78E-111	2.29E-111	6.57E-105	0.00E+00	0.00E+00	0.00E+00	6.57E-105	2.99E-108	3.46E-107
CO_2	7.54E-16	2.77E-16	7.96E-10	0.00E+00	1.18E-32	1.24E-26	7.96E-10	3.62E-13	4.19E-12
CO_3^{-2}	8.65E-12	4.33E-12	1.25E-05	2.19E-04	0.00E+00	0.00E+00	2.31E-04	1.05E-07	1.22E-06
Cr^{+3}	5.22E-12	2.27E-12	6.52E-06	2.02E-06	0.00E+00	0.00E+00	8.54E-06	3.88E-09	4.49E-08
Cu^{+2}	1.51E-15	8.00E-16	2.30E-09	2.74E-07	0.00E+00	0.00E+00	2.76E-07	1.26E-10	1.45E-09
F^{-}	1.16E-12	1.84E-13	5.30E-07	1.43E-05	0.00E+00	0.00E+00	1.48E-05	6.72E-09	7.78E-08
Fe^{+3}	1.73E-11	8.07E-12	2.32E-05	1.16E-04	0.00E+00	0.00E+00	1.39E-04	6.33E-08	7.32E-07
H_2O	4.85E-07	7.29E-08	2.10E-01	0.00E+00	1.21E-03	5.22E+02	5.22E+02	2.37E-01	2.74E+00
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	2.73E-12	2.29E-14	6.60E-08	0.00E+00	0.00E+00	0.00E+00	6.60E-08	3.00E-11	3.47E-10
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	6.88E-15	3.50E-15	1.01E-08	0.00E+00	0.00E+00	0.00E+00	1.01E-08	4.58E-12	5.30E-11
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	1.58E-15	2.65E-15	7.61E-09	1.55E-06	0.00E+00	0.00E+00	1.55E-06	7.06E-10	8.17E-09
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	4.51E-12	1.47E-12	4.23E-06	2.22E-06	0.00E+00	0.00E+00	6.45E-06	2.93E-09	3.40E-08
La^{+3}	4.19E-16	4.85E-16	1.40E-09	1.21E-06	0.00E+00	0.00E+00	1.21E-06	5.52E-10	6.39E-09
Li^{+}	7.45E-14	4.31E-15	1.24E-08	2.81E-05	0.00E+00	0.00E+00	2.81E-05	1.28E-08	1.48E-07
Mg^{+2}	1.24E-14	2.53E-15	7.26E-09	9.77E-07	0.00E+00	0.00E+00	9.85E-07	4.48E-10	5.18E-09
Mn^{+3}	1.35E-14	6.19E-15	1.78E-08	9.48E-06	0.00E+00	0.00E+00	9.50E-06	4.32E-09	5.00E-08
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	3.51E-13	8.20E-14	2.36E-07	0.00E+00	3.09E-02	2.07E+04	2.07E+04	9.43E+00	1.09E+02
Na^{+}	4.70E-09	9.02E-10	2.59E-03	1.74E-04	0.00E+00	0.00E+00	2.77E-03	1.26E-06	1.46E-05
NH3	5.72E-13	8.13E-14	2.34E-07	0.00E+00	0.00E+00	0.00E+00	2.34E-07	1.06E-10	1.23E-09
NH4+	4.59E-14	8.13E-14	1.99E-08	0.00E+00	0.00E+00	0.00E+00	1.99E-08	9.03E-12	1.04E-10
Ni^{+2}	2.36E-12	1.16E-12	3.33E-06	4.22E-06	0.00E+00	0.00E+00	7.55E-06	3.43E-09	3.97E-08
NO	6.16E-36	1.54E-36	4.44E-30	0.00E+00	0.00E+00	0.00E+00	4.44E-30	2.02E-33	2.33E-32
NO_2	8.69E-49	3.34E-49	9.59E-43	0.00E+00	0.00E+00	0.00E+00	9.59E-43	4.36E-46	5.05E-45
NO_2^{-}	2.35E-11	9.01E-12	2.59E-05	3.97E-05	0.00E+00	0.00E+00	6.56E-05	2.98E-08	3.45E-07
NO_3^{-}	3.14E-09	1.62E-09	4.67E-03	3.06E-05	0.00E+00	0.00E+00	4.70E-03	2.14E-06	2.47E-05
O_2	1.13E-13	3.02E-14	8.69E-08	0.00E+00	8.20E-03	6.30E+03	6.30E+03	2.86E+00	3.31E+01
O^{-}	0.00E+00	0.00E+00	0.00E+00	1.91E-04	0.00E+00	0.00E+00	1.91E-04	8.68E-08	1.00E-06
OH^{-}	1.80E-09	2.55E-10	7.33E-04	6.28E-04	0.00E+00	0.00E+00	1.36E-03	6.19E-07	7.16E-06
$OH(b)^{-}$	2.39E-11	3.40E-12	9.77E-06	3.96E-26	0.00E+00	0.00E+00	9.77E-06	4.44E-09	5.14E-08
Pb^{+2}	5.52E-15	9.54E-15	2.74E-08	5.54E-06	0.00E+00	0.00E+00	5.57E-06	2.53E-09	2.93E-08
Pd^{+2}	4.27E-16	3.79E-16	1.09E-09	2.27E-07	0.00E+00	0.00E+00	2.29E-07	1.04E-10	1.20E-09
PO_4^{-3}	4.42E-13	3.50E-13	1.01E-06	2.50E-05	0.00E+00	0.00E+00	2.60E-05	1.18E-08	1.37E-07
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	4.13E-16	3.54E-16	1.02E-09	7.36E-08	0.00E+00	0.00E+00	7.46E-08	3.39E-11	3.93E-10
Ru^{+3}	6.13E-16	5.17E-16	1.49E-09	6.83E-07	0.00E+00	0.00E+00	6.84E-07	3.11E-10	3.60E-09
S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.70E-23	0.00E+00	0.00E+00	1.70E-23	7.75E-27	8.97E-26
SiO2	8.35E-14	4.19E-14	1.20E-07	1.26E-03	0.00E+00	0.00E+00	1.26E-03	5.72E-07	6.63E-06
SiO_4^{-4}	6.38E-26	4.90E-26	1.41E-19	4.37E-13	0.00E+00	0.00E+00	4.37E-13	1.99E-16	2.30E-15
SO_2	9.36E-52	5.00E-52	1.44E-45	0.00E+00	0.00E+00	0.00E+00	1.44E-45	6.54E-49	7.57E-48
SO_4^{-2}	1.05E-12	8.45E-13	2.43E-06	9.18E-06	0.00E+00	0.00E+00	1.16E-05	5.28E-09	6.11E-08
Sr^{+2}	2.77E-16	2.02E-16	5.82E-10	3.61E-07	0.00E+00	0.00E+00	3.62E-07	1.64E-10	1.90E-09
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	6.88E-16	2.75E-16	7.91E-10	6.11E-07	0.00E+00	0.00E+00	6.11E-07	2.78E-10	3.22E-09
Zn^{+2}	2.57E-15	1.40E-15	4.04E-09	3.07E-05	0.00E+00	0.00E+00	3.07E-05	1.40E-08	1.62E-07
Zr^{+4}	1.90E-15	1.45E-15	4.16E-09	2.92E-05	0.00E+00	0.00E+00	2.92E-05	1.33E-08	1.54E-07

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	5.56E-13	4.08E-13	1.17E-06	1.09E-04	0.00E+00	0.00E+00	1.10E-04	5.01E-08	5.80E-07
$C_2O_4^{-2}$	5.56E-13	4.08E-13	1.17E-06	1.09E-04	0.00E+00	0.00E+00	1.10E-04	5.01E-08	5.80E-07
Formate	3.96E-25	1.49E-25	4.27E-19	2.02E-14	0.00E+00	0.00E+00	2.02E-14	9.17E-18	1.06E-16
Acetate	3.07E-25	1.51E-25	4.34E-19	2.05E-14	0.00E+00	0.00E+00	2.05E-14	9.32E-18	1.08E-16
Glycolate	2.04E-24	1.28E-24	3.68E-18	1.01E-14	0.00E+00	0.00E+00	1.01E-14	4.58E-18	5.30E-17
IDA	9.56E-25	1.06E-24	3.05E-18	2.57E-14	0.00E+00	0.00E+00	2.57E-14	1.17E-17	1.35E-16
Citrate	8.73E-26	1.40E-25	4.03E-19	2.21E-14	0.00E+00	0.00E+00	2.21E-14	1.00E-17	1.16E-16
HEDTA	4.09E-25	9.50E-25	2.73E-18	1.81E-14	0.00E+00	0.00E+00	1.81E-14	8.22E-18	9.52E-17
EDTA	4.92E-26	1.20E-25	3.45E-19	1.94E-14	0.00E+00	0.00E+00	1.94E-14	8.84E-18	1.02E-16

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	2.46E-09	2.68E-02	1.03E-06	2.20E-09	2.39E-02	1.75E-04	4.66E-09	5.07E-02	1.76E-04
^{241}Am	8.37E-15	9.11E-08	5.86E-11	1.58E-11	1.72E-04	1.11E-07	1.58E-11	1.72E-04	1.11E-07
^{243}Am	5.47E-18	5.95E-11	6.58E-13	1.28E-15	1.39E-08	1.54E-10	1.28E-15	1.40E-08	1.54E-10
^{14}C	1.72E-16	1.87E-09	9.23E-13	1.12E-15	1.22E-08	6.00E-12	1.29E-15	1.40E-08	6.92E-12
^{60}Co	1.13E-15	1.23E-08	2.39E-14	1.75E-12	1.90E-05	3.71E-11	1.75E-12	1.90E-05	3.71E-11
^{243}Cm	9.07E-19	9.87E-12	4.31E-16	2.21E-14	2.41E-07	1.05E-11	2.21E-14	2.41E-07	1.05E-11
^{244}Cm	2.15E-17	2.34E-10	6.37E-15	5.03E-13	5.47E-06	1.49E-10	5.03E-13	5.48E-06	1.49E-10
^{137}Cs	2.46E-09	2.68E-02	6.80E-07	3.57E-10	3.89E-03	9.87E-08	2.82E-09	3.07E-02	7.78E-07
^{152}Eu	6.30E-17	6.86E-10	8.70E-15	8.41E-14	9.16E-07	1.16E-11	8.42E-14	9.17E-07	1.16E-11
^{154}Eu	1.31E-14	1.42E-07	1.16E-12	9.12E-12	9.92E-05	8.10E-10	9.13E-12	9.94E-05	8.11E-10
^{155}Eu	3.77E-15	4.11E-08	1.87E-13	1.35E-12	1.47E-05	6.67E-11	1.35E-12	1.47E-05	6.69E-11
^{3}H	3.68E-15	4.01E-08	9.20E-15	2.84E-14	3.10E-07	7.11E-14	3.21E-14	3.50E-07	8.03E-14
^{129}I	5.27E-18	5.73E-11	7.16E-10	5.54E-17	6.03E-10	7.52E-09	6.06E-17	6.60E-10	8.24E-09
^{63}Ni	2.02E-14	2.20E-07	8.54E-12	3.03E-13	3.30E-06	1.28E-10	3.23E-13	3.52E-06	1.37E-10
^{237}Np	6.65E-18	7.24E-11	2.27E-10	1.29E-14	1.41E-07	4.41E-07	1.30E-14	1.41E-07	4.41E-07
^{238}Pu	3.75E-17	4.08E-10	5.25E-14	6.15E-14	6.69E-07	8.61E-11	6.15E-14	6.70E-07	8.62E-11
^{239}Pu	5.18E-16	5.64E-09	2.00E-10	5.44E-13	5.93E-06	2.11E-07	5.45E-13	5.93E-06	2.11E-07
^{240}Pu	1.34E-16	1.46E-09	1.42E-11	1.44E-13	1.56E-06	1.52E-08	1.44E-13	1.57E-06	1.52E-08
^{238}U	3.73E-18	4.07E-11	2.67E-07	1.03E-15	1.12E-08	7.37E-05	1.04E-15	1.13E-08	7.40E-05

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	4.14E-09	4.96E-09	1.43E-02	6.49E-06	7.51E-05
50-32-8	2.29E-10	4.82E-10	1.39E-03	6.31E-07	7.30E-06
56-23-5	2.92E-25	3.76E-25	1.08E-18	4.91E-22	5.68E-21
57-14-7	4.33E-10	2.17E-10	6.24E-04	2.84E-07	3.28E-06
58-90-2	1.55E-10	3.00E-10	8.62E-04	3.92E-07	4.53E-06
59-89-2	1.63E-14	1.58E-14	4.54E-08	2.06E-11	2.39E-10
60-35-5	5.43E-12	2.68E-12	7.69E-06	3.50E-09	4.05E-08
62-75-9	1.14E-09	7.05E-10	2.03E-03	9.22E-07	1.07E-05
64-19-7	1.14E-11	5.70E-12	1.64E-05	7.45E-09	8.62E-08
71-43-2	1.15E-18	7.47E-19	2.15E-12	9.76E-16	1.13E-14
75-05-8	3.09E-11	1.06E-11	3.04E-05	1.38E-08	1.60E-07
75-12-7	5.31E-12	2.00E-12	5.74E-06	2.61E-09	3.02E-08
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	9.82E-20	1.08E-19	3.10E-13	1.41E-16	1.63E-15
83-32-9	1.22E-14	1.56E-14	4.50E-08	2.05E-11	2.37E-10
84-66-2	3.42E-10	6.34E-10	1.82E-03	8.29E-07	9.59E-06
84-74-2	3.58E-10	8.33E-10	2.39E-03	1.09E-06	1.26E-05
87-68-3	3.80E-20	8.26E-20	2.38E-13	1.08E-16	1.25E-15
88-89-1	1.27E-14	2.44E-14	7.01E-08	3.19E-11	3.69E-10
91-20-3	7.07E-15	7.56E-15	2.18E-08	9.89E-12	1.14E-10
95-50-1	8.49E-16	1.04E-15	3.00E-09	1.36E-12	1.58E-11
98-86-2	1.72E-10	1.73E-10	4.97E-04	2.26E-07	2.61E-06
100-21-0	4.23E-16	5.86E-16	1.69E-09	7.66E-13	8.87E-12
101-84-8	1.84E-15	2.61E-15	7.50E-09	3.41E-12	3.95E-11
106-93-4	2.56E-15	4.02E-15	1.16E-08	5.25E-12	6.08E-11
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	4.01E-19	3.08E-19	8.86E-13	4.03E-16	4.66E-15
108-95-2	5.50E-10	4.32E-10	1.24E-03	5.64E-07	6.53E-06
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	2.03E-11	3.02E-11	8.68E-05	3.95E-08	4.57E-07
120-82-1	4.47E-16	6.77E-16	1.95E-09	8.85E-13	1.02E-11
122-39-4	1.39E-10	1.97E-10	5.65E-04	2.57E-07	2.97E-06
126-73-8	6.78E-11	1.51E-10	4.33E-04	1.97E-07	2.28E-06
127-18-4	1.68E-23	2.33E-23	6.71E-17	3.05E-20	3.53E-19
129-00-0	1.67E-10	2.82E-10	8.10E-04	3.68E-07	4.26E-06
132-64-9	1.25E-12	1.75E-12	5.04E-06	2.29E-09	2.65E-08
144-62-7	1.37E-11	1.03E-11	2.95E-05	1.34E-08	1.55E-07
193-39-5	2.62E-13	6.05E-13	1.74E-06	7.91E-10	9.15E-09
206-44-0	9.33E-15	1.57E-14	4.53E-08	2.06E-11	2.38E-10
208-96-8	6.08E-12	7.73E-12	2.22E-05	1.01E-08	1.17E-07
603-34-9	2.15E-10	4.40E-10	1.27E-03	5.76E-07	6.66E-06
621-64-7	1.45E-14	1.57E-14	4.53E-08	2.06E-11	2.38E-10
1321-64-8	6.25E-15	1.57E-14	4.51E-08	2.05E-11	2.37E-10
1336-36-3	4.19E-14	1.13E-13	3.24E-07	1.47E-10	1.70E-09
3697-24-3	7.79E-15	1.58E-14	4.53E-08	2.06E-11	2.38E-10
4170-30-3	7.88E-11	4.61E-11	1.33E-04	6.02E-08	6.97E-07
10061-01-5	2.12E-17	1.96E-17	5.64E-11	2.56E-14	2.97E-13
26140-60-3	8.18E-15	1.57E-14	4.52E-08	2.06E-11	2.38E-10

Appendix B

Calculation: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

24590-WTP-M4C-FRP-00005, Rev C

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Calculation Cover Sheet

R10664579

ISSUED BY
RPP-WTP PDC Sheet i

RIVER PROTECTION PROJECT-WASTE TREATMENT PLANT		JOB NO.: 24590	
CALC NO. 24590-WTP-M4C-FRP-00005	GROUP Process Eng.		FACILITY Central
SUBJECT Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report			
CALCULATION STATUS DESIGNATION	☒ PRELIMINARY ☐ SUPERSEDED BY:	☐ COMMITTED	☐ CONFIRMED ☐ CANCELLED
SOFTWARE APPLICATIONS	☒ N/A		
QAS: ☐ YES ☐ NO	PROGRAM NAME:		VERSION/RELEASE NO.:

RECORD OF REVISIONS

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	ORIGINATOR	CHECKED	APPROVED/ ACCEPTED	DATE
A	Initial Issue	102	102	E. Berríos	J. Cook/C. Nguyen/R. Rieck	O. Block	05/21/03
B	Revision to incorporate new emissions profile	104	B-27	E. Berríos	J. Cook/C. Leung	O. Block	12/12/03
C	Revision to incorporate new emissions profile	90	B-19	E. Berríos	J. Cook	S. Saunders	01/27/06

Notes/Comments

Calculations were performed on a Compaq Personal Computer using the software Microsoft Excel® 2000.

This calculation does not affect any structures, systems, components, or services of the WTP.

This revision is a complete rewrite therefore no revision bars are used.

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1 Objective

The objective of this calculation is to estimate the air emission rates for all organic constituents that are not tracked through the Steady State Flowsheet Model (SSFM) to support the update of the *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-03-008). The estimation of the releases is based on the performance of the representative compounds that are tracked in the SSFM.

2 Inputs

- Organic constituent feed concentrations were obtained from Section 8 of the *WTP Air Emissions Hazardous Organic Constituents Feed Concentrations* (24590-WTP-M4C-FRP-00006). These concentrations are shown below in units of milligrams per liter. The feed concentration of 1336-36-3 as shown in the table is 0.7 mg/l for LAW supernatant and for HLW, the concentration is 50 mg/kg (from Section 8.2.1 of 24590-WTP-RPT-PO-03-008). For oxalic acid (144-62-7), formic acid (64-18-6), and acetic acid (64-19-7), the feed concentrations as per Section 2 of 24590-WTP-M4C-FRP-00006 are 3,000 mg/l, 15,000 mg/l, and 21,704 mg/l respectively.

Organic Constituents Feed Concentrations

CAS #	COPC	Feed Concentration (mg/L)
100-00-5	p-Nitrochlorobenzene	40.0
100-21-0	p-Phthalic acid	60.0

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 3

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

CAS #	COPC	Feed Concentration (mg/L)
100-41-4	Ethyl benzene	4.0
100-42-5	Styrene	4.0
10061-01-5	cis-1,3-Dichloropropene	4.0
10061-02-6	trans-1,3-Dichloropropene	4.0
101-55-3	4-Bromophenylphenyl ether	60.0
101-84-8	Diphenyl ether	10.0
106-35-4	3-Heptanone	4.0
106-42-3	p-Xylene (Dimethyl benzene)	10.0
106-46-7	1,4-Dichlorobenzene	4.0
106-88-7	1,2-Epoxybutane	10.0
106-93-4	Ethylene dibromide (Dibromethane)	4.0
106-97-8	Butane	10.0
106-99-0	1,3-Butadiene	4.0
107-02-8	Acrolein	10.0
107-05-1	3-Chloropropene (Allyl chloride)	4.0
107-06-2	1,2-Dichloroethane (Ethylene chloride)	4.0
107-12-0	Propionitrile	10.0
107-13-1	Acrylonitrile	20.0
107-18-6	2-Propene-1-ol	60.0
107-31-3	Formic acid, methyl ester	60.0
107-66-4	Dibutylphosphate	60.0
107-87-9	2-Pentanone	20.0
108-03-2	1-Nitropropane	60.0
108-05-4	Vinyl acetate	60.0
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	10.0
108-20-3	Bis(isopropyl)ether	10.0
108-38-3	m-Xylene (Dimethyl benzene)	10.0
108-39-4	m-Cresol	10.0
108-87-2	Methylcyclohexane	10.0
108-88-3	Toluene	4.0
108-90-7	Chlorobenzene	4.0
108-93-0	Cyclohexanol	10.0
108-94-1	Cyclohexanone	10.0
108-95-2	Phenol	60.0
109-66-0	n-Pentane	10.0
109-99-9	Tetrahydrofuran	4.0
110-12-3	5-Methyl-2-hexanone	4.0
110-43-0	2-Heptanone	4.0
110-54-3	n-Hexane	10.0
110-62-3	n-Valeraldehyde	60.0
110-82-7	Cyclohexane	10.0
110-83-8	Cyclohexene	4.0

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 4

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

CAS #	COPC	Feed Concentration (mg/L)
110-86-1	Pyridine	20.0
111-65-9	n-Octane	10.0
111-76-2	Ethylene glycol monobutyl ether	60.0
111-84-2	n-Nonane	10.0
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	60.0
117-84-0	n-Dioctyl phthalate	60.0
120-12-7	Anthracene	60.0
120-82-1	1,2,4-Trichlorobenzene	10.0
120-83-2	2,4-Dichlorophenol	60.0
121-44-8	Triethylamine	10.0
121-69-7	Dimethylaniline	10.0
122-39-4	N,N-Diphenylamine	20.0
123-19-3	4-Heptanone	4.0
123-38-6	n-Propionaldehyde	20.0
123-51-3	3-Methyl-1-butanol	10.0
123-86-4	Acetic acid n-butyl ester	0.2
123-91-1	1,4-Dioxane	2.0
126-73-8	Tributyl phosphate	40.0
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	10.0
127-18-4	Perchloroethylene (tetrachloroethylene)	4.0
127-19-5	N,N-Dimethylacetamide	10.0
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	20.0
129-00-0	Pyrene	60.0
1321-64-8	Pentachloronaphthalene	60.0
1321-65-9	Trichloronaphthalene	60.0
132-64-9	Dibenzofuran	60.0
1335-87-1	Hexachloronaphthalene	60.0
1335-88-2	Tetrachloronaphthalene	60.0
1336-36-3	Polychlorinated biphenyls (PCBs)	0.7*
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	0.2
141-79-7	4-Methyl-3-penten-2-one	60.0
142-82-5	n-Heptane	10.0
156-60-5	trans-1,2-Dichloroethylene	10.0
1634-04-4	Methyl tert-butyl ether	10.0
189-55-9	Dibenzo[a,i]pyrene	60.0
189-64-0	Dibenzo[a,h]pyrene	60.0
191-24-2	Benzo(g,h,i)perylene	60.0
191-30-0	Benzo[a,i]pyrene	60.0
192-65-4	Dibenzo[a,e]pyrene	60.0
193-39-5	Indeno(1,2,3-cd)pyrene	60.0
206-44-0	Fluoranthene	60.0
208-96-8	Acenaphthylene	60.0

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 5

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

CAS #	COPC	Feed Concentration (mg/L)
2234-13-1	Octachloronaphthalene	0.2
224-42-0	Dibenz[a,j]acridine	60.0
226-36-8	Dibenz[a,h]acridine	60.0
25551-13-7	Trimethyl benzene	10.0
26140-60-3	Terphenyls	60.0
27154-33-2	Trichlorofluoroethane	10.0
287-92-3	Cyclopentane	10.0
3697-24-3	5-Methylchrysene	60.0
3825-26-1	Ammonium perfluorooctanoate	60.0
4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	10.0
50-00-0	Formaldehyde	10.0
50-32-8	Benzo(a)pyrene	38.0
53-70-3	Dibenzo(a,h)anthracene	38.0
540-59-0	1,2-Dichloroethylene	10.0
540-84-1	2,2,4-Trimethylpentane	10.0
541-73-1	1,3-Dichlorobenzene	4.0
56-23-5	Carbon tetrachloride	4.0
563-80-4	3-Methyl-2-butanone	10.0
56-49-5	3-Methylcholanthrene	60.0
57-14-7	1,1-Dimethylhydrazine	60.0
58-90-2	2,3,4,6-Tetrachlorophenol	60.0
591-78-6	2-Hexanone	10.0
59-50-7	4-Chloro-3-methylphenol	60.0
59-89-2	N-Nitrosomorpholine	60.0
602-87-9	5-Nitroacenaphthene	60.0
60-29-7	Ethyl ether	60.0
603-34-9	Triphenylamine	60.0
60-34-4	Methylhydrazine	10.0
60-35-5	Acetamide	10.0
621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	60.0
624-83-9	Methyl isocyanate	10.0
627-13-4	Nitric acid, propyl ester	5.0
62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	60.0
630-20-6	1,1,1,2-Tetrachloroethane	10.0
64-17-5	Ethyl alcohol	10.0
67-56-1	Methyl alcohol (Methanol)	10.0
67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	2.0
67-64-1	2-Propanone (Acetone)	20.0
67-66-3	Chloroform	4.0
67-72-1	Hexachloroethane	60.0
684-16-2	Hexafluoroacetone	10.0
71-23-8	n-Propyl alcohol	4.0

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 6

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

CAS #	COPC	Feed Concentration (mg/L)
71-36-3	n-Butyl alcohol	10.0
71-43-2	Benzene	4.0
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	4.0
74-83-9	Bromomethane (Methyl bromide)	4.0
74-87-3	Chloromethane (Methyl chloride)	4.0
74-97-5	Bromochloromethane	10.0
74-99-7	Methylacetylene	60.0
75-00-3	Chloroethane	4.0
75-01-4	Vinyl chloride (1-Chloroethene)	4.0
75-05-8	Acetonitrile	10.0
75-07-0	Acetaldehyde	60.0
75-09-2	Dichloromethane (Methylene chloride)	4.0
75-12-7	Formamide	60.0
75-15-0	Carbon disulfide	10.0
75-21-8	Ethylene oxide (Oxirane)	2.0
75-27-4	Bromodichloromethane	10.0
75-34-3	1,1-Dichloroethane	4.0
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	10.0
75-43-4	Dichlorofluoromethane	4.0
75-45-6	Chlorodifluoromethane	4.0
75-50-3	Trimethylamine	10.0
75-52-5	Nitromethane	60.0
75-55-8	2-Methylaziridine	60.0
75-61-6	Difluorodibromomethane	10.0
75-63-8	Trifluorobromomethane	10.0
75-65-0	2-Methyl-2-propanol	10.0
75-69-4	Trichlorofluoromethane	10.0
75-71-8	Dichlorodifluoromethane	10.0
76-03-9	Trichloroacetic acid	10.0
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	60.0
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	60.0
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	10.0
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	10.0
76-15-3	Chloropentafluoroethane	10.0
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	60.0
78-87-5	1,2-Dichloropropane	4.0
78-92-2	1-Methylpropyl alcohol (2-Butanol)	4.0
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	10.0
79-00-5	1,1,2-Trichloroethane	10.0
79-01-6	Trichloroethylene	10.0
79-09-4	Propionic acid	60.0
79-10-7	2-Propenoic acid	60.0

CAS #	COPC	Feed Concentration (mg/L)
79-20-9	Methyl acetate	60.0
79-34-5	1,1,2,2-Tetrachloroethane	0.02
83-32-9	Acenaphthene	60.0
84-66-2	Diethyl phthalate	60.0
84-74-2	Dibutyl phthalate	60.0
85-01-8	Phenanthrene	60.0
85-68-7	Butylbenzyl phthalate	60.0
86-73-7	Fluorene	60.0
87-68-3	Hexachlorobutadiene	10.0
88-06-2	2,4,6-Trichlorophenol	60.0
88-72-2	2-Nitrotoluene	10.0
88-75-5	2-Nitrophenol	60.0
88-89-1	Picric acid	60.0
91-20-3	Naphthalene	2.0
91-22-5	Quinoline	60.0
91-58-7	2-Chloronapthalene	60.0
92-52-4	1,1`-Biphenyl	40.0
92-93-3	4-Nitrobiphenyl	60.0
95-13-6	Indene	60.0
95-47-6	o-Xylene	4.0
95-48-7	o-Cresol (2-Methylphenol)	10.0
95-49-8	2-Chlorotoluene	60.0
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	4.0
95-57-8	2-Chlorophenol	60.0
95-95-4	2,4,5-Trichlorophenol	60.0
96-22-0	3-Pentanone	20.0
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	60.0
98-51-1	p-tert-Butyltoluene	60.0
98-82-8	Cumene	60.0
98-83-9	alpha-Methylstyrene	10.0
98-86-2	Acetophenone	40.0
98-95-3	Nitrobenzene	40.0

*1336-36-3 LAW supernate feed concentration is 0.7 mg/l and for the HLW solids is 50 mg / kg total solids (24590-WTP-RPT-PO-03-008, Section 8.2.1)

- Constituents were separated into groups based on similar physical and chemical characteristics and expected behavior throughout the flowsheet. The constituents and their respected group numbers are presented below along with the phase that they are expected to be in the offgas. The constituents with an "X" under the Modeled column indicate the constituents that were included in the flowsheet. This data was obtained from the *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-03-008), Table 2. Since the issuance of Rev 1 of 24590-WTP-RPT-PO-03-008, some feed organic constituents that were tracked in the SSFM have been deleted. These have been replaced by the following constituents: 101-84-8, 1321-64-8, 193-39-5, 206-44-0, 26140-60-3, 3697-24-3, 59-89-2, 621-64-7, 64-19-7, 83-32-9, 95-50-1 (24590-WTP-MRQ-PO-05-0049). These changes will be incorporated in Table 2 of

24590-WTP-RPT-PO-03-008 in the next revision. The table below also provides the F_v values for each organic constituent. F_v is a unitless parameter used to classify a constituent as being in one of three categories: vapor phase, particle phase, or particle-bound phase. This phase type affects the removal efficiency of the offgas control system for that compound. An F_v value of 1 indicates that the constituent exists only in the vapor phase. If the F_v value is less than 1, for example 0.9, this means that 90% of the compound exists in the vapor phase and 10% is particle-bound (i.e. [1-0.9]*100%). Therefore, removal efficiency for each portion of the constituent will differ based on the phase. Using the example above on HEPA filters, 90% of the constituent value on the gas stream will have a DF of 1 through the HEPA filters while 10% of its value will have a DF of 200,000. The F_v values were obtained from CCN 129507.

Organic Constituents Grouping

CAS#	Compound	F_v value	Group	Modeled	Phase
100-00-5	p-Nitrochlorobenzene	1	10		vapor
100-21-0	p-Phthalic acid	1	1	X	vapor
100-41-4	Ethyl benzene	1	20		vapor
100-42-5	Styrene	1	19		vapor
10061-01-5	cis-1,3-Dichloropropene	1	19	X	vapor
10061-02-6	trans-1,3-Dichloropropene	1	17		vapor
101-55-3	4-Bromophenylphenyl ether	1	14		vapor
101-84-8	Diphenyl ether	1	16	X	vapor
106-35-4	3-Heptanone	1	14		vapor
106-42-3	p-Xylene (Dimethyl benzene)	1	19		vapor
106-46-7	1,4-Dichlorobenzene	1	18		vapor
106-88-7	1,2-Epoxybutane	1	15		vapor
106-93-4	Ethylene dibromide (Dibromethane)	1	16	X	vapor
106-97-8	Butane	1	26	X	vapor
106-99-0	1,3-Butadiene	1	23	X	vapor
107-02-8	Acrolein	1	14		vapor
107-05-1	3-Chloropropene (Allyl chloride)	1	20		vapor
107-06-2	1,2-Dichloroethane (Ethylene chloride)	1	17		vapor
107-12-0	Propionitrile	1	13		vapor
107-13-1	Acrylonitrile	1	14		vapor
107-18-6	2-Propene-1-ol	1	10		vapor
107-31-3	Formic acid, methyl ester	1	15		vapor
107-66-4	Dibutylphosphate	0.995	5		particle-bound
107-87-9	2-Pentanone	1	14		vapor
108-03-2	1-Nitropropane	1	14		vapor
108-05-4	Vinyl acetate	1	16		vapor
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	1	14		vapor
108-20-3	Bis(isopropyl)ether	1	18		vapor
108-38-3	m-Xylene (Dimethyl benzene)	1	19		vapor
108-39-4	m-Cresol	1	9		vapor
108-87-2	Methylcyclohexane	1	25	X	vapor
108-88-3	Toluene	1	19	X	vapor
108-90-7	Chlorobenzene	1	19		vapor
108-93-0	Cyclohexanol	1	10		vapor
108-94-1	Cyclohexanone	1	11		vapor

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 9

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

CAS#	Compound	F_v value	Group	Modeled	Phase
108-95-2	Phenol	1	8	X	vapor
109-66-0	n-Pentane	1	26		vapor
109-99-9	Tetrahydrofuran	1	13		vapor
110-12-3	5-Methyl-2-hexanone	1	15		vapor
110-43-0	2-Heptanone	1	15		vapor
110-54-3	n-Hexane	1	27	X	vapor
110-62-3	n-Valeraldehyde	1	15		vapor
110-82-7	Cyclohexane	1	24	X	vapor
110-83-8	Cyclohexene	1	22		vapor
110-86-1	Pyridine	1	11		vapor
111-65-9	n-Octane	1	28		vapor
111-76-2	Ethylene glycol monobutyl ether	1	9		vapor
111-84-2	n-Nonane	1	28	X	vapor
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	0.130	30		particle-bound
117-84-0	n-Dioctyl phthalate	0.852	32		particle-bound
120-12-7	Anthracene	0.998	13	X	particle-bound
120-82-1	1,2,4-Trichlorobenzene	1	17	X	vapor
120-83-2	2,4-Dichlorophenol	1	10		vapor
121-44-8	Triethylamine	1	15		vapor
121-69-7	Dimethylaniline	1	13		vapor
122-39-4	N,N-Diphenylamine	1	10	X	vapor
123-19-3	4-Heptanone	1	13		vapor
123-38-6	n-Propionaldehyde	1	14		vapor
123-51-3	3-Methyl-1-butanol	1	12		vapor
123-86-4	Acetic acid n-butyl ester	1	16		vapor
123-91-1	1,4-Dioxane	1	10		vapor
126-73-8	Tributyl phosphate	0.996	7	X	particle-bound
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	1	16		vapor
127-18-4	Perchloroethylene (tetrachloroethylene)	1	21	X	vapor
127-19-5	N,N-Dimethylacetamide	1	5		vapor
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1	32		vapor
129-00-0	Pyrene	0.994	33	X	particle-bound
1321-64-8	Pentachloronaphthalene	0.971	14	X	particle-bound
1321-65-9	Trichloronaphthalene	0.999	15		particle-bound
132-64-9	Dibenzofuran	0.999	15	X	particle-bound
1335-87-1	Hexachloronaphthalene	0.984	14		particle-bound
1335-88-2	Tetrachloronaphthalene	0.991	15		particle-bound
1336-36-3	Polychlorinated biphenyls (PCBs)	1	35	X	vapor
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1	14		vapor
141-79-7	4-Methyl-3-penten-2-one	1	13		vapor
142-82-5	n-Heptane	1	27		vapor
144-62-7	Oxalic acid	1	3	X	vapor
156-60-5	trans-1,2-Dichloroethylene	1	20		vapor
1634-04-4	Methyl tert-butyl ether	1	16		vapor
189-55-9	Dibenzo[a,i]pyrene	0	5		particle

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 10

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

CAS#	Compound	F_v value	Group	Modeled	Phase
189-64-0	Dibenzo[a,h]pyrene	0	5		particle
191-24-2	Benzo(g,h,i)perylene	0.065	30		particle-bound
191-30-0	Benzo[a,i]pyrene	0	5		particle
192-65-4	Dibenzo[a,e]pyrene	0	5		particle
193-39-5	Indeno(1,2,3-cd)pyrene	0	30	X	particle
206-44-0	Fluoranthene	0.992	33	X	particle-bound
208-96-8	Acenaphthylene	1	14	X	vapor
2234-13-1	Octachloronaphthalene	0.629	14		particle-bound
224-42-0	Dibenz[a,j]acridine	0.241	4		particle-bound
226-36-8	Dibenz[a,h]acridine	0.285	4		particle-bound
25551-13-7	Trimethyl benzene	1	19		vapor
26140-60-3	Terphenyls	0.872	34	X	particle-bound
27154-33-2	Trichlorofluoroethane	1	23		vapor
287-92-3	Cyclopentane	1	24		vapor
3697-24-3	5-Methylchrysene	0.823	32	X	particle-bound
3825-26-1	Ammonium perfluorooctanoate	1	14		vapor
4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	1	11	X	vapor
50-00-0	Formaldehyde	1	8		vapor
50-32-8	Benzo(a)pyrene	0.290	30	X	particle-bound
53-70-3	Dibenzo(a,h)anthracene	0	7		particle
540-59-0	1,2-Dichloroethylene	1	19		vapor
540-84-1	2,2,4-Trimethylpentane	1	28		vapor
541-73-1	1,3-Dichlorobenzene	1	19		vapor
56-23-5	Carbon tetrachloride	1	22	X	vapor
563-80-4	3-Methyl-2-butanone	1	14		vapor
56-49-5	3-Methylcholanthrene	0.364	28		particle-bound
57-14-7	1,1-Dimethylhydrazine	1	12	X	vapor
58-90-2	2,3,4,6-Tetrachlorophenol	1	11	X	vapor
591-78-6	2-Hexanone	1	14		vapor
59-50-7	4-Chloro-3-methylphenol	1	32		vapor
59-89-2	N-Nitrosomorpholine	1	6	X	vapor
602-87-9	5-Nitroacenaphthene	0.997	9		particle-bound
60-29-7	Ethyl ether	1	17		vapor
603-34-9	Triphenylamine	1	32	X	vapor
60-34-4	Methylhydrazine	1	10		vapor
60-35-5	Acetamide	1	5	X	vapor
621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	1	10	X	vapor
624-83-9	Methyl isocyanate	1	17		vapor
627-13-4	Nitric acid, propyl ester	1	17		vapor
62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	1	9	X	vapor
630-20-6	1,1,1,2-Tetrachloroethane	1	18		vapor
64-17-5	Ethyl alcohol	1	10		vapor
64-18-6	Formic acid	1	7		vapor
64-19-7	Acetic acid	1	6	X	vapor

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 11

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

CAS#	Compound	F_v value	Group	Modeled	Phase
67-56-1	Methyl alcohol (Methanol)	1	10		vapor
67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	1	11		vapor
67-64-1	2-Propanone (Acetone)	1	13		vapor
67-66-3	Chloroform	1	19		vapor
67-72-1	Hexachloroethane	1	19		vapor
684-16-2	Hexafluoroacetone	1	19		vapor
71-23-8	n-Propyl alcohol	1	11		vapor
71-36-3	n-Butyl alcohol	1	11		vapor
71-43-2	Benzene	1	19	X	vapor
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	1	21		vapor
74-83-9	Bromomethane (Methyl bromide)	1	19		vapor
74-87-3	Chloromethane (Methyl chloride)	1	20		vapor
74-97-5	Bromochloromethane	1	17		vapor
74-99-7	Methylacetylene	1	20		vapor
75-00-3	Chloroethane	1	20		vapor
75-01-4	Vinyl chloride (1-Chloroethene)	1	22		vapor
75-05-8	Acetonitrile	1	13	X	vapor
75-07-0	Acetaldehyde	1	13		vapor
75-09-2	Dichloromethane (Methylene chloride)	1	19		vapor
75-12-7	Formamide	1	4	X	vapor
75-15-0	Carbon disulfide	1	20		vapor
75-21-8	Ethylene oxide (Oxirane)	1	15		vapor
75-27-4	Bromodichloromethane	1	18		vapor
75-34-3	1,1-Dichloroethane	1	19		vapor
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	1	22		vapor
75-43-4	Dichlorofluoromethane	1	20		vapor
75-45-6	Chlorodifluoromethane	1	22		vapor
75-50-3	Trimethylamine	1	14		vapor
75-52-5	Nitromethane	1	13		vapor
75-55-8	2-Methylaziridine	1	11		vapor
75-61-6	Difluorodibromomethane	1	22		vapor
75-63-8	Trifluorobromomethane	1	25		vapor
75-65-0	2-Methyl-2-propanol	1	11		vapor
75-69-4	Trichlorofluoromethane	1	23		vapor
75-71-8	Dichlorodifluoromethane	1	25		vapor
76-03-9	Trichloroacetic acid	1	5		vapor
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	1	24		vapor
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	1	23		vapor
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	1	25		vapor
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	1	28		vapor
76-15-3	Chloropentafluoroethane	1	29	X	vapor
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	1	11		vapor
78-87-5	1,2-Dichloropropane	1	19		vapor
78-92-2	1-Methylpropyl alcohol (2-Butanol)	1	11		vapor
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	1	13		vapor

CAS#	Compound	F_v value	Group	Modeled	Phase
79-00-5	1,1,2-Trichloroethane	1	17		vapor
79-01-6	Trichloroethylene	1	20	X	vapor
79-09-4	Propionic acid	1	8		vapor
79-10-7	2-Propenoic acid	1	8		vapor
79-20-9	Methyl acetate	1	14		vapor
79-34-5	1,1,2,2-Tetrachloroethane	1	16		vapor
83-32-9	Acenaphthene	1	15	X	vapor
84-66-2	Diethyl phthalate	1	8	X	vapor
84-74-2	Dibutyl phthalate	0.994	31	X	particle-bound
85-01-8	Phenanthrene	0.999	13		particle-bound
85-68-7	Butylbenzyl phthalate	0.948	31		particle-bound
86-73-7	Fluorene	1	14		vapor
87-68-3	Hexachlorobutadiene	1	20	X	vapor
88-06-2	2,4,6-Trichlorophenol	1	10		vapor
88-72-2	2-Nitrotoluene	1	12		vapor
88-75-5	2-Nitrophenol	1	12		vapor
88-89-1	Picric acid	0.939	2	X	particle-bound
91-20-3	Naphthalene	1	16	X	vapor
91-22-5	Quinoline	1	9		vapor
91-58-7	2-Chloronapthalene	1	16		vapor
92-52-4	1,1`-Biphenyl	1	16		vapor
92-93-3	4-Nitrobiphenyl	0.999	10		particle-bound
95-13-6	Indene	1	18		vapor
95-47-6	o-Xylene	1	19		vapor
95-48-7	o-Cresol (2-Methylphenol)	1	9		vapor
95-49-8	2-Chlorotoluene	1	19		vapor
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	1	18	X	vapor
95-57-8	2-Chlorophenol	1	11		vapor
95-95-4	2,4,5-Trichlorophenol	1	9		vapor
96-22-0	3-Pentanone	1	14		vapor
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	1	19		vapor
98-51-1	p-tert-Butyltoluene	1	21		vapor
98-82-8	Cumene	1	20		vapor
98-83-9	alpha-Methylstyrene	1	19		vapor
98-86-2	Acetophenone	1	11	X	vapor
98-95-3	Nitrobenzene	1	12		vapor

- Each organic constituent has a specific removal efficiency (i.e. decontamination factor - DF) that has been specified by engineering calculations and Research and Technology testing results. The DFs assigned per facility are as follows:
  - Pretreatment
    - PVP Caustic scrubber (24590-PTF-MKD-PVP-00002)
      - Vapor: 1
      - Particle: 3.5
    - PVP HEME (24590-WTP-RPT-PO-03-008, Table 11)
      - Vapor: 1

    - Particle: 200
  - PVV/PJV HEPA Filters (24590-WTP-RPT-ENV-01-004, section 4.2.2.1)
    - Vapor: 1
    - Particle: 200,000
  - PVP Thermal Oxidizer (24590-WTP-RPT-PO-03-008, Appendix G)
    - DFs dependent on organic constituent. Values are shown in the table at the end of this section.
  - PVP Carbon Beds (24590-WTP-RPT-PO-03-008, Appendix G)
    - DFs dependent on organic constituent. Values are shown in the table at the end of this section.
  - PJV Demister (24590-WTP-RPT-PO-03-008, Table 11)
    - Vapor: 1
    - Particle: 5

- LAW and HLW Vitrification (CCN 053500)
  - Melters
    - Vapor: 1.1
    - Particle: 1.1
  - SBS
    - Vapor: 1
    - Particle: 20
  - WESP
    - Vapor: 1
    - Particle: 20
  - HLW HEME
    - Vapor: 1
    - Particle: 90
  - LVP/HOP/PJV HEPA filters
    - Vapor: 1
    - Particle: 200,000
  - LVP/HOP Sulfur Activated Carbon
    - Vapor: 1
    - Particle: 1
  - HOP Silver Mordenite
    - Vapor: 1
    - Particle: 1
  - LVP/HOP Thermal Catalytic Oxidizer
    - Vapor: 20
    - Particle: 20
  - LVP/HOP Selective Catalytic Reducer
    - Vapor: 1
    - Particle: 1
  - LVP Caustic Scrubber
    - Vapor: 1
    - Particle: 1

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 14

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

Pretreatment Facility Organic Constituents Thermal Oxidizer and Carbon Bed Adsorber DFs		
CAS Registry Number	**PT Thermal Oxidizer DF**	**PT Carbon Bed Adsorber DF**
100-00-5	10,000	5
100-21-0	20	50
100-41-4	10,000	1
100-42-5	10,000	1
10061-01-5	100	1
10061-02-6	50	1
101-55-3	3.333333	50
101-84-8	50	5
106-35-4	10,000	1
106-42-3	1,000	1
106-46-7	50	2
106-88-7	10,000	1
106-93-4	1	10
106-97-8	10,000	1
106-99-0	10,000	1
107-02-8	10,000	1
107-05-1	10,000	1
107-06-2	10,000	1
107-12-0	10,000	1
107-13-1	10,000	1
107-18-6	10,000	1
107-31-3	10,000	1
107-66-4	10,000	1
107-87-9	10,000	1
108-03-2	10,000	1
108-05-4	10,000	1
108-10-1	10,000	1
108-20-3	10,000	1
108-38-3	1,000	1
108-39-4	1,000	2
108-87-2	10,000	1
108-88-3	10,000	1
108-90-7	20	5
108-93-0	10,000	2
108-94-1	10,000	2
108-95-2	10	20
109-66-0	10,000	1
109-99-9	10,000	1
110-12-3	10,000	1

Pretreatment Facility Organic Constituents Thermal Oxidizer and Carbon Bed Adsorber DFs		
CAS Registry Number	**PT Thermal Oxidizer DF**	**PT Carbon Bed Adsorber DF**
110-43-0	10,000	1
110-54-3	10,000	1
110-62-3	10,000	1
110-82-7	10,000	1
110-83-8	10,000	1
110-86-1	10,000	1
111-65-9	10,000	1
111-76-2	10,000	2
111-84-2	10,000	2
117-81-7	10,000	5
117-84-0	10,000	5
120-12-7	1,000	5
120-82-1	100	5
120-83-2	3.333333	50
121-44-8	10,000	1
121-69-7	10,000	2
122-39-4	50	5
123-19-3	10,000	1
123-38-6	10,000	1
123-51-3	10,000	1
123-86-4	10,000	1
123-91-1	10,000	1
126-73-8	10,000	5
126-98-7	10,000	1
127-18-4	1	10
127-19-5	10,000	1
128-37-0	10,000	5
129-00-0	3.333333	50
1321-64-8	3.333333	50
1321-65-9	3.333333	50
132-64-9	3.333333	50
1335-87-1	3.333333	50
1335-88-2	3.333333	50
1336-36-3	3.333333	50
141-78-6	10,000	1
141-79-7	10,000	1
142-82-5	10,000	1
144-62-7	10	20
156-60-5	10,000	1

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 16

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

Pretreatment Facility Organic Constituents Thermal Oxidizer and Carbon Bed Adsorber DFs		
CAS Registry Number	**PT Thermal Oxidizer DF**	**PT Carbon Bed Adsorber DF**
1634-04-4	10,000	1
189-55-9	3.333333	50
189-64-0	3.333333	50
191-24-2	3.333333	50
191-30-0	3.333333	50
192-65-4	3.333333	50
193-39-5	3.333333	50
206-44-0	3.333333	50
208-96-8	3.333333	50
2234-13-1	3.333333	50
224-42-0	3.333333	50
226-36-8	3.333333	50
25551-13-7	1,000	2
26140-60-3	3.333333	50
27154-33-2	1	10
287-92-3	10,000	1
3697-24-3	3.333333	50
3825-26-1	3.333333	50
4170-30-3	10,000	1
50-00-0	10,000	1
50-32-8	3.333333	50
53-70-3	3.333333	50
540-59-0	10,000	1
540-84-1	10,000	1
541-73-1	50	2
56-23-5	1	5
563-80-4	10,000	1
56-49-5	3.333333	50
57-14-7	10,000	1
58-90-2	3.333333	10
591-78-6	1,000	1
59-50-7	3.333333	20
59-89-2	10,000	2
602-87-9	3.333333	50
60-29-7	10,000	1
603-34-9	3.333333	50
60-34-4	10,000	1
60-35-5	10,000	2
621-64-7	10,000	2

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 17

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

Pretreatment Facility Organic Constituents Thermal Oxidizer and Carbon Bed Adsorber DFs		
CAS Registry Number	**PT Thermal Oxidizer DF**	**PT Carbon Bed Adsorber DF**
624-83-9	1,000	1
627-13-4	10,000	1
62-75-9	10,000	2
630-20-6	1	10
64-17-5	10,000	1
64-18-6	10,000	1
64-19-7	10,000	1
67-56-1	10,000	1
67-63-0	10,000	1
67-64-1	10,000	1
67-66-3	1	2
67-72-1	1	50
684-16-2	1	1
71-23-8	10,000	1
71-36-3	10,000	1
71-43-2	100	1
71-55-6	1,000	1
74-83-9	1,000	1
74-87-3	20	1
74-97-5	1	2
74-99-7	10,000	1
75-00-3	1,000	1
75-01-4	10,000	1
75-05-8	1,000	1
75-07-0	10,000	1
75-09-2	50	1
75-12-7	10,000	1
75-15-0	10,000	1
75-21-8	10,000	1
75-27-4	1	5
75-34-3	10,000	1
75-35-4	10,000	1
75-43-4	1,000	1
75-45-6	50	1
75-50-3	10,000	1
75-52-5	10,000	1
75-55-8	10,000	1
75-61-6	1	1
75-63-8	1	1

CALCULATION SHEET

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 18

BY: E. Berrios
DATE: 01/09/06

SUBJECT: Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report

Pretreatment Facility Organic Constituents Thermal Oxidizer and Carbon Bed Adsorber DFs		
CAS Registry Number	**PT Thermal Oxidizer DF**	**PT Carbon Bed Adsorber DF**
75-65-0	10,000	1
75-69-4	1	1
75-71-8	1	1
76-03-9	1	50
76-11-9	20	5
76-12-0	20	5
76-13-1	20	2
76-14-2	1	1
76-15-3	1	1
78-83-1	10,000	1
78-87-5	1,000	1
78-92-2	10,000	1
78-93-3	1,000	1
79-00-5	10,000	1
79-01-6	10,000	1
79-09-4	10,000	1
79-10-7	10,000	1
79-20-9	10,000	1
79-34-5	1	10
83-32-9	3.333333	50
84-66-2	10,000	5
84-74-2	10,000	5
85-01-8	3.333333	50
85-68-7	10,000	5
86-73-7	3.333333	50
87-68-3	50	5
88-06-2	3.333333	50
88-72-2	10,000	2
88-75-5	3.333333	20
88-89-1	10,000	5
91-20-3	100	2
91-22-5	10,000	2
91-58-7	3.333333	50
92-52-4	1,000	5
92-93-3	3.333333	50
95-13-6	1,000	2
95-47-6	10,000	1
95-48-7	1,000	2
95-49-8	10,000	2

Pretreatment Facility Organic Constituents Thermal Oxidizer and Carbon Bed Adsorber DFs		
CAS Registry Number	**PT Thermal Oxidizer DF**	**PT Carbon Bed Adsorber DF**
95-50-1	50	2
95-57-8	10,000	2
95-95-4	3.333333	50
96-22-0	10,000	1
96-69-5	3.333333	50
98-51-1	10,000	2
98-82-8	10,000	2
98-83-9	100	2
98-86-2	100	2
98-95-3	10,000	2

- The results from the SSFM used to estimate the organic releases in this calculation were based on the model run request titled *2005 Air Emissions Profile* (24590-WTP-MRQ-PO-05-0049). The stream reports used in this calculation are:
  - FRP01 - LAW Feed
  - FRP14 – HLW Feed
  - HOP10 – Unabated HLW Vessel Ventilation Header
  - HMP06 – Unabated HLW Melter Offgas
  - LFP06+RLD32+RLD33+RLD34 – Unabated LAW Vessel Ventilation Header (known as LVP01)
  - LMP06 – Unabated LAW Melter Offgas
  - PJV04 – Unabated Pretreatment RFD/PJM
  - PJV32 – Unabated HLW RFD/PJM
  - PVP01 – Unabated Pretreatment Vessel Vent

  These stream reports can be found in Attachment A of this calculation.

3 Background

There are a total of 219 organic constituents (excluding Products of Incomplete Combustion) that are required to be tracked through the WTP for permitting purposes. Emissions profiles for the WTP are generated by using the SSFM. In order to simplify the flowsheet, not all organic constituents are tracked in the SSFM. The constituents were segregated into groups based on similar physical and chemical properties. Representatives from each group were selected and are tracked in the SSFM. Only 51 organic constituents are tracked in the SSFM. Based on the behavior and results of these representative constituents, the expected emissions rates for the non-tracked constituents can be calculated. This calculation estimates these rates.

4 Applicable Codes and Standards

NA

5 Methodology

The following methodology was used in this calculation:

- Organic feed rates to the WTP were calculated by multiplying the constituent's feed concentration in mg/l by the volumetric flowrate of the feed stream in liters per minute. This mass flowrate was then converted to grams per second.
- The results from the representative compounds were obtained from the SSFM for each desired stream (PVP01 is used as an example). The performance factor (PF) for the representative compounds was calculated per stream relative to the feed stream, FRP01 and FRP14. This was done by obtaining the representative compounds mass feed rate from stream reports # FRP01 and FRP14 and its mass flowrate at the stream being evaluated. The PF was calculated by dividing the constituent's mass feed rate by the specified stream's constituent mass flowrate.

  $$PF = \frac{\text{mass rate at waste feed [representative compound]}}{\text{mass rate at point of interest [representative compound]}}$$

- Once the PF was calculated, it was multiplied by the feed rate for the non-represented compound in order to obtain the mass flowrate of the constituent at that stream. If more than one compound was used to represent a group, the average PF between the compounds was used to calculate the non-represented compound rate.
- The combined rate of the 14 coplanar PCBs is established as 1% of the total PCB (as represented by CAS# 1336-36-3). Thus, to calculate the feed rate for each coplanar PCB, the feed rate of the total PCB was multiplied by 0.01 and divided by 14.
- For the constituents in the Pretreatment Vessel Vent the stack calculation is easily determined by applying the DFs per unit operation. Thus, the feed rate entering the Pretreatment Vessel Vent is divided by all the applicable DFs for each constituent. The final number obtained is the stack emissions estimate. This same process also applies to the Pretreatment PJM/RFD system and the HLW PJM/RFD system. For example, if a constituent had a value of 1.0E-03 g/sec at the entrance to the pretreatment caustic scrubber (stream PVP01) and DFs of 1 for the caustic scrubber, 1 for the HEME, 1 for the HEPA filters, 1000 for the TCO and 5 for the carbon beds, then the stack flowrate would be:
  1.0E-03 / (1*1*1*1000*5) = 2.0E-07 g/sec.
- For particle-bound constituents with F_v values within the following range $1 > F_v \geq 0.05$, the vapor and particle fraction for the constituent were calculated and then the applicable DFs were applied. For example, if a constituent had a mass rate in stream PVP01 of 10 g/sec with an F_v value of 0.9, this means that:
  10 g/sec * 0.9 = 9 g/sec of the constituent is in the vapor phase and,
  10 g/sec - 9 g/sec = 1 g/sec of the constituent is in the particle-bound phase
  Assuming that the thermal oxidizer DF is 10,000 and the carbon bed DF is 5, then the stack emission rate for this constituent is:
  Vapor portion:
  9 g/sec / (DF NaOH Scrubber * DF HEME * DF HEPA * DF TO * DF CB) = stack emission rate in g/sec
  9 g/sec / (1 * 1 * 1 * 10,000 * 5) = 1.80E-04 g/sec
  Particle portion:
  1 g/sec / (DF NaOH Scrubber * DF HEME * DF HEPA * DF TO * DF CB) = stack emission rate in g/sec
  1 g/sec / (3.5 * 200 * 200,000 * 10,000 * 5) = 1.43E-13 g/sec
  Therefore the total stack emission rate for this constituent is:
  Total = vapor portion + particle portion
  Total = 1.80E-04 g/sec + 1.43E-13 g/sec = 1.80E-04 g/sec
- For constituents with F_v values less than 0.05, the constituent is considered entirely in the particle phase and the applicable DFs were applied.
- In the HLW and LAW vitrification facilities, there is generation of offgas in the melter, which is eventually mixed with the vessel vents in the primary offgas system. Thus for the vitrification plants, the estimation of

organic constituents generation from the melter and vessel vents is calculated as was done in the Pretreatment vessel vent and PJM/RFD areas. When the offgas meets the vessel vent stream, these two streams were added together to obtain the overall constituent mass flowrate at that point. From then on, the specific DFs were used for all unit operations found from the mixing point up to the stack. The effect of the Fv values was taken into account as described above.

- After the values were calculated for each stream, they were analyzed to determine if they were less than 1E-15. If yes, then the value was set to zero, otherwise, the value remain the same.

6 Assumptions

NA

7 Calculations

Calculations were performed using the Microsoft Excel® 2000 spreadsheet on a Compaq PC workstation. The calculation for two groupings of organic constituents having similar chemical and physical properties is shown for all the streams. Of the groups selected, one group has one representative compound while the other group has two representative compounds. The groups selected are:
Group 4: represented by Formamide (75-12-7)
Group 8: represented by Phenol (108-95-2) and Diethyl Phthalate (84-66-2)
The entire lists of constituents for these two groups are as follows:
Group 4
- Formamide (75-12-7)
- Dibenz[a,j]acridine (224-42-0)
- Dibenz[a,h]acridine (226-36-8)

Group 8
- - Phenol (108-95-2)
- - Diethyl Phthalate (84-66-2)
- Formaldehyde (50-00-0)
- Propionic Acid (79-09-4)
- 2-Propenoic Acid (79-10-7)

Also the calculation for Coplanar PCBs is included for all the streams. The coplanar PCBs are represented by:
2,3',4,4',5-Pentachlorobiphenyl (PBC 118) (31508-00-6)
3,3',4,4'-Tetrachlorobiphenyl (TCB) (32598-13-3)
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) (32598-14-4)
3,3',4,4',5,5'-Hexachlorobiphenyl (32774-16-6)
2,2',3,4,4',5,5'-Heptachlorobiphenyl (35065-29-3)
2,2',3,3',4,4',5-Heptachlorobiphenyl (35065-30-6)
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157) (38380-08-4)
2,3,3',4,4',5,5'-Heptachlorobiphenyl (39635-31-9)
2,3',4,4',5,5'-Hexachlorobiphenyl (52663-72-6)
3,3',4,4',5-Pentachlorobiphenyl (57465-28-8)
2',3,4,4',5-Pentachlorobiphenyl (65510-44-3)
2,3,3',4,4',5'-Hexachlorobiphenyl (69782-90-7)
3,4,4',5-Tetrachlorobiphenyl (70362-50-4)
2,3,4,4',5-Pentachlorobiphenyl (74472-37-0)

7.1 Feed Rate

FRP14 is the HLW waste feed stream while FRP01 is the LAW waste feed. The total feed rate per constituent is calculated by adding the feed rate values in each stream.

For all the calculations in this section refer to Table B-1 in Attachment B. From Attachment A, streams FRP01 and FRP14, the total WTP feed volumetric flowrate for this stream is: 1.51 ft^3/min (cell D1)
Converting to liters per minute: 1.51 ft^3/min * 28.317 l/ft^3 = 42.9 l/min (cell D2)

Group 4 feed rates in grams per second:
Formamide (75-12-7) feed concentration: 60 mg/l (cell C149)
60 mg/l (cell C149) * 42.9 l/min * 1 g / 1000 mg * 1 min / 60 sec = 4.29E-02 g/sec (cell H149)
The other 2 constituents in this group have the same feed concentration thus the feed rate is the same.

Group 8 feed rates in grams per second:
Phenol (108-95-2) feed concentration: 60 mg/l (cell C41)
60 mg/l (cell C41) * 42.9 l/min * 1 g / 1000 mg * 1 min / 60 sec = 4.29E-02 g/sec (cell H41)
Constituents Diethyl Phthalate (84-66-2), Propionic Acid (79-09-4), and 2-Propenoic Acid (79-10-7) have the same feed concentration thus the feed rate is the same. Formaldehyde's (50-00-0) feed concentration is different.
Formaldehyde feed concentration (50-00-0): 10 mg/l (cell C103)
10 mg/l (cell C103) * 42.9 l/min * 1 g / 1000 mg * 1 min / 60 sec = 7.14E-03 g/sec (cell H103)

Coplanar PCBs feed rate:
The coplanar PCB feed rate is obtained by summing the SSFM results for streams FRP01 and FRP14. The feed rate for the PCBs depends on the amount of supernate in the feed and the amount of solids in the feed. For the supernate, the PCBs are based on a concentration of 0.7 mg/l. For the solids, the PCBs are based on a concentration of 50 mg PCBs / kg of total solids. Per Tables A-2 and A-3, the PCBs total feed rate is 1.74E-03 g/sec.
Based on this, the feed rate for the 14 coplanar PCBs is:
1.74E-03 (cell H78) * 0.01/14 = 1.24E-06 g/sec (cells L8 through L21)

7.2 Pretreatment Vessel Vent Analysis

To determine the stack releases from the Pretreatment Vessel Vent System (PVV), first the mass rates of all the constituents are calculated in stream PVP01 (the unabated Pretreatment Vessel Vent stream). Then the corresponding DFs for each constituent within the system are applied to these values to obtain the final stack releases (stream PVP12). For particle-bound constituents with F_v values within the range $1 > F_v \geq 0.05$, both the vapor and particle DF were applied to the corresponding vapor and particle mass rate to arrive at the desired emission rate.

7.2.1 PVP01 Stream

This streams depicts the unabated Pretreatment Vessel Ventilation. For all the calculations in this section refer to Table B-2. First the feed rate is obtained followed by the mass rate of the representative constituent at the stream specified. The performance factor for this constituent is calculated and applied to the non-represented compounds to obtain their mass rate.

Group 4
Formamide (75-12-7) feed rate: 4.29E-02 g/sec (cell C147)

Formamide (75-12-7) rate at PVP01 from the PVP01 stream report in Attachment A: 6.34E-06 g/sec (cell H147 of Table B-2)
Performance factor for Formamide: 6.34E-06/4.29E-02 = 1.48E-04 (cell I147, also copied to cell O8)

Dibenz[a,j]acridine (224-42-0) feed rate: 4.29E-02 g/sec (cell C92)
Mass rate at PVP01: 4.29E-02 (cell C92) * 1.48E-04 (cell O8) = 6.34E-06 g/sec (cell K92)
Dibenz[a,h]acridine (226-36-8) feed rate: 4.29E-02 g/sec (cell C93)
Mass rate at PVP01: 4.29E-02 (cell C93) * 1.48E-04 (cell O8) = 6.34E-06 g/sec (cell K93)

Group 8
Phenol (108-95-2) feed rate: 4.29E-02 g/sec (cell C39)
Phenol (108-95-2) rate at PVP01 from the PVP01 stream report in Attachment A: 1.31E-03 g/sec (cell H39)
Performance factor for Phenol: 1.31E-03/4.29E-02 = 3.06E-02 (cell I39)

Diethyl Phthalate (84-66-2) feed rate: 4.29E-02 g/sec (cell C180)
Diethyl Phthalate (84-66-2) rate at PVP01 from the PVP01 stream report in Attachment A: 2.05E-03 g/sec (cell H180)
Performance factor for Diethyl Phthalate: 2.05E-03/4.29E-02 = 4.79E-02 (cell I180)

Since this group is represented by the above 2 constituents, an average performance factor is then calculated and applied to the other constituents. Average performance factor is:
(3.06E-02 (cell I39) + 4.79E-02 (cell I180))/2 = 3.92E-02 (cell O12)

Formaldehyde (50-00-0) feed rate: 7.14E-03 g/sec (cell C101)
Mass rate at PVP01: 7.14E-03 (cell C101) * 3.92E-02 (cell O12) = 2.80E-04 g/sec (cell K101)

Propionic Acid (79-09-4) feed rate: 4.29E-02 g/sec (cell C175)
Mass rate at PVP01: 4.29E-02 (cell C175) * 3.92E-02 (cell O12) = 1.68E-03 g/sec (cell K175)

2-Propenoic Acid (79-10-7) feed rate: 5.72E-02 g/sec (cell C176)
Mass rate at PVP01: 5.72E-02 (cell C176) * 3.92E-02 (cell O12) = 2.24E-03 g/sec (cell K176)

Column L adjusts the values to zero if they are below 1E-15, otherwise they remain the same.

Coplanar PCBs
1336-36-3 feed rate at PVP01 from the PVP01 stream report in Attachment A: 4.31E-03 g/sec (cell H76)
Mass rate for the 14 coplanar PCBs in PVP01 is:
4.31E-03 (cell H76) * 0.01/14 = 3.08E-06 g/sec (cells T7 through T20)
Thus the corrected mass rate for 1336-36-3 in PVP01 is:
4.31E-03 g/sec * 0.99 = 4.26E-03 g/sec (cell K76)

7.2.2 PVP12 Stream

For all the calculations for this stream refer to Table B-3 of Attachment B. Input to this spreadsheet are the results from PVP01 stream calculations. These numbers are imported to Column C from cells L4 through L208 of Table B-2. Also all the DFs and F_v values are imported from Section 2 of this calculation. The corresponding DFs for this stream are related to the following unit operations: caustic scrubber, HEME, HEPA filters, TO, and carbon beds. The calculations for Group 4 and Coplanar PCBs are the only ones shown below. The remaining groups are calculated in the same manner.

Group 4

Formamide (75-12-7) mass rate at PVP01: 6.34E-06 g/sec (cell C147)
To calculate the emission rate, first, the F_v value for the constituent is analyzed and the split between vapor and particle is determined. The F_v value is imported to column E from Section 2. The F_v value given pertains to the vapor phase. If this value is less than 0.05, the constituent is assumed to be 100% particle. Column F makes this adjustment to the Fv. Since the F_v value for formamide is 1 (cell E147) no adjustment is required and the value in cell F147 is 1. The particle fraction is calculated by using the following formula: $1 - F_v$. This calculation is done in column G. Since the F_v value is 1 for formamide, the particle fraction is 1 - 1 = 0 (cell G147). Columns L and M provide the TO and carbon bed DF for formamide:
TO DF = 10,000 (cell L147)
Carbon bed DF = 1 (cell M147)
Cells W21 through AB26 show the applicable DFs for the PVP/PVV system for vapor and particle constituents. The overall DF is calculated in column AB.

The emission rates are then calculated for both the vapor and particle fractions. The vapor mass rate is calculated by multiplying the stream mass rate (cell C147) by the F_v vapor value (cell F147). This value is then divided by the overall vapor DF calculated in cell AB25 and by the TO DF (cell L147) and the carbon bed DF (cell M147).
Vapor fraction = 6.34E-06 g/sec (cell C147) * 1 (cell F147) / 1 (cell AB25) / 10,000 (cell L147) / 1 (cell M147)
Vapor fraction = 6.34E-10 g/sec (cell N147)

The particle mass rate is calculated identically as the vapor fraction except for the overall DF used which is the particle DF shown in cell AB26. The particle emission rate is shown on cell O147.
Particle fraction = 6.34E-06 g/sec (cell C147) * 0 (cell G147) / 1.32E+08 (cell AB26) / 10,000 (cell L147) / 1 (cell M147)
Particle fraction = 0 g/sec (cell O147)

The overall emission rate is then the summation of the vapor and particle fraction:
Total emission rate = vapor fraction + particle fraction
Total emission rate = 6.34E-10 g/sec (cell N147) + 0 g/sec (cell O147) = 6.34E-10 g/sec (cell P147)

Dibenz[a,j]acridine (224-42-0) mass rate at PVP01: 6.34E-06 g/sec (cell C92)
The same process as described above was followed:
F_v vapor: 0.241 (cell E92)
Since F_v is $\geq$0.05, the value remains the same in cell F92. The particle fraction is therefore:
Particle fraction: 1 - 0.241 = 0.759 (cell G92)
The vapor fraction mass rate is:
Vapor fraction = 6.34E-06 g/sec (cell C92) * 0.241 (cell F92) / 1 (cell AB25) / 3.333333 (cell L92) / 50 (cell M92)
Vapor fraction = 9.17E-09 g/sec (cell N92)
The particle fraction mass rate is:
Particle fraction = 6.34E-06 g/sec (cell C92) * 0.759 (cell G92) / 1.32E+08 (cell AB26) / 3.333333 (cell L92) / 50 (cell M92)
Particle fraction = 2.19E-16 g/sec (cell O92)
The total emission rate is:
Total emission rate: 9.17E-09 g/sec (cell N92) + 2.19E-16 g/sec (cell O92) = 9.17E-09 g/sec (cell P92)

Dibenz[a,h]acridine (226-36-8) mass rate at PVP01: 6.34E-06 g/sec (cell C93)
F_v vapor: 0.285 (cell E93)
Since F_v is $\geq$0.05, the value remains the same in cell F93. The particle fraction is therefore:

Particle fraction: 1 - 0.285 = 0.715 (cell G93)
The vapor fraction mass rate is:
Vapor fraction = 6.34E-06 g/sec (cell C93) * 0.285 (cell F93) / 1 (cell AB25) / 3.333333 (cell L93) / 50 (cell M93)
Vapor fraction = 1.08E-08 g/sec (cell N93)
The particle fraction mass rate is:
Particle fraction = 6.34E-06 g/sec (cell C93) * 0.715 (cell G93) / 1.32E+08 (cell AB26) / 3.333333 (cell L93) / 50 (cell M93)
Particle fraction = 2.06E-16 g/sec (cell O93)
The total emission rate is:
Total emission rate: 1.08E-08 g/sec (cell N93) + 2.06E-16 g/sec (cell O93) = 1.08E-08 g/sec (cell P93)

Column Q adjusts the values to zero if they are less than 1E-15, otherwise the value remains the same.

Coplanar PCBs
1336-36-3 corrected mass rate at PVP01: 4.26E-03 (cell C76)
F_v vapor: 1 (cell E76)
Since F_v is $\geq$0.05, the value remains the same in cell F76. The particle fraction is therefore:
Particle fraction: 1 - 1 = 0 (cell G76)
The vapor fraction mass rate is:
Vapor fraction = 4.26E-03 g/sec (cell C76) * 1 (cell F76) / 1 (cell AB25) / 3.333333 (cell L76) / 50 (cell M76)
Vapor fraction = 2.56E-05 g/sec (cell N76)
The particle fraction mass rate is:
Particle fraction = 4.26E-03 g/sec (cell C76) * 0 (cell G76) / 1.32E+08 (cell AB26) / 3.333333 (cell L76) / 50 (cell M76)
Particle fraction = 0 g/sec (cell O76)
The total emission rate is:
Total emission rate: 2.56E-05 g/sec (cell N76) + 0 g/sec (cell O76) = 2.56E-05 g/sec (cell P76)
Mass rate for the 14 coplanar PCBs in PVP12 is:
2.56E-05 (cell N76) * 0.01/14/0.99 = 1.85E-08 g/sec (cells U6 through U19)

7.3 Pretreatment PJM/RFD Analysis

To determine the stack releases from the Pretreatment PJM/RFD Ventilation System (PJV), first the mass rates of all the constituents are calculated in stream PJV04 (the unabated Pretreatment PJM/RFD Vent stream). Then the corresponding DFs for each constituent within the system are applied to these values to obtain the final stack releases (stream PJV11).

7.3.1 PJV04 Stream

This streams depicts the unabated Pretreatment RFD/PJM Ventilation. For all the calculations in this section refer to Table B-4. First the feed rate is obtained followed by the mass rate of the representative constituent at the stream specified. The performance factor for this constituent is calculated and applied to the non-represented compounds to obtain their mass rate.

Group 4
Formamide (75-12-7) feed rate: 4.29E-02 g/sec (cell C147)
Formamide (75-12-7) rate at PJV04 from the PJV04 stream report in Attachment A: 6.80E-08 g/sec (cell H147)
Performance factor for Formamide: 6.80E-08/4.29E-02 = 1.59E-06 (cell I147, also copied to cell O8)

Dibenz[a,j]acridine (224-42-0) feed rate: 4.29E-02 g/sec (cell C92)
Mass rate at PJV04: 4.29E-02 (cell C92) * 1.59E-06 (cell O8) = 6.80E-08 g/sec (cell K92)
Dibenz[a,h]acridine (226-36-8) feed rate: 4.29E-02 g/sec (cell C93)
Mass rate at PJV04: 4.29E-02 (cell C93) * 1.59E-06 (cell O8) = 6.80E-08 g/sec (cell K93)

Group 8
Phenol (108-95-2) feed rate: 4.29E-02 g/sec (cell C39)
Phenol (108-95-2) rate at PJV04 from the PJV04 stream report in Attachment A: 5.94E-08 g/sec (cell H39)
Performance factor for Phenol: 5.94E-08/4.29E-02 = 1.39E-06 (cell I39)

Diethyl Phthalate (84-66-2) feed rate: 4.29E-02 g/sec (cell C180)
Diethyl Phthalate (84-66-2) rate at PJV04 from the PJV04 stream report in Attachment A: 5.46E-08 g/sec (cell H180)
Performance factor for Diethyl Phthalate: 5.46E-08/4.29E-02 = 1.27E-06 (cell I180)

Since this group is represented by the above 2 constituents, an average performance factor is then calculated and applied to the other constituents. Average performance factor is:
(1.39E-06 (cell I39) + 1.27E-06 (cell I180))/2 = 1.33E-06 (cell O12)

Formaldehyde (50-00-0) feed rate: 7.14E-03 g/sec (cell C101)
Mass rate at PJV04: 7.14E-03 (cell C101) * 1.33E-06 (cell O12) = 9.50E-09 g/sec (cell K101)

Propionic Acid (79-09-4) feed rate: 4.29E-02 g/sec (cell C175)
Mass rate at PJV04: 4.29E-02 (cell C175) * 1.33E-06 (cell O12) = 5.70E-08 g/sec (cell K175)

2-Propenoic Acid (79-10-7) feed rate: 5.72E-02 g/sec (cell C176)
Mass rate at PJV04: 5.72E-02 (cell C176) * 1.33E-06 (cell O12) = 7.60E-08 g/sec (cell K176)

Coplanar PCBs
1336-36-3 feed rate at PJV04 from the PJV04 stream report in Attachment A: 1.37E-09 g/sec (cell H76)
Mass rate for the 14 coplanar PCBs in PJV04 is:
1.37E-09 (cell H76) * 0.01/14 = 9.81E-13 g/sec (cells T7 through T20)
This means that the corrected mass rate for 1336-36-3 in PJV04 is:
1.37E-09 g/sec * 0.99 = 1.36E-09 g/sec (cell K76)

7.3.2 PJV11 Stream

For all the calculations for this stream refer to Table B-5 of Attachment B. Input to this spreadsheet is the results from PJV04 stream calculations. These numbers are imported to Column C from cells L4 through L208. Also all the DFs and F_v values are imported from Section 2 of this calculation. The corresponding DFs for this stream are related to the following unit operations: demister and HEPA filters. The calculations for Group 4 and Coplanar PCBs are the only ones shown below. The remaining groups are calculated in the same manner.

Group 4
Formamide (75-12-7) mass rate at PJV04: 6.80E-08 g/sec (cell C147)
To calculate the emission rate, first the F_v value for the constituent is analyzed and the split between vapor and particle is determined. The F_v value is imported to column E from Section 2. The F_v value given pertains to the vapor phase. If this value is less than 0.05, the constituent is assumed to be 100% particle. Column F makes this adjustment to the Fv. Since the F_v value for formamide is 1 (cell E147) no adjustment is required and the value in

cell F147 is 1. The particle fraction is calculated by using the following formula: 1 - F_v. This calculation is done in column G. Since the F_v value is 1 for formamide, the particle fraction is 1 - 1 = 0 (cell G147). Cells P24 through T26 show the applicable DFs for the PT PJV system for vapor and particle constituents. The overall DF is calculated in column T.

The emission rates are then calculated for both the vapor and particle fractions. The vapor mass rate is calculated by multiplying the stream mass rate (cell C147) by the F_v vapor value (cell F147). This value is then divided by the overall vapor DF calculated in cell T25 to arrive to the vapor fraction emission rate (cell K147).
Vapor fraction = 6.80E-08 g/sec (cell C147) * 1 (cell F147) / 1 (cell T25)
Vapor fraction = 6.80E-08 g/sec (cell K147)

The particle mass rate is calculated identically as the vapor fraction except for the overall DF used which is the particle DF shown in cell T26. The particle emission rate is shown on cell L147.
Particle fraction = 6.80E-08 g/sec (cell C147) * 0 (cell G147) / 1.00E+06 (cell T26)
Particle fraction = 0 g/sec (cell L147)

The overall emission rate is then the summation of the vapor and particle fraction:
Total emission rate = vapor fraction + particle fraction
Total emission rate = 6.80E-08 g/sec (cell K147) + 0 g/sec (cell L147) = 6.80E-08 g/sec (cell M147)

Dibenz[a,j]acridine (224-42-0) mass rate at PJV04: 6.80E-08 g/sec (cell C92)
The same process as described above was followed:
F_v vapor: 0.241 (cell E92)
Since F_v is $\geq$0.05, the value remains the same in cell F92. The particle fraction is therefore:
Particle fraction: 1 - 0.241 = 0.759 (cell G92)
The vapor fraction mass rate is:
Vapor fraction = 6.80E-08 g/sec (cell C92) * 0.241 (cell F92) / 1 (cell T25)
Vapor fraction = 1.64E-08 g/sec (cell K92)
The particle fraction mass rate is:
Particle fraction = 6.80E-08 g/sec (cell C92) * 0.759 (cell G92) / 1.00E+06 (cell T26)
Particle fraction = 5.16E-14 g/sec (cell L92)
The total emission rate is:
Total emission rate: 1.64E-08 g/sec (cell K92) + 5.16E-14 g/sec (cell L92) = 1.64E-08 g/sec (cell M92)

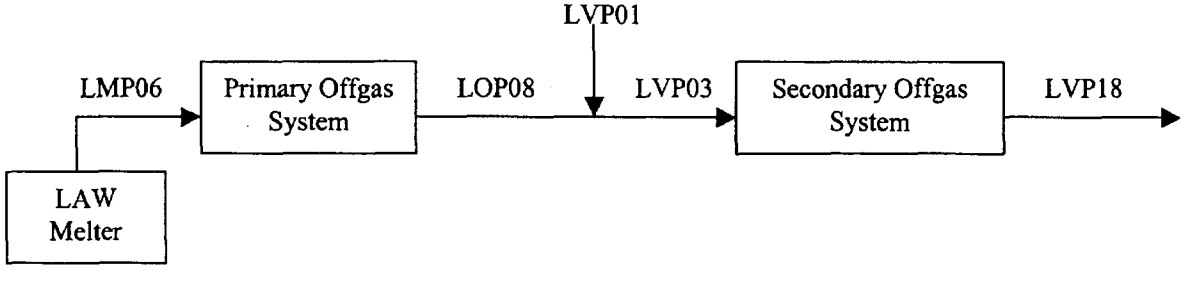
Dibenz[a,h]acridine (226-36-8) feed rate mass rate at PJV04: 6.80E-08 g/sec (cell C93)
F_v vapor: 0.285 (cell E93)
Since F_v is $\geq$0.05, the value remains the same in cell F93. The particle fraction is therefore:
Particle fraction: 1 - 0.285 = 0.715 (cell G93)
The vapor fraction mass rate is:
Vapor fraction = 6.80E-08 g/sec (cell C93) * 0.285 (cell F93) / 1 (cell T25)
Vapor fraction = 1.94E-08 g/sec (cell K93)
The particle fraction mass rate is:
Particle fraction = 6.80E-08 g/sec (cell C93) * 0.715 (cell G93) / 1.00E+06 (cell T26)
Particle fraction = 4.86E-14 g/sec (cell L93)
The total emission rate is:
Total emission rate: 1.94E-08 g/sec (cell K93) + 4.86E-14 g/sec (cell L93) = 1.94E-08 g/sec (cell M93)

Column N adjusts the values to zero if they are less than 1E-15, otherwise the value remains the same.

Coplanar PCBs
1336-36-3 corrected mass rate at PJV04: 1.36E-09 g/sec (cell C76)
F_v vapor: 1 (cell E76)
Since F_v is $\geq$0.05, the value remains the same in cell F76. The particle fraction is therefore:
Particle fraction: 1 - 1 = 0 (cell G76)
The vapor fraction mass rate is:
Vapor fraction = 1.36E-09 g/sec (cell C76) * 1 (cell F76) / 1 (cell T25)
Vapor fraction = 1.36E-09 g/sec (cell K76)
The particle fraction mass rate is:
Particle fraction = 1.36E-09 g/sec (cell C76) * 0 (cell G76) / 1.00E+06 (cell T26)
Particle fraction = 0 g/sec (cell L76)
The total emission rate is:
Total emission rate: 1.36E-09 g/sec (cell K76) + 0 g/sec (cell L76) = 1.36E-09 g/sec (cell M76)
Mass rate for the 14 coplanar PCBs in PJV11 is:
1.36E-09 (cell M76) * 0.01/14/0.99 = 9.81E-13 g/sec (cells S6 through S19)

7.4 LAW Vitrification Analysis

To determine the stack releases from the LAW Melter Offgas System (LVP), first the mass rates of all the constituents are calculated in stream LMP06 (the unabated LAW Melter Offgas stream). From these values, the DFs that correspond to the SBS and WESP are applied to each constituent. These results are representative of LOP08. At this point the LAW Vessel Ventilation header joins the main offgas system. At this point also the mass rates of all the constituents are calculated in stream LVP01 (the unabated LAW Vessel Ventilation Header). The values from these two streams, LOP08 and LVP01, are then added together to represent stream LVP03 (combined offgas stream). From this point on, the corresponding DFs for each constituent within the system are applied to these values to obtain the final stack releases (stream LVP18). See sketch below for a simplified depiction of the process.



7.4.1 LMP06 Stream

This streams depicts the unabated LAW Melter Offgas. For all the calculations in this section refer to Table B-6. First the feed rate is obtained followed by the mass rate of the representative constituent at the stream specified. The performance factor for this constituent is calculated and applied to the non-represented compounds to obtain their mass rate.

Group 4
Formamide (75-12-7) feed rate: 4.29E-02 g/sec (cell C147)

Formamide (75-12-7) rate at LMP06 from the LMP06 stream report in Attachment A: 3.65E-02 g/sec (cell H147)
Performance factor for Formamide: 3.65E-02/4.29E-02 = 8.51E-01 (cell I147, also copied to cell O8)

Dibenz[a,j]acridine (224-42-0) feed rate: 4.29E-02 g/sec (cell C92)
Mass rate at LMP06: 4.29E-02 (cell C92) * 8.51E-01 (cell O8) = 3.65E-02 g/sec (cell K92)
Dibenz[a,h]acridine (226-36-8) feed rate: 4.29E-02 g/sec (cell C93)
Mass rate at LMP06: 4.29E-02 (cell C92) * 8.51E-01 (cell O8) = 3.65E-02 g/sec (cell K93)

Group 8
Phenol (108-95-2) feed rate: 4.29E-02 g/sec (cell C39)
Phenol (108-95-2) rate at LMP06 from the LMP06 stream report in Attachment A: 1.78E-02 g/sec (cell H39)
Performance factor for Phenol: 1.78E-02/4.29E-02 = 4.16E-01 (cell I39)

Diethyl Phthalate (84-66-2) feed rate: 4.29E-02 g/sec (cell C180)
Diethyl Phthalate (84-66-2) rate at LMP06 from the LMP06 stream report in Attachment A: 1.12E-02 g/sec (cell H180)
Performance factor for Diethyl Phthalate: 1.12E-02/4.29E-02 = 2.62E-01 (cell I180)

Since this group is represented by the above 2 constituents, an average performance factor is then calculated and applied to the other constituents. Average performance factor is:
(4.16E-01 (cell I39) + 2.62E-01 (cell I180))/2 = 3.39E-01 (cell O12)

Formaldehyde (50-00-0) feed rate: 7.14E-03 g/sec (cell C101)
Mass rate at LMP06: 7.14E-03 (cell C101) * 3.39E-01 (cell O12) = 2.42E-03 g/sec (cell K101)

Propionic Acid (79-09-4) feed rate: 4.29E-02 g/sec (cell C175)
Mass rate at LMP06: 4.29E-02 (cell C175) * 3.39E-01 (cell O12) = 1.42E-02 g/sec (cell K175)

2-Propenoic Acid (79-10-7) feed rate: 5.72E-02 g/sec (cell C176)
Mass rate at LMP06: 5.72E-02 (cell C176) * 3.39E-01 (cell O12) = 1.94E-02 g/sec (cell K176)

Column L adjusts the values to zero if they are less than 1E-15, otherwise the value remains the same.

Coplanar PCBs
1336-36-3 feed rate at LMP06 from the LMP06 stream report in Attachment A: 5.88E-11 g/sec (cell H76)
Mass rate for the 14 coplanar PCBs in LMP06 is:
5.88E-11 (cell H76) * 0.01/14 = 4.20E-14 g/sec (cells T7 through T20)
Thus the corrected mass rate of 1336-36-3 in LMP06 is:
5.88E-11 g/sec * 0.99 = 5.82E-11 g/sec (cell K76)

7.4.2 LVP01 Stream

This streams depicts the unabated LAW Vessel Ventilation. This stream is represented by the addition of streams LFP06, RLD32, RLD33, and RLD34. For all the calculations in this section refer to Table B-7. First the feed rate is obtained followed by the mass rate of the representative constituent at the stream specified. The performance factor for this constituent is calculated and applied to the non-represented compounds to obtain their mass rate.

Group 4
Formamide (75-12-7) feed rate: 4.29E-02 g/sec (cell C147)

Formamide (75-12-7) rate at LVP01 from the addition of stream reports LFP06, RLD32, RLD33, and RLD34 in Attachment A:
2.02E-07 g/sec (Table A-7) + 0 g/sec (Table A-8) + 0 g/sec (Table A-9) + 0 g/sec (Table A-10) = 2.02E-07 g/sec (cell H147)
Performance factor for Formamide: 2.02E-07/4.29E-02 = 4.71E-06 (cell I147, also copied to cell O8)

Dibenz[a,j]acridine (224-42-0) feed rate: 4.29E-02 g/sec (cell C92)
Mass rate at LVP01: 4.29E-02 (cell C92) * 4.71E-06 (cell O8) = 2.02E-07 g/sec (cell K92)
Dibenz[a,h]acridine (226-36-8) feed rate: 4.29E-02 g/sec (cell C93)
Mass rate at LVP01: 4.29E-02 (cell C93) * 4.71E-06 (cell O8) = 2.02E-07 g/sec (cell K93)

Group 8
Phenol (108-95-2) feed rate: 4.29E-02 g/sec (cell C39)
Phenol (108-95-2) rate at LVP01 from the addition of stream reports LFP06, RLD32, RLD33, and RLD34 in Attachment A: 2.36E-05g/sec (cell H39)
Performance factor for Phenol: 2.36E-05/4.29E-02 = 5.51E-04 (cell I39)

Diethyl Phthalate (84-66-2) feed rate: 4.29E-02 g/sec (cell C180)
Diethyl Phthalate (84-66-2) rate at LVP01 from the addition of stream reports LFP06, RLD32, RLD33, and RLD34 in Attachment A: 2.72E-05 g/sec (cell H180)
Performance factor for Diethyl Phthalate: 2.72E-05/4.29E-02 = 6.35E-04 (cell I180)

Since this group is represented by the above 2 constituents, an average performance factor is then calculated and applied to the other constituents. Average performance factor is:
(5.51E-04(cell I39) + 6.35E-04 (cell I180))/2 = 5.93E-04 (cell O12)

Formaldehyde (50-00-0) feed rate: 7.14E-03 g/sec (cell C101)
Mass rate at LVP01: 7.14E-03 (cell C101) * 5.93E-04 (cell O12) = 4.24E-06 g/sec (cell K101)

Propionic Acid (79-09-4) feed rate: 4.29E-02 g/sec (cell C175)
Mass rate at LVP01: 4.29E-02 (cell C175) * 5.93E-04 (cell O12) = 2.54E-05 g/sec (cell K175)

2-Propenoic Acid (79-10-7) feed rate: 5.72E-02 g/sec (cell C176)
Mass rate at LVP01: 5.72E-02 (cell C176) * 5.93E-04 (cell O12) = 3.39E-05 g/sec (cell K176)

Column L adjusts the values to zero if they are less than 1E-15, otherwise the value remains the same.

Coplanar PCBs
1336-36-3 feed rate at LVP01 from the addition of stream reports LFP06, RLD32, RLD33, and RLD34 in Attachment A: 1.47E-10 g/sec (cell H76)
Mass rate for the 14 coplanar PCBs in LVP01 is:
1.47E-10 (cell H76) * 0.01/14 = 1.05E-13 g/sec (cells T7 through T20)
Thus the corrected mass rate for 1336-36-3 in LVP01 is:
1.47E-10 g/sec * 0.99 = 1.45E-10 g/sec (cell K76)

7.4.3 LVP18 Stream

For all the calculations for this stream refer to Table B-8 of Attachment B. Input to this spreadsheet is the results from LMP06 and LVP01 stream calculations. The numbers for LMP06 were imported to Column C (cells C4

through C208). The ones for stream LVP01 were imported to column K (cells K4 through K208). Also all the DFs and F_v values were imported from Section 2 of this calculation. The corresponding DFs for this stream are related to the following unit operations: SBS, WESP, HEPA filters, TCO, and caustic scrubber. The calculations for Group 4 and Coplanar PCBs are the only ones shown below. The remaining groups are calculated in the same manner.

First the intermediate stream, LOP08, is calculated by applying the DFs for the SBS and WESP to stream LMP06. At this point, the values calculated for LVP01 are added to LOP08 to represent stream LVP03. The DFs for the rest of the unit operations in the system are then applied to the values in LVP03. Final results represent the composition of stream LVP18.

7.4.3.1 LOP08 Calculation

Group 4

Formamide (75-12-7) mass rate at LMP06: 3.65E-02 g/sec (cell C147)
To calculate the emission rate, first the F_v value for the constituent is analyzed and the split between vapor and particle is determined. The F_v value is imported to column E from Section 2. The F_v value given pertains to the vapor phase. If this value is less than 0.05, the constituent is assumed to be 100% particle. Column F makes this adjustment to the Fv. Since the F_v value for formamide is 1 (cell E147) no adjustment is required and the value in cell F147 is 1. The particle fraction is calculated by using the following formula: 1 - F_v. This calculation is done in column G. Since the F_v value is 1 for formamide, the particle fraction is 1 - 1 = 0 (cell G147). Cells R5 through U9 show the applicable DFs for the LOP Primary Offgas system for vapor and particle constituents. The overall DF is calculated in column U.

The emission rates are then calculated for both the vapor and particle fractions. The vapor mass rate is calculated by multiplying the stream mass rate (cell C147) by the F_v vapor value (cell F147). This value is then divided by the overall vapor DF calculated in cell U8 to arrive to the vapor fraction emission rate (cell H147).
Vapor fraction = 3.65E-02 g/sec (cell C147) * 1 (cell F147) / 1 (cell U8)
Vapor fraction = 3.65E-02 g/sec (cell H147)

The particle mass rate is calculated identically as the vapor fraction except for the overall DF used which is the particle DF shown in cell U9. The particle emission rate is shown on cell I147.
Particle fraction = 3.65E-02 g/sec (cell C147) * 0 (cell G147) / 400 (cell U9)
Particle fraction = 0 g/sec (cell I147)

The overall emission rate is then the summation of the vapor and particle fraction:
Total emission rate = vapor fraction + particle fraction
Total emission rate = 3.65E-02 g/sec (cell H147) + 0 g/sec (cell I147) = 3.65E-02 g/sec (cell J147)

Dibenz[a,j]acridine (224-42-0) mass rate at LMP06: 3.65E-02 g/sec (cell C92)
The same process as described above was followed:
F_v vapor: 0.241 (cell E92)
Since F_v is $\geq$0.05, the value remains the same in cell F92. The particle fraction is therefore:
Particle fraction: 1 - 0.241 = 0.759 (cell G92)
The vapor fraction mass rate is:
Vapor fraction = 3.65E-02 g/sec (cell C92) * 0.241 (cell F92) / 1 (cell U8)
Vapor fraction = 8.79E-03 g/sec (cell H92)
The particle fraction mass rate is:
Particle fraction = 3.65E-02 g/sec (cell C92) * 0.759 (cell G92) / 400 (cell U9)

Particle fraction = 6.92E-05 g/sec (cell I92)
The total emission rate is:
Total emission rate: 8.79E-03 g/sec (cell H92) + 6.92E-05 g/sec (cell I92) = 8.86E-03 g/sec (cell J92)

Dibenz[a,h]acridine (226-36-8) feed rate mass rate at LMP06: 3.65E-02 g/sec (cell C93)
F_v vapor: 0.285 (cell E93)
Since F_v is $\geq$0.05, the value remains the same in cell F93. The particle fraction is therefore:
Particle fraction: 1 - 0.285 = 0.715 (cell G93)
The vapor fraction mass rate is:
Vapor fraction = 3.65E-02 g/sec (cell C93) * 0.285 (cell F93) / 1 (cell U8)
Vapor fraction = 1.04E-02 g/sec (cell H93)
The particle fraction mass rate is:
Particle fraction = 3.65E-02 g/sec (cell C93) * 0.714860 (cell G93) / 400 (cell U9)
Particle fraction = 6.52E-05 g/sec (cell I93)
The total emission rate is:
Total emission rate: 1.04E-02 g/sec (cell H93) + 6.52E-05 g/sec (cell I93) = 1.05E-02 g/sec (cell J93)

Coplanar PCBs
1336-36-3 corrected mass rate at LMP06: 5.82E-11 g/sec (cell C76)
F_v vapor: 1 (cell E76)
Since F_v is $\geq$0.05, the value remains the same in cell F76. The particle fraction is therefore:
Particle fraction: 1 - 1 = 0 (cell G76)
The vapor fraction mass rate is:
Vapor fraction = 5.82E-11 g/sec (cell C76) * 1 (cell F76) / 1 (cell U8)
Vapor fraction = 5.82E-11 g/sec (cell H76)
The particle fraction mass rate is:
Particle fraction = 5.82E-11 g/sec (cell C76) * 0 (cell G76) / 400 (cell U9)
Particle fraction = 0 g/sec (cell I76)
The total emission rate is:
Total emission rate: 5.81E-11 g/sec (cell H76) + 0 g/sec (cell I76) = 5.82E-11 g/sec (cell J76)
Mass rate for the 14 coplanar PCBs in LOP08 is:
5.82E-11 (cell J76) * 0.01/14/0.99 = 4.20E-14 g/sec (cells J213 through J226)

7.4.3.2 LVP03 Calculation

The composition of this stream is calculated by summing the mass rates in streams LVP01 and LOP08 for each constituents.

Group 4
Formamide (75-12-7) mass rate at LVP01: 2.02E-07 g/sec (cell K147)
Formamide (75-12-7) mass rate at LOP08: 3.65E-02 g/sec (cell J147)
Formamide (75-12-7) mass rate at LVP03: 2.02E-07 + 3.65E-02 = 3.65E-02 g/sec (cell L147)

Dibenz[a,j]acridine (224-42-0) mass rate at LVP01: 2.02E-07 g/sec (cell K92)
Dibenz[a,j]acridine (224-42-0) mass rate at LOP08: 8.86E-03 g/sec (cell J92)
Dibenz[a,j]acridine (224-42-0) mass rate at LVP03: 2.02E-07 + 8.86E-03 = 8.86E-03 g/sec (cell L92)

Dibenz[a,h]acridine (226-36-8) mass rate at LVP01: 2.02E-07 g/sec (cell K93)
Dibenz[a,h]acridine (226-36-8) mass rate at LOP08: 1.05E-02 g/sec (cell J93)

Dibenz[a,h]acridine (226-36-8) mass rate at LVP03: 2.02E-07 + 1.05E-02 = 1.05E-02 g/sec (cell L93)

Coplanar PCBs
1336-36-3 mass rate at LVP01: 1.45E-10 g/sec (cell K76)
1336-36-3 mass rate at LOP08: 5.82E-11 g/sec (cell J76)
1336-36-3 mass rate at LVP03: 1.45E-10 + 5.82E-11 = 2.03E-10 g/sec (cell L76)
Mass rate for the 14 coplanar PCBs in LVP03 is:
Mass rate at LVP01: 1.05E-13 g/sec (cell K213)
Mass rate at LOP08: 4.20E-14 g/sec (cell J213)
Mass rate at LVP03 = 1.05E-13 g/sec + 4.20E-14 g/sec = 1.47E-13 g/sec (cells L213 through L226)

7.4.3.3 LVP18 Calculation

The composition of this stream is calculated by using the values of stream LVP03 and applying the corresponding DFs from the following units: HEPA Filters, sulfur impregnated carbon bed, TCO, SCR, and Caustic Scrubber. The calculations for Group 4 and Coplanar PCBs are the only ones shown below as all the rest of the calculations are the same.

Group 4
Formamide (75-12-7) mass rate at LVP03: 3.65E-02 g/sec (cell L147)
Cells R11 through X15 show the applicable DFs for the LVP Secondary Offgas system for vapor and particle constituents. The overall DF is calculated in column X.

The emission rates are then calculated for both the vapor and particle fractions. The vapor mass rate is calculated by multiplying the stream mass rate (cell L147) by the F_v vapor value (cell F147). This value is then divided by the overall vapor DF calculated in cell X14 to arrive to the vapor fraction emission rate (cell M147).
Vapor fraction = 3.65E-02 g/sec (cell L147) * 1 (cell F147) / 20 (cell X14)
Vapor fraction = 1.82E-03 g/sec (cell M147)

The particle mass rate is calculated identically as the vapor fraction except for the overall DF used which is the particle DF shown in cell AA15. The particle emission rate is shown on cell N147.
Particle fraction = 3.65E-02 g/sec (cell L147) * 0 (cell G147) / 4.00E+06 (cell X15)
Particle fraction = 0 g/sec (cell N147)

The overall emission rate is then the summation of the vapor and particle fraction:
Total emission rate = vapor fraction + particle fraction
Total emission rate = 1.82E-03 g/sec (cell M147) + 0 g/sec (cell N147) = 1.82E-03 g/sec (cell O147)

Dibenz[a,j]acridine (224-42-0) mass rate at LVP03: 8.86E-03 g/sec (cell L92)
The vapor fraction mass rate is:
Vapor fraction = 8.86E-03 g/sec (cell L92) * 0.241 (cell F92) / 20 (cell X14)
Vapor fraction = 1.07E-04 g/sec (cell M92)
The particle fraction mass rate is:
Particle fraction = 8.86E-03 g/sec (cell L92) * 0.759 (cell G92) / 4.00E+06 (cell X15)
Particle fraction = 1.68E-09 g/sec (cell N92)
The total emission rate is:
Total emission rate: 1.07E-04 g/sec (cell M92) + 1.68E-09 g/sec (cell N92) = 1.07E-04 g/sec (cell O92)

Dibenz[a,h]acridine (226-36-8) feed rate mass rate at LVP03: 1.05E-02 g/sec (cell L93)

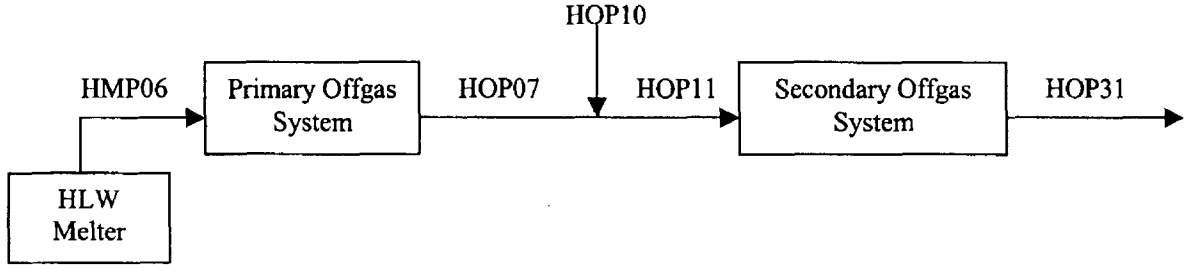
The vapor fraction mass rate is:
Vapor fraction = 1.05E-02 g/sec (cell L93) * 0.285 (cell F93) / 20 (cell X14)
Vapor fraction = 1.49E-04 g/sec (cell M93)
The particle fraction mass rate is:
Particle fraction = 1.05E-02 g/sec (cell L93) * 0.715 (cell G93) / 4.00E+06 (cell X15)
Particle fraction = 1.87E-09 g/sec (cell N93)
The total emission rate is:
Total emission rate: 1.49E-04 g/sec (cell M93) + 1.87E-09 g/sec (cell N93) = 1.49E-04 g/sec (cell O93)

Column P adjusts the values to zero if they are less than 1E-15, otherwise they remain the same.

Coplanar PCBs
1336-36-3 mass rate at LVP03: 2.03E-10 g/sec (cell L76)
The vapor fraction mass rate is:
Vapor fraction = 2.03E-10 g/sec (cell L76) * 1 (cell F76) / 20 (cell X14)
Vapor fraction = 1.02E-11 g/sec (cell M76)
The particle fraction mass rate is:
Particle fraction = 2.03E-10 g/sec (cell L76) * 0 (cell G76) / 4.00E+06 (cell X15)
Particle fraction = 0 g/sec (cell N76)
The total emission rate is:
Total emission rate: 1.02E-11 g/sec (cell M76) + 0 g/sec (cell N76) = 1.02E-11 g/sec (cell O76)
Mass rate for the 14 coplanar PCBs in LVP18 is:
1.02E-11 (cell O76) * 0.01/14 = 7.34E-15 g/sec (cells O213 through O226)

7.5 HLW Vitrification Analysis

To determine the stack releases from the HLW Melter Offgas System (HOP), first the mass rates of all the constituents are calculated in stream HMP06 (the unabated HLW Melter Offgas stream). From these values, the DFs that correspond to the SBS and WESP are applied to each constituent. These results are representative of HOP07. At this point the HLW Vessel Ventilation header joins the main offgas system. The mass rates of all the constituents are calculated in stream HOP10 (the unabated HLW Vessel Ventilation Header). The values from these two streams, HOP07 and HOP10, are then added together to represent stream HOP11 (combined offgas stream). From this point on, the corresponding DFs for each constituent within the system are applied to these values to obtain the final stack releases (stream HOP31). See sketch below for a simplified depiction of the process.



7.5.1 HMP06 Stream

This streams depicts the unabated HLW Melter Offgas. For all the calculations in this section refer to Table B-9. First the feed rate is obtained followed by the mass rate of the representative constituent at the stream specified. The performance factor for this constituent is calculated and applied to the non-represented compounds to obtain their mass rate.

Group 4
Formamide (75-12-7) feed rate: 4.29E-02 g/sec (cell C147)
Formamide (75-12-7) rate at HMP06 from the HMP06 stream report in Attachment A: 2.16E-03 g/sec (cell H147)
Performance factor for Formamide: 2.16E-03/4.29E-02 = 5.04E-02 (cell I147, also copied to cell O8)

Dibenz[a,j]acridine (224-42-0) feed rate: 4.29E-02 g/sec (cell C92)
Mass rate at HMP06: 4.29E-02 (cell C92) * 5.04E-02 (cell O8) = 2.16E-03 g/sec (cell K92)
Dibenz[a,h]acridine (226-36-8) feed rate: 4.29E-02 g/sec (cell C93)
Mass rate at HMP06: 4.29E-02 (cell C93) * 5.04E-02 (cell O8) = 2.16E-03 g/sec (cell K93)

Group 8
Phenol (108-95-2) feed rate: 4.29E-02 g/sec (cell C39)
Phenol (108-95-2) rate at HMP06 from the HMP06 stream report in Attachment A: 1.95E-03 g/sec (cell H39)
Performance factor for Phenol: 1.95E-03/4.29E-02 = 4.56E-02 (cell I39)

Diethyl Phthalate (84-66-2) feed rate: 4.29E-02 g/sec (cell C180)
Diethyl Phthalate (84-66-2) rate at HMP06 from the HMP06 stream report in Attachment A: 1.56E-03 g/sec (cell H180)
Performance factor for Diethyl Phthalate: 1.56E-03/4.29E-02 = 3.65E-02 (cell I180)

Since this group is represented by the above 2 constituents, an average performance factor is then calculated and applied to the other constituents. Average performance factor is:
(4.56E-02 (cell I39) + 3.65E-02 (cell I180))/2 = 4.10E-02 (cell O12)

Formaldehyde (50-00-0) feed rate: 7.14E-03 g/sec (cell C101)
Mass rate at HMP06: 7.14E-03 (cell C101) * 4.10E-02 (cell O12) = 2.93E-04 g/sec (cell K101)

Propionic Acid (79-09-4) feed rate: 4.29E-02 g/sec (cell C175)
Mass rate at HMP06: 4.29E-02 (cell C175) * 4.10E-02 (cell O12) = 1.76E-03 g/sec (cell K175)

2-Propenoic Acid (79-10-7) feed rate: 5.72E-02 g/sec (cell C176)
Mass rate at HMP06: 5.72E-02 (cell C176) * 4.10E-02 (cell O12) = 2.35E-03 g/sec (cell K176)

Column L adjusts the values to zero if they are less than 1E-15, otherwise the values stay the same.

Coplanar PCBs
1336-36-3 feed rate at HMP06 from the HMP06 stream report in Attachment A: 2.10E-10 g/sec (cell H76)
Mass rate for the 14 coplanar PCBs in HMP06 is:
2.10E-10 (cell H76) * 0.01/14 = 1.50E-13 g/sec (cells T7 through T20)
Thus the correct mass rate for 1336-36-3 in HMP06 is:
2.10E-10 g/sec * 0.99 = 2.08E-10 g/sec (cell K76)

7.5.2 HOP10 Stream

This streams depicts the unabated HLW Vessel Ventilation. For all the calculations in this section refer to Table B-10. First the feed rate is obtained followed by the mass rate of the representative constituent at the stream specified. The performance factor for this constituent is calculated and applied to the non-represented compounds to obtain their mass rate.

Group 4
Formamide (75-12-7) feed rate: 4.29E-02 g/sec (cell C147)
Formamide (75-12-7) rate at HOP10 from the HOP10 stream report in Attachment A: 3.02E-08 g/sec (cell H147)
Performance factor for Formamide: 3.02E-08/4.29E-02 = 7.04E-07 (cell I147, also copied to cell O8)

Dibenz[a,j]acridine (224-42-0) feed rate: 4.29E-02 g/sec (cell C92)
Mass rate at HOP10: 4.29E-02 (cell C92) * 7.04E-07 (cell O8) = 3.02E-08 g/sec (cell K92)
Dibenz[a,h]acridine (226-36-8) feed rate: 4.29E-02 g/sec (cell C93)
Mass rate at HOP10: 4.29E-02 (cell C93) * 7.04E-07 (cell O8) = 3.02E-08 g/sec (cell K93)

Group 8
Phenol (108-95-2) feed rate: 4.29E-02 g/sec (cell C39)
Phenol (108-95-2) rate at HOP10 from the HOP10 stream report in Attachment A: 6.53E-06 g/sec (cell H39)
Performance factor for Phenol: 6.53E-06/4.29E-02 = 1.52E-04 (cell I39)

Diethyl Phthalate (84-66-2) feed rate: 4.29E-02 g/sec (cell C180)
Diethyl Phthalate (84-66-2) rate at HOP10 from the HOP10 stream report in Attachment A: 9.59E-06 g/sec (cell H180)
Performance factor for Diethyl Phthalate: 9.59E-06/4.29E-02 = 2.24E-04 (cell I180)

Since this group is represented by the above 2 constituents, an average performance factor is then calculated and applied to the other constituents. Average performance factor is:
(1.52E-04 (cell I39) + 2.24E-04 (cell I180))/2 = 1.88E-04 (cell O12)

Formaldehyde (50-00-0) feed rate: 7.14E-03 g/sec (cell C101)
Mass rate at HOP10: 7.14E-03 (cell C101) * 1.88E-04 (cell O12) = 1.34E-06 g/sec (cell K101)

Propionic Acid (79-09-4) feed rate: 4.29E-02 g/sec (cell C175)
Mass rate at HOP10: 4.29E-02 (cell C175) * 1.88E-04 (cell O12) = 8.06E-06 g/sec (cell K175)

2-Propenoic Acid (79-10-7) feed rate: 5.72E-02 g/sec (cell C176)
Mass rate at HOP10: 5.72E-02 (cell C176) * 1.88E-04 (cell O12) = 1.08E-05 g/sec (cell K176)

Column L adjusts the values to zero if they are less than 1E-15, otherwise they remain the same.

Coplanar PCBs
1336-36-3 feed rate at HOP10 from the HOP10 stream report in Attachment A: 1.70E-09 g/sec (cell H76)
Mass rate for the 14 coplanar PCBs in HOP10 is:
1.70E-09 (cell H76) * 0.01/14 = 1.22E-12 g/sec (cells T7 through T20)
Thus the corrected mass rate for 1336-36-3 in HOP10 is:
1.70E-09 g/sec * 0.99 = 1.69E-09 g/sec (cell K76)

7.5.3 HOP31 Stream

For all the calculations for this stream refer to Table B-11 of Attachment B. Input to this spreadsheet is the results from HMP06 and HOP10 stream calculations. The numbers for HMP06 were imported to Column C (cells C4 through C208). The ones for stream HOP10 are imported to column K (cells K4 through K208). Also all the DFs and F_v values are imported from Section 2 of this calculation. The corresponding DFs for this stream are related to the following unit operations: SBS, WESP, HEME, HEPA filters, sulfur impregnated carbon beds, silver mordenite, TCO, and SCR. The calculations for Group 4 and Coplanar PCBs are the only ones shown below. The remaining groups are calculated in the same manner.

First the intermediate stream, HOP07, is calculated by applying the DFs for the SBS and WESP to stream HMP06. At this point, the values calculated for HOP10 are added to HOP07 to represent stream HOP11. The DFs for the rest of the unit operations in the system are then applied to the values in HOP11. Final results represent the composition of stream HOP31.

7.5.3.1 HOP07 Calculation

Group 4
Formamide (75-12-7) mass rate at HMP06: 2.16E-03 g/sec (cell C147)
To calculate the emission rate, first the F_v value for the constituent is analyzed and the split between vapor and particle is determined. The F_v value is imported to column E from Section 2. The F_v value given pertains to the vapor phase. If this value is less than 0.05, the constituent is assumed to be 100% particle. Column F makes this adjustment to the F_v. Since the F_v value for formamide is 1 (cell E147) no adjustment is required and the value in cell F147 is 1. The particle fraction is calculated by using the following formula: $1 - F_v$. This calculation is done in column G. Since the F_v value is 1 for formamide, the particle fraction is 1 - 1 = 0 (cell G147). Cells R5 through U9 show the applicable DFs for the HOP Primary Offgas system for vapor and particle constituents. The overall DF is calculated in column U.

The emission rates are then calculated for both the vapor and particle fractions. The vapor mass rate is calculated by multiplying the stream mass rate (cell C147) by the F_v vapor value (cell F147). This value is then divided by the overall vapor DF calculated in cell U8 to arrive to the vapor fraction emission rate (cell H147).
Vapor fraction = 2.16E-03 g/sec (cell C147) * 1 (cell F147) / 1 (cell U8)
Vapor fraction = 2.16E-03 g/sec (cell H147)

The particle mass rate is calculated identically as the vapor fraction except for the overall DF used which is the particle DF shown in cell U9. The particle emission rate is shown on cell I147.
Particle fraction = 2.16E-03 g/sec (cell C147) * 0 (cell G147) / 400 (cell U9)
Particle fraction = 0 g/sec (cell I147)

The overall emission rate is then the summation of the vapor and particle fraction:
Total emission rate = vapor fraction + particle fraction
Total emission rate = 2.16E-03 g/sec (cell H147) + 0 g/sec (cell I147) = 2.16E-03 g/sec (cell J147)

Dibenz[a,j]acridine (224-42-0) mass rate at HMP06: 2.16E-03 g/sec (cell C92)
The same process as described above was followed:
F_v vapor: 0.241 (cell E92)
Since F_v is ≥ 0.05, the value remains the same in cell F92. The particle fraction is therefore:
Particle fraction: 1 - 0.241 = 0.759 (cell G92)

The vapor fraction mass rate is:
Vapor fraction = 2.16E-03 g/sec (cell C92) * 0.241 (cell F92) / 1 (cell U8)
Vapor fraction = 5.21E-04 g/sec (cell H92)
The particle fraction mass rate is:
Particle fraction = 2.16E-03 g/sec (cell C92) * 0.759 (cell G92) / 400 (cell U9)
Particle fraction = 4.10E-06 g/sec (cell I92)
The total emission rate is:
Total emission rate: 5.21E-04 g/sec (cell H92) + 4.10E-06 g/sec (cell I92) = 5.25E-04 g/sec (cell J92)

Dibenz[a,h]acridine (226-36-8) feed rate mass rate at HMP06: 2.16E-03 g/sec (cell C93)
F_v vapor: 0.285 (cell E93)
Since F_v is $\geq$0.05, the value remains the same in cell F93. The particle fraction is therefore:
Particle fraction: 1 - 0.285 = 0.715 (cell G93)
The vapor fraction mass rate is:
Vapor fraction = 2.16E-03 g/sec (cell C93) * 0.285 (cell F93) / 1 (cell U8)
Vapor fraction = 6.16E-04 g/sec (cell H93)
The particle fraction mass rate is:
Particle fraction = 2.16E-03 g/sec (cell C93) * 0.715 (cell G93) / 400 (cell U9)
Particle fraction = 3.86E-06 g/sec (cell I93)
The total emission rate is:
Total emission rate: 6.16E-04 g/sec (cell H93) + 3.86E-06 g/sec (cell I93) = 6.20E-04 g/sec (cell J93)

Coplanar PCBs
1336-36-3 mass rate at HMP06: 2.08E-10 g/sec (cell C76)
F_v vapor: 1 (cell E76)
Since F_v is $\geq$0.05, the value remains the same in cell F76. The particle fraction is therefore:
Particle fraction: 1 - 1 = 0 (cell G76)
The vapor fraction mass rate is:
Vapor fraction = 2.08E-10 g/sec (cell C76) * 1 (cell F76) / 1 (cell U8)
Vapor fraction = 2.08E-10 g/sec (cell H76)
The particle fraction mass rate is:
Particle fraction = 2.08E-10 g/sec (cell C76) * 0 (cell G76) / 400 (cell U9)
Particle fraction = 0 g/sec (cell I76)
The total emission rate is:
Total emission rate: 2.08E-10 g/sec (cell H76) + 0 g/sec (cell I76) = 2.08E-10 g/sec (cell J76)
Mass rate for the 14 coplanar PCBs in HOP07 is:
2.08E-10 (cell J76) * 0.01/14/0.99 = 1.50E-13 g/sec (cells J213 through J226)

7.5.3.2 HOP11 Calculation

The composition of this stream is calculated by summing the mass rates in streams HOP10 and HOP07 for each constituent.

Group 4
Formamide (75-12-7) mass rate at HOP10: 3.02E-08 g/sec (cell K147)
Formamide (75-12-7) mass rate at HOP07: 2.16E-03 g/sec (cell J147)
Formamide (75-12-7) mass rate at HOP11: 3.02E-08 + 2.16E-03 = 2.16E-03 g/sec (cell L147)

Dibenz[a,j]acridine (224-42-0) mass rate at HOP10: 3.02E-08 g/sec (cell K92)

Dibenz[a,j]acridine (224-42-0) mass rate at HOP07: 5.25E-04 g/sec (cell J92)
Dibenz[a,j]acridine (224-42-0) mass rate at HOP11: 3.02E-08 + 5.25E-04 = 5.25E-04 g/sec (cell L92)

Dibenz[a,h]acridine (226-36-8) mass rate at HOP10: 3.02E-08 g/sec (cell K93)
Dibenz[a,h]acridine (226-36-8) mass rate at HOP07: 6.20E-04 g/sec (cell J93)
Dibenz[a,h]acridine (226-36-8) mass rate at HOP11: 3.02E-08 + 6.20E-04 = 6.20E-04 g/sec (cell L93)

Coplanar PCBs
1336-36-3 mass rate at HOP10: 1.69E-09 g/sec (cell K76)
1336-36-3 mass rate at HOP07: 2.08E-10 g/sec (cell J76)
1336-36-3 mass rate at HOP11: 1.69E-09 + 2.08E-10 = 1.89E-09 g/sec (cell L76)
Mass rate for the 14 coplanar PCBs in HOP11 is:
Mass rate at HOP10: 1.22E-12 g/sec (cell K213)
Mass rate at HOP07: 1.50E-13 g/sec (cell J213)
Mass rate at HOP11: 1.22E-12 g/sec + 1.50E-13 g/sec = 1.37E-12 g/sec (cells L213 through L226)

7.5.3.3 HOP31 Calculation

The composition of this stream is calculated by using the values of stream HOP11 and applying the corresponding DFs from the following units: HEME, HEPA Filters, sulfur impregnated carbon beds, silver mordenite, TCO, and SCR. The calculations for Group 4 and Coplanar PCBs are the only ones shown below as all the rest of the calculations are the same.

Group 4
Formamide (75-12-7) mass rate at HOP11: 2.16E-03 g/sec (cell L147)
Cells R11 through Y15 show the applicable DFs for the HOP Secondary Offgas system for vapor and particle constituents. The overall DF is calculated in column Y.

The emission rates are then calculated for both the vapor and particle fractions. The vapor mass rate is calculated by multiplying the stream mass rate (cell L147) by the F_v vapor value (cell F147). This value is then divided by the overall vapor DF calculated in cell Y14 to arrive to the vapor fraction emission rate (cell M147).
Vapor fraction = 2.16E-03 g/sec (cell L147) * 1 (cell F147) / 20 (cell Y14)
Vapor fraction = 1.08E-04 g/sec (cell M147)

The particle mass rate is calculated identically as the vapor fraction except for the overall DF used which is the particle DF shown in cell Y15. The particle emission rate is shown on cell N147.
Particle fraction = 2.16E-03 g/sec (cell L147) * 0 (cell G147) / 3.60E+08 (cell Y15)
Particle fraction = 0 g/sec (cell N147)

The overall emission rate is then the summation of the vapor and particle fraction:
Total emission rate = vapor fraction + particle fraction
Total emission rate = 1.08E-04 g/sec (cell M147) + 0 g/sec (cell N147) = 1.08E-04 g/sec (cell O147)

Dibenz[a,j]acridine (224-42-0) mass rate at HOP11: 5.25E-04 g/sec (cell L92)
The vapor fraction mass rate is:
Vapor fraction = 5.25E-04 g/sec (cell L92) * 0.241 (cell F92) / 20 (cell Y14)
Vapor fraction = 6.32E-06 g/sec (cell M92)
The particle fraction mass rate is:
Particle fraction = 5.25E-04 g/sec (cell L92) * 0.759 (cell G92) / 3.60E+08 (cell Y15)

Particle fraction = 1.11E-12 g/sec (cell N92)
The total emission rate is:
Total emission rate: 6.32E-06 g/sec (cell M92) + 1.11E-12 g/sec (cell N92) = 6.32E-12 g/sec (cell O92)

Dibenz[a,h]acridine (226-36-8) feed rate mass rate at HOP11: 6.20E-04 g/sec (cell L93)
The vapor fraction mass rate is:
Vapor fraction = 6.20E-04 g/sec (cell L93) * 0.285 (cell F93) / 20 (cell Y14)
Vapor fraction = 8.83E-06 g/sec (cell M93)
The particle fraction mass rate is:
Particle fraction = 6.20E-04 g/sec (cell L93) * 0.715 (cell G93) / 3.60E+08 (cell Y15)
Particle fraction = 1.23E-12 g/sec (cell N93)
The total emission rate is:
Total emission rate: 8.83E-06 g/sec (cell M93) + 1.23E-12 g/sec (cell N93) = 8.83E-06 g/sec (cell O93)

Column P adjusts the values to zero if they are less than 1E-15, otherwise the values remain the same.

Coplanar PCBs
1336-36-3 mass rate at HOP11: 1.89E-09 g/sec (cell L76)
The vapor fraction mass rate is:
Vapor fraction = 1.89E-09 g/sec (cell L76) * 1 (cell F76) / 20 (cell Y14)
Vapor fraction = 9.47E-11 g/sec (cell M76)
The particle fraction mass rate is:
Particle fraction = 1.89E-09 g/sec (cell L76) * 0 (cell G76) / 3.60E+08 (cell Y15)
Particle fraction = 0 g/sec (cell N76)
The total emission rate is:
Total emission rate: 9.46E-11 g/sec (cell M76) + 0 g/sec (cell N76) = 9.47E-11 g/sec (cell O76)
Mass rate for the 14 coplanar PCBs in HOP31 is:
9.47E-11 (cell O76) * 0.01/14/0.99 = 6.83E-14 g/sec (cells O213 through O226)

7.6 HLW PJM/RFD Analysis

To determine the stack releases from the HLW PJM/RFD Ventilation System (PJV), first the mass rates of all the constituents are calculated in stream PJV32 (the unabated HLW PJM/RFD Vent stream). Then the corresponding DFs for each constituent within the system are applied to these values to obtain the final stack releases (stream PJV34).

7.6.1 PJV32 Stream

This streams depicts the unabated HLW RFD/PJM Ventilation. For all the calculations in this section refer to Table B-12. First the feed rate is obtained followed by the mass rate of the representative constituent at the stream specified. The performance factor for this constituent is calculated and applied to the non-represented compounds to obtain their mass rate.

Group 4
Formamide (75-12-7) feed rate: 4.29E-02 g/sec (cell C147)
Formamide (75-12-7) rate at PJV32 from the PJV32 stream report in Attachment A: 1.94E-24 g/sec (cell H147)
Performance factor for Formamide: 1.94E-24/4.29E-02 = 4.53E-23 (cell I147, also copied to cell O8)

Dibenz[a,j]acridine (224-42-0) feed rate: 4.29E-02 g/sec (cell C92)

Mass rate at PVP01: 4.29E-02 (cell C92) * 4.53E-23 (cell O8) = 1.94E-24 g/sec (cell K92)
Dibenz[a,h]acridine (226-36-8) feed rate: 4.29E-02 g/sec (cell C93)
Mass rate at PVP01: 4.29E-02 (cell C93) * 4.53E-23 (cell O8) = 1.94E-24 g/sec (cell K93)

Group 8
Phenol (108-95-2) feed rate: 4.29E-02 g/sec (cell C39)
Phenol (108-95-2) rate at PJV32 from the PJV32 stream report in Attachment A: 4.65E-24 g/sec (cell H39)
Performance factor for Phenol: 4.65E-24/4.29E-02 = 1.08E-22 (cell I39)

Diethyl Phthalate (84-66-2) feed rate: 4.29E-02 g/sec (cell C180)
Diethyl Phthalate (84-66-2) rate at PJV32 from the PJV32 stream report in Attachment A: 4.26E-24 g/sec (cell H180)
Performance factor for Diethyl Phthalate: 4.26E-24/4.29E-02 = 9.94E-23 (cell I180)

Since this group is represented by the above 2 constituents, an average performance factor is then calculated and applied to the other constituents. Average performance factor is:
(1.08E-22 (cell I39) + 9.94E-23 (cell I180))/2 = 1.04E-22 (cell O12)

Formaldehyde (50-00-0) feed rate: 7.14E-03 g/sec (cell C101)
Mass rate at PVP01: 7.14E-03 (cell C101) * 1.04E-22 (cell O12) = 7.42E-25 g/sec (cell K101)

Propionic Acid (79-09-4) feed rate: 4.29E-02 g/sec (cell C175)
Mass rate at PVP01: 4.29E-02 (cell C175) * 1.04E-22 (cell O12) = 4.45E-24 g/sec (cell K175)

2-Propenoic Acid (79-10-7) feed rate: 5.72E-02 g/sec (cell C176)
Mass rate at PVP01: 5.72E-02 (cell C176) * 1.04E-22 (cell O12) = 5.94E-24 g/sec (cell K176)

Column L adjusts the values to zero if they are less than 1E-15, otherwise the values remain the same.
Coplanar PCBs
1336-36-3 feed rate at PJV32 from the PJV32 stream report in Attachment A: 1.21E-15 g/sec (cell H76)
Mass rate for the 14 coplanar PCBs in PJV32 is:
1.21E-15 (cell H76) * 0.01/14 = 8.62E-19 g/sec (cells T7 through T20)
Thus the corrected mass rate for 1336-36-3 in PJV32 is:
1.21E-15 g/sec * 0.99 = 1.20E-15 g/sec (cell K76)

7.6.2 PJV34 Stream

For all the calculations for this stream refer to Table B-13 of Attachment B. Input to this spreadsheet is the results from PJV32 stream calculations. These numbers are imported to Column C (cells C4 through C208). Also all the DFs are imported from Section 2 of this calculation. The corresponding DFs for this stream are related to the following unit operations: HEPA filters. The calculations for Group 4 and Coplanar PCBs are the only ones shown below as all the rest of the calculations are the same.

Group 4
Formamide (75-12-7) mass rate at PJV32: 0 g/sec (cell C147)
To calculate the emission rate, first the F_v value for the constituent is analyzed and the split between vapor and particle is determined. The F_v value is imported to column E from Section 2. The F_v value given pertains to the vapor phase. If this value is less than 0.05, the constituent is assumed to be 100% particle. Column F makes this adjustment to the Fv. Since the F_v value for formamide is 1 (cell E147) no adjustment is required and the value in

cell F147 is 1. The particle fraction is calculated by using the following formula: 1 - F_v. This calculation is done in column G. Since the F_v value is 1 for formamide, the particle fraction is 1 - 1 = 0 (cell G147). Cells M25 through P29 show the applicable DFs for the HOP Primary Offgas system for vapor and particle constituents. The overall DF is calculated in column O.

The emission rates are then calculated for both the vapor and particle fractions. The vapor mass rate is calculated by multiplying the stream mass rate (cell C147) by the F_v vapor value (cell F147). This value is then divided by the overall vapor DF calculated in cell P28 to arrive to the vapor fraction emission rate (cell H147).
Vapor fraction = 0 g/sec (cell C147) * 1 (cell F147) / 1 (cell P28)
Vapor fraction = 0 g/sec (cell H147)

The particle mass rate is calculated identically as the vapor fraction except for the overall DF used which is the particle DF shown in cell P29. The particle emission rate is shown on cell I147.
Particle fraction = 0 g/sec (cell C147) * 0 (cell G147) / 200,000 (cell P29)
Particle fraction = 0 g/sec (cell I147)

The overall emission rate is then the summation of the vapor and particle fraction:
Total emission rate = vapor fraction + particle fraction
Total emission rate = 0 g/sec (cell H147) + 0 g/sec (cell I147) = 0 g/sec (cell J147)

Dibenz[a,j]acridine (224-42-0) mass rate at PJV32: 0 g/sec (cell C92)
The same process as described above was followed:
F_v vapor: 0.241 (cell E92)
Since F_v is $\geq$0.05, the value remains the same in cell F92. The particle fraction is therefore:
Particle fraction: 1 - 0.241 = 0.759 (cell G92)
The vapor fraction mass rate is:
Vapor fraction = 0 g/sec (cell C92) * 0.241 (cell F92) / 1 (cell P28)
Vapor fraction = 0 g/sec (cell H92)
The particle fraction mass rate is:
Particle fraction = 0 g/sec (cell C92) * 0.759 (cell G92) / 200,000 (cell P29)
Particle fraction = 0 g/sec (cell I92)
The total emission rate is:
Total emission rate: 0 g/sec (cell H92) + 0 g/sec (cell I92) = 0 g/sec (cell J92)

Dibenz[a,h]acridine (226-36-8) feed rate mass rate at PJV32: 0 g/sec (cell C93)
F_v vapor: 0.285 (cell E93)
Since F_v is $\geq$0.05, the value remains the same in cell F93. The particle fraction is therefore:
Particle fraction: 1 - 0.285 = 0.715 (cell G93)
The vapor fraction mass rate is:
Vapor fraction = 0 g/sec (cell C93) * 0.285 (cell F93) / 1 (cell P28)
Vapor fraction = 0 g/sec (cell H93)
The particle fraction mass rate is:
Particle fraction = 0 g/sec (cell C93) * 0.715 (cell G93) / 200,000 (cell P29)
Particle fraction = 0 g/sec (cell I93)
The total emission rate is:
Total emission rate: 0 g/sec (cell H93) + 0 g/sec (cell I93) = 0 g/sec (cell J93)

Column K adjusts the values to zero if they are less than 1E-15, otherwise the values remain the same.

Coplanar PCBs

1336-36-3 corrected mass rate at PJV32: 1.20E-15 g/sec (cell C76)
F_v vapor: 1 (cell E76)
Since F_v is $\geq$0.05, the value remains the same in cell F76. The particle fraction is therefore:
Particle fraction: 1 - 1 = 0 (cell G76)
The vapor fraction mass rate is:
Vapor fraction = 1.20E-15 g/sec (cell C76) * 1 (cell F76) / 1 (cell P28)
Vapor fraction = 1.20E-15 g/sec (cell H76)
The particle fraction mass rate is:
Particle fraction = 1.20E-15 g/sec (cell C76) * 0 (cell G76) / 200,000 (cell P29)
Particle fraction = 0 g/sec (cell I76)
The total emission rate is:
Total emission rate: 1.20E-15 g/sec (cell H76) + 0 g/sec (cell I76) = 1.20E-15 g/sec (cell J76)
Mass rate for the 14 coplanar PCBs in PJV34 is:
1.20E-15 (cell J76) * 0.01/14/0.99 = 8.62E-19 g/sec (cells J6 through J19)

8 Results and Conclusion

A summary of the results per constituent per stream is presented below. Emissions rates from the non-represented organic compounds in the SSFM have been estimated in this calculation. These rates will be reported in the next revision of the *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-03-008). This calculation will be updated each time a new official emissions profile is generated.

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 44

	A	B	C	F	I	L	O	R	U	X	AA	AD	AG	AJ
1	Summary of Organic Constituents Emission Rates for the WTP													
2			Feed	Unabated Streams					Abated Streams					
3	CAS #	COPC	FRP01+FRP14	PVP01	PJV04	LMP06	HMP06	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34	
4			WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	
5			g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	
6	100-00-5	p-Nitrochlorobenzene	2.86E-02	1.55E-02	2.20E-08	4.26E-04	8.68E-05	5.65E-11	3.10E-07	2.20E-08	2.17E-05	4.49E-06	5.65E-11	
7	100-21-0	p-Phthalic acid	4.29E-02	2.38E-09	1.90E-07	4.14E-01	2.28E-03	1.43E-09	2.38E-12	1.90E-07	2.07E-02	1.14E-04	1.43E-09	
8	100-41-4	Ethyl benzene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
9	100-42-5	Styrene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	5.21E-15	0.00E+00	
10	10061-01-5	cis-1,3-Dichloropropene	2.86E-03	2.85E-03	1.66E-09	0.00E+00	1.51E-15	0.00E+00	2.85E-05	1.66E-09	0.00E+00	1.49E-14	0.00E+00	
11	10061-02-6	trans-1,3-Dichloropropene	2.86E-03	2.83E-03	1.67E-09	0.00E+00	6.76E-14	0.00E+00	5.65E-05	1.67E-09	1.02E-15	2.08E-13	0.00E+00	
12	101-55-3	4-Bromophenylphenyl ether	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	2.09E-04	2.69E-08	3.24E-09	4.97E-09	0.00E+00	
13	101-84-8	Diphenyl ether	7.14E-03	6.98E-03	4.21E-09	2.72E-13	1.22E-12	0.00E+00	2.79E-05	4.21E-09	1.25E-13	2.03E-12	0.00E+00	
14	106-35-4	3-Heptanone	2.86E-03	2.33E-03	1.79E-09	2.88E-09	2.72E-09	0.00E+00	2.33E-07	1.79E-09	2.16E-10	3.31E-10	0.00E+00	
15	106-42-3	p-Xylene (Dimethyl benzene)	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	7.15E-06	4.15E-09	0.00E+00	1.31E-14	0.00E+00	
16	106-46-7	1,4-Dichlorobenzene	2.86E-03	2.79E-03	1.68E-09	0.00E+00	4.89E-13	0.00E+00	2.79E-05	1.68E-09	4.90E-15	8.13E-13	0.00E+00	
17	106-88-7	1,2-Epoxybutane	7.14E-03	6.33E-03	4.36E-09	4.38E-10	6.95E-10	0.00E+00	6.33E-07	4.36E-09	4.42E-11	1.46E-10	0.00E+00	
18	106-93-4	Ethylene dibromide (Dibromethane)	2.86E-03	2.72E-03	1.70E-09	4.42E-13	3.60E-12	0.00E+00	2.72E-04	1.70E-09	1.21E-13	3.22E-12	0.00E+00	
19	106-97-8	Butane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
20	106-99-0	1,3-Butadiene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
21	107-02-8	Acrolein	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-07	4.48E-09	5.40E-10	8.28E-10	0.00E+00	
22	107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
23	107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.86E-03	2.83E-03	1.67E-09	0.00E+00	6.76E-14	0.00E+00	2.83E-07	1.67E-09	1.02E-15	2.08E-13	0.00E+00	
24	107-12-0	Propionitrile	7.14E-03	2.97E-03	5.17E-09	5.34E-07	2.75E-07	6.21E-14	2.97E-07	5.17E-09	3.11E-08	1.97E-08	6.21E-14	
25	107-13-1	Acrylonitrile	1.43E-02	1.16E-02	8.95E-09	1.44E-08	1.36E-08	0.00E+00	1.16E-06	8.95E-09	1.08E-09	1.66E-09	0.00E+00	
26	107-18-6	2-Propene-1-ol	4.29E-02	2.33E-02	3.30E-08	6.40E-04	1.30E-04	8.48E-11	2.33E-06	3.30E-08	3.25E-05	6.73E-06	8.48E-11	
27	107-31-3	Formic acid, methyl ester	4.29E-02	3.80E-02	2.61E-08	2.63E-09	4.17E-09	0.00E+00	3.80E-06	2.61E-08	2.65E-10	8.78E-10	0.00E+00	
28	107-66-4	Dibutylphosphate	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	5.05E-09	6.74E-08	1.76E-03	1.07E-04	0.00E+00	
29	107-87-9	2-Pentanone	1.43E-02	1.16E-02	8.95E-09	1.44E-08	1.36E-08	0.00E+00	1.16E-06	8.95E-09	1.08E-09	1.66E-09	0.00E+00	
30	108-03-2	1-Nitropropane	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	3.49E-06	2.69E-08	3.24E-09	4.97E-09	0.00E+00	
31	108-05-4	Vinyl acetate	4.29E-02	4.06E-02	2.56E-08	3.57E-11	1.50E-10	0.00E+00	4.06E-06	2.56E-08	6.63E-12	8.39E-11	0.00E+00	
32	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-07	4.48E-09	5.40E-10	8.28E-10	0.00E+00	
33	108-20-3	Bis(isopropyl)ether	7.14E-03	6.97E-03	4.21E-09	0.00E+00	1.22E-12	0.00E+00	6.97E-07	4.21E-09	1.22E-14	2.03E-12	0.00E+00	
34	108-38-3	m-Xylene (Dimethyl benzene)	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	7.15E-06	4.15E-09	0.00E+00	1.31E-14	0.00E+00	
35	108-39-4	m-Cresol	7.14E-03	6.00E-04	7.44E-09	4.99E-04	9.71E-05	0.00E+00	3.00E-07	7.44E-09	2.51E-05	4.94E-06	0.00E+00	
36	108-87-2	Methylcyclohexane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-07	4.15E-09	0.00E+00	0.00E+00	0.00E+00	
37	108-88-3	Toluene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
38	108-90-7	Chlorobenzene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-05	1.66E-09	0.00E+00	5.21E-15	0.00E+00	
39	108-93-0	Cyclohexanol	7.14E-03	3.88E-03	5.49E-09	1.07E-04	2.17E-05	1.41E-11	1.94E-07	5.49E-09	5.42E-06	1.12E-06	1.41E-11	
40	108-94-1	Cyclohexanone	7.14E-03	1.24E-03	5.88E-09	2.24E-05	7.17E-06	0.00E+00	6.20E-08	5.88E-09	1.16E-06	3.93E-07	0.00E+00	
41	108-95-2	Phenol	4.29E-02	1.31E-03	5.94E-08	1.78E-02	1.95E-03	0.00E+00	6.56E-06	5.94E-08	8.93E-04	9.80E-05	0.00E+00	
42	109-66-0	n-Pentane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
43	109-99-9	Tetrahydrofuran	2.86E-03	1.19E-03	2.07E-09	2.14E-07	1.10E-07	2.48E-14	1.19E-07	2.07E-09	1.25E-08	7.87E-09	2.48E-14	
44	110-12-3	5-Methyl-2-hexanone	2.86E-03	2.53E-03	1.74E-09	1.75E-10	2.78E-10	0.00E+00	2.53E-07	1.74E-09	1.77E-11	5.85E-11	0.00E+00	
45	110-43-0	2-Heptanone	2.86E-03	2.53E-03	1.74E-09	1.75E-10	2.78E-10	0.00E+00	2.53E-07	1.74E-09	1.77E-11	5.85E-11	0.00E+00	
46	110-54-3	n-Hexane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
47	110-62-3	n-Valeraldehyde	4.29E-02	3.80E-02	2.61E-08	2.63E-09	4.17E-09	0.00E+00	3.80E-06	2.61E-08	2.65E-10	8.78E-10	0.00E+00	
48	110-82-7	Cyclohexane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-07	4.15E-09	0.00E+00	0.00E+00	0.00E+00	
49	110-83-8	Cyclohexene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
50	110-86-1	Pyridine	1.43E-02	2.48E-03	1.18E-08	4.49E-05	1.43E-05	0.00E+00	2.48E-07	1.18E-08	2.33E-06	7.87E-07	0.00E+00	
51	111-65-9	n-Octane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
52	111-76-2	Ethylene glycol monobutyl ether	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	1.80E-07	4.47E-08	1.51E-04	2.97E-05	0.00E+00	
53	111-84-2	n-Nonane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	3.58E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
54	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.29E-02	1.48E-01	7.17E-08	1.86E-02	1.25E-03	7.93E-10	3.84E-07	9.32E-09	1.63E-05	1.11E-06	1.03E-10	
55	117-84-0	n-Dioctyl phthalate	4.29E-02	2.38E-02	3.15E-08	2.23E-04	6.06E-05	4.08E-11	4.05E-07	2.68E-08	8.29E-06	2.34E-06	3.47E-11	
56	120-12-7	Anthracene	4.29E-02	2.02E-02	3.04E-08	1.19E-06	7.26E-07	7.45E-13	4.02E-06	3.03E-08	7.56E-08	5.90E-08	7.44E-13	
57	120-82-1	1,2,4-Trichlorobenzene	7.14E-03	7.07E-03	4.18E-09	0.00E+00	1.69E-13	0.00E+00	1.41E-05	4.18E-09	2.55E-15	5.20E-13	0.00E+00	
58	120-83-2	2,4-Dichlorophenol	4.29E-02	2.33E-02	3.30E-08	6.40E-04	1.30E-04	8.48E-11	1.40E-04	3.30E-08	3.25E-05	6.73E-06	8.48E-11	
59	121-44-8	Triethylamine	7.14E-03	6.33E-03	4.36E-09	4.38E-10	6.95E-10	0.00E+00	6.33E-07	4.36E-09	4.42E-11	1.46E-10	0.00E+00	
60	121-69-7	Dimethylaniline	7.14E-03	2.97E-03	5.17E-09	5.34E-07	2.75E-07	6.21E-14	1.49E-07	5.17E-09	3.11E-08	1.97E-08	6.21E-14	
61	122-39-4	N,N-Diphenylamine	1.43E-02	1.57E-03	1.36E-08	4.26E-04	8.68E-05	5.65E-11	6.27E-06	1.36E-08	2.17E-05	4.49E-06	5.65E-11	
62	123-19-3	4-Heptanone	2.86E-03	1.19E-03	2.07E-09	2.14E-07	1.10E-07	2.48E-14	1.19E-07	2.07E-09	1.25E-08	7.87E-09	2.48E-14	
63	123-38-6	n-Propionaldehyde	1.43E-02	1.16E-02	8.95E-09	1.44E-08	1.36E-08	0.00E+00	1.16E-06	8.95E-09	1.08E-09	1.66E-09	0.00E+00	
64	123-51-3	3-Methyl-1-butanol	7.14E-03	1.42E-03	5.73E-09	1.23E-05	4.26E-06	0.00E+00	1.42E-07	5.73E-09	6.48E-07	2.40E-07	0.00E+00	
65	123-86-4	Acetic acid n-butyl ester	1.35E-04	1.28E-04	8.06E-11	1.13E-13	4.72E-13	0.00E+00	1.28E-08	8.06E-11	2.09E-14	2.65E-13	0.00E+00	
66	123-91-1	1,4-Dioxane	1.43E-03	7.76E-04	1.10E-09	2.13E-05	4.34E-06	2.83E-12	7.76E-08	1.10E-09	1.08E-06	2.24E-07	2.83E-12	
67	126-73-8	Tributyl phosphate	2.86E-02	4.56E-04	4.43E-08	1.81E-02	1.51E-03	9.66E-10	9.08E-09	4.42E-08	8.96E-04	7.51E-05	9.62E-10	
68	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	7.14E-03	6.77E-03	4.26E-09	5.95E-12	2.49E-11	0.00E+00	6.77E-07	4.26E-09	1.10E-12	1.40E-11	0.00E+00	
69	127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-04	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
70	127-19-5	N,N-Dimethylacetamide	7.14E-03	8.46E-06	1.13E-08	5.93E-03	3.61E-04	0.00E+00	8.46E-10	1.13E-08	2.97E-04	1.81E-05	0.00E+00	
71	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.43E-02	7.93E-03	1.05E-08	7.43E-05	2.02E-05	1.36E-11	1.59E-07	1.05E-08	3.79E-06	1.07E-06	1.36E-11	
72	129-00-0	Pyrene	4.29E-02	9.35E-03	3.79E-08	1.06E-04	3.46E-05	2.45E-11	5.57E-05	3.77E-08	5.56E-06	1.92E-06	2.43E-11	
73	1321-64-8	Pentachloronaphthalene	4.29E-02	4.19E-02	2.53E-08	2.76E-12	7.35E-12	0.00E+00	2.44E-04	2.45E-08	1.23E-12	1.19E-11	0.00E+00	
74	1321-65-9	Trichloronaphthalene	4.29E-02	3.80E-02	2.61E-08	2.63E-09	4.17E-09	0.00E+00	2.28E-04	2.61E-08	2.65E-10	8.76E-10	0.00E+00	
75	132-64-9	Dibenzofuran	4.29E-02	3.41E-02	2.71E-08	5.25E-09	8.33E-09	0.00E+00	2.05E-04	2.70E-08	5.29E-10	1.74E-09	0.00E+00	
76	1335-87-1	Hexachloronaphthalene	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	2.06E-04	2.64E-08	3.16E-09	4.86E-09	0.00E+00	
77	1335-88-2	Tetrachloronaphthalene	4.29E-02	3.80E-02	2.61E-08	2.63E-09	4.17E-09	0.00E+00	2.26E-04	2.59E-08	2.62E-10	8.68E-10	0.00E+00	
78	1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03	4.26E-03	1.36E-09	5.82E-11	2.08E-10	1.20E-15	2.56E-05	1.36E-09	1.02E-11	9.47E-11	1.20E-15	
79	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.35E-04	1.10E-04	8.48E-11	1.37E-10	1.29E-10	0.00E+00	1.10E-08	8.48E-11	1.02E-11	1.57E-11	0.00E+00	
80	141-79-7	4-Methyl-3-penten-2-one	4.29E-02	1.78E-02	3.10E-08	3.20E-06	1.65E-06	3.73E-13	1.78E-06	3.10E-08	1.87E-07	1.18E-07	3.73E-13	
81	142-82-5	n-Heptane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
82	144-62-7	Oxalic acid	2.14E+00	3.27E-05	3.41E-06	1.83E+00	1.08E-01	0.00E+00	1.63E-07	3.41E-06	9.16E-02	5.40E-03	0.00E+00	
83	156-60-5	trans-1,2-Dichloroethylene	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.15E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
84	1634-04-4	Methyl tert-butyl ether	7.14E-03	6.77E-03	4.26E-09	5.95E-12	2.49E-11	0.00E+00	6.77E-07	4.26E-09	1.10E-12	1.40E-11	0.00E+00	
85	189-55-9	Dibenzo[a,i]pyrene	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	2.31E-15	6.77E-14	2.26E-11	1.57E-14	0.00E+00	
86	189-64-0	Dibenzo[a,h]pyrene	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	2.31E-15	6.77E-14	2.26E-11	1.57E-14	0.00E+00	
87	191-24-2	Benzo(g,h,i)perylene	4.29E-02	1.48E-01	7.17E-08	1.86E-02	1.25E-03	7.93E-10	5.75E-05	4.66E-09	4.21E-06	2.93E-07	5.15E-11	
88	191-30-0	Benzo[a,l]pyrene	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	2.31E-15	6.77E-14	2.26E-11	1.57E-14	0.00E+00	
89	192-65-4	Dibenzo[a,e]pyrene	4.29E-02	5.07E-05	6.77E-08	3.56E-02	2.17E-03	0.00E+00	2.31E-15	6.77E-14	2.26E-11	1.57E-14	0.00E+00	
90	193-39-5	Indeno(1,2,3-cd)pyrene	4.29E-02	2.93E-01	6.86E-08	5.91E-10	2.84E-10	5.96E-15	1.33E-11	6.86E-14	1.26E-15	0.00E+00	0.00E+00	
91	206-44-0	Fluoranthene	4.29E-02	4.19E-02	2.53E-08	1.27E-11	7.39E-12	0.00E+00	2.49E-04	2.51E-08	5.79E-12	1.22E-11	0.00E+00	
92	208-96-8	Acenaphthylene	4.29E-02	2.79E-02	2.85E-08	8.65E-08	8.15E-08	0.00E+00	1.67E-04	2.85E-08	6.48E-09	9.92E-09	0.00E+00	
93	2234-13-1	Octachloronaphthalene	1.35E-04	1.10E-04	8.48E-11	1.37E-10	1.29E-10	0.00E+00	4.16E-07	5.33E-11	4.84E-12	8.36E-12	0.00E+00	
94	224-42-0	Dibenz[a,j]acridine	4.29E-02	6.34E-06	6.80E-08	3.65E-02	2.16E-03	0.00E+00	9.17E-09	1.64E-08	1.07E-04	6.32E-06	0.00E+00	
95	226-36-8	Dibenz[a,h]acridine	4.29E-02	6.34E-06	6.80E-08	3.65E-02	2.16E-03	0.00E+00	1.08E-08	1.94E-08	1.49E-04	8.83E-06	0.00E+00	
96	2551-13-7	Trimethyl benzene	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	3.57E-06	4.15E-09	0.00E+00	1.31E-14	0.00E+00	
97	26140-60-3	Terphenyls	4.29E-02	4.19E-02	2.53E-08	8.58E-12	7.38E-12	0.00E+00	2.19E-04	2.21E-08	3.39E-12	1.07E-11	0.00E+00	
98	27154-33-2	Trichlorofluoroethane	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.15E-04	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
99	287-92-3	Cyclopentane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-07	4.15E-09	0.00E+00	0.00E+00	0.00E+00	
100	3697-24-3	5-Methylchrysene	4.29E-02	4.19E-02	2.53E-08	1.37E-11	7.40E-12	0.00E+00	2.07E-04	2.08E-08	5.07E-12	1.01E-11	0.00E+00	
101	3825-26-1	Ammonium perfluorooctanoate	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	2.09E-04	2.69E-08	3.24E-09	4.97E-09	0.00E+00	
102	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	7.14E-03	1.25E-03	5.88E-09	2.19E-05	7.02E-06	0.00E+00	1.25E-07	5.88E-09	1.14E-06	3.86E-07	0.00E+00	
103	50-00-0	Formaldehyde	7.14E-03	2.80E-04	9.50E-09	2.42E-03	2.93E-04	0.00E+00	2.80E-08	9.50E-09	1.21E-04	1.47E-05	0.00E+00	
104	50-32-8	Benzo(a)pyrene	2.72E-02	1.40E-03	4.73E-08	2.36E-02	1.59E-03	1.00E-09	2.44E-06	1.37E-08	1.01E-04	6.83E-06	2.91E-10	
105	53-70-3	Dibenzo(a,h)anthracene	2.72E-02	4.33E-04	4.21E-08	1.72E-02	1.44E-03	9.18E-10	1.40E-07	2.27E-09	2.64E-06	2.24E-07	4.96E-11	
106	540-59-0	1,2-Dichloroethylene	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	7.15E-07	4.15E-09	0.00E+00	1.31E-14	0.00E+00	
107	540-84-1	2,2,4-Trimethylpentane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
108	541-73-1	1,3-Dichlorobenzene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-05	1.66E-09	0.00E+00	5.21E-15	0.00E+00	
109	56-23-5	Carbon tetrachloride	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	5.73E-04	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
110	563-80-4	3-Methyl-2-butanone	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-07	4.48E-09	5.40E-10	8.28E-10	0.00E+00	
111	56-49-5	3-Methylcholanthrene	4.29E-02	4.30E-02	2.49E-08	0.00E+00	0.00E+00	0.00E+00	9.39E-05	9.05E-09	0.00E+00	0.00E+00	0.00E+00	
112	57-14-7	1,1-Dimethylhydrazine	4.29E-02	8.54E-03	3.44E-08	7.41E-05	2.56E-05	0.00E+00	8.54E-07	3.44E-08	3.89E-06	1.44E-06	0.00E+00	
113	58-90-2	2,3,4,6-Tetrachlorophenol	4.29E-02	7.12E-03	3.56E-08	1.60E-04	5.01E-05	0.00E+00	2.14E-04	3.56E-08	8.30E-06	2.73E-06	0.00E+00	
114	591-78-6	2-Hexanone	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-06	4.48E-09	5.40E-10	8.28E-10	0.00E+00	
115	59-50-7	4-Chloro-3-methylphenol	4.29E-02	2.38E-02	3.15E-08	2.23E-04	6.06E-05	4.08E-11	3.57E-04	3.15E-08	1.14E-05	3.20E-06	4.08E-11	
116	59-89-2	N-Nitrosomorpholine	4.29E-02	4.19E-02	2.53E-08	1.55E-11	7.41E-12	0.00E+00	2.09E-06	2.53E-08	7.14E-12	1.23E-11	0.00E+00	
117	602-87-9	5-Nitroacenaphthene	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	2.15E-05	4.45E-08	1.50E-04	2.95E-05	0.00E+00	
118	60-29-7	Ethyl ether	4.29E-02	4.24E-02	2.51E-08	0.00E+00	1.01E-12	0.00E+00	4.24E-06	2.51E-08	1.53E-14	3.12E-12	0.00E+00	

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: 45

	A	B	C	F	I	L	O	R	U	X	AA	AD	AG	AJ
1	Summary of Organic Constituents Emission Rates for the WTP													
2			Feed	Unabated Streams					Abated Streams					
3	CAS #	COPC	FRP01+FRP14	PVP01	PJV04	LMP06	HMP06	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34	
4			WTP Feed	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	PT Vessel Vent	PT RFD/PJM	LAW Melter	HLW Melter	HLW PJM/RFD	
5			g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	
119	603-34-9	Triphenylamine	4.29E-02	5.65E-03	3.77E-08	4.46E-04	1.21E-04	8.15E-11	3.39E-05	3.77E-08	2.28E-05	6.39E-06	8.15E-11	
120	60-34-4	Methylhydrazine	7.14E-03	3.88E-03	5.49E-09	1.07E-04	2.17E-05	1.41E-11	3.88E-07	5.49E-09	5.42E-06	1.12E-06	1.41E-11	
121	60-35-5	Acetamide	7.14E-03	8.46E-06	1.13E-08	5.93E-03	3.61E-04	0.00E+00	4.23E-10	1.13E-08	2.97E-04	1.81E-05	0.00E+00	
122	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.29E-02	4.19E-02	2.53E-08	1.37E-11	7.39E-12	8.48E-11	2.09E-06	2.53E-08	5.49E-07	1.23E-11	8.48E-11	
123	624-83-9	Methyl isocyanate	7.14E-03	7.07E-03	4.18E-09	0.00E+00	1.69E-13	0.00E+00	7.07E-06	4.18E-09	2.55E-15	5.20E-13	0.00E+00	
124	627-13-4	Nitric acid, propyl ester	3.57E-03	3.53E-03	2.09E-09	0.00E+00	8.45E-14	0.00E+00	3.53E-07	2.09E-09	1.28E-15	2.60E-13	0.00E+00	
125	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	1.80E-07	4.47E-08	1.51E-04	2.97E-05	0.00E+00	
126	630-20-6	1,1,1,2-Tetrachloroethane	7.14E-03	6.97E-03	4.21E-09	0.00E+00	1.22E-12	0.00E+00	6.97E-04	4.21E-09	1.22E-14	2.03E-12	0.00E+00	
127	64-17-5	Ethyl alcohol	7.14E-03	3.88E-03	5.49E-09	1.07E-04	2.17E-05	1.41E-11	3.88E-07	5.49E-09	5.42E-06	1.12E-06	1.41E-11	
128	64-18-6	Formic acid	1.07E+01	1.71E-01	1.66E-05	6.77E+00	5.67E-01	3.62E-07	1.71E-05	1.66E-05	3.39E-01	2.84E-02	3.62E-07	
129	64-19-7	Acetic acid	1.55E+01	1.51E+01	9.12E-06	5.60E-09	2.67E-09	0.00E+00	1.51E-03	9.12E-06	2.57E-09	4.44E-09	0.00E+00	
130	67-56-1	Methyl alcohol (Methanol)	7.14E-03	3.88E-03	5.49E-09	1.07E-04	2.17E-05	1.41E-11	3.88E-07	5.49E-09	5.42E-06	1.12E-06	1.41E-11	
131	67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	1.43E-03	2.48E-04	1.18E-09	4.49E-06	1.43E-06	0.00E+00	2.48E-08	1.18E-09	2.33E-07	7.87E-08	0.00E+00	
132	67-64-1	2-Propanone (Acetone)	1.43E-02	5.94E-03	1.03E-08	1.07E-06	5.50E-07	1.24E-13	5.94E-07	1.03E-08	6.23E-08	3.93E-08	1.24E-13	
133	67-66-3	Chloroform	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	1.43E-03	1.66E-09	0.00E+00	5.21E-15	0.00E+00	
134	67-72-1	Hexachloroethane	4.29E-02	4.29E-02	2.49E-08	0.00E+00	7.66E-15	0.00E+00	8.58E-04	2.49E-08	0.00E+00	7.85E-14	0.00E+00	
135	684-16-2	Hexafluoroacetone	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	7.15E-03	4.15E-09	0.00E+00	1.31E-14	0.00E+00	
136	71-23-8	n-Propyl alcohol	2.86E-03	4.96E-04	2.35E-09	8.97E-06	2.87E-06	0.00E+00	4.96E-08	2.35E-09	4.66E-07	1.57E-07	0.00E+00	
137	71-36-3	n-Butyl alcohol	7.14E-03	1.24E-03	5.88E-09	2.24E-05	7.17E-06	0.00E+00	1.24E-07	5.88E-09	1.16E-06	3.93E-07	0.00E+00	
138	71-43-2	Benzene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-05	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
139	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
140	74-83-9	Bromomethane (Methyl bromide)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	5.21E-15	0.00E+00	
141	74-87-3	Chloromethane (Methyl chloride)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	1.43E-04	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
142	74-97-5	Bromochloromethane	7.14E-03	7.07E-03	4.18E-09	0.00E+00	1.69E-13	0.00E+00	3.53E-03	4.18E-09	2.55E-15	5.20E-13	0.00E+00	
143	74-99-7	Methylacetylene	4.29E-02	4.29E-02	2.49E-08	0.00E+00	0.00E+00	0.00E+00	4.29E-06	2.49E-08	0.00E+00	0.00E+00	0.00E+00	
144	75-00-3	Chloroethane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
145	75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
146	75-05-8	Acetonitrile	7.14E-03	2.58E-03	5.28E-09	8.70E-07	4.29E-07	0.00E+00	2.58E-06	5.28E-09	4.96E-08	2.95E-08	0.00E+00	
147	75-07-0	Acetaldehyde	4.29E-02	1.78E-02	3.10E-08	3.20E-06	1.65E-06	3.73E-13	1.78E-06	3.10E-08	1.87E-07	1.18E-07	3.73E-13	
148	75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	5.72E-05	1.66E-09	0.00E+00	5.21E-15	0.00E+00	
149	75-12-7	Formamide	4.29E-02	6.34E-06	6.80E-08	3.65E-02	2.16E-03	0.00E+00	6.34E-10	6.80E-08	1.82E-03	1.08E-04	0.00E+00	
150	75-15-0	Carbon disulfide	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.15E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
151	75-21-8	Ethylene oxide (Oxirane)	1.43E-03	1.27E-03	8.72E-10	8.76E-11	1.39E-10	0.00E+00	1.27E-07	8.72E-10	8.84E-12	2.93E-11	0.00E+00	
152	75-27-4	Bromodichloromethane	7.14E-03	6.97E-03	4.21E-09	0.00E+00	1.22E-12	0.00E+00	1.39E-03	4.21E-09	1.22E-14	2.03E-12	0.00E+00	
153	75-34-3	1,1-Dichloroethane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	5.21E-15	0.00E+00	
154	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
155	75-43-4	Dichlorofluoromethane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
156	75-45-6	Chlorodifluoromethane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	5.73E-05	1.66E-09	0.00E+00	0.00E+00	0.00E+00	
157	75-50-3	Trimethylamine	7.14E-03	5.82E-03	4.48E-09	7.21E-09	6.79E-09	0.00E+00	5.82E-07	4.48E-09	5.40E-10	8.28E-10	0.00E+00	
158	75-52-5	Nitromethane	4.29E-02	1.78E-02	3.10E-08	3.20E-06	1.65E-06	3.73E-13	1.78E-06	3.10E-08	1.87E-07	1.18E-07	3.73E-13	
159	75-55-8	2-Methylaziridine	4.29E-02	7.45E-03	3.53E-08	1.35E-04	4.30E-05	0.00E+00	7.45E-07	3.53E-08	6.99E-06	2.36E-06	0.00E+00	
160	75-61-6	Difluorodibromomethane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
161	75-63-8	Trifluorobromomethane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	
162	75-65-0	2-Methyl-2-propanol	7.14E-03	1.24E-03	5.88E-09	2.24E-05	7.17E-06	0.00E+00	1.24E-07	5.88E-09	1.16E-06	3.93E-07	0.00E+00	
163	75-69-4	Trichlorofluoromethane	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
164	75-71-8	Dichlorodifluoromethane	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	
165	76-03-9	Trichloroacetic acid	7.14E-03	8.46E-06	1.13E-08	5.93E-03	3.61E-04	0.00E+00	1.69E-07	1.13E-08	2.97E-04	1.81E-05	0.00E+00	
166	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.29E-02	4.30E-02	2.49E-08	0.00E+00	0.00E+00	0.00E+00	4.30E-04	2.49E-08	0.00E+00	0.00E+00	0.00E+00	
167	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	4.29E-02	2.48E-08	0.00E+00	0.00E+00	0.00E+00	4.29E-04	2.48E-08	0.00E+00	0.00E+00	0.00E+00	
168	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.14E-03	7.17E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	1.79E-04	4.15E-09	0.00E+00	0.00E+00	0.00E+00	
169	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
170	76-15-3	Chloropentafluoroethane	7.14E-03	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
171	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.29E-02	7.45E-03	3.53E-08	1.35E-04	4.30E-05	0.00E+00	7.45E-07	3.53E-08	6.99E-06	2.36E-06	0.00E+00	
172	78-87-5	1,2-Dichloropropane	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-06	1.66E-09	0.00E+00	5.21E-15	0.00E+00	
173	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.86E-03	4.96E-04	2.35E-09	8.97E-06	2.87E-06	0.00E+00	4.96E-08	2.35E-09	4.66E-07	1.57E-07	0.00E+00	
174	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	7.14E-03	2.97E-03	5.17E-09	5.34E-07	2.75E-07	6.21E-14	2.97E-06	5.17E-09	3.11E-08	1.97E-08	6.21E-14	
175	79-00-5	1,1,2-Trichloroethane	7.14E-03	7.07E-03	4.18E-09	0.00E+00	1.69E-13	0.00E+00	7.07E-07	4.18E-09	2.55E-15	5.20E-13	0.00E+00	
176	79-01-6	Trichloroethylene	7.14E-03	7.16E-03	4.15E-09	0.00E+00	0.00E+00	0.00E+00	7.16E-07	4.15E-09	0.00E+00	0.00E+00	0.00E+00	
177	79-09-4	Propionic acid	4.29E-02	1.68E-03	5.70E-08	1.45E-02	1.76E-03	0.00E+00	1.68E-07	5.70E-08	7.28E-04	8.84E-05	0.00E+00	
178	79-10-7	2-Propenoic acid	5.72E-02	2.24E-03	7.60E-08	1.94E-02	2.35E-03	0.00E+00	2.24E-07	7.60E-08	9.70E-04	1.18E-04	0.00E+00	
179	79-20-9	Methyl acetate	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	3.49E-06	2.69E-08	3.24E-09	4.97E-09	0.00E+00	
180	79-34-5	1,1,2,2-Tetrachloroethane	1.35E-05	1.28E-05	8.06E-12	1.13E-14	4.72E-14	0.00E+00	1.28E-06	8.06E-12	2.09E-15	2.65E-14	0.00E+00	
181	83-32-9	Acenaphthene	4.29E-02	4.18E-02	2.52E-08	2.45E-12	7.34E-12	0.00E+00	2.51E-04	2.52E-08	1.13E-12	1.22E-11	0.00E+00	
182	84-66-2	Diethyl phthalate	4.29E-02	2.05E-03	5.46E-08	1.12E-02	1.56E-03	0.00E+00	4.11E-08	5.46E-08	5.62E-04	7.87E-05	0.00E+00	
183	84-74-2	Dibutyl phthalate	4.29E-02	4.09E-03	4.93E-08	4.56E-03	6.92E-04	4.43E-10	8.13E-08	4.90E-08	2.28E-04	3.48E-05	4.41E-10	
184	85-01-8	Phenanthrene	4.29E-02	1.78E-02	3.10E-08	3.20E-06	1.65E-06	3.73E-13	1.07E-04	3.10E-08	1.87E-07	1.18E-07	3.72E-13	
185	85-68-7	Butylbenzyl phthalate	4.29E-02	4.09E-03	4.93E-08	4.56E-03	6.92E-04	4.43E-10	7.75E-08	4.67E-08	2.07E-04	3.17E-05	4.20E-10	
186	86-73-7	Fluorene	4.29E-02	3.49E-02	2.69E-08	4.33E-08	4.07E-08	0.00E+00	2.09E-04	2.69E-08	3.24E-09	4.97E-09	0.00E+00	
187	87-68-3	Hexachlorobutadiene	7.14E-03	7.15E-03	4.14E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-05	4.14E-09	0.00E+00	0.00E+00	0.00E+00	
188	88-06-2	2,4,6-Trichlorophenol	4.29E-02	2.33E-02	3.30E-08	6.40E-04	1.30E-04	8.48E-11	1.40E-04	3.30E-08	3.25E-05	6.73E-06	8.48E-11	
189	88-72-2	2-Nitrotoluene	7.14E-03	1.42E-03	5.73E-09	1.23E-05	4.26E-06	0.00E+00	7.12E-08	5.73E-09	6.48E-07	2.40E-07	0.00E+00	
190	88-75-5	2-Nitrophenol	4.29E-02	8.54E-03	3.44E-08	7.41E-05	2.56E-05	0.00E+00	1.28E-04	3.44E-08	3.89E-06	1.44E-06	0.00E+00	
191	88-89-1	Picric acid	4.29E-02	7.76E-08	6.82E-08	3.67E-02	2.16E-03	0.00E+00	1.45E-12	6.37E-08	1.60E-03	9.44E-05	0.00E+00	
192	91-20-3	Naphthalene	1.43E-03	1.30E-03	8.63E-10	3.29E-12	1.29E-11	0.00E+00	6.51E-06	8.63E-10	5.77E-13	6.37E-12	0.00E+00	
193	91-22-5	Quinoline	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	1.80E-07	4.47E-08	1.51E-04	2.97E-05	0.00E+00	
194	91-58-7	2-Chloronapthalene	4.29E-02	4.06E-02	2.56E-08	3.57E-11	1.50E-10	0.00E+00	2.44E-04	2.56E-08	6.63E-12	8.39E-11	0.00E+00	
195	92-52-4	1,1'-Biphenyl	2.86E-02	2.71E-02	1.70E-08	2.38E-11	9.97E-11	0.00E+00	5.41E-06	1.70E-08	4.42E-12	5.59E-11	0.00E+00	
196	92-93-3	4-Nitrobiphenyl	4.29E-02	2.33E-02	3.30E-08	6.40E-04	1.30E-04	8.48E-11	1.40E-04	3.29E-08	3.25E-05	6.72E-06	8.47E-11	
197	95-13-6	Indene	4.29E-02	4.18E-02	2.52E-08	0.00E+00	7.33E-12	0.00E+00	2.09E-05	2.52E-08	7.35E-14	1.22E-11	0.00E+00	
198	95-47-6	o-Xylene	2.86E-03	2.86E-03	1.66E-09	0.00E+00	0.00E+00	0.00E+00	2.86E-07	1.66E-09	0.00E+00	5.21E-15	0.00E+00	
199	95-48-7	o-Cresol (2-Methylphenol)	7.14E-03	6.00E-04	7.44E-09	4.99E-04	9.71E-05	0.00E+00	3.00E-07	7.44E-09	2.51E-05	4.94E-06	0.00E+00	
200	95-49-8	2-Chlorotoluene	4.29E-02	4.29E-02	2.49E-08	0.00E+00	7.66E-15	0.00E+00	2.14E-06	2.49E-08	0.00E+00	7.85E-14	0.00E+00	
201	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.86E-03	2.79E-03	1.68E-09	0.00E+00	4.89E-13	0.00E+00	2.79E-05	1.68E-09	4.90E-15	8.13E-13	0.00E+00	
202	95-57-8	2-Chlorophenol	4.29E-02	7.45E-03	3.53E-08	1.35E-04	4.30E-05	0.00E+00	3.72E-07	3.53E-08	6.99E-06	2.36E-06	0.00E+00	
203	95-95-4	2,4,5-Trichlorophenol	4.29E-02	3.60E-03	4.47E-08	3.00E-03	5.83E-04	0.00E+00	2.16E-05	4.47E-08	1.51E-04	2.97E-05	0.00E+00	
204	96-22-0	3-Pentanone	1.43E-02	1.16E-02	8.95E-09	1.44E-08	1.36E-08	0.00E+00	1.16E-06	8.95E-09	1.08E-09	1.66E-09	0.00E+00	
205	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	4.29E-02	2.49E-08	0.00E+00	7.66E-15	0.00E+00	2.57E-04	2.49E-08	0.00E+00	7.85E-14	0.00E+00	
206	98-51-1	p-tert-Butyltoluene	4.29E-02	4.29E-02	2.48E-08	0.00E+00	0.00E+00	0.00E+00	2.15E-06	2.48E-08	0.00E+00	0.00E+00	0.00E+00	
207	98-82-8	Cumene	4.29E-02	4.29E-02	2.49E-08	0.00E+00	0.00E+00	0.00E+00	2.15E-06	2.49E-08	0.00E+00	0.00E+00	0.00E+00	
208	98-83-9	alpha-Methylstyrene	7.14E-03	7.15E-03	4.15E-09	0.00E+00	1.28E-15	0.00E+00	3.57E-05	4.15E-09	0.00E+00	1.31E-14	0.00E+00	
209	98-86-2	Acetophenone	2.86E-02	5.16E-03	2.33E-08	7.50E-05	2.45E-05	0.00E+00	2.58E-05	2.33E-08	3.90E-06	1.36E-06	0.00E+00	
210	98-95-3	Nitrobenzene	2.86E-02	5.69E-03	2.29E-08	4.94E-05	1.70E-05	0.00E+00	2.85E-07	2.29E-08	2.59E-06	9.62E-07	0.00E+00	
211	Coplanar PCB's													
212	31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
213	32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
214	32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
215	32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
216	35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
217	35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
218	38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
219	39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
220	52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
221	57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
222	65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
223	69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
224	70362-50-4	3,4,4',5-Tetrachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	
225	74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	1.24E-06	3.08E-06	9.81E-13	4.20E-14	1.50E-13	0.00E+00	1.85E-08	9.81E-13	7.34E-15	6.83E-14	0.00E+00	

9 References

Project Documents

CCN 053500, Memorandum, Jim Rouse/Edgardo Berríos to Fred Beranek, "HLW and LAW Vitrification Decontamination Factors for Air Emissions Modeling"

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24590-PTF-MKD-PVP-00002, Rev 5, *Mechanical Data Sheet PTF Vessel Vent Caustic Scrubber*

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24590-WTP-RPT-PO-03-008, Rev 1, *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant*

10 Attachments

Attachment A - Stream Reports (25 pages)

Attachment B - Calculations (19 pages)

Attachment A - Stream Reports

Table A-1 PJV32 Stream Report

Stream Number: PJV32
Stream Name: HLW pulse ventilation header offgas
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Variable	Value	Units	
Density	1.03E-03	g/cm^3	(does not include solid phase)
Enthalpy	-7.39E+05	BTU/hr	
Mass Flow	2.11E+04	Lb/hr	
	5.06E+05	Lb/day	
Volumetric Flow	4.08E+04	GPM	(does not include solid phase)
	5.45E+03	ft^3/min	(does not include solid phase)
Molar Flow	7.34E+02	Lbmol/hr	
Molecular Weight	2.87E+01	Lb/Lbmol	
Pressure	8.91E+02	mbar	
Temperature	2.52E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	2.24E+00	pH	
Total TRU	5.30E-14	Ci/L	
Total Activity	1.76E-11	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	2.94E-09	4.43E-10	2.60E-02	6.92E-05	3.59E-02	5.06E+05	5.06E+05	2.30E+02	2.86E+03
Ag^+	2.76E-23	2.49E-23	1.46E-15	7.67E-08	0.00E+00	0.00E+00	7.67E-08	3.49E-11	4.04E-10
Al^{+3}	3.34E-19	7.52E-20	4.42E-12	4.00E-06	0.00E+00	0.00E+00	4.00E-06	1.82E-09	2.10E-08
As^{+3}	1.22E-22	7.61E-23	4.47E-15	8.05E-09	0.00E+00	0.00E+00	8.05E-09	3.66E-12	4.24E-11
B^{+3}	1.87E-19	1.69E-20	9.91E-13	7.10E-06	0.00E+00	0.00E+00	7.10E-06	3.23E-09	3.73E-08
Ba^{+2}	2.54E-23	2.91E-23	1.71E-15	2.04E-08	0.00E+00	0.00E+00	2.04E-08	9.28E-12	1.07E-10
Bi^{+3}	2.99E-23	5.21E-23	3.06E-15	1.85E-07	0.00E+00	0.00E+00	1.85E-07	8.41E-11	9.73E-10
Ca^{+2}	8.08E-15	2.03E-15	1.19E-07	4.63E-08	0.00E+00	0.00E+00	1.68E-07	7.63E-11	8.83E-10
Cd^{+2}	4.71E-23	4.42E-23	2.59E-15	8.30E-07	0.00E+00	0.00E+00	8.30E-07	3.77E-10	4.37E-09
Ce^{+3}	6.78E-14	7.93E-14	4.66E-06	1.46E-08	0.00E+00	0.00E+00	4.67E-06	2.12E-09	2.46E-08
Cl^-	8.32E-14	2.46E-14	1.45E-06	3.73E-15	0.00E+00	0.00E+00	1.45E-06	6.57E-10	7.60E-09
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	7.01E-18	2.58E-18	1.51E-10	0.00E+00	4.78E-15	1.03E-07	1.03E-07	4.67E-11	5.41E-10
CO_3^{-2}	4.07E-16	2.04E-16	1.20E-08	1.38E-10	0.00E+00	0.00E+00	1.21E-08	5.50E-12	6.37E-11
Cr^{+3}	4.83E-15	2.10E-15	1.23E-07	7.39E-08	0.00E+00	0.00E+00	1.97E-07	8.96E-11	1.04E-08
Cu^{+2}	4.67E-23	2.48E-23	1.45E-15	5.14E-09	0.00E+00	0.00E+00	5.14E-09	2.34E-12	2.70E-11
F^-	9.70E-13	1.54E-13	9.03E-06	6.78E-14	0.00E+00	0.00E+00	9.03E-06	4.11E-09	4.75E-08
Fe^{+3}	1.68E-14	7.84E-15	4.60E-07	3.04E-06	0.00E+00	0.00E+00	3.50E-06	1.59E-09	1.84E-08
H_2O	2.93E-09	4.40E-10	2.59E-02	0.00E+00	3.48E-04	3.07E+03	3.07E+03	1.40E+00	1.62E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	4.00E-15	3.37E-17	1.98E-09	0.00E+00	0.00E+00	0.00E+00	1.98E-09	8.99E-13	1.04E-11
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	2.12E-14	1.08E-14	6.33E-07	7.68E-29	0.00E+00	0.00E+00	6.33E-07	2.88E-10	3.33E-09
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	3.44E-06	0.00E+00	0.00E+00	3.44E-06	1.56E-09	1.81E-08
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	5.33E-14	1.74E-14	1.02E-06	2.45E-23	0.00E+00	0.00E+00	1.02E-06	4.64E-10	5.37E-09
La^{+3}	1.31E-23	1.51E-23	8.89E-16	7.63E-08	0.00E+00	0.00E+00	7.63E-08	3.47E-11	4.01E-10
Li^+	1.29E-13	7.47E-15	4.39E-07	4.49E-07	0.00E+00	0.00E+00	8.88E-07	4.04E-10	4.67E-09
Mg^{+2}	3.85E-22	7.81E-23	4.59E-15	4.91E-08	0.00E+00	0.00E+00	4.91E-08	2.23E-11	2.59E-10
Mn^{+3}	4.17E-22	1.91E-22	1.12E-14	3.98E-07	0.00E+00	0.00E+00	3.98E-07	1.81E-10	2.10E-09
MnO_4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.81E-02	3.86E+05	3.86E+05	1.75E+02	2.03E+03
Na^+	5.15E-12	9.87E-13	5.80E-05	7.31E-12	0.00E+00	0.00E+00	5.80E-05	2.64E-08	3.05E-07
NH3	8.07E-16	1.15E-16	6.74E-09	0.00E+00	0.00E+00	0.00E+00	6.74E-09	3.06E-12	3.54E-11
NH4+	1.41E-13	1.15E-16	1.25E-06	0.00E+00	0.00E+00	0.00E+00	1.25E-06	5.68E-10	6.57E-09
Ni^{+2}	2.28E-15	1.12E-15	6.55E-08	1.50E-07	0.00E+00	0.00E+00	2.16E-07	9.82E-11	1.14E-09
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	7.25E-19	2.78E-19	1.64E-11	2.12E-11	0.00E+00	0.00E+00	3.75E-11	1.71E-14	1.97E-13
NO_3^-	2.93E-12	1.52E-12	8.91E-05	1.63E-11	0.00E+00	0.00E+00	8.91E-05	4.05E-08	4.69E-07
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.47E-03	1.17E+05	1.17E+05	5.33E+01	6.17E+02
O^-	0.00E+00	0.00E+00	0.00E+00	2.77E-05	0.00E+00	0.00E+00	2.77E-05	1.26E-08	1.46E-07
OH^-	1.75E-12	2.49E-13	1.46E-05	3.97E-10	0.00E+00	0.00E+00	1.46E-05	6.64E-09	7.68E-08
OH(b)	7.40E-19	1.05E-19	6.17E-12	3.76E-34	0.00E+00	0.00E+00	6.17E-12	2.80E-15	3.24E-14
Pb^{+2}	1.71E-22	2.95E-22	1.73E-14	2.20E-07	0.00E+00	0.00E+00	2.20E-07	1.00E-10	1.16E-09
Pd^{+2}	1.33E-23	1.18E-23	6.95E-16	3.59E-09	0.00E+00	0.00E+00	3.59E-09	1.63E-12	1.89E-11
PO_4^{-3}	1.37E-20	1.06E-20	6.36E-13	2.04E-06	0.00E+00	0.00E+00	2.04E-06	9.28E-10	1.07E-08
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	1.29E-23	1.11E-23	6.50E-16	6.35E-09	0.00E+00	0.00E+00	6.35E-09	2.89E-12	3.34E-11
Ru^{+3}	1.90E-23	1.60E-23	9.39E-16	5.47E-07	0.00E+00	0.00E+00	5.47E-07	2.49E-10	2.88E-09
S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.08E-29	0.00E+00	0.00E+00	1.08E-29	4.89E-33	5.66E-32
SiO2	2.58E-21	1.29E-21	7.60E-14	1.72E-05	0.00E+00	0.00E+00	1.72E-05	7.83E-09	9.06E-08
SiO_4^{-4}	1.97E-33	1.52E-33	8.90E-26	1.32E-12	0.00E+00	0.00E+00	1.32E-12	5.98E-16	6.92E-15
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	3.28E-20	2.61E-20	1.53E-12	1.93E-13	0.00E+00	0.00E+00	1.73E-12	7.85E-16	9.09E-15
Sr^{+2}	1.68E-16	1.23E-16	7.20E-09	4.17E-09	0.00E+00	0.00E+00	1.14E-08	5.17E-12	5.98E-11
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl^{+4}	2.15E-23	8.58E-24	5.04E-16	1.04E-09	0.00E+00	0.00E+00	1.04E-09	4.73E-13	5.47E-12
Zn^{+2}	7.98E-23	4.34E-23	2.55E-15	9.66E-07	0.00E+00	0.00E+00	9.66E-07	4.39E-10	5.08E-09
Zr^{+4}	5.87E-23	4.47E-23	2.63E-15	4.83E-07	0.00E+00	0.00E+00	4.83E-07	2.20E-10	2.54E-09

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	1.72E-20	1.26E-20	7.42E-13	3.01E-04	0.00E+00	0.00E+00	3.01E-04	1.37E-07	1.59E-06

$C_2O_4^{-2}$	1.72E-20	1.26E-20	7.42E-13	3.01E-04	0.00E+00	0.00E+00	3.01E-04	1.37E-07	1.59E-06
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	1.89E-26	0.00E+00	0.00E+00	1.89E-26	8.59E-30	9.94E-29
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	5.15E-27	0.00E+00	0.00E+00	5.15E-27	2.34E-30	2.71E-29
HEDTA	0.00E+00	0.00E+00	0.00E+00	6.87E-27	0.00E+00	0.00E+00	6.87E-27	3.12E-30	3.61E-29
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	1.69E-12	3.76E-04	6.00E-09	1.59E-11	3.53E-03	1.33E-05	1.76E-11	3.90E-03	1.33E-05
^{241}Am	2.59E-22	5.75E-14	3.70E-17	4.20E-14	9.34E-06	6.01E-09	4.20E-14	9.34E-06	6.01E-09
^{243}Am	1.69E-25	3.76E-17	4.15E-19	3.41E-18	7.58E-10	8.37E-12	3.41E-18	7.58E-10	8.37E-12
^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{60}Co	3.49E-23	7.76E-15	1.51E-20	3.75E-15	8.35E-07	1.63E-12	3.75E-15	8.35E-07	1.63E-12
^{243}Cm	2.80E-26	6.23E-18	2.72E-22	4.73E-17	1.05E-08	4.59E-13	4.73E-17	1.05E-08	4.59E-13
^{244}Cm	6.63E-25	1.48E-16	4.02E-21	1.07E-15	2.39E-07	6.51E-12	1.07E-15	2.39E-07	6.51E-12
^{137}Cs	7.61E-17	1.69E-08	4.30E-13	1.45E-11	3.23E-03	8.19E-08	1.45E-11	3.23E-03	8.19E-08
^{152}Eu	1.95E-24	4.33E-16	5.49E-21	1.80E-16	4.00E-08	5.08E-13	1.80E-16	4.00E-08	5.08E-13
^{154}Eu	4.03E-22	8.97E-14	7.32E-19	1.95E-14	4.34E-06	3.54E-11	1.95E-14	4.34E-06	3.54E-11
^{155}Eu	1.17E-22	2.59E-14	1.18E-19	2.89E-15	6.44E-07	2.92E-12	2.89E-15	6.44E-07	2.92E-12
^{3}H	2.11E-23	4.68E-15	1.07E-21	2.44E-15	5.43E-07	1.25E-13	2.44E-15	5.43E-07	1.25E-13
^{129}I	0.00E+00	0.00E+00	0.00E+00	7.71E-19	1.72E-10	2.14E-09	7.71E-19	1.72E-10	2.14E-09
^{63}Ni	6.25E-22	1.39E-13	5.39E-18	5.60E-16	1.25E-07	4.83E-12	5.60E-16	1.25E-07	4.83E-12
^{231}Np	2.06E-25	4.57E-17	1.43E-16	2.77E-17	6.16E-09	1.93E-08	2.77E-17	6.16E-09	1.93E-08
^{238}Pu	1.16E-24	2.57E-16	3.31E-20	1.31E-16	2.92E-08	3.76E-12	1.31E-16	2.92E-08	3.76E-12
^{239}Pu	1.60E-23	3.56E-15	1.26E-18	1.16E-15	2.59E-07	9.20E-09	1.16E-15	2.59E-07	9.20E-09
^{240}Pu	4.15E-24	9.23E-16	8.96E-18	3.07E-16	6.83E-08	6.64E-10	3.07E-16	6.83E-08	6.64E-10
^{241}Pu	8.71E-23	1.94E-14	4.15E-19	8.25E-15	1.83E-06	3.93E-11	8.25E-15	1.83E-06	3.93E-11
^{242}Pu	4.39E-28	9.77E-20	5.47E-20	2.06E-21	4.59E-13	2.57E-13	2.06E-21	4.59E-13	2.57E-13
^{125}Sb	2.41E-22	5.36E-14	1.14E-19	8.65E-15	1.92E-06	4.09E-12	8.65E-15	1.92E-06	4.09E-12
^{151}Sm	3.41E-21	7.59E-13	6.35E-17	8.03E-14	1.79E-05	1.50E-09	8.03E-14	1.79E-05	1.50E-09
^{126}Sn	3.83E-24	8.52E-16	1.65E-16	3.38E-17	7.51E-09	1.46E-09	3.38E-17	7.51E-09	1.46E-09
^{90}Sr	1.69E-12	3.76E-04	6.00E-09	9.78E-13	2.18E-04	3.47E-09	2.67E-12	5.94E-04	9.47E-09
^{99}Tc	6.69E-22	1.49E-13	1.93E-14	2.02E-13	4.49E-05	5.84E-06	2.02E-13	4.49E-05	5.84E-06
^{230}Th	6.30E-27	1.40E-18	2.81E-14	9.09E-19	2.02E-10	4.05E-06	9.09E-19	2.02E-10	4.05E-06
^{233}U	2.08E-25	4.63E-17	1.06E-17	7.50E-17	1.67E-08	3.82E-09	7.50E-17	1.67E-08	3.82E-09
^{234}U	1.48E-25	3.29E-17	1.17E-17	3.91E-18	8.69E-10	3.08E-10	3.91E-18	8.69E-10	3.08E-10
^{235}U	5.82E-27	1.30E-18	1.32E-15	8.79E-20	1.96E-11	2.00E-08	8.79E-20	1.96E-11	2.00E-08
^{236}U	9.98E-27	2.22E-18	7.56E-17	1.21E-19	2.69E-11	9.16E-10	1.21E-19	2.69E-11	9.16E-10
^{238}U	1.15E-25	2.57E-17	1.68E-13	2.20E-18	4.89E-10	3.21E-06	2.20E-18	4.89E-10	3.21E-06

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components			Mt/day	g/sec
Unit	mol/L	Lb/gal	Lb/day		
Total	7.22E-15	1.30E-14	7.62E-07	3.46E-10	4.01E-09
50-32-8	1.54E-15	3.25E-15	1.91E-07	8.68E-11	1.00E-09
56-23-5	1.64E-62	2.11E-62	1.24E-54	5.63E-58	6.52E-57
57-14-7	1.27E-44	6.38E-45	3.75E-37	1.70E-40	1.97E-39
58-90-2	2.56E-31	4.98E-31	2.91E-23	1.32E-26	1.53E-25
59-89-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60-35-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62-75-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64-19-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71-43-2	3.15E-56	2.05E-56	1.20E-48	5.46E-52	6.34E-51
75-05-8	1.48E-45	5.06E-46	2.98E-38	1.35E-41	1.57E-40
75-12-7	1.67E-29	6.28E-30	3.69E-22	1.68E-25	1.94E-24
78-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	2.21E-58	2.42E-58	1.42E-50	6.46E-54	7.47E-53
83-32-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84-66-2	7.44E-30	1.38E-29	8.10E-22	3.68E-25	4.26E-24
84-74-2	6.17E-16	1.43E-15	8.43E-08	3.83E-11	4.43E-10
87-68-3	7.94E-60	1.73E-59	1.01E-51	4.61E-55	5.34E-54
88-89-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91-20-3	6.46E-50	6.91E-50	4.06E-42	1.84E-45	2.14E-44
95-50-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98-86-2	9.09E-31	9.14E-31	5.37E-23	2.44E-26	2.82E-25
100-21-0	3.34E-15	4.63E-15	2.72E-07	1.24E-10	1.43E-09
101-84-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-93-4	2.72E-49	4.27E-49	2.51E-41	1.14E-44	1.32E-43
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	2.89E-56	2.07E-56	1.21E-48	5.52E-52	6.39E-51
108-95-2	1.91E-29	1.50E-29	8.83E-22	4.01E-25	4.65E-24
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	1.52E-18	2.41E-18	1.42E-10	6.44E-14	7.45E-13
120-82-1	5.74E-52	8.69E-52	5.11E-44	2.32E-47	2.69E-46
122-39-4	1.29E-18	1.83E-16	1.07E-08	4.88E-12	5.65E-11
126-73-8	1.41E-15	3.13E-15	1.84E-07	8.35E-11	9.66E-10
127-18-4	2.92E-61	4.05E-61	2.38E-53	1.08E-56	1.25E-55
129-00-0	4.69E-17	7.92E-17	4.65E-09	2.11E-12	2.45E-11
132-64-9	2.02E-47	2.83E-47	1.66E-39	7.57E-43	8.76E-42
144-62-7	3.13E-32	2.35E-32	1.38E-24	6.28E-28	7.27E-27
193-39-5	6.36E-21	1.93E-20	1.13E-12	5.15E-16	5.96E-15
206-44-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
208-96-8	8.02E-34	1.02E-33	5.98E-26	2.72E-29	3.15E-28
603-34-9	1.26E-16	2.64E-16	1.55E-08	7.04E-12	8.15E-11
621-64-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1321-64-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1336-36-3	1.45E-21	3.91E-21	2.29E-13	1.04E-16	1.21E-15
3697-24-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4170-30-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10061-01-5	1.82E-53	1.69E-53	9.91E-46	4.50E-49	5.21E-48
26140-60-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A-2 FRP01 Stream Report

Stream Number: FRP01
Stream Name: Waste feed from DOE to LAW Feed Receipt
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	1.26E+00	g/cm^3	(does not include solid phase)
Enthalpy	-1.54E+07	BTU/hr	
Mass Flow	2.80E+03	Lb/hr	
	6.23E+04	Lb/day	
Volumetric Flow	4.12E+00	GPM	(does not include solid phase)
	5.50E-01	ft^3/min	(does not include solid phase)
Molar Flow	1.28E+02	Lbmol/hr	
Molecular Weight	1.99E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	2.50E+01	C	
Na Molarity	4.00E+00	mol/L	
pH	1.44E+01	pH	
Total TRU	4.24E-04	Ci/L	
Total Activity	2.26E+00	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	6.19E+01	1.03E+01	6.09E+04	0.00E+00	0.00E+00	0.00E+00	6.09E+04	2.77E+01	3.20E+02
Ag^+	3.17E-05	2.85E-05	1.69E-01	0.00E+00	0.00E+00	0.00E+00	1.69E-01	7.69E-05	8.89E-04
Al^{+3}	3.84E-01	8.64E-02	5.12E+02	0.00E+00	0.00E+00	0.00E+00	5.12E+02	2.33E-01	2.70E+00
As^{+3}	1.40E-04	8.73E-05	5.18E-01	0.00E+00	0.00E+00	0.00E+00	5.18E-01	2.35E-04	2.72E-03
B^{+3}	2.32E-03	2.09E-04	1.24E+00	0.00E+00	0.00E+00	0.00E+00	1.24E+00	5.64E-04	6.52E-03
Ba^{+2}	2.91E-05	3.34E-05	1.98E-01	0.00E+00	0.00E+00	0.00E+00	1.98E-01	8.99E-05	1.04E-03
Bi^{+3}	3.43E-05	5.99E-05	3.55E-01	0.00E+00	0.00E+00	0.00E+00	3.55E-01	1.61E-04	1.87E-03
Ca^{+2}	1.98E-03	6.81E-04	3.92E+00	0.00E+00	0.00E+00	0.00E+00	3.92E+00	1.78E-03	2.06E-02
Cd^{+2}	5.41E-05	5.07E-05	3.01E-01	0.00E+00	0.00E+00	0.00E+00	3.01E-01	1.37E-04	1.58E-03
Ce^{+3}	6.69E-05	7.83E-05	4.64E-01	0.00E+00	0.00E+00	0.00E+00	4.64E-01	2.11E-04	2.44E-03
Cl^-	6.17E-02	1.82E-02	1.08E+02	0.00E+00	0.00E+00	0.00E+00	1.08E+02	4.92E-02	5.69E-01
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_3^{-2}	3.07E-01	1.54E-01	9.10E+02	0.00E+00	0.00E+00	0.00E+00	9.10E+02	4.14E-01	4.79E+00
Cr^{+3}	9.19E-03	3.99E-03	2.36E+01	0.00E+00	0.00E+00	0.00E+00	2.36E+01	1.07E-02	1.24E-01
Cu^{+2}	5.35E-05	2.84E-05	1.68E-01	0.00E+00	0.00E+00	0.00E+00	1.68E-01	7.65E-05	8.85E-04
F^-	2.47E-02	3.91E-03	2.32E+01	0.00E+00	0.00E+00	0.00E+00	2.32E+01	1.05E-02	1.22E-01
Fe^{+3}	1.39E-03	6.48E-04	3.84E+00	0.00E+00	0.00E+00	0.00E+00	3.84E+00	1.75E-03	2.02E-02
H_2O	5.24E+01	7.88E+00	4.68E+04	0.00E+00	0.00E+00	0.00E+00	4.68E+04	2.13E+01	2.46E+02
H_2O(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	5.60E-05	9.38E-05	5.56E-01	0.00E+00	0.00E+00	0.00E+00	5.56E-01	2.53E-04	2.93E-03
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	1.31E-01	4.28E-02	2.54E+02	0.00E+00	0.00E+00	0.00E+00	2.54E+02	1.15E-01	1.34E+00
La^{+3}	1.48E-05	1.72E-05	1.02E-01	0.00E+00	0.00E+00	0.00E+00	1.02E-01	4.64E-05	5.37E-04
Li^+	4.20E-04	2.43E-05	1.44E-01	0.00E+00	0.00E+00	0.00E+00	1.44E-01	6.55E-05	7.59E-04
Mg^{+2}	4.42E-04	8.98E-05	5.31E-01	0.00E+00	0.00E+00	0.00E+00	5.31E-01	2.41E-04	2.79E-03
Mn^{+3}	4.79E-04	2.20E-04	1.30E+00	0.00E+00	0.00E+00	0.00E+00	1.30E+00	5.92E-04	6.85E-03
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na^+	4.00E+00	7.67E-01	4.55E+03	0.00E+00	0.00E+00	0.00E+00	4.55E+03	2.07E+00	2.39E+01
NH3	2.82E-03	4.01E-04	2.38E+00	0.00E+00	0.00E+00	0.00E+00	2.38E+00	1.08E-03	1.25E-02
NH4+	0.00E+00	4.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni^{+2}	7.32E-04	3.59E-04	2.13E+00	0.00E+00	0.00E+00	0.00E+00	2.13E+00	9.66E-04	1.12E-02
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	8.34E-01	3.20E-01	1.90E+03	0.00E+00	0.00E+00	0.00E+00	1.90E+03	8.63E-01	9.99E+00
NO_3^-	1.13E+00	5.83E-01	3.46E+03	0.00E+00	0.00E+00	0.00E+00	3.46E+03	1.57E+00	1.82E+01
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OH^-	2.53E+00	3.59E-01	2.13E+03	0.00E+00	0.00E+00	0.00E+00	2.13E+03	9.68E-01	1.12E+01
OH(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	1.96E-04	3.39E-04	2.01E+00	0.00E+00	0.00E+00	0.00E+00	2.01E+00	9.15E-04	1.06E-02
Pd^{+2}	1.52E-05	1.35E-05	8.00E-02	0.00E+00	0.00E+00	0.00E+00	8.00E-02	3.64E-05	4.21E-04
PO_4^{-3}	1.57E-02	1.24E-02	7.37E+01	0.00E+00	0.00E+00	0.00E+00	7.37E+01	3.35E-02	3.88E-01
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	1.47E-05	1.26E-05	7.48E-02	0.00E+00	0.00E+00	0.00E+00	7.48E-02	3.40E-05	3.94E-04
Ru^{+3}	2.18E-05	1.84E-05	1.09E-01	0.00E+00	0.00E+00	0.00E+00	1.09E-01	4.96E-05	5.74E-04
S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	2.96E-03	1.48E-03	8.80E+00	0.00E+00	0.00E+00	0.00E+00	8.80E+00	4.00E-03	4.63E-02
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	3.74E-02	3.00E-02	1.78E+02	0.00E+00	0.00E+00	0.00E+00	1.78E+02	8.09E-02	9.36E-01
Sr^{+2}	6.95E-06	5.08E-06	3.01E-02	0.00E+00	0.00E+00	0.00E+00	3.01E-02	1.37E-05	1.59E-04
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl^{+4}	2.44E-05	9.75E-06	5.78E-02	0.00E+00	0.00E+00	0.00E+00	5.78E-02	2.63E-05	3.04E-04
Zn^{+2}	9.13E-05	4.98E-05	2.95E-01	0.00E+00	0.00E+00	0.00E+00	2.95E-01	1.34E-04	1.55E-03
Zr^{+4}	6.74E-05	5.13E-05	3.04E-01	0.00E+00	0.00E+00	0.00E+00	3.04E-01	1.38E-04	1.60E-03

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	1.58E-02	1.16E-02	6.88E+01	0.00E+00	0.00E+00	0.00E+00	6.88E+01	3.13E-02	3.62E-01

$C_2O_4^{-2}$	1.58E-02	1.16E-02	6.88E+01	0.00E+00	0.00E+00	0.00E+00	6.88E+01	3.13E-02	3.62E-01
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	2.26E+00	5.08E+04	2.65E+01	0.00E+00	0.00E+00	0.00E+00	2.26E+00	5.08E+04	2.65E+01
^{241}Am	2.98E-04	6.69E+00	4.30E-03	0.00E+00	0.00E+00	0.00E+00	2.98E-04	6.69E+00	4.30E-03
^{243}Am	1.95E-07	4.37E-03	4.83E-05	0.00E+00	0.00E+00	0.00E+00	1.95E-07	4.37E-03	4.83E-05
^{14}C	6.09E-06	1.37E-01	6.75E-05	0.00E+00	0.00E+00	0.00E+00	6.09E-06	1.37E-01	6.75E-05
^{60}Co	4.00E-05	8.97E-01	1.75E-06	0.00E+00	0.00E+00	0.00E+00	4.00E-05	8.97E-01	1.75E-06
^{243}Cm	3.22E-06	7.22E-04	3.15E-08	0.00E+00	0.00E+00	0.00E+00	3.22E-06	7.22E-04	3.15E-08
^{244}Cm	7.61E-07	1.71E-02	4.65E-07	0.00E+00	0.00E+00	0.00E+00	7.61E-07	1.71E-02	4.65E-07
^{137}Cs	2.17E+00	4.87E+04	1.24E+00	0.00E+00	0.00E+00	0.00E+00	2.17E+00	4.87E+04	1.24E+00
^{152}Eu	2.24E-06	5.03E-02	6.38E-07	0.00E+00	0.00E+00	0.00E+00	2.24E-06	5.03E-02	6.38E-07
^{154}Eu	4.65E-04	1.04E+01	8.51E-05	0.00E+00	0.00E+00	0.00E+00	4.65E-04	1.04E+01	8.51E-05
^{155}Eu	1.34E-04	3.02E+00	1.37E-05	0.00E+00	0.00E+00	0.00E+00	1.34E-04	3.02E+00	1.37E-05
^{3}H	5.19E-05	1.17E+00	2.67E-07	0.00E+00	0.00E+00	0.00E+00	5.19E-05	1.17E+00	2.67E-07
^{129}I	1.86E-07	4.17E-03	5.21E-02	0.00E+00	0.00E+00	0.00E+00	1.86E-07	4.17E-03	5.21E-02
^{94}Nb	7.20E-04	1.62E+01	6.27E-04	0.00E+00	0.00E+00	0.00E+00	7.20E-04	1.62E+01	6.27E-04
^{237}Np	2.36E-07	5.30E-03	1.66E-02	0.00E+00	0.00E+00	0.00E+00	2.36E-07	5.30E-03	1.66E-02
^{238}Pu	1.33E-06	2.99E-02	3.85E-06	0.00E+00	0.00E+00	0.00E+00	1.33E-06	2.99E-02	3.85E-06
^{239}Pu	1.84E-05	4.14E-01	1.47E-02	0.00E+00	0.00E+00	0.00E+00	1.84E-05	4.14E-01	1.47E-02
^{240}Pu	4.78E-06	1.07E-01	1.04E-03	0.00E+00	0.00E+00	0.00E+00	4.78E-06	1.07E-01	1.04E-03
^{241}Pu	1.00E-04	2.25E+00	4.82E-05	0.00E+00	0.00E+00	0.00E+00	1.00E-04	2.25E+00	4.82E-05
^{242}Pu	5.06E-10	1.14E-05	6.36E-06	0.00E+00	0.00E+00	0.00E+00	5.06E-10	1.14E-05	6.36E-06
^{125}Sb	2.77E-04	6.22E+00	1.32E-05	0.00E+00	0.00E+00	0.00E+00	2.77E-04	6.22E+00	1.32E-05
^{151}Sm	3.89E-03	8.74E+01	7.32E-03	0.00E+00	0.00E+00	0.00E+00	3.89E-03	8.74E+01	7.32E-03
^{126}Sn	4.41E-06	9.90E-02	1.92E-02	0.00E+00	0.00E+00	0.00E+00	4.41E-06	9.90E-02	1.92E-02
^{90}Sr	8.64E-02	1.94E+03	3.10E-02	0.00E+00	0.00E+00	0.00E+00	8.64E-02	1.94E+03	3.10E-02
^{99}Tc	7.67E-04	1.72E+01	2.24E+00	0.00E+00	0.00E+00	0.00E+00	7.67E-04	1.72E+01	2.24E+00
^{232}Th	7.17E-09	1.61E-04	3.22E+00	0.00E+00	0.00E+00	0.00E+00	7.17E-09	1.61E-04	3.22E+00
^{233}U	2.39E-07	5.36E-03	1.23E-03	0.00E+00	0.00E+00	0.00E+00	2.39E-07	5.36E-03	1.23E-03
^{234}U	1.70E-07	3.81E-03	1.35E-03	0.00E+00	0.00E+00	0.00E+00	1.70E-07	3.81E-03	1.35E-03
^{235}U	6.68E-09	1.50E-04	1.53E-01	0.00E+00	0.00E+00	0.00E+00	6.68E-09	1.50E-04	1.53E-01
^{236}U	1.14E-08	2.57E-04	8.76E-03	0.00E+00	0.00E+00	0.00E+00	1.14E-08	2.57E-04	8.76E-03
^{238}U	1.32E-07	2.97E-03	1.95E+01	0.00E+00	0.00E+00	0.00E+00	1.32E-07	2.97E-03	1.95E+01

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	4.06E-01	2.19E-01	1.30E+03	5.92E-01	6.85E+00
50-32-8	1.51E-04	3.18E-04	1.89E+00	8.57E-04	9.92E-03
56-23-5	2.60E-05	3.34E-05	1.98E-01	9.00E-05	1.04E-03
57-14-7	9.98E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
58-90-2	2.59E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
59-89-2	5.17E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
60-35-5	1.69E-04	8.33E-05	4.94E-01	2.25E-04	2.60E-03
62-75-9	8.10E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
64-19-7	3.81E-01	1.81E-01	1.07E+03	4.88E-01	5.64E+00
71-43-2	5.12E-05	3.34E-05	1.98E-01	9.00E-05	1.04E-03
75-05-8	2.44E-04	8.36E-05	4.96E-01	2.25E-04	2.61E-03
75-12-7	1.33E-03	5.00E-04	2.96E+00	1.35E-03	1.56E-02
76-15-3	8.47E-05	8.34E-05	4.95E-01	2.25E-04	2.60E-03
79-01-6	7.61E-05	8.35E-05	4.95E-01	2.25E-04	2.60E-03
83-32-9	3.89E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
84-66-2	2.70E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
84-74-2	2.16E-04	5.02E-04	2.98E+00	1.35E-03	1.57E-02
87-68-3	3.83E-05	8.33E-05	4.94E-01	2.25E-04	2.60E-03
88-89-1	2.82E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
91-20-3	1.56E-05	1.67E-05	9.89E-02	4.50E-05	5.20E-04
95-50-1	2.72E-05	3.34E-05	1.98E-01	8.99E-05	1.04E-03
96-86-2	3.32E-04	3.34E-04	1.98E+00	9.00E-04	1.04E-02
100-21-0	3.61E-04	5.00E-04	2.97E+00	1.35E-03	1.56E-02
101-84-8	5.88E-05	8.35E-05	4.95E-01	2.25E-04	2.61E-03
106-93-4	2.13E-05	3.34E-05	1.98E-01	9.00E-05	1.04E-03
106-97-8	1.72E-04	8.34E-05	4.95E-01	2.25E-04	2.60E-03
106-99-0	7.39E-05	3.34E-05	1.98E-01	8.99E-05	1.04E-03
108-87-2	1.02E-04	8.36E-05	4.96E-01	2.25E-04	2.61E-03
108-88-3	4.34E-05	3.34E-05	1.98E-01	8.99E-05	1.04E-03
108-95-2	6.38E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
110-54-3	1.16E-04	8.34E-05	4.95E-01	2.25E-04	2.60E-03
110-82-7	1.19E-04	8.36E-05	4.96E-01	2.25E-04	2.61E-03
111-84-2	7.80E-05	8.35E-05	4.95E-01	2.25E-04	2.60E-03
120-12-7	3.37E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
120-82-1	5.51E-05	8.34E-05	4.95E-01	2.25E-04	2.60E-03
122-39-4	1.18E-04	1.67E-04	9.88E-01	4.49E-04	5.20E-03
126-73-8	1.50E-04	3.33E-04	1.98E+00	8.99E-04	1.04E-02
127-18-4	2.41E-05	3.34E-05	1.98E-01	8.99E-05	1.04E-03
129-00-0	2.97E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
132-64-9	3.57E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
144-62-7	3.33E-02	2.50E-02	1.48E+02	6.74E-02	7.81E-01
193-39-5	2.17E-04	5.00E-04	2.97E+00	1.35E-03	1.56E-02
206-44-0	2.97E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
208-96-8	3.94E-04	5.00E-04	2.97E+00	1.35E-03	1.56E-02
603-34-9	2.45E-04	5.02E-04	2.97E+00	1.35E-03	1.56E-02
621-64-7	4.61E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
1321-64-8	2.00E-04	5.01E-04	2.97E+00	1.35E-03	1.56E-02
1336-36-3	2.01E-06	5.40E-06	3.20E-02	1.46E-05	1.68E-04
3697-24-3	2.48E-04	5.02E-04	2.97E+00	1.35E-03	1.56E-02
4170-30-3	1.43E-04	8.36E-05	4.96E-01	2.25E-04	2.61E-03
10061-01-5	3.60E-05	3.33E-05	1.98E-01	8.99E-05	1.04E-03
26140-60-3	2.61E-04	5.02E-04	2.97E+00	1.35E-03	1.56E-02

Table A-3 FRP14 Stream Report

Stream Number: FRP14
Stream Name: Waste feed from DOE to HLW Feed Receipt
Configuration: MRQ-05-0049.scmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Date File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Variable	Value	Units	
Density	1.25E+00	g/cm^3	(does not include solid phase)
Enthalpy	-2.66E+07	BTU/hr	
Mass Flow	4.78E+03	Lb/hr	
	1.14E+05	Lb/day	
Volumetric Flow	7.21E+00	GPM	(does not include solid phase)
	9.63E-01	ft^3/min	(does not include solid phase)
Molar Flow	2.22E+02	Lbmol/hr	
Molecular Weight	1.99E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	4.90E+01	C	
Na Molarity	4.00E+00	mol/L	
pH	1.44E+01	pH	
Total TRU	2.90E-02	Ci/L	
Total Activity	5.16E+00	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	6.14E+01	1.02E+01	1.08E+05	5.05E+03	0.00E+00	0.00E+00	1.11E+05	5.04E+01	5.83E+02
Ag^+	3.17E-05	2.85E-05	2.96E-01	3.50E+00	0.00E+00	0.00E+00	3.80E+00	1.73E-03	2.00E-02
Al^{+3}	3.84E-01	8.64E-02	8.97E+02	4.93E+02	0.00E+00	0.00E+00	1.39E+03	6.32E-01	7.31E+00
As^{+3}	1.40E-04	8.73E-05	9.06E-01	2.20E-01	0.00E+00	0.00E+00	1.13E+00	5.12E-04	5.92E-03
B^{+3}	2.32E-03	2.09E-04	2.17E+00	3.00E+00	0.00E+00	0.00E+00	5.17E+00	2.35E-03	2.72E-02
Ba^{+2}	2.91E-05	3.34E-05	3.46E-01	3.20E+00	0.00E+00	0.00E+00	3.55E+00	1.61E-03	1.87E-02
Bi^{+3}	3.43E-05	5.99E-05	6.21E-01	1.67E+01	0.00E+00	0.00E+00	1.73E+01	7.85E-03	9.09E-02
Ca^{+2}	1.98E-03	6.61E-04	6.86E+00	1.92E+01	0.00E+00	0.00E+00	2.60E+01	1.18E-02	1.37E-01
Cd^{+2}	5.41E-05	5.07E-05	5.27E-01	1.17E+01	0.00E+00	0.00E+00	1.23E+01	5.58E-03	6.45E-02
Ce^{+3}	6.69E-05	7.83E-05	8.12E-01	4.01E+00	0.00E+00	0.00E+00	4.82E+00	2.19E-03	2.53E-02
Cl^-	6.17E-02	1.82E-02	1.89E+02	3.93E+00	0.00E+00	0.00E+00	1.93E+02	8.79E-02	1.02E+00
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_3^{-2}	3.07E-01	1.54E-01	1.59E+03	4.40E+02	0.00E+00	0.00E+00	2.03E+03	9.24E-01	1.07E+01
Cr^{+3}	9.19E-03	3.99E-03	4.14E+01	9.96E+00	0.00E+00	0.00E+00	5.13E+01	2.33E-02	2.70E-01
Cu^{+2}	5.35E-05	2.84E-05	2.95E-01	1.36E+00	0.00E+00	0.00E+00	1.66E+00	7.53E-04	8.72E-03
F^-	2.47E-02	3.91E-03	4.06E+01	7.13E+01	0.00E+00	0.00E+00	1.12E+02	5.08E-02	5.88E-01
Fe^{+3}	1.39E-03	6.48E-04	6.72E+00	5.09E+02	0.00E+00	0.00E+00	5.15E+02	2.34E-01	2.71E+00
H_2O	5.20E+01	7.81E+00	8.11E+04	0.00E+00	0.00E+00	0.00E+00	8.11E+04	3.68E+01	4.26E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	5.60E-05	9.38E-05	9.74E-01	1.99E+00	0.00E+00	0.00E+00	2.97E+00	1.35E-03	1.56E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	1.31E-01	4.28E-02	4.44E+02	1.01E+01	0.00E+00	0.00E+00	4.54E+02	2.07E-01	2.39E+00
La^{+3}	1.46E-05	1.72E-05	1.79E-01	5.94E+00	0.00E+00	0.00E+00	6.12E+00	2.78E-03	3.22E-02
Li^+	4.20E-04	2.43E-05	2.52E-01	4.18E-01	0.00E+00	0.00E+00	6.71E-01	3.05E-04	3.53E-03
Mg^{+2}	4.42E-04	8.96E-05	9.29E-01	3.93E+00	0.00E+00	0.00E+00	4.86E+00	2.21E-03	2.56E-02
Mn^{+3}	4.79E-04	2.20E-04	2.28E+00	4.67E+01	0.00E+00	0.00E+00	4.90E+01	2.23E-02	2.58E-01
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na^+	4.00E+00	7.67E-01	7.96E+03	7.92E+02	0.00E+00	0.00E+00	8.76E+03	3.98E+00	4.61E+01
NH3	2.82E-03	4.01E-04	4.16E+00	0.00E+00	0.00E+00	0.00E+00	4.16E+00	1.89E-03	2.19E-02
NH4+	0.00E+00	4.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni^{+2}	7.32E-04	3.59E-04	3.72E+00	2.09E+01	0.00E+00	0.00E+00	2.46E+01	1.12E-02	1.29E-01
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	8.34E-01	3.20E-01	3.32E+03	1.99E+02	0.00E+00	0.00E+00	3.52E+03	1.60E+00	1.85E+01
NO_3^-	1.13E+00	5.83E-01	6.05E+03	1.53E+02	0.00E+00	0.00E+00	6.21E+03	2.82E+00	3.27E+01
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OH^-	2.53E+00	3.59E-01	3.73E+03	1.82E+03	0.00E+00	0.00E+00	5.54E+03	2.52E+00	2.92E+01
OH(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	1.96E-04	3.39E-04	3.52E+00	2.74E+01	0.00E+00	0.00E+00	3.09E+01	1.40E-02	1.62E-01
Pd^{+2}	1.52E-05	1.35E-05	1.40E-01	1.13E+00	0.00E+00	0.00E+00	1.27E+00	5.78E-04	6.69E-03
PO_4^{-3}	1.57E-02	1.24E-02	1.29E+02	1.21E+02	0.00E+00	0.00E+00	2.50E+02	1.14E-01	1.32E+00
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	1.47E-05	1.26E-05	1.31E-01	3.58E-01	0.00E+00	0.00E+00	4.88E-01	2.22E-04	2.57E-03
Ru^{+3}	2.16E-05	1.84E-05	1.91E-01	2.50E+00	0.00E+00	0.00E+00	2.70E+00	1.23E-03	1.42E-02
S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	2.96E-03	1.48E-03	1.54E+01	8.20E+01	0.00E+00	0.00E+00	9.75E+01	4.43E-02	5.13E-01
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	3.74E-02	3.00E-02	3.11E+02	4.50E+01	0.00E+00	0.00E+00	3.56E+02	1.62E-01	1.88E+00
Sr^{+2}	6.95E-06	5.08E-06	5.28E-02	1.80E+00	0.00E+00	0.00E+00	1.85E+00	8.41E-04	9.74E-03
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	2.44E-05	9.75E-06	1.01E-01	7.23E-01	0.00E+00	0.00E+00	8.24E-01	3.74E-04	4.33E-03
Zn^{+2}	9.13E-05	4.98E-05	5.17E-01	1.81E+00	0.00E+00	0.00E+00	2.33E+00	1.06E-03	1.23E-02
Zr^{+4}	6.74E-05	5.13E-05	5.32E-01	1.24E+02	0.00E+00	0.00E+00	1.25E+02	5.66E-02	6.55E-01

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	1.58E-02	1.16E-02	1.20E+02	5.95E+01	0.00E+00	0.00E+00	1.80E+02	8.16E-02	9.47E-01

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB. NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: A-7

$C_2O_4^{2-}$	1.58E-02	1.16E-02	1.20E+02	5.95E+01	0.00E+00	0.00E+00	1.80E+02	8.18E-02	9.47E-01
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	2.26E+00	8.88E+04	4.64E+01	2.90E+00	1.14E+05	8.52E+02	5.16E+00	2.03E+05	8.98E+02
^{241}Am	2.98E-04	1.17E+01	7.53E-03	2.15E-02	8.48E+02	5.44E-01	2.18E-02	8.58E+02	5.52E-01
^{243}Am	1.95E-07	7.65E-03	8.45E-05	1.74E-06	6.84E-02	7.55E-04	1.94E-06	7.60E-02	8.40E-04
^{14}C	6.09E-06	2.39E-01	1.18E-04	1.55E-06	6.06E-02	3.00E-05	7.64E-06	3.00E-01	1.48E-04
^{60}Co	4.00E-05	1.57E+00	3.06E-06	2.39E-03	9.39E+01	1.83E-04	2.43E-03	9.54E+01	1.86E-04
^{243}Cm	3.22E-08	1.26E-03	5.51E-08	3.02E-05	1.19E+00	5.18E-05	3.03E-05	1.19E+00	5.19E-05
^{244}Cm	7.61E-07	2.99E-02	8.14E-07	6.87E-04	2.70E+01	7.36E-04	6.88E-04	2.70E+01	7.36E-04
^{137}Cs	2.17E+00	8.52E+04	2.18E+00	3.58E-01	1.41E+04	3.58E-01	2.53E+00	9.92E+04	2.52E+00
^{152}Eu	2.24E-06	8.81E-02	1.12E-06	1.15E-04	4.51E+00	5.73E-05	1.17E-04	4.60E+00	5.84E-05
^{154}Eu	4.65E-04	1.83E+01	1.49E-04	1.24E-02	4.88E+02	3.99E-03	1.29E-02	5.07E+02	4.14E-03
^{155}Eu	1.34E-04	5.28E+00	2.40E-05	1.84E-03	7.24E+01	3.29E-04	1.98E-03	7.77E+01	3.53E-04
^{3}H	5.19E-05	2.04E+00	4.68E-07	1.55E-05	6.08E-01	1.40E-07	6.74E-05	2.65E+00	6.08E-07
^{129}I	1.86E-07	7.30E-03	9.11E-02	8.95E-08	2.73E-03	3.41E-02	2.55E-07	1.00E-02	1.25E-01
^{63}Ni	7.20E-04	2.83E+01	1.10E-03	4.14E-04	1.63E+01	6.32E-04	1.13E-03	4.46E+01	1.73E-03
^{237}Np	2.36E-07	9.27E-03	2.90E-02	1.77E-05	6.95E-01	2.18E+00	1.79E-05	7.05E-01	2.20E+00
^{238}Pu	1.33E-06	5.24E-02	6.74E-06	8.39E-05	3.30E+00	4.24E-04	8.53E-05	3.35E+00	4.31E-04
^{239}Pu	1.84E-05	7.24E-01	2.57E-02	7.43E-04	2.92E+01	1.04E+00	7.62E-04	2.99E+01	1.06E+00
^{240}Pu	4.78E-06	1.88E-01	1.82E-03	1.96E-04	7.71E+00	7.48E-02	2.01E-04	7.89E+00	7.67E-02
^{241}Pu	1.00E-04	3.94E+00	6.43E-05	5.27E-03	2.07E+02	4.43E-03	5.37E-03	2.11E+02	4.51E-03
^{242}Pu	5.08E-10	1.99E-05	1.11E-05	1.83E-08	7.18E-04	4.02E-04	1.88E-08	7.38E-04	4.13E-04
^{125}Sb	2.77E-04	1.09E+01	2.31E-05	7.67E-03	3.01E+02	6.40E-04	7.95E-03	3.12E+02	6.63E-04
^{151}Sm	3.99E-03	1.53E+02	1.28E-02	9.31E-02	3.66E+03	3.06E-01	9.70E-02	3.81E+03	3.19E-01
^{126}Sn	4.41E-06	1.73E-01	3.36E-02	3.60E-05	1.41E+00	2.74E-01	4.04E-05	1.59E+00	3.08E-01
^{90}Sr	8.64E-02	3.40E+03	5.42E-02	2.39E+00	9.39E+04	1.50E+00	2.48E+00	9.73E+04	1.55E+00
^{99}Tc	7.67E-04	3.01E+01	3.92E+00	3.60E-03	1.41E+02	1.84E+01	4.37E-03	1.71E+02	2.23E+01
^{232}Th	7.17E-09	2.82E-04	5.84E+00	5.86E-07	2.30E-02	4.61E+02	5.93E-07	2.33E-02	4.66E+02
^{233}U	2.39E-07	9.39E-03	2.15E-03	4.79E-05	1.88E+00	4.31E-01	4.82E-05	1.89E+00	4.33E-01
^{234}U	1.70E-07	6.66E-03	2.37E-03	2.49E-06	9.79E-02	3.48E-02	2.66E-06	1.05E-01	3.71E-02
^{235}U	6.68E-09	2.62E-04	2.68E-01	5.99E-08	2.35E-03	2.40E+00	6.66E-08	2.61E-03	2.67E+00
^{236}U	1.14E-08	4.50E-04	1.53E-02	8.23E-08	3.23E-03	1.10E-01	9.37E-08	3.68E-03	1.28E-01
^{238}U	1.32E-07	5.20E-03	3.41E+01	1.41E-06	5.54E-02	3.63E+02	1.54E-06	6.06E-02	3.98E+02

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	4.06E-01	2.20E-01	2.28E+03	1.04E+00	1.20E+01
50-32-8	1.51E-04	3.18E-04	3.30E+00	1.50E-03	1.74E-02
56-23-5	2.60E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
57-14-7	9.98E-04	5.01E-04	5.19E+00	2.36E-03	2.73E-02
58-90-2	2.59E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
59-89-2	5.17E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
60-35-5	1.89E-04	8.33E-05	8.65E-01	3.93E-04	4.55E-03
62-75-9	6.10E-04	5.01E-04	5.20E+00	2.36E-03	2.73E-02
64-19-7	3.61E-01	1.81E-01	1.88E+03	8.53E-01	9.88E+00
71-43-2	5.12E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
75-05-8	2.44E-04	8.36E-05	8.67E-01	3.94E-04	4.56E-03
75-12-7	1.33E-03	5.00E-04	5.19E+00	2.36E-03	2.73E-02
78-15-3	6.47E-05	8.34E-05	8.66E-01	3.93E-04	4.55E-03
79-01-6	7.61E-05	8.35E-05	8.66E-01	3.94E-04	4.56E-03
83-32-9	3.89E-04	5.01E-04	5.20E+00	2.36E-03	2.73E-02
84-66-2	2.70E-04	5.01E-04	5.20E+00	2.36E-03	2.73E-02
84-74-2	2.16E-04	5.02E-04	5.21E+00	2.37E-03	2.74E-02
87-68-3	3.83E-05	8.33E-05	8.65E-01	3.93E-04	4.55E-03
88-89-1	2.62E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
91-20-3	1.56E-05	1.67E-05	1.73E-01	7.87E-05	9.11E-04
95-50-1	2.72E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
98-86-2	3.32E-04	3.34E-04	3.46E+00	1.57E-03	1.82E-02
100-21-0	3.61E-04	5.00E-04	5.19E+00	2.36E-03	2.73E-02
101-84-8	5.88E-05	8.35E-05	8.67E-01	3.94E-04	4.56E-03
106-93-4	2.13E-05	3.34E-05	3.47E-01	1.58E-04	1.82E-03
106-97-8	1.72E-04	8.34E-05	8.66E-01	3.94E-04	4.56E-03
108-90-0	7.39E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
108-87-2	1.02E-04	8.36E-05	8.67E-01	3.94E-04	4.56E-03
108-88-3	4.34E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
108-95-2	6.38E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
110-54-3	1.16E-04	8.34E-05	8.66E-01	3.94E-04	4.55E-03
110-82-7	1.19E-04	8.36E-05	8.67E-01	3.94E-04	4.56E-03
111-84-2	7.80E-05	8.35E-05	8.66E-01	3.94E-04	4.56E-03
120-12-7	3.37E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
120-82-1	5.51E-05	8.34E-05	8.66E-01	3.94E-04	4.56E-03
122-39-4	1.18E-04	1.67E-04	1.73E+00	7.88E-04	9.10E-03
126-73-8	1.50E-04	3.33E-04	3.46E+00	1.57E-03	1.82E-02
127-18-4	2.41E-05	3.34E-05	3.46E-01	1.57E-04	1.82E-03
129-00-0	2.97E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
132-64-9	3.57E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
144-62-7	3.33E-02	2.50E-02	2.60E+02	1.18E-01	1.37E+00
193-39-5	2.17E-04	5.00E-04	5.19E+00	2.36E-03	2.73E-02
206-44-0	2.97E-04	5.01E-04	5.20E+00	2.36E-03	2.74E-02
208-96-8	3.94E-04	5.00E-04	5.19E+00	2.36E-03	2.73E-02
603-34-9	2.45E-04	5.02E-04	5.21E+00	2.37E-03	2.74E-02
621-64-7	4.61E-04	5.01E-04	5.20E+00	2.36E-03	2.73E-02
1321-64-8	2.00E-04	5.01E-04	5.20E+00	2.37E-03	2.74E-02
1336-36-3	1.07E-05	2.87E-05	2.98E-01	1.35E-04	1.57E-03
3697-24-3	2.48E-04	5.02E-04	5.20E+00	2.37E-03	2.74E-02
4170-30-3	1.43E-04	8.36E-05	8.68E-01	3.95E-04	4.57E-03
10061-01-5	3.60E-05	3.33E-05	3.46E-01	1.57E-04	1.82E-03
26140-60-3	2.61E-04	5.02E-04	5.21E+00	2.37E-03	2.74E-02

Table A-4 PVP01 Stream Report

Stream Number: PVP01
Stream Name: Pretreatment vessel vents feed to caustic scrubber
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Variable	Value	Units	
Density	1.10E-03	g/cm^3	(does not include solid phase)
Enthalpy	-4.75E+06	BTU/hr	
Mass Flow	3.28E+04	Lb/hr	
	7.87E+05	Lb/day	
Volumetric Flow	5.95E+04	GPM	(does not include solid phase)
	7.96E+03	ft^3/min	(does not include solid phase)
Molar Flow	1.15E+03	Lbmol/hr	
Molecular Weight	2.84E+01	Lb/Lbmol	
Pressure	9.68E+02	mbar	
Temperature	2.89E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	5.55E+00	pH	
Total TRU	3.27E-12	Ci/L	
Total Activity	2.10E-09	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	1.69E-07	2.65E-08	2.27E+00	2.59E-02	3.86E-02	7.84E+05	7.84E+05	3.56E+02	4.13E+03
Ag^+	5.18E-14	4.68E-14	3.99E-06	1.84E-05	0.00E+00	0.00E+00	2.04E-05	9.25E-09	1.07E-07
Al^{+3}	4.93E-10	1.11E-10	9.52E-03	1.90E-03	0.00E+00	0.00E+00	1.14E-02	5.19E-06	6.01E-05
As^{+3}	2.09E-13	1.30E-13	1.12E-05	1.92E-06	0.00E+00	0.00E+00	1.31E-05	5.96E-09	6.89E-08
B^{+3}	3.68E-12	3.32E-13	2.85E-05	4.82E-04	0.00E+00	0.00E+00	5.10E-04	2.32E-07	2.68E-06
Ba^{+2}	4.91E-14	5.63E-14	4.83E-06	1.51E-05	0.00E+00	0.00E+00	1.99E-05	9.04E-09	1.05E-07
Bi^{+3}	3.00E-14	5.23E-14	4.49E-06	4.24E-05	0.00E+00	0.00E+00	4.68E-05	2.13E-08	2.46E-07
Ca^{+2}	7.54E-11	2.52E-11	2.16E-03	3.10E-03	0.00E+00	0.00E+00	5.26E-03	2.39E-06	2.77E-05
Cd^{+2}	4.86E-14	4.56E-14	3.91E-06	3.34E-05	0.00E+00	0.00E+00	3.73E-05	1.69E-08	1.96E-07
Ce^{+3}	1.89E-12	2.21E-12	1.89E-04	1.71E-05	0.00E+00	0.00E+00	2.07E-04	9.39E-08	1.09E-06
Cr	6.53E-11	1.93E-11	1.66E-03	1.08E-05	0.00E+00	0.00E+00	1.67E-03	7.57E-07	8.77E-06
CO	4.90E-35	1.15E-35	9.82E-28	0.00E+00	1.36E-71	2.73E-64	9.82E-28	4.46E-31	5.17E-30
CO_2	8.00E-15	2.94E-15	2.52E-07	0.00E+00	1.45E-12	4.56E-05	4.59E-05	2.08E-08	2.41E-07
CO_3^{-2}	4.60E-10	2.30E-10	1.97E-02	1.62E-03	0.00E+00	0.00E+00	2.16E-02	9.80E-06	1.13E-04
Cr^{+3}	8.09E-12	3.51E-12	3.01E-04	2.85E-05	0.00E+00	0.00E+00	3.29E-04	1.50E-07	1.73E-06
Cu^{+2}	8.75E-14	4.64E-14	3.98E-06	6.19E-06	0.00E+00	0.00E+00	1.02E-05	4.62E-09	5.35E-08
F	2.82E-11	4.47E-12	3.83E-04	1.79E-04	0.00E+00	0.00E+00	5.62E-04	2.56E-07	2.96E-06
Fe^{+3}	2.83E-12	1.32E-12	1.13E-04	2.47E-03	0.00E+00	0.00E+00	2.58E-03	1.17E-06	1.36E-05
H_2O	1.58E-07	2.36E-08	2.04E+00	0.00E+00	1.55E-03	2.00E+04	2.00E+04	9.08E+00	1.05E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	7.69E-11	6.47E-13	5.55E-05	0.00E+00	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.61E-35	2.25E-27	2.25E-27	1.02E-30	1.18E-29
HCO3-	4.08E-16	2.08E-16	1.78E-08	0.00E+00	0.00E+00	0.00E+00	1.78E-08	8.10E-12	9.38E-11
H2CO3	8.00E-28	4.14E-28	3.55E-20	0.00E+00	0.00E+00	0.00E+00	3.55E-20	1.61E-23	1.87E-22
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-35	1.62E-28	1.62E-28	7.35E-32	8.51E-31
Hg^{+2}	8.38E-14	1.40E-13	1.20E-05	4.34E-05	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-33	4.72E-26	4.72E-26	2.15E-29	2.48E-28
K^+	1.41E-10	4.60E-11	3.95E-03	2.99E-05	0.00E+00	0.00E+00	3.98E-03	1.81E-06	2.09E-05
La^{+3}	2.22E-14	2.57E-14	2.21E-06	2.51E-05	0.00E+00	0.00E+00	2.73E-05	1.24E-08	1.44E-07
Li^+	2.95E-12	1.71E-13	1.47E-05	1.12E-05	0.00E+00	0.00E+00	2.59E-05	1.18E-08	1.36E-07
Mg^{+2}	6.64E-12	1.35E-12	1.16E-04	3.70E-04	0.00E+00	0.00E+00	4.86E-04	2.21E-07	2.56E-06
Mn^{+3}	7.38E-13	3.37E-13	2.89E-05	2.02E-04	0.00E+00	0.00E+00	2.31E-04	1.05E-07	1.21E-06
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	3.18E-12	7.42E-13	6.37E-05	0.00E+00	2.92E-02	5.86E+05	5.86E+05	2.66E+02	3.08E+03
Na^+	3.77E-09	7.23E-10	6.20E-02	2.02E-03	0.00E+00	0.00E+00	6.40E-02	2.91E-05	3.37E-04
NH3	5.47E-12	7.78E-13	6.67E-05	0.00E+00	1.26E-10	1.53E-03	1.60E-03	7.28E-07	8.42E-06
NH4+	3.02E-15	7.78E-13	3.90E-08	0.00E+00	0.00E+00	0.00E+00	3.90E-08	1.77E-11	2.05E-10
Ni^{+2}	6.88E-13	3.37E-13	2.89E-05	5.41E-05	0.00E+00	0.00E+00	8.30E-05	3.77E-08	4.37E-07
NO	3.98E-34	9.97E-35	8.54E-27	0.00E+00	0.00E+00	0.00E+00	8.54E-27	3.88E-30	4.50E-29
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.65E-50	2.85E-42	2.85E-42	1.29E-45	1.50E-44
NO_2^-	7.39E-10	2.84E-10	2.43E-02	5.04E-04	0.00E+00	0.00E+00	2.48E-02	1.13E-05	1.31E-04
NO_3^-	1.49E-09	7.73E-10	6.63E-02	4.10E-04	0.00E+00	0.00E+00	6.67E-02	3.03E-05	3.51E-04
O_2	1.02E-12	2.73E-13	2.34E-05	0.00E+00	7.77E-03	1.76E+05	1.76E+05	8.09E+01	9.36E+02
O^-	0.00E+00	0.00E+00	0.00E+00	1.33E-03	0.00E+00	0.00E+00	1.33E-03	6.02E-07	6.97E-06
OH^-	3.52E-09	5.00E-10	4.29E-02	7.51E-03	0.00E+00	0.00E+00	5.04E-02	2.29E-05	2.65E-04
OH(b)	5.30E-17	7.52E-18	6.45E-10	1.98E-19	0.00E+00	0.00E+00	6.45E-10	2.93E-13	3.39E-12
Pb^{+2}	1.72E-13	2.97E-13	2.54E-05	6.94E-05	0.00E+00	0.00E+00	9.48E-05	4.31E-08	4.99E-07
Pd^{+2}	1.35E-14	1.20E-14	1.03E-06	2.90E-06	0.00E+00	0.00E+00	3.93E-06	1.79E-09	2.07E-08
PO_4^{-3}	2.34E-11	1.86E-11	1.59E-03	5.34E-04	0.00E+00	0.00E+00	2.13E-03	9.66E-07	1.12E-05
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	1.28E-14	1.10E-14	9.41E-07	9.21E-07	0.00E+00	0.00E+00	1.86E-06	8.47E-10	9.80E-09
Ru^{+3}	1.90E-14	1.60E-14	1.37E-06	8.34E-06	0.00E+00	0.00E+00	9.72E-06	4.42E-09	5.11E-08
S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.44E-20	0.00E+00	0.00E+00	3.44E-20	1.56E-23	1.81E-22
SiO2	7.83E-12	3.92E-12	3.36E-04	1.84E-03	0.00E+00	0.00E+00	2.18E-03	9.91E-07	1.15E-05
SiO_4^{-4}	4.31E-19	3.31E-19	2.84E-11	2.77E-10	0.00E+00	0.00E+00	3.05E-10	1.39E-13	1.60E-12
SO_2	1.57E-37	8.39E-38	7.19E-30	0.00E+00	0.00E+00	0.00E+00	7.19E-30	3.27E-33	3.78E-32
SO_4^{-2}	3.58E-11	2.87E-11	2.46E-03	1.20E-04	0.00E+00	0.00E+00	2.58E-03	1.17E-06	1.36E-05
Sr^{+2}	6.86E-15	5.02E-15	4.30E-07	4.50E-06	0.00E+00	0.00E+00	4.93E-06	2.24E-09	2.59E-08
Sucrose	0.00E+00	0.00E+00	0.00E+00	4.32E-37	0.00E+00	0.00E+00	4.32E-37	1.96E-40	2.27E-39
Ti^{+4}	4.10E-14	1.64E-14	1.40E-06	5.43E-06	0.00E+00	0.00E+00	6.84E-06	3.11E-09	3.60E-08
Zn^{+2}	1.39E-13	7.61E-14	6.52E-06	1.11E-04	0.00E+00	0.00E+00	1.17E-04	5.33E-08	6.17E-07
Zr^{+4}	1.13E-13	8.61E-14	7.38E-06	6.10E-04	0.00E+00	0.00E+00	6.18E-04	2.81E-07	3.25E-06

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	1.46E-11	1.07E-11	9.18E-04	3.46E-03	0.00E+00	0.00E+00	4.38E-03	1.99E-06	2.30E-05

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB. NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: A-9

$C_2O_4^{2}$	1.46E-11	1.07E-11	9.18E-04	3.46E-03	0.00E+00	0.00E+00	4.38E-03	1.99E-06	2.30E-05
Formate	1.98E-18	7.46E-19	6.39E-11	7.80E-10	0.00E+00	0.00E+00	8.44E-10	3.84E-13	4.44E-12
Acetate	1.54E-18	7.58E-19	6.50E-11	7.93E-10	0.00E+00	0.00E+00	8.58E-10	3.90E-13	4.51E-12
Glycolate	1.02E-17	6.41E-18	5.50E-10	7.85E-10	0.00E+00	0.00E+00	1.33E-09	6.06E-13	7.02E-12
IDA	5.17E-18	5.75E-18	4.93E-10	2.45E-10	0.00E+00	0.00E+00	7.38E-10	3.35E-13	3.88E-12
Citrate	4.73E-19	7.58E-19	6.50E-11	3.14E-10	0.00E+00	0.00E+00	3.79E-10	1.72E-13	2.00E-12
HEDTA	2.21E-18	5.14E-18	4.41E-10	2.95E-10	0.00E+00	0.00E+00	7.36E-10	3.35E-13	3.87E-12
EDTA	2.66E-19	6.49E-19	5.57E-11	3.01E-10	0.00E+00	0.00E+00	3.57E-10	1.62E-13	1.88E-12

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	1.18E-09	3.83E-01	5.54E-04	9.23E-10	3.00E-01	3.61E-03	2.10E-09	6.83E-01	4.17E-03
^{241}Am	2.59E-13	8.41E-05	5.41E-08	6.60E-12	2.14E-03	1.38E-06	6.86E-12	2.23E-03	1.43E-06
^{243}Am	1.69E-16	5.49E-08	6.07E-10	5.33E-16	1.73E-07	1.91E-09	7.02E-16	2.28E-07	2.52E-09
^{14}C	9.10E-15	2.95E-06	1.46E-09	7.76E-16	2.52E-07	1.24E-10	9.88E-15	3.21E-06	1.58E-09
^{60}Co	5.97E-14	1.94E-05	3.78E-11	1.21E-12	3.94E-04	7.67E-10	1.27E-12	4.13E-04	8.05E-10
^{243}Cm	4.80E-17	1.56E-08	6.79E-13	1.53E-14	4.98E-06	2.17E-10	1.54E-14	5.00E-06	2.18E-10
^{244}Cm	1.14E-15	3.69E-07	1.00E-11	3.49E-13	1.13E-04	3.09E-09	3.50E-13	1.14E-04	3.10E-09
^{137}Cs	1.09E-09	3.54E-01	8.99E-06	1.43E-10	4.64E-02	1.18E-06	1.23E-09	4.00E-01	1.02E-05
^{152}Eu	1.95E-15	6.33E-07	8.03E-12	3.51E-14	1.14E-05	1.45E-10	3.71E-14	1.20E-05	1.53E-10
^{154}Eu	4.04E-13	1.31E-04	1.07E-09	3.81E-12	1.24E-03	1.01E-08	4.21E-12	1.37E-03	1.11E-08
^{155}Eu	1.17E-13	3.80E-05	1.72E-10	5.64E-13	1.83E-04	8.30E-10	6.81E-13	2.21E-04	1.00E-09
^{3}H	4.51E-14	1.46E-05	3.36E-12	8.22E-12	2.67E-03	6.12E-10	8.26E-12	2.68E-03	6.15E-10
^{129}I	3.54E-16	1.15E-07	1.44E-08	7.66E-17	2.49E-08	3.10E-07	4.31E-16	1.40E-07	1.75E-06
^{63}Ni	6.42E-13	2.08E-04	8.08E-09	1.32E-13	4.30E-05	1.67E-09	7.74E-13	2.51E-04	9.75E-09
^{237}Np	3.52E-16	1.14E-07	3.57E-07	8.99E-15	2.92E-06	9.12E-06	9.34E-15	3.03E-06	9.48E-06
^{238}Pu	1.16E-15	3.76E-07	4.64E-11	2.57E-14	8.32E-06	1.07E-09	2.68E-14	8.70E-06	1.12E-09
^{239}Pu	1.60E-14	5.21E-06	1.65E-07	2.27E-13	7.37E-05	2.62E-06	2.43E-13	7.90E-05	2.81E-06
^{240}Pu	4.16E-15	1.35E-06	1.31E-08	6.00E-14	1.95E-05	1.89E-07	6.41E-14	2.08E-05	2.02E-07
^{241}Pu	8.73E-14	2.83E-05	8.06E-10	1.61E-12	5.22E-04	1.12E-08	1.70E-12	5.51E-04	1.18E-08
^{242}Pu	3.15E-20	1.02E-11	5.73E-12	5.53E-18	1.80E-09	1.01E-09	5.56E-18	1.81E-09	1.01E-09
^{125}Sb	2.42E-13	7.86E-05	1.67E-10	2.35E-12	7.61E-04	1.62E-09	2.59E-12	8.40E-04	1.78E-09
^{151}Sm	3.39E-12	1.10E-03	9.21E-06	2.63E-11	9.18E-03	7.69E-07	3.17E-11	1.03E-02	8.61E-07
^{126}Sn	3.85E-15	1.25E-06	2.43E-07	1.10E-14	3.57E-06	6.93E-07	1.48E-14	4.82E-06	9.36E-07
^{90}Sr	8.35E-11	2.71E-02	4.32E-07	7.24E-10	2.35E-01	3.75E-06	8.07E-10	2.62E-01	4.18E-06
^{99}Tc	1.15E-12	3.72E-04	4.84E-05	2.89E-12	9.39E-04	1.22E-04	4.04E-12	1.31E-03	1.70E-04
^{232}Th	1.07E-17	3.47E-09	6.96E-05	2.97E-16	9.64E-08	1.93E-03	3.08E-16	9.99E-08	2.00E-03
^{233}U	3.57E-16	1.16E-07	2.65E-06	2.44E-14	7.90E-06	1.81E-06	2.47E-14	8.02E-06	1.83E-06
^{234}U	2.53E-16	8.21E-08	2.92E-06	1.27E-15	4.11E-07	1.46E-07	1.52E-15	4.93E-07	1.75E-07
^{235}U	9.97E-16	3.23E-09	3.30E-06	3.04E-17	9.88E-09	1.01E-05	4.04E-17	1.31E-08	1.34E-05
^{236}U	1.71E-17	5.54E-09	1.89E-07	4.18E-17	1.36E-08	4.63E-07	5.89E-17	1.91E-08	6.52E-07
^{238}U	1.98E-16	6.42E-08	4.21E-04	7.16E-16	2.32E-07	1.53E-03	9.14E-16	2.97E-07	1.95E-03

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	6.81E-05	3.53E-05	3.03E+03	1.38E+00	1.59E+01
50-32-8	1.48E-09	3.11E-09	2.66E-01	1.21E-04	1.40E-03
56-23-5	4.95E-09	6.35E-09	5.44E-01	2.47E-04	2.86E-03
57-14-7	3.78E-08	1.89E-08	1.62E+00	7.38E-04	8.54E-03
58-90-2	8.16E-09	1.58E-08	1.35E+00	6.15E-04	7.12E-03
59-89-2	9.58E-08	9.28E-08	7.96E+00	3.62E-03	4.19E-02
60-35-5	3.80E-11	1.87E-11	1.61E-03	7.31E-07	8.46E-06
62-75-9	1.29E-08	7.98E-09	6.84E-01	3.11E-04	3.60E-03
64-19-7	6.69E-05	3.35E-05	2.87E+03	1.31E+00	1.51E+01
71-43-2	9.74E-09	6.35E-09	5.44E-01	2.47E-04	2.86E-03
75-05-8	1.67E-08	5.72E-09	4.91E-01	2.23E-04	2.58E-03
75-12-7	3.74E-11	1.41E-11	1.21E-03	5.48E-07	6.34E-06
76-15-3	1.23E-08	1.59E-08	1.36E+00	6.18E-04	7.16E-03
79-01-6	1.45E-08	1.59E-08	1.36E+00	6.19E-04	7.16E-03
83-32-9	7.21E-08	9.28E-08	7.95E+00	3.61E-03	4.18E-02
84-66-2	2.45E-09	4.55E-09	3.90E-01	1.77E-04	2.05E-03
84-74-2	3.90E-09	9.06E-09	7.77E-01	3.53E-04	4.09E-03
87-68-3	7.28E-09	1.59E-08	1.36E+00	6.18E-04	7.15E-03
88-89-1	8.99E-14	1.72E-13	1.47E-05	6.70E-09	7.76E-08
91-20-3	2.70E-09	2.89E-09	2.48E-01	1.13E-04	1.30E-03
95-50-1	5.04E-09	6.18E-09	5.30E-01	2.41E-04	2.79E-03
98-86-2	1.14E-08	1.14E-08	9.80E-01	4.46E-04	5.16E-03
100-21-0	3.81E-15	5.28E-15	4.53E-07	2.06E-10	2.38E-09
101-84-8	1.09E-08	1.55E-08	1.33E+00	6.03E-04	6.98E-03
106-93-4	3.85E-09	6.04E-09	5.18E-01	2.35E-04	2.72E-03
106-97-8	3.27E-08	1.59E-08	1.36E+00	6.18E-04	7.16E-03
106-99-0	1.41E-08	6.35E-09	5.44E-01	2.47E-04	2.86E-03
108-67-2	1.94E-08	1.59E-08	1.36E+00	6.20E-04	7.17E-03
108-88-3	8.25E-09	6.35E-09	5.44E-01	2.47E-04	2.86E-03
108-95-2	3.70E-09	2.91E-09	2.49E-01	1.13E-04	1.31E-03
110-54-3	2.21E-08	1.59E-08	1.36E+00	6.18E-04	7.16E-03
110-82-7	2.26E-08	1.59E-08	1.36E+00	6.20E-04	7.17E-03
111-84-2	1.48E-08	1.59E-08	1.36E+00	6.19E-04	7.16E-03
120-12-7	3.01E-08	4.47E-08	3.83E+00	1.74E-03	2.02E-02
120-82-1	1.03E-08	1.57E-08	1.34E+00	6.11E-04	7.07E-03
122-39-4	2.48E-09	3.47E-09	2.98E-01	1.35E-04	1.57E-03
126-73-8	4.55E-10	1.01E-09	8.66E-02	3.94E-05	4.56E-04
127-18-4	4.58E-09	6.34E-09	5.44E-01	2.47E-04	2.86E-03
129-00-0	1.23E-08	2.07E-08	1.78E+00	8.08E-04	9.35E-03
132-64-9	5.39E-08	7.57E-08	6.49E+00	2.95E-03	3.41E-02
144-62-7	9.64E-11	7.24E-11	6.21E-03	2.82E-06	3.27E-05
193-39-5	2.82E-07	6.49E-07	5.57E+01	2.53E-02	2.93E-01
206-44-0	5.50E-08	9.29E-08	7.96E+00	3.62E-03	4.19E-02
208-96-8	4.87E-06	6.18E-08	5.30E+00	2.41E-03	2.79E-02
603-34-9	6.12E-09	1.25E-08	1.07E+00	4.88E-04	5.65E-03
621-64-7	8.54E-08	9.28E-08	7.96E+00	3.62E-03	4.19E-02
1321-64-8	3.71E-06	9.29E-08	7.97E+00	3.62E-03	4.19E-02
1336-36-3	3.55E-09	9.55E-09	8.19E-01	3.72E-04	4.31E-03
3697-24-3	4.60E-08	9.29E-08	7.97E+00	3.62E-03	4.19E-02
4170-30-3	4.72E-09	2.76E-09	2.37E-01	1.08E-04	1.25E-03
10061-01-5	6.83E-09	6.32E-09	5.42E-01	2.46E-04	2.85E-03
26140-60-3	4.84E-08	9.30E-08	7.97E+00	3.62E-03	4.19E-02

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: A-10

Table A-5 PJV04 Stream Report

Stream Number: PJV04
Stream Name: Vapor feed to demister
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Variable	Value	Units	
Density	1.15E-03	g/cm^3	(does not include solid phase)
Enthalpy	-8.59E+06	BTU/hr	
Mass Flow	1.71E+05	Lb/hr	
	4.10E+06	Lb/day	
Volumetric Flow	2.96E+05	GPM	(does not include solid phase)
	3.96E+04	ft^3/min	(does not include solid phase)
Molar Flow	5.95E+03	Lbmol/hr	
Molecular Weight	2.87E+01	Lb/Lbmol	
Pressure	9.93E+02	mbar	
Temperature	2.50E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	4.16E+00	pH	
Total TRU	2.55E-12	Ci/L	
Total Activity	4.31E-10	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	5.86E-09	9.45E-10	4.03E-01	1.86E-02	4.01E-02	4.10E+06	4.10E+06	1.86E+03	2.16E+04
Ag^+	1.85E-15	1.87E-15	7.13E-07	1.30E-05	0.00E+00	0.00E+00	1.37E-05	6.21E-09	7.19E-08
Al^{+3}	2.25E-11	5.08E-12	2.16E-03	1.79E-03	0.00E+00	0.00E+00	3.95E-03	1.80E-06	2.08E-05
As^{+3}	8.18E-15	5.11E-15	2.18E-06	9.12E-07	0.00E+00	0.00E+00	3.09E-06	1.41E-09	1.63E-08
B^{+3}	1.36E-13	1.22E-14	5.23E-06	8.60E-05	0.00E+00	0.00E+00	9.12E-05	4.14E-08	4.80E-07
Ba^{+2}	1.71E-15	1.95E-15	8.34E-07	1.15E-05	0.00E+00	0.00E+00	1.24E-05	5.63E-09	6.51E-08
Br^{-3}	2.01E-15	3.51E-15	1.50E-06	6.05E-05	0.00E+00	0.00E+00	6.20E-05	2.82E-08	3.26E-07
Ca^{+2}	1.42E-13	4.76E-14	2.03E-05	7.75E-05	0.00E+00	0.00E+00	9.78E-05	4.45E-08	5.15E-07
Cd^{+2}	3.17E-15	2.97E-15	1.27E-06	4.69E-05	0.00E+00	0.00E+00	4.82E-05	2.19E-08	2.53E-07
Ce^{+3}	6.75E-14	7.90E-14	3.37E-05	1.44E-05	0.00E+00	0.00E+00	4.81E-05	2.19E-08	2.53E-07
Cl^-	3.79E-12	1.12E-12	4.79E-04	1.40E-05	0.00E+00	0.00E+00	4.92E-04	2.24E-07	2.59E-06
CO	1.10E-111	2.57E-112	1.10E-103	0.00E+00	0.00E+00	0.00E+00	1.10E-103	4.99E-107	5.78E-106
CO_2	1.36E-16	4.99E-17	2.13E-08	0.00E+00	4.20E-16	6.58E-08	8.71E-08	3.96E-11	4.58E-10
CO_3^{-2}	1.80E-11	9.01E-12	3.84E-03	1.57E-03	0.00E+00	0.00E+00	5.42E-03	2.46E-06	2.85E-05
Cr^{+3}	5.43E-13	2.36E-13	1.01E-04	3.65E-05	0.00E+00	0.00E+00	1.37E-04	6.23E-08	7.21E-07
Cu^{+2}	3.13E-15	1.66E-15	7.10E-07	4.89E-06	0.00E+00	0.00E+00	5.60E-06	2.55E-09	2.95E-08
F^-	1.78E-12	2.83E-13	1.21E-04	2.54E-04	0.00E+00	0.00E+00	3.75E-04	1.71E-07	1.97E-06
Fe^{+3}	9.72E-14	4.53E-14	1.93E-05	1.84E-03	0.00E+00	0.00E+00	1.86E-03	8.45E-07	9.78E-06
H_2O	5.28E-09	7.93E-10	3.39E-01	0.00E+00	5.63E-04	3.61E+04	3.61E+04	1.64E+01	1.90E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	3.79E-12	3.19E-14	1.36E-05	0.00E+00	0.00E+00	0.00E+00	1.36E-05	6.19E-09	7.17E-08
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	1.87E-15	9.51E-16	4.06E-07	9.36E-22	0.00E+00	0.00E+00	4.06E-07	1.84E-10	2.14E-09
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	3.28E-15	5.49E-15	2.35E-06	2.90E-05	0.00E+00	0.00E+00	3.14E-05	1.43E-08	1.65E-07
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	7.79E-12	2.54E-12	1.08E-03	3.59E-05	0.00E+00	0.00E+00	1.12E-03	5.09E-07	5.89E-06
La^{+3}	8.70E-16	1.01E-15	4.30E-07	2.17E-05	0.00E+00	0.00E+00	2.21E-05	1.00E-08	1.16E-07
Li^+	1.18E-13	6.81E-15	2.91E-06	5.37E-06	0.00E+00	0.00E+00	8.28E-06	3.76E-09	4.36E-08
Mg^{+2}	2.59E-14	5.24E-15	2.24E-06	1.60E-05	0.00E+00	0.00E+00	1.82E-05	8.28E-09	9.58E-08
Mn^{+3}	2.80E-14	1.29E-14	5.49E-06	1.69E-04	0.00E+00	0.00E+00	1.75E-04	7.93E-08	9.18E-07
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	5.53E-14	1.29E-14	5.51E-06	0.00E+00	3.12E-02	3.12E+06	3.12E+06	1.42E+03	1.64E+04
Na^+	2.45E-10	4.71E-11	2.01E-02	2.83E-03	0.00E+00	0.00E+00	2.29E-02	1.04E-05	1.21E-04
NH3	1.67E-13	2.38E-14	1.01E-05	0.00E+00	0.00E+00	0.00E+00	1.01E-05	4.61E-09	5.34E-08
NH4+	1.25E-14	2.38E-14	8.01E-07	4.12E-23	0.00E+00	0.00E+00	8.01E-07	3.64E-10	4.21E-09
Ni^{+2}	4.50E-14	2.20E-14	9.41E-06	7.54E-05	0.00E+00	0.00E+00	8.48E-05	3.86E-08	4.46E-07
NO	6.65E-37	1.67E-37	7.11E-29	0.00E+00	0.00E+00	0.00E+00	7.11E-29	3.23E-32	3.74E-31
NO_2	9.76E-50	3.75E-50	1.60E-41	0.00E+00	0.00E+00	0.00E+00	1.60E-41	7.27E-45	8.42E-44
NO_2^-	4.88E-11	1.87E-11	8.00E-03	7.09E-04	0.00E+00	0.00E+00	8.71E-03	3.96E-06	4.58E-05
NO_3^-	8.58E-11	4.44E-11	1.90E-02	5.47E-04	0.00E+00	0.00E+00	1.95E-02	8.87E-06	1.03E-04
O_2	1.78E-14	4.76E-15	2.03E-06	0.00E+00	8.30E-03	9.46E+05	9.46E+05	4.30E+02	4.98E+03
O^-	0.00E+00	0.00E+00	0.00E+00	2.62E-04	0.00E+00	0.00E+00	2.62E-04	1.19E-07	1.38E-06
OH^-	1.43E-10	2.03E-11	8.68E-03	6.48E-03	0.00E+00	0.00E+00	1.52E-02	6.89E-06	7.97E-05
OH(b)	2.16E-19	3.07E-20	1.31E-11	6.92E-25	0.00E+00	0.00E+00	1.31E-11	5.96E-15	6.90E-14
Pb^{+2}	1.15E-14	1.99E-14	8.49E-06	9.90E-05	0.00E+00	0.00E+00	1.07E-04	4.88E-08	5.65E-07
Pd^{+2}	8.90E-16	7.90E-16	3.37E-07	4.06E-06	0.00E+00	0.00E+00	4.40E-06	2.00E-09	2.31E-08
PO_4^{-3}	9.18E-13	7.28E-13	3.11E-04	4.47E-04	0.00E+00	0.00E+00	7.57E-04	3.44E-07	3.98E-06
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	8.60E-16	7.39E-16	3.16E-07	1.32E-06	0.00E+00	0.00E+00	1.63E-06	7.41E-10	8.58E-09
Ru^{+3}	1.28E-15	1.08E-15	4.61E-07	1.23E-05	0.00E+00	0.00E+00	1.27E-05	5.78E-09	6.69E-08
S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.67E-22	0.00E+00	0.00E+00	3.67E-22	1.67E-25	1.93E-24
SiO2	1.73E-13	8.69E-14	3.71E-05	4.46E-04	0.00E+00	0.00E+00	4.83E-04	2.19E-07	2.54E-06
SiO_4^{-4}	9.10E-26	7.00E-26	2.99E-17	7.91E-12	0.00E+00	0.00E+00	7.91E-12	3.59E-15	4.16E-14
SO_2	1.40E-52	7.48E-53	3.19E-44	0.00E+00	0.00E+00	0.00E+00	3.19E-44	1.45E-47	1.68E-46
SO_4^{-2}	2.19E-12	1.76E-12	7.50E-04	1.61E-04	0.00E+00	0.00E+00	9.11E-04	4.14E-07	4.79E-06
Sr^{+2}	4.57E-16	3.34E-16	1.43E-07	8.44E-06	0.00E+00	0.00E+00	8.59E-06	2.99E-09	3.47E-08
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl^{+4}	1.43E-15	5.71E-16	2.44E-07	2.73E-06	0.00E+00	0.00E+00	2.98E-06	1.35E-09	1.57E-08
Zn^{+2}	5.35E-15	2.92E-15	1.25E-06	2.00E-05	0.00E+00	0.00E+00	2.13E-05	9.68E-09	1.12E-07
Zr^{+4}	3.94E-15	3.00E-15	1.28E-06	4.48E-04	0.00E+00	0.00E+00	4.49E-04	2.04E-07	2.36E-06

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	9.07E-13	6.66E-13	2.84E-04	2.24E-03	0.00E+00	0.00E+00	2.52E-03	1.15E-06	1.33E-05

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB. NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO : A-11

$C_2O_4^{-2}$	9.07E-13	6.66E-13	2.84E-04	2.24E-03	0.00E+00	0.00E+00	2.52E-03	1.15E-06	1.33E-05
Formate	4.02E-25	1.51E-25	6.44E-17	3.08E-13	0.00E+00	0.00E+00	3.08E-13	1.40E-16	1.62E-15
Acetate	3.11E-25	1.53E-25	6.55E-17	3.13E-13	0.00E+00	0.00E+00	3.13E-13	1.42E-16	1.65E-15
Glycolate	2.07E-24	1.30E-24	5.54E-16	1.54E-13	0.00E+00	0.00E+00	1.54E-13	7.02E-17	8.13E-16
IDA	1.06E-24	1.18E-24	5.03E-16	3.93E-13	0.00E+00	0.00E+00	3.93E-13	1.79E-16	2.07E-15
Citrate	9.69E-26	1.55E-25	6.64E-17	3.37E-13	0.00E+00	0.00E+00	3.37E-13	1.53E-16	1.77E-15
HEDTA	4.54E-25	1.05E-24	4.50E-16	2.78E-13	0.00E+00	0.00E+00	2.77E-13	1.26E-16	1.46E-15
EDTA	5.46E-26	1.33E-25	5.68E-17	2.97E-13	0.00E+00	0.00E+00	2.97E-13	1.35E-16	1.56E-15

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	1.66E-10	2.69E-01	1.13E-04	2.65E-10	4.28E-01	3.12E-03	4.31E-10	6.96E-01	3.23E-03
^{241}Am	1.75E-14	2.82E-05	1.81E-08	1.90E-12	3.08E-03	1.98E-06	1.92E-12	3.10E-03	2.00E-06
^{243}Am	1.14E-17	1.84E-08	2.04E-10	1.54E-16	2.49E-07	2.75E-09	1.65E-16	2.67E-07	2.95E-09
^{14}C	3.57E-16	5.76E-07	2.85E-10	1.34E-16	2.17E-07	1.07E-10	4.91E-16	7.93E-07	3.92E-10
^{60}Co	2.34E-15	3.78E-06	7.37E-12	2.10E-13	3.40E-04	6.62E-10	2.13E-13	3.44E-04	6.69E-10
^{243}Cm	1.88E-18	3.04E-09	1.33E-13	2.66E-15	4.30E-06	1.88E-10	2.66E-15	4.30E-06	1.88E-10
^{244}Cm	4.46E-17	7.20E-08	1.96E-12	6.05E-14	9.77E-05	2.66E-09	6.05E-14	9.78E-05	2.66E-09
^{137}Cs	1.60E-10	2.59E-01	6.58E-06	4.31E-11	6.96E-02	1.77E-06	2.03E-10	3.29E-01	8.34E-06
^{152}Eu	1.31E-16	2.12E-07	2.89E-12	1.01E-14	1.64E-05	2.07E-10	1.03E-14	1.66E-05	2.10E-10
^{154}Eu	2.72E-14	4.40E-05	3.59E-10	1.10E-12	1.77E-03	1.45E-08	1.12E-12	1.82E-03	1.48E-08
^{155}Eu	7.87E-15	1.27E-05	5.77E-11	1.62E-13	2.62E-04	1.19E-09	1.70E-13	2.75E-04	1.25E-09
^{3}H	2.18E-15	3.53E-06	8.10E-13	3.48E-15	5.63E-06	1.29E-12	5.67E-15	9.16E-06	2.10E-12
^{129}I	1.09E-17	1.76E-08	2.19E-07	7.02E-18	1.13E-08	1.42E-07	1.79E-17	2.89E-08	3.61E-07
^{63}Ni	4.22E-14	6.81E-05	2.64E-09	3.65E-14	5.90E-05	2.29E-09	7.87E-14	1.27E-04	4.93E-09
^{237}Np	1.38E-17	2.23E-08	6.99E-06	1.56E-15	2.52E-06	7.87E-06	1.57E-15	2.54E-06	7.94E-06
^{238}Pu	7.81E-17	1.26E-07	1.62E-11	7.39E-15	1.19E-05	1.54E-09	7.47E-15	1.21E-05	1.55E-09
^{239}Pu	1.08E-15	1.75E-06	6.20E-06	6.55E-14	1.06E-04	3.76E-06	6.66E-14	1.08E-04	3.82E-06
^{240}Pu	2.80E-16	4.52E-07	4.39E-09	1.73E-14	2.79E-05	2.71E-07	1.76E-14	2.84E-05	2.76E-07
^{241}Pu	5.87E-15	9.49E-06	2.03E-10	4.64E-13	7.49E-04	1.60E-08	4.70E-13	7.59E-04	1.62E-08
^{242}Pu	2.98E-20	4.79E-11	2.68E-13	1.59E-18	2.57E-09	1.44E-09	1.62E-18	2.62E-09	1.47E-09
^{125}Sb	1.82E-14	2.62E-05	5.58E-11	6.73E-13	1.09E-03	2.31E-09	6.89E-13	1.11E-03	2.37E-09
^{151}Sm	2.28E-13	3.69E-04	3.09E-08	8.14E-12	1.32E-02	1.10E-06	8.37E-12	1.35E-02	1.13E-06
^{126}Sn	2.58E-16	4.17E-07	8.10E-08	3.15E-15	5.09E-06	9.88E-07	3.41E-15	5.51E-06	1.07E-06
^{90}Sr	5.57E-12	9.00E-03	1.44E-07	2.08E-10	3.36E-01	5.37E-06	2.14E-10	3.45E-01	5.51E-06
^{99}Tc	4.49E-14	7.26E-05	9.44E-06	4.83E-13	7.81E-04	1.02E-04	5.28E-13	8.54E-04	1.11E-04
^{232}Th	4.20E-19	6.78E-10	1.36E-05	5.15E-17	8.33E-08	1.67E-03	5.20E-17	8.40E-08	1.68E-03
^{233}U	1.40E-17	2.26E-08	5.17E-09	4.22E-15	6.82E-06	1.56E-06	4.23E-15	6.84E-06	1.56E-06
^{234}U	9.93E-18	1.61E-08	5.70E-09	2.19E-16	3.54E-07	1.26E-07	2.29E-16	3.71E-07	1.32E-07
^{235}U	3.91E-19	6.32E-10	6.45E-07	5.27E-18	8.52E-09	8.69E-06	5.66E-18	9.15E-09	9.34E-06
^{236}U	6.70E-19	1.08E-09	3.69E-08	7.24E-18	1.17E-06	3.99E-07	7.91E-18	1.28E-06	4.36E-07
^{238}U	7.76E-18	1.25E-08	8.22E-05	1.24E-16	2.01E-07	1.32E-03	1.32E-16	2.13E-07	1.40E-03

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	1.06E-11	6.12E-12	2.61E-03	1.19E-06	1.37E-05
50-32-8	1.00E-14	2.11E-14	9.00E-06	4.09E-09	4.73E-08
56-23-5	5.75E-16	7.36E-16	3.15E-07	1.43E-10	1.66E-09
57-14-7	3.05E-14	1.53E-14	6.54E-06	2.97E-09	3.44E-08
58-90-2	6.19E-15	1.58E-14	6.76E-06	3.07E-09	3.56E-08
59-89-2	1.16E-14	1.12E-14	4.80E-06	2.18E-09	2.53E-08
60-35-5	1.02E-14	5.02E-15	2.14E-06	9.75E-10	1.13E-08
62-75-9	3.22E-14	1.99E-14	8.49E-06	3.86E-09	4.47E-08
64-19-7	6.10E-12	4.06E-12	1.73E-03	7.88E-07	9.12E-06
71-43-2	1.13E-15	7.39E-16	3.15E-07	1.43E-10	1.66E-09
75-05-8	6.86E-15	2.35E-15	1.00E-06	4.56E-10	5.28E-09
75-12-7	8.08E-14	3.03E-14	1.29E-05	5.88E-09	6.80E-08
76-15-3	1.43E-15	1.84E-15	7.87E-07	3.58E-10	4.14E-09
79-01-6	1.68E-15	1.85E-15	7.88E-07	3.58E-10	4.15E-09
83-32-9	8.73E-15	1.12E-14	4.80E-06	2.18E-09	2.52E-08
84-66-2	1.31E-14	2.43E-14	1.04E-05	4.72E-09	5.46E-08
84-74-2	9.45E-15	2.20E-14	9.37E-06	4.26E-09	4.93E-08
87-68-3	8.47E-16	1.84E-15	7.87E-07	3.58E-10	4.14E-09
88-89-1	1.59E-14	3.04E-14	1.30E-05	5.89E-09	6.82E-08
91-20-3	3.59E-16	3.84E-16	1.64E-07	7.46E-11	8.63E-10
95-50-1	6.10E-16	7.49E-16	3.20E-07	1.45E-10	1.68E-09
96-86-2	1.03E-14	1.04E-14	4.44E-06	2.02E-09	2.33E-08
100-21-0	6.11E-14	8.47E-14	3.61E-05	1.64E-08	1.90E-07
101-84-8	1.32E-15	1.87E-15	8.00E-07	3.64E-10	4.21E-09
106-93-4	4.83E-16	7.57E-16	3.23E-07	1.47E-10	1.70E-09
106-97-8	3.80E-15	1.84E-15	7.87E-07	3.58E-10	4.14E-09
106-99-0	1.63E-15	7.37E-16	3.15E-07	1.43E-10	1.66E-09
108-87-2	2.25E-15	1.85E-15	7.89E-07	3.58E-10	4.15E-09
108-88-3	9.60E-16	7.38E-16	3.15E-07	1.43E-10	1.66E-09
108-95-2	3.37E-14	2.64E-14	1.13E-05	5.13E-09	5.94E-08
110-54-3	2.56E-15	1.84E-15	7.87E-07	3.58E-10	4.14E-09
110-82-7	2.63E-15	1.85E-15	7.89E-07	3.58E-10	4.15E-09
111-84-2	1.72E-15	1.85E-15	7.88E-07	3.58E-10	4.14E-09
120-12-7	9.09E-15	1.35E-14	5.77E-06	2.62E-09	3.04E-08
120-82-1	1.23E-15	1.86E-15	7.95E-07	3.61E-10	4.18E-09
122-39-4	4.27E-15	6.03E-15	2.58E-06	1.17E-09	1.36E-08
126-73-8	8.88E-15	1.97E-14	8.43E-06	3.83E-09	4.43E-08
127-18-4	5.33E-16	7.38E-16	3.15E-07	1.43E-10	1.66E-09
129-00-0	1.00E-14	1.69E-14	7.20E-06	3.27E-09	3.79E-08
132-64-9	8.58E-15	1.20E-14	5.14E-06	2.34E-09	2.71E-08
144-62-7	2.02E-12	1.52E-12	6.48E-04	2.94E-07	3.41E-06
193-39-5	1.33E-14	3.06E-14	1.30E-05	5.93E-09	6.86E-08
206-44-0	6.87E-15	1.13E-14	4.80E-06	2.18E-09	2.53E-08
208-96-8	9.97E-15	1.27E-14	5.41E-06	2.46E-09	2.85E-08
603-34-9	8.20E-15	1.68E-14	7.16E-06	3.26E-09	3.77E-08
621-64-7	1.03E-14	1.12E-14	4.80E-06	2.18E-09	2.53E-08
1321-64-8	4.49E-15	1.13E-14	4.80E-06	2.18E-09	2.53E-08
1336-36-3	2.27E-16	6.11E-16	2.61E-07	1.19E-10	1.37E-09
3697-24-3	5.57E-15	1.13E-14	4.81E-06	2.18E-09	2.53E-08
4170-30-3	4.48E-15	2.62E-15	1.12E-06	5.08E-10	5.88E-09
10061-01-5	7.99E-16	7.40E-16	3.16E-07	1.44E-10	1.66E-09
26140-60-3	5.86E-15	1.13E-14	4.81E-06	2.19E-09	2.53E-08

Table A-6 LMP06 Stream Report

Stream Number: LMP06
Stream Name: Melter offgas (primary)
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	4.01E-04	g/cm³	(does not include solid phase)
Enthalpy	-2.53E+07	BTU/hr	
Mass Flow	8.97E+03	Lb/hr	
	2.15E+05	Lb/day	
Volumetric Flow	4.43E+04	GPM	(does not include solid phase)
	5.92E+03	ft³/min	(does not include solid phase)
Molar Flow	3.90E+02	Lbmol/hr	
Molecular Weight	2.28E+01	Lb/Lbmol	
Pressure	9.83E+02	mbar	
Temperature	4.00E+02	C	
Na Molarity	0.00E+00	mol/L	
pH	0.00E+00	pH	
Total TRU	1.10E-09	Ci/L	
Total Activity	3.68E-07	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	1.01E+03	1.76E-02	2.13E+05	2.14E+05	9.72E+01	1.13E+03
Ag^{+}	0.00E+00	0.00E+00	0.00E+00	1.55E-02	0.00E+00	0.00E+00	1.55E-02	7.06E-06	8.17E-05
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	3.63E+01	0.00E+00	0.00E+00	3.63E+01	1.65E-02	1.91E-01
As^{+3}	0.00E+00	0.00E+00	0.00E+00	2.75E-01	0.00E+00	0.00E+00	2.75E-01	1.25E-04	1.45E-03
B^{+3}	0.00E+00	0.00E+00	0.00E+00	1.13E+02	0.00E+00	0.00E+00	1.13E+02	5.14E-02	5.95E-01
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	5.32E-03	0.00E+00	0.00E+00	5.32E-03	2.42E-06	2.80E-05
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	1.20E-02	0.00E+00	0.00E+00	1.20E-02	5.45E-06	6.31E-05
Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	4.30E+01	0.00E+00	0.00E+00	4.30E+01	1.95E-02	2.26E-01
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.05E-01	0.00E+00	0.00E+00	1.05E-01	4.79E-05	5.54E-04
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	1.20E-01	0.00E+00	0.00E+00	1.20E-01	5.45E-05	6.31E-04
Cl^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.30E-06	9.39E+01	9.39E+01	4.27E-02	4.94E-01
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.30E-04	1.48E+04	1.48E+04	6.71E+00	7.76E+01
CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	1.72E+00	0.00E+00	0.00E+00	1.72E+00	7.83E-04	9.07E-03
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	2.25E-03	0.00E+00	0.00E+00	2.25E-03	1.02E-06	1.18E-05
F^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	2.28E+01	0.00E+00	0.00E+00	2.28E+01	1.04E-02	1.20E-01
H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-02	1.05E+05	1.05E+05	4.78E+01	5.53E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.41E-06	1.83E+02	1.83E+02	8.30E-02	9.61E-01
HCO3-	0.00E+00	0.00E+00	0.00E+00	3.26E-15	0.00E+00	0.00E+00	3.26E-15	1.48E-18	1.71E-17
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.17E-06	2.32E+01	2.32E+01	1.05E-02	1.22E-01
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	5.47E+00	0.00E+00	0.00E+00	5.47E+00	2.48E-03	2.88E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	0.00E+00	0.00E+00	0.00E+00	3.60E+01	0.00E+00	0.00E+00	3.60E+01	1.64E-02	1.89E-01
La^{+3}	0.00E+00	0.00E+00	0.00E+00	5.56E-03	0.00E+00	0.00E+00	5.56E-03	2.53E-06	2.92E-05
Li^{+}	0.00E+00	0.00E+00	0.00E+00	8.98E+00	0.00E+00	0.00E+00	8.98E+00	4.08E-03	4.72E-02
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	5.91E+00	0.00E+00	0.00E+00	5.91E+00	2.69E-03	3.11E-02
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	2.20E-01	0.00E+00	0.00E+00	2.20E-01	1.00E-04	1.16E-03
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.12E-03	6.15E+04	6.15E+04	2.80E+01	3.24E+02
Na^{+}	0.00E+00	0.00E+00	0.00E+00	1.28E+02	0.00E+00	0.00E+00	1.28E+02	5.84E-02	6.76E-01
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06	1.12E+01	1.12E+01	5.09E-03	5.90E-02
NH4+	0.00E+00	0.00E+00	0.00E+00	1.44E-16	0.00E+00	0.00E+00	1.44E-16	6.55E-20	7.58E-19
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	2.00E-01	0.00E+00	0.00E+00	2.00E-01	9.10E-05	1.05E-03
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.07E-04	4.91E+03	4.91E+03	2.23E+00	2.58E+01
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.81E-05	6.87E+02	6.87E+02	3.12E-01	3.62E+00
NO_2^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-03	2.56E+04	2.56E+04	1.16E+01	1.35E+02
O^{-}	0.00E+00	0.00E+00	0.00E+00	3.92E+02	0.00E+00	0.00E+00	3.92E+02	1.78E-01	2.06E+00
OH^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OH(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	6.66E-02	0.00E+00	0.00E+00	6.66E-02	3.03E-05	3.50E-04
Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.07E-03	0.00E+00	0.00E+00	1.07E-03	4.87E-07	5.64E-06
PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	5.62E+00	0.00E+00	0.00E+00	5.62E+00	2.55E-03	2.96E-02
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	3.84E-03	0.00E+00	0.00E+00	3.84E-03	1.74E-06	2.02E-05
Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	9.81E-02	0.00E+00	0.00E+00	9.81E-02	4.46E-05	5.16E-04
S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SIO2	0.00E+00	0.00E+00	0.00E+00	1.70E+02	0.00E+00	0.00E+00	1.70E+02	7.74E-02	8.95E-01
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	9.15E-14	0.00E+00	0.00E+00	9.15E-14	4.16E-17	4.81E-16
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.20E-07	1.77E+01	1.77E+01	8.06E-03	9.33E-02
SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	9.26E-04	0.00E+00	0.00E+00	9.26E-04	4.21E-07	4.87E-06
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	5.23E-01	0.00E+00	0.00E+00	5.23E-01	2.38E-04	2.75E-03
Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	2.70E+01	0.00E+00	0.00E+00	2.70E+01	1.23E-02	1.42E-01
Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	8.32E+00	0.00E+00	0.00E+00	8.32E+00	3.78E-03	4.38E-02

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	9.71E+02	0.00E+00	0.00E+00	9.71E+02	4.41E-01	5.11E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB. NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: A-13

$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	9.71E+02	0.00E+00	0.00E+00	9.71E+02	4.41E-01	5.11E+00
Formate	0.00E+00	0.00E+00	0.00E+00	4.79E-11	0.00E+00	0.00E+00	4.79E-11	2.18E-14	2.52E-13
Acetate	0.00E+00	0.00E+00	0.00E+00	4.87E-11	0.00E+00	0.00E+00	4.87E-11	2.21E-14	2.56E-13
Glycolate	0.00E+00	0.00E+00	0.00E+00	4.12E-10	0.00E+00	0.00E+00	4.12E-10	1.87E-13	2.17E-12
IDA	0.00E+00	0.00E+00	0.00E+00	3.88E-10	0.00E+00	0.00E+00	3.88E-10	1.76E-13	2.04E-12
Citrate	0.00E+00	0.00E+00	0.00E+00	5.11E-11	0.00E+00	0.00E+00	5.11E-11	2.32E-14	2.69E-13
HEDTA	0.00E+00	0.00E+00	0.00E+00	3.47E-10	0.00E+00	0.00E+00	3.47E-10	1.58E-13	1.82E-12
EDTA	0.00E+00	0.00E+00	0.00E+00	4.38E-11	0.00E+00	0.00E+00	4.38E-11	1.99E-14	2.30E-13

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	0.00E+00	0.00E+00	0.00E+00	3.68E-07	8.90E+01	3.41E+00	3.68E-07	8.90E+01	3.41E+00
^{241}Am	0.00E+00	0.00E+00	0.00E+00	9.39E-10	2.27E-01	1.46E-04	9.39E-10	2.27E-01	1.46E-04
^{243}Am	0.00E+00	0.00E+00	0.00E+00	6.11E-13	1.48E-04	1.63E-06	6.11E-13	1.48E-04	1.63E-06
^{14}C	0.00E+00	0.00E+00	0.00E+00	1.51E-09	3.64E-01	1.80E-04	1.51E-09	3.64E-01	1.80E-04
^{60}Co	0.00E+00	0.00E+00	0.00E+00	4.99E-11	1.21E-02	2.35E-08	4.99E-11	1.21E-02	2.35E-08
^{243}Cm	0.00E+00	0.00E+00	0.00E+00	4.28E-14	1.03E-05	4.51E-10	4.28E-14	1.03E-05	4.51E-10
^{244}Cm	0.00E+00	0.00E+00	0.00E+00	1.01E-12	2.44E-04	6.65E-09	1.01E-12	2.44E-04	6.65E-09
^{137}Cs	0.00E+00	0.00E+00	0.00E+00	2.47E-08	5.96E+00	1.51E-04	2.47E-08	5.96E+00	1.51E-04
^{152}Eu	0.00E+00	0.00E+00	0.00E+00	2.80E-12	6.77E-04	6.58E-09	2.80E-12	6.77E-04	6.58E-09
^{154}Eu	0.00E+00	0.00E+00	0.00E+00	5.80E-10	1.40E-01	1.14E-06	5.80E-10	1.40E-01	1.14E-06
^{155}Eu	0.00E+00	0.00E+00	0.00E+00	1.67E-10	4.04E-02	1.84E-07	1.67E-10	4.04E-02	1.84E-07
^{3}H	0.00E+00	0.00E+00	0.00E+00	1.62E-09	3.92E-01	8.99E-08	1.62E-09	3.92E-01	8.99E-08
^{129}I	0.00E+00	0.00E+00	0.00E+00	4.91E-11	1.19E-02	1.48E-01	4.91E-11	1.19E-02	1.48E-01
^{63}Ni	0.00E+00	0.00E+00	0.00E+00	2.03E-09	4.89E-01	1.90E-05	2.03E-09	4.89E-01	1.90E-05
^{237}Np	0.00E+00	0.00E+00	0.00E+00	2.95E-13	7.12E-05	2.23E-04	2.95E-13	7.12E-05	2.23E-04
^{236}Pu	0.00E+00	0.00E+00	0.00E+00	1.67E-12	4.03E-04	5.19E-08	1.67E-12	4.03E-04	5.19E-08
^{239}Pu	0.00E+00	0.00E+00	0.00E+00	2.30E-11	5.56E-03	1.98E-04	2.30E-11	5.56E-03	1.98E-04
^{240}Pu	0.00E+00	0.00E+00	0.00E+00	5.97E-12	1.44E-03	1.40E-05	5.97E-12	1.44E-03	1.40E-05
^{241}Pu	0.00E+00	0.00E+00	0.00E+00	1.25E-10	3.03E-02	6.48E-07	1.25E-10	3.03E-02	6.48E-07
^{242}Pu	0.00E+00	0.00E+00	0.00E+00	6.31E-16	1.52E-07	8.54E-08	6.31E-16	1.52E-07	8.54E-08
^{125}Sb	0.00E+00	0.00E+00	0.00E+00	8.71E-10	2.10E-01	4.47E-07	8.71E-10	2.10E-01	4.47E-07
^{151}Sm	0.00E+00	0.00E+00	0.00E+00	7.06E-10	1.70E-01	1.43E-05	7.06E-10	1.70E-01	1.43E-05
^{126}Sn	0.00E+00	0.00E+00	0.00E+00	5.49E-12	1.33E-03	2.57E-04	5.49E-12	1.33E-03	2.57E-04
^{90}Sr	0.00E+00	0.00E+00	0.00E+00	2.41E-07	5.82E+01	9.29E-04	2.41E-07	5.82E+01	9.29E-04
^{99}Tc	0.00E+00	0.00E+00	0.00E+00	9.41E-08	2.27E+01	2.96E+00	9.41E-08	2.27E+01	2.96E+00
^{232}Th	0.00E+00	0.00E+00	0.00E+00	8.83E-15	2.13E-06	4.27E-02	8.83E-15	2.13E-06	4.27E-02
^{233}U	0.00E+00	0.00E+00	0.00E+00	3.01E-13	7.28E-05	1.67E-05	3.01E-13	7.28E-05	1.67E-05
^{234}U	0.00E+00	0.00E+00	0.00E+00	2.11E-13	5.10E-05	1.81E-05	2.11E-13	5.10E-05	1.81E-05
^{235}U	0.00E+00	0.00E+00	0.00E+00	8.31E-15	2.01E-06	2.05E-03	8.31E-15	2.01E-06	2.05E-03
^{236}U	0.00E+00	0.00E+00	0.00E+00	1.42E-14	3.44E-06	1.17E-04	1.42E-14	3.44E-06	1.17E-04
^{238}U	0.00E+00	0.00E+00	0.00E+00	1.65E-13	3.98E-05	2.61E-01	1.65E-13	3.98E-05	2.61E-01

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	8.70E-06	7.16E-06	4.57E+02	2.08E-01	2.40E+00
50-32-8	3.34E-08	7.02E-08	4.48E+00	2.04E-03	2.36E-02
56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57-14-7	4.40E-10	2.21E-10	1.41E-02	6.40E-06	7.41E-05
58-90-2	2.47E-10	4.77E-10	3.05E-02	1.38E-05	1.60E-04
59-89-2	4.78E-17	4.63E-17	2.95E-09	1.34E-12	1.55E-11
60-35-5	3.58E-08	1.77E-08	1.13E+00	5.12E-04	5.93E-03
62-75-9	1.44E-08	8.92E-09	5.69E-01	2.59E-04	3.00E-03
64-19-7	3.33E-14	1.67E-14	1.06E-06	4.84E-10	5.60E-09
71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-05-8	7.57E-12	2.59E-12	1.65E-04	7.52E-08	8.70E-07
75-12-7	2.89E-07	1.09E-07	6.93E+00	3.15E-03	3.65E-02
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83-32-9	5.68E-18	7.31E-18	4.66E-10	2.12E-13	2.45E-12
84-66-2	1.80E-08	3.34E-08	2.13E+00	9.69E-04	1.12E-02
84-74-2	5.85E-09	1.36E-08	8.68E-01	3.94E-04	4.56E-03
87-68-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88-89-1	5.71E-08	1.09E-07	6.97E+00	3.17E-03	3.67E-02
91-20-3	9.18E-18	9.82E-18	6.26E-10	2.85E-13	3.29E-12
95-50-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98-86-2	2.22E-10	2.23E-10	1.42E-02	6.48E-06	7.50E-05
100-21-0	8.90E-07	1.23E-06	7.87E+01	3.58E-02	4.14E-01
101-84-8	5.70E-19	8.09E-19	5.16E-11	2.35E-14	2.72E-13
106-93-4	8.40E-19	1.32E-18	8.40E-11	3.82E-14	4.42E-13
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-95-2	6.77E-08	5.32E-08	3.39E+00	1.54E-03	1.78E-02
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	2.38E-12	3.54E-12	2.26E-04	1.03E-07	1.19E-06
120-82-1	4.00E-25	6.05E-25	3.86E-17	1.75E-20	2.03E-19
122-39-4	9.00E-10	1.27E-09	8.11E-02	3.68E-05	4.26E-04
126-73-8	2.42E-08	5.38E-08	3.43E+00	1.56E-03	1.81E-02
127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129-00-0	1.87E-10	3.16E-10	2.02E-02	9.18E-06	1.06E-04
132-64-9	1.12E-14	1.57E-14	9.98E-07	4.54E-10	5.25E-09
144-62-7	7.26E-06	5.46E-06	3.48E+02	1.58E-01	1.83E+00
193-39-5	7.64E-16	1.76E-15	1.12E-07	5.11E-11	5.91E-10
206-44-0	2.25E-17	3.79E-17	2.42E-09	1.10E-12	1.27E-11
208-96-8	2.03E-13	2.58E-13	1.64E-05	7.48E-09	8.65E-08
603-34-9	6.48E-10	1.33E-09	8.47E-02	3.85E-05	4.46E-04
621-64-7	3.75E-17	4.06E-17	2.60E-09	1.18E-12	1.37E-11
1321-64-8	3.27E-18	8.21E-18	5.24E-10	2.38E-13	2.76E-12
1336-36-3	6.52E-17	1.75E-16	1.12E-08	5.08E-12	5.88E-11
3697-24-3	2.01E-17	4.07E-17	2.60E-09	1.18E-12	1.37E-11
4170-30-3	1.11E-10	6.51E-11	4.15E-03	1.89E-06	2.19E-05
10061-01-5	5.00E-26	4.63E-26	2.95E-18	1.34E-21	1.55E-20
26140-60-3	1.33E-17	2.56E-17	1.63E-09	7.41E-13	8.58E-12

Table A-7 LFP06 Stream Report

Stream Number: LFP06
Stream Name: LAW LFP Vents
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Variable	Value	Units	
Density	1.14E-03	g/cm³	(does not include solid phase)
Enthalpy	-6.17E+04	BTU/hr	
Mass Flow	4.88E+02	Lb/hr	
	1.17E+04	Lb/day	
Volumetric Flow	8.52E+02	GPM	(does not include solid phase)
	1.14E+02	ft³/min	(does not include solid phase)
Molar Flow	1.71E+01	Lbmol/hr	
Molecular Weight	2.85E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	2.64E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	4.51E+00	pH	
Total TRU	1.66E-13	Ci/L	
Total Activity	4.04E-11	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	1.90E-08	3.24E-09	3.98E-03	1.79E-03	4.02E-02	1.17E+04	1.17E+04	5.32E+00	6.18E+01
Ag^{+}	1.22E-14	1.10E-14	1.35E-08	4.72E-10	0.00E+00	0.00E+00	1.40E-08	6.35E-12	7.35E-11
Al^{+3}	1.48E-10	3.34E-11	4.09E-05	4.57E-05	0.00E+00	0.00E+00	8.66E-05	3.94E-08	4.56E-07
As^{+3}	5.39E-14	3.37E-14	4.13E-08	8.15E-09	0.00E+00	0.00E+00	4.95E-08	2.25E-11	2.60E-10
B^{+3}	5.93E-10	5.35E-11	6.57E-05	3.37E-06	0.00E+00	0.00E+00	6.90E-05	3.14E-08	3.63E-07
Ba^{+2}	1.12E-14	1.29E-14	1.58E-08	1.70E-10	0.00E+00	0.00E+00	1.60E-08	7.26E-12	8.40E-11
Bi^{+3}	1.33E-14	2.31E-14	2.84E-08	4.13E-10	0.00E+00	0.00E+00	2.88E-08	1.31E-11	1.51E-10
Ca^{+2}	1.67E-12	5.59E-13	6.86E-07	6.44E-05	0.00E+00	0.00E+00	6.50E-05	2.96E-08	3.42E-07
Cd^{+2}	2.09E-14	1.98E-14	2.41E-08	6.10E-09	0.00E+00	0.00E+00	3.02E-08	1.37E-11	1.59E-10
Ce^{+3}	4.99E-13	5.84E-13	7.16E-07	3.61E-09	0.00E+00	0.00E+00	7.20E-07	3.27E-10	3.79E-09
Cl^{-}	2.78E-11	8.23E-12	1.01E-05	1.59E-08	0.00E+00	0.00E+00	1.01E-05	4.60E-09	5.32E-08
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.22E-33	1.90E-27	1.90E-27	8.65E-31	1.00E-29
CO_3^{-2}	1.19E-10	5.97E-11	7.32E-05	7.73E-05	0.00E+00	0.00E+00	1.51E-04	6.84E-08	7.92E-07
Cr^{+3}	3.58E-12	1.58E-12	1.91E-06	1.58E-07	0.00E+00	0.00E+00	2.07E-06	9.39E-10	1.09E-08
Cu^{+2}	2.07E-14	1.10E-14	1.34E-08	7.14E-11	0.00E+00	0.00E+00	1.35E-08	6.14E-12	7.11E-11
F^{-}	1.36E-11	2.15E-12	2.64E-06	2.45E-10	0.00E+00	0.00E+00	2.64E-06	1.20E-09	1.39E-08
Fe^{+3}	6.54E-13	3.05E-13	3.74E-07	9.11E-05	0.00E+00	0.00E+00	9.15E-05	4.16E-08	4.81E-07
H_2O	1.28E-08	1.93E-09	2.36E-03	0.00E+00	1.40E-03	2.58E+02	2.58E+02	1.17E-01	1.36E+00
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	5.16E-23	4.34E-25	5.32E-19	0.00E+00	0.00E+00	0.00E+00	5.32E-19	2.42E-22	2.80E-21
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	6.68E-34	3.40E-34	4.17E-28	9.78E-23	0.00E+00	0.00E+00	9.78E-23	4.45E-26	5.14E-25
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	2.16E-14	3.62E-14	4.44E-08	1.20E-07	0.00E+00	0.00E+00	1.64E-07	7.45E-11	8.63E-10
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	5.32E-11	1.74E-11	2.13E-05	2.01E-07	0.00E+00	0.00E+00	2.15E-05	9.77E-09	1.13E-07
La^{+3}	5.73E-15	6.64E-15	8.15E-09	1.87E-10	0.00E+00	0.00E+00	8.34E-09	3.79E-12	4.39E-11
Li^{+}	2.43E-12	1.41E-13	1.73E-07	1.79E-05	0.00E+00	0.00E+00	1.81E-05	8.21E-09	9.50E-08
Mg^{+2}	1.70E-13	3.46E-14	4.24E-08	2.37E-05	0.00E+00	0.00E+00	2.37E-05	1.08E-08	1.25E-07
Mn^{+3}	1.85E-13	8.47E-14	1.04E-07	2.63E-07	0.00E+00	0.00E+00	3.67E-07	1.67E-10	1.93E-09
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	3.66E-33	8.57E-34	1.05E-27	0.00E+00	3.06E-02	8.78E+03	8.78E+03	3.99E+00	4.62E+01
Na^{+}	1.64E-09	3.14E-10	3.85E-04	7.85E-08	0.00E+00	0.00E+00	3.85E-04	1.75E-07	2.03E-06
NH3	1.93E-13	2.74E-14	3.36E-08	0.00E+00	0.00E+00	0.00E+00	3.36E-08	1.53E-11	1.77E-10
NH4+	2.77E-32	2.74E-14	5.12E-27	4.32E-24	0.00E+00	0.00E+00	4.32E-24	1.96E-27	2.27E-26
Ni^{+2}	2.99E-13	1.46E-13	1.80E-07	2.39E-07	0.00E+00	0.00E+00	4.18E-07	1.90E-10	2.20E-09
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^{-}	3.22E-10	1.24E-10	1.52E-04	6.82E-10	0.00E+00	0.00E+00	1.52E-04	6.89E-08	7.98E-07
NO_3^{-}	5.88E-10	3.04E-10	3.73E-04	5.25E-10	0.00E+00	0.00E+00	3.73E-04	1.70E-07	1.96E-06
O_2	1.94E-35	5.16E-36	6.36E-30	0.00E+00	8.14E-03	2.67E+03	2.67E+03	1.21E+00	1.40E+01
O^{--}	0.00E+00	0.00E+00	0.00E+00	3.18E-04	0.00E+00	0.00E+00	3.18E-04	1.45E-07	1.67E-06
OH^{-}	3.20E-10	4.55E-11	5.58E-05	2.07E-09	0.00E+00	0.00E+00	5.58E-05	2.54E-08	2.93E-07
$OH(b)^{-}$	2.37E-09	3.36E-10	4.13E-04	0.00E+00	0.00E+00	0.00E+00	4.13E-04	1.88E-07	2.17E-06
Pb^{+2}	7.58E-14	1.31E-13	1.61E-07	2.69E-09	0.00E+00	0.00E+00	1.64E-07	7.43E-11	8.60E-10
Pd^{+2}	5.87E-15	5.21E-15	6.40E-09	3.61E-11	0.00E+00	0.00E+00	6.43E-09	2.92E-12	3.38E-11
PO_4^{-3}	6.05E-12	4.79E-12	5.88E-06	6.26E-07	0.00E+00	0.00E+00	6.51E-06	2.96E-09	3.42E-08
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	5.68E-15	4.88E-15	5.98E-09	1.16E-10	0.00E+00	0.00E+00	6.10E-09	2.77E-12	3.21E-11
Ru^{+3}	8.44E-15	7.12E-15	8.73E-09	2.75E-09	0.00E+00	0.00E+00	1.15E-08	5.22E-12	6.04E-11
S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.12E-23	0.00E+00	0.00E+00	3.12E-23	1.42E-26	1.64E-25
SiO2	1.14E-12	5.73E-13	7.03E-07	1.02E-03	0.00E+00	0.00E+00	1.02E-03	4.65E-07	5.38E-06
SiO_4^{-4}	8.73E-25	6.71E-25	8.23E-19	0.00E+00	0.00E+00	0.00E+00	8.23E-19	3.74E-22	4.33E-21
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	1.44E-11	1.16E-11	1.42E-05	2.66E-07	0.00E+00	0.00E+00	1.45E-05	6.58E-09	7.62E-08
Sr^{+2}	3.07E-15	2.25E-15	2.76E-09	2.04E-11	0.00E+00	0.00E+00	2.78E-09	1.26E-12	1.46E-11
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl^{+4}	9.42E-15	3.76E-15	4.62E-09	1.94E-05	0.00E+00	0.00E+00	1.94E-05	8.80E-09	1.02E-07
Zn^{+2}	3.52E-14	1.92E-14	2.36E-08	5.43E-05	0.00E+00	0.00E+00	5.44E-05	2.47E-08	2.86E-07
Zr^{+4}	2.60E-14	1.98E-14	2.43E-08	5.00E-05	0.00E+00	0.00E+00	5.00E-05	2.27E-08	2.63E-07

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	5.46E-12	4.01E-12	4.92E-06	2.71E-05	0.00E+00	0.00E+00	3.20E-05	1.46E-08	1.69E-07

$C_2O_4^{-2}$	5.46E-12	4.01E-12	4.92E-06	2.71E-05	0.00E+00	0.00E+00	3.20E-05	1.46E-08	1.69E-07
Formate	3.43E-24	1.29E-24	1.58E-18	0.00E+00	0.00E+00	0.00E+00	1.58E-18	7.19E-22	8.32E-21
Acetate	2.66E-24	1.31E-24	1.61E-18	0.00E+00	0.00E+00	0.00E+00	1.61E-18	7.31E-22	8.46E-21
Glycolate	1.77E-23	1.11E-23	1.36E-17	0.00E+00	0.00E+00	0.00E+00	1.36E-17	6.18E-21	7.15E-20
IDA	9.38E-24	1.04E-23	1.28E-17	0.00E+00	0.00E+00	0.00E+00	1.28E-17	5.81E-21	6.73E-20
Citrate	8.58E-25	1.38E-24	1.69E-18	0.00E+00	0.00E+00	0.00E+00	1.69E-18	7.67E-22	8.88E-21
HEDTA	4.02E-24	9.33E-24	1.14E-17	0.00E+00	0.00E+00	0.00E+00	1.14E-17	5.20E-21	6.02E-20
EDTA	4.83E-25	1.18E-24	1.44E-18	0.00E+00	0.00E+00	0.00E+00	1.44E-18	6.56E-22	7.60E-21

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	4.00E-11	1.86E-04	2.02E-06	4.72E-13	2.19E-06	1.40E-07	4.04E-11	1.88E-04	2.16E-06
^{241}Am	1.15E-13	5.35E-07	3.44E-10	2.10E-15	9.75E-09	6.27E-12	1.17E-13	5.44E-07	3.50E-10
^{243}Am	7.52E-17	3.49E-10	3.86E-12	1.00E-18	4.65E-12	5.14E-14	7.62E-17	3.54E-10	3.91E-12
^{14}C	2.35E-15	1.09E-08	5.39E-12	4.49E-20	2.09E-13	1.03E-16	2.35E-15	1.09E-08	5.39E-12
^{60}Co	1.54E-14	7.16E-08	1.40E-13	1.47E-16	6.82E-10	1.33E-15	1.56E-14	7.23E-08	1.41E-13
^{243}Cm	1.24E-17	5.76E-11	2.51E-15	9.56E-19	4.44E-12	1.94E-16	1.34E-17	6.21E-11	2.71E-15
^{244}Cm	2.94E-16	1.36E-09	3.72E-14	2.18E-17	1.01E-10	2.76E-15	3.15E-16	1.46E-09	3.99E-14
^{137}Cs	2.49E-14	1.16E-07	2.93E-12	5.22E-14	2.42E-07	6.15E-12	7.71E-14	3.58E-07	9.09E-12
^{152}Eu	8.66E-16	4.02E-09	5.10E-14	7.75E-18	3.60E-11	4.56E-16	8.74E-16	4.06E-09	5.15E-14
^{154}Eu	1.80E-13	8.34E-07	6.80E-12	1.27E-15	5.89E-09	4.81E-14	1.81E-13	8.40E-07	6.85E-12
^{155}Eu	5.19E-14	2.41E-07	1.09E-12	3.15E-16	1.46E-09	6.64E-15	5.22E-14	2.43E-07	1.10E-12
^{3}H	1.71E-15	7.93E-09	1.82E-15	8.22E-16	3.82E-09	8.78E-16	2.53E-15	1.18E-08	2.70E-15
^{129}I	7.15E-17	3.32E-10	4.15E-09	1.27E-17	5.92E-11	7.39E-10	8.43E-17	3.91E-10	4.89E-09
^{63}Ni	2.78E-13	1.29E-06	5.01E-11	3.13E-15	1.45E-08	5.65E-13	2.81E-13	1.31E-06	5.07E-11
^{237}Np	9.11E-17	4.23E-10	1.32E-09	9.79E-19	4.55E-12	1.42E-11	9.20E-17	4.27E-10	1.34E-09
^{238}Pu	5.15E-16	2.39E-09	3.08E-13	5.07E-18	2.35E-11	3.03E-15	5.20E-16	2.42E-09	3.11E-13
^{239}Pu	7.12E-15	3.31E-08	1.18E-09	5.77E-17	2.68E-10	9.53E-12	7.18E-15	3.34E-08	1.19E-09
^{240}Pu	1.85E-15	8.58E-09	8.33E-11	1.51E-17	7.00E-11	6.80E-13	1.86E-15	8.65E-09	8.40E-11
^{241}Pu	3.88E-14	1.80E-07	3.65E-12	3.50E-16	1.63E-09	3.48E-14	3.91E-14	1.82E-07	3.69E-12
^{242}Pu	1.95E-19	9.08E-13	5.06E-13	1.52E-21	7.04E-15	3.94E-15	1.97E-19	9.15E-13	5.12E-13
^{125}Sb	1.07E-13	4.97E-07	1.06E-12	1.55E-15	7.21E-09	1.53E-14	1.09E-13	5.05E-07	1.07E-12
^{151}Sm	1.50E-12	6.99E-06	5.85E-10	3.83E-15	1.78E-08	1.49E-12	1.51E-12	7.01E-06	5.87E-10
^{126}Sn	1.70E-15	7.91E-09	1.54E-09	9.60E-18	4.46E-11	8.65E-12	1.71E-15	7.96E-09	1.54E-09
^{90}Sr	3.73E-11	1.73E-04	2.77E-09	2.61E-13	1.21E-06	1.94E-11	3.76E-11	1.75E-04	2.79E-09
^{99}Tc	2.98E-13	1.37E-06	1.79E-07	1.45E-13	6.72E-07	8.74E-08	4.41E-13	2.05E-06	2.66E-07
^{232}Th	2.77E-18	1.28E-11	2.57E-07	4.62E-19	2.14E-12	4.30E-08	3.23E-18	1.50E-11	3.00E-07
^{233}U	9.22E-17	4.28E-10	9.80E-11	1.88E-18	8.72E-12	2.00E-12	9.41E-17	4.37E-10	1.00E-10
^{234}U	6.54E-17	3.04E-10	1.06E-10	4.01E-19	1.86E-12	6.62E-13	6.58E-17	3.06E-10	1.09E-10
^{235}U	2.58E-18	1.20E-11	1.22E-08	1.47E-20	6.81E-14	6.95E-11	2.59E-18	1.20E-11	1.23E-08
^{236}U	4.42E-18	2.05E-11	6.99E-10	2.46E-20	1.14E-13	3.89E-12	4.44E-18	2.06E-11	7.03E-10
^{238}U	5.11E-17	2.37E-10	1.56E-06	2.98E-19	1.38E-12	9.07E-09	5.14E-17	2.39E-10	1.57E-06

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	2.31E-08	3.02E-08	3.70E-02	1.68E-05	1.95E-04
50-32-8	3.15E-06	6.64E-09	8.15E-03	3.70E-06	4.29E-05
56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57-14-7	1.14E-09	5.74E-10	7.04E-04	3.20E-07	3.70E-06
58-90-2	4.54E-10	8.79E-10	1.08E-03	4.90E-07	5.68E-06
59-89-2	2.04E-14	1.97E-14	2.42E-08	1.10E-11	1.27E-10
60-35-5	8.27E-11	4.08E-11	5.00E-05	2.27E-08	2.63E-07
62-75-9	5.43E-09	3.36E-09	4.12E-03	1.87E-06	2.17E-05
64-19-7	1.42E-11	7.11E-12	8.72E-06	3.96E-09	4.59E-08
71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-05-8	5.56E-11	1.90E-11	2.34E-05	1.06E-08	1.23E-07
75-12-7	8.32E-11	3.13E-11	3.84E-05	1.74E-08	2.02E-07
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83-32-9	2.42E-15	3.11E-15	3.82E-09	1.74E-12	2.01E-11
84-66-2	2.28E-09	4.22E-09	5.18E-03	2.35E-06	2.72E-05
84-74-2	2.19E-09	5.09E-09	6.24E-03	2.84E-06	3.28E-05
87-68-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88-89-1	2.01E-13	3.84E-13	4.71E-07	2.14E-10	2.48E-09
91-20-3	1.20E-15	1.28E-15	1.57E-09	7.13E-13	8.25E-12
95-50-1	1.24E-17	1.52E-17	1.86E-11	8.46E-15	9.79E-14
98-86-2	4.80E-10	4.83E-10	5.93E-04	2.69E-07	3.12E-06
100-21-0	7.14E-14	9.90E-14	1.21E-07	5.52E-11	6.39E-10
101-84-8	2.43E-16	3.45E-16	4.23E-10	1.92E-13	2.22E-12
106-93-4	1.95E-16	3.06E-16	3.76E-10	1.71E-13	1.98E-12
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-95-2	4.66E-09	3.68E-09	4.49E-03	2.04E-06	2.36E-05
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	2.87E-11	4.27E-11	5.24E-05	2.38E-08	2.76E-07
120-82-1	5.22E-18	7.90E-18	9.70E-12	4.41E-15	5.10E-14
122-39-4	6.32E-10	8.92E-10	1.09E-03	4.96E-07	5.76E-06
126-73-8	7.51E-10	1.67E-09	2.05E-03	9.31E-07	1.08E-05
127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129-00-0	4.68E-10	7.90E-10	9.69E-04	4.41E-07	5.10E-06
132-64-9	5.89E-13	8.27E-13	1.01E-06	4.61E-10	5.33E-09
144-62-7	2.15E-10	1.62E-10	1.98E-04	9.01E-08	1.04E-06
193-39-5	3.25E-13	7.50E-13	9.20E-07	4.18E-10	4.84E-09
206-44-0	9.57E-15	1.61E-14	1.98E-08	9.00E-12	1.04E-10
208-96-8	5.25E-12	6.67E-12	8.19E-06	3.72E-09	4.31E-08
603-34-9	7.29E-10	1.49E-09	1.83E-03	8.32E-07	9.63E-06
621-64-7	1.60E-14	1.74E-14	2.13E-08	9.69E-12	1.12E-10
1321-64-8	1.39E-15	3.50E-15	4.29E-09	1.95E-12	2.26E-11
1336-36-3	7.84E-15	2.11E-14	2.58E-08	1.17E-11	1.36E-10
3697-24-3	8.57E-15	1.73E-14	2.13E-08	9.67E-12	1.12E-10
4170-30-3	2.25E-10	1.32E-10	1.61E-04	7.34E-08	8.49E-07
10061-01-5	2.93E-20	2.71E-20	3.33E-14	1.51E-17	1.75E-16
26140-60-3	5.86E-15	1.09E-14	1.34E-08	6.07E-12	7.03E-11

Table A-8 RLD32 Stream Report

Stream Number: RLD32
Stream Name: LAW SBS condensate vessel vent
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Variable	Value	Units	
Density	1.13E-03	g/cm^3	(does not include solid phase)
Enthalpy	-8.80E+03	BTU/hr	
Mass Flow	4.42E+01	Lb/hr	
	1.06E+03	Lb/day	
Volumetric Flow	7.83E+01	GPM	(does not include solid phase)
	1.05E+01	ft^3/min	(does not include solid phase)
Molar Flow	1.56E+00	Lbmol/hr	
Molecular Weight	2.84E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	3.00E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	3.75E+00	pH	
Total TRU	8.19E-15	Ci/L	
Total Activity	2.06E-12	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	5.25E-08	7.90E-09	8.91E-04	7.57E-06	3.97E-02	1.06E+03	1.06E+03	4.82E-01	5.58E+00
Ag^+	0.00E+00	0.00E+00	0.00E+00	1.54E-10	0.00E+00	0.00E+00	1.54E-10	6.96E-14	8.06E-13
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	3.62E-07	0.00E+00	0.00E+00	3.62E-07	1.65E-10	1.91E-09
As^{+3}	0.00E+00	0.00E+00	0.00E+00	2.72E-09	0.00E+00	0.00E+00	2.72E-09	1.24E-12	1.43E-11
B^{+3}	0.00E+00	0.00E+00	0.00E+00	1.12E-06	0.00E+00	0.00E+00	1.12E-06	5.11E-10	5.92E-09
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	5.32E-11	0.00E+00	0.00E+00	5.32E-11	2.42E-14	2.80E-13
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	1.18E-10	0.00E+00	0.00E+00	1.18E-10	5.38E-14	6.23E-13
Ca^{+2}	3.25E-12	1.09E-12	1.23E-07	3.06E-07	0.00E+00	0.00E+00	4.28E-07	1.95E-10	2.25E-09
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.05E-09	0.00E+00	0.00E+00	1.05E-09	4.75E-13	5.50E-12
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	1.20E-09	0.00E+00	0.00E+00	1.20E-09	5.45E-13	6.31E-12
Cl^-	1.23E-11	3.63E-12	4.10E-07	0.00E+00	0.00E+00	0.00E+00	4.10E-07	1.86E-10	2.16E-09
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	1.32E-14	4.85E-15	5.47E-10	0.00E+00	1.19E-27	4.92E-23	5.47E-10	2.49E-13	2.88E-12
CO_3^{-2}	2.98E-12	1.49E-12	1.68E-07	0.00E+00	0.00E+00	0.00E+00	1.68E-07	7.64E-11	8.85E-10
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	1.68E-08	0.00E+00	0.00E+00	1.68E-08	7.66E-12	8.86E-11
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	2.23E-11	0.00E+00	0.00E+00	2.23E-11	1.01E-14	1.17E-13
F^-	6.91E-12	1.09E-12	1.23E-07	0.00E+00	0.00E+00	0.00E+00	1.23E-07	5.61E-11	6.50E-10
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	2.27E-07	0.00E+00	0.00E+00	2.27E-07	1.03E-10	1.20E-09
H_2O	5.23E-08	7.87E-09	8.87E-04	0.00E+00	1.69E-03	2.87E+01	2.87E+01	1.30E-02	1.51E-01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	1.78E-22	1.50E-24	1.69E-19	0.00E+00	0.00E+00	0.00E+00	1.69E-19	7.68E-23	8.89E-22
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	3.25E-23	0.00E+00	0.00E+00	3.25E-23	1.48E-26	1.71E-25
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	3.99E-08	0.00E+00	0.00E+00	3.99E-08	1.81E-11	2.10E-10
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	9.69E-12	3.16E-12	3.56E-07	0.00E+00	0.00E+00	0.00E+00	3.56E-07	1.62E-10	1.88E-09
La^{+3}	0.00E+00	0.00E+00	0.00E+00	5.56E-11	0.00E+00	0.00E+00	5.56E-11	2.53E-14	2.92E-13
Li^+	7.20E-12	4.17E-13	4.70E-08	4.17E-08	0.00E+00	0.00E+00	8.87E-08	4.03E-11	4.67E-10
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	5.75E-08	0.00E+00	0.00E+00	5.75E-08	2.61E-11	3.02E-10
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	2.20E-09	0.00E+00	0.00E+00	2.20E-09	9.98E-13	1.16E-11
MnO_4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-02	7.91E+02	7.91E+02	3.60E-01	4.16E+00
Na^+	5.86E-11	1.12E-11	1.27E-06	0.00E+00	0.00E+00	0.00E+00	1.27E-06	5.77E-10	6.67E-09
NH3	5.24E-12	7.45E-13	8.40E-08	0.00E+00	0.00E+00	0.00E+00	8.40E-08	3.82E-11	4.42E-10
NH4+	1.76E-15	7.45E-13	2.99E-11	1.43E-24	0.00E+00	0.00E+00	2.99E-11	1.36E-14	1.57E-13
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	1.98E-09	0.00E+00	0.00E+00	1.98E-09	8.99E-13	1.04E-11
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.98E-03	2.40E+02	2.40E+02	1.09E-01	1.26E+00
O^{--}	0.00E+00	0.00E+00	0.00E+00	3.28E-06	0.00E+00	0.00E+00	3.28E-06	1.49E-09	1.72E-08
OH^-	5.69E-11	8.07E-12	9.10E-07	0.00E+00	0.00E+00	0.00E+00	9.10E-07	4.14E-10	4.79E-09
OH(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	6.58E-10	0.00E+00	0.00E+00	6.58E-10	2.99E-13	3.46E-12
Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.07E-11	0.00E+00	0.00E+00	1.07E-11	4.87E-15	5.64E-14
PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	5.45E-08	0.00E+00	0.00E+00	5.45E-08	2.48E-11	2.87E-10
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	3.83E-11	0.00E+00	0.00E+00	3.83E-11	1.74E-14	2.02E-13
Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	9.13E-10	0.00E+00	0.00E+00	9.13E-10	4.15E-13	4.80E-12
S^{-6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	0.00E+00	0.00E+00	0.00E+00	1.70E-06	0.00E+00	0.00E+00	1.70E-06	7.71E-10	8.93E-09
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	9.12E-22	0.00E+00	0.00E+00	9.12E-22	4.15E-25	4.80E-24
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{+2}	5.47E-17	4.00E-17	4.51E-12	4.72E-12	0.00E+00	0.00E+00	9.24E-12	4.20E-15	4.86E-14
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	5.23E-09	0.00E+00	0.00E+00	5.23E-09	2.38E-12	2.75E-11
Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	2.69E-07	0.00E+00	0.00E+00	2.69E-07	1.22E-10	1.42E-09
Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	8.27E-08	0.00E+00	0.00E+00	8.27E-08	3.76E-11	4.35E-10

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	9.68E-06	0.00E+00	0.00E+00	9.68E-06	4.40E-09	5.09E-08

$C_2O_4^{2-}$	0.00E+00	0.00E+00	0.00E+00	9.68E-06	0.00E+00	0.00E+00	9.68E-06	4.40E-09	5.09E-08
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	6.65E-13	2.84E-07	4.53E-12	1.40E-12	5.96E-07	3.24E-08	2.06E-12	8.80E-07	3.24E-08
^{241}Am	0.00E+00	0.00E+00	0.00E+00	5.30E-15	2.26E-09	1.46E-12	5.30E-15	2.26E-09	1.46E-12
^{243}Am	0.00E+00	0.00E+00	0.00E+00	3.45E-18	1.47E-12	1.63E-14	3.45E-18	1.47E-12	1.63E-14
^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{60}Co	0.00E+00	0.00E+00	0.00E+00	2.78E-16	1.19E-10	2.31E-16	2.78E-16	1.19E-10	2.31E-16
^{243}Cm	0.00E+00	0.00E+00	0.00E+00	2.42E-19	1.03E-13	4.50E-18	2.42E-19	1.03E-13	4.50E-18
^{244}Cm	0.00E+00	0.00E+00	0.00E+00	5.71E-18	2.44E-12	6.64E-17	5.71E-18	2.44E-12	6.64E-17
^{137}Cs	0.00E+00	0.00E+00	0.00E+00	1.38E-13	5.88E-08	1.49E-12	1.38E-13	5.88E-08	1.49E-12
^{152}Eu	0.00E+00	0.00E+00	0.00E+00	1.58E-17	6.75E-12	8.56E-17	1.58E-17	6.75E-12	8.56E-17
^{154}Eu	0.00E+00	0.00E+00	0.00E+00	3.27E-15	1.40E-09	1.14E-14	3.27E-15	1.40E-09	1.14E-14
^{155}Eu	0.00E+00	0.00E+00	0.00E+00	9.45E-16	4.03E-10	1.83E-15	9.45E-16	4.03E-10	1.83E-15
^{3}H	0.00E+00	0.00E+00	0.00E+00	7.43E-15	3.17E-09	7.27E-16	7.43E-15	3.17E-09	7.27E-16
^{129}I	0.00E+00	0.00E+00	0.00E+00	4.63E-17	1.98E-11	2.47E-10	4.63E-17	1.98E-11	2.47E-10
^{63}Ni	0.00E+00	0.00E+00	0.00E+00	1.13E-14	4.83E-09	1.87E-13	1.13E-14	4.83E-09	1.87E-13
^{237}Np	0.00E+00	0.00E+00	0.00E+00	1.66E-16	7.11E-13	2.22E-12	1.66E-16	7.11E-13	2.22E-12
^{238}Pu	0.00E+00	0.00E+00	0.00E+00	9.41E-18	4.02E-12	5.17E-16	9.41E-18	4.02E-12	5.17E-16
^{239}Pu	0.00E+00	0.00E+00	0.00E+00	1.30E-16	5.55E-11	1.97E-12	1.30E-16	5.55E-11	1.97E-12
^{240}Pu	0.00E+00	0.00E+00	0.00E+00	3.37E-17	1.44E-11	1.40E-13	3.37E-17	1.44E-11	1.40E-13
^{241}Pu	0.00E+00	0.00E+00	0.00E+00	7.08E-16	3.02E-10	6.47E-15	7.08E-16	3.02E-10	6.47E-15
^{242}Pu	0.00E+00	0.00E+00	0.00E+00	3.56E-21	1.52E-15	8.52E-16	3.56E-21	1.52E-15	8.52E-16
^{125}Sb	0.00E+00	0.00E+00	0.00E+00	4.82E-15	2.06E-09	4.37E-15	4.82E-15	2.06E-09	4.37E-15
^{151}Sm	0.00E+00	0.00E+00	0.00E+00	3.99E-15	1.70E-09	1.43E-13	3.99E-15	1.70E-09	1.43E-13
^{126}Sn	0.00E+00	0.00E+00	0.00E+00	3.10E-17	1.32E-11	2.57E-12	3.10E-17	1.32E-11	2.57E-12
^{90}Sr	6.65E-13	2.84E-07	4.53E-12	6.96E-13	2.97E-07	4.74E-12	1.36E-12	5.81E-07	9.27E-12
^{99}Tc	0.00E+00	0.00E+00	0.00E+00	5.25E-13	2.24E-07	2.91E-08	5.25E-13	2.24E-07	2.91E-08
^{232}Th	0.00E+00	0.00E+00	0.00E+00	4.99E-20	2.13E-14	4.27E-10	4.99E-20	2.13E-14	4.27E-10
^{233}U	0.00E+00	0.00E+00	0.00E+00	1.70E-18	7.26E-13	1.66E-13	1.70E-18	7.26E-13	1.66E-13
^{234}U	0.00E+00	0.00E+00	0.00E+00	1.19E-18	5.09E-13	1.81E-13	1.19E-18	5.09E-13	1.81E-13
^{235}U	0.00E+00	0.00E+00	0.00E+00	4.69E-20	2.00E-14	2.04E-11	4.69E-20	2.00E-14	2.04E-11
^{238}U	0.00E+00	0.00E+00	0.00E+00	8.03E-20	3.43E-14	1.17E-12	8.03E-20	3.43E-14	1.17E-12
^{236}U	0.00E+00	0.00E+00	0.00E+00	9.30E-19	3.97E-13	2.60E-09	9.30E-19	3.97E-13	2.60E-09

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	7.41E-09	1.54E-08	1.74E-03	7.90E-07	9.15E-06
50-32-8	3.62E-09	7.63E-09	8.81E-04	3.91E-07	4.53E-06
56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57-14-7	1.20E-25	6.01E-26	6.78E-21	3.08E-24	3.56E-23
58-90-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59-89-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60-35-5	6.09E-26	3.00E-26	3.39E-21	1.54E-24	1.78E-23
62-75-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64-19-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-05-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-12-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83-32-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84-66-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84-74-2	2.51E-09	5.83E-09	6.58E-04	2.99E-07	3.46E-06
87-68-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88-89-1	6.14E-29	1.17E-28	1.32E-23	6.02E-27	6.96E-26
91-20-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95-50-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98-86-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100-21-0	8.21E-14	1.14E-13	1.28E-08	5.84E-12	6.75E-11
101-84-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-93-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-67-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-95-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	3.01E-11	4.48E-11	5.05E-06	2.30E-09	2.66E-08
120-82-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122-39-4	7.22E-10	1.02E-09	1.15E-04	5.23E-08	6.05E-07
126-73-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129-00-0	5.26E-10	8.88E-10	1.00E-04	4.55E-08	5.27E-07
132-64-9	1.05E-29	1.47E-29	1.65E-24	7.52E-28	8.70E-27
144-62-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
193-39-5	1.21E-13	2.79E-13	3.15E-08	1.43E-11	1.66E-10
206-44-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
208-96-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
603-34-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
621-64-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1321-64-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1336-36-3	5.25E-15	1.41E-14	1.59E-09	7.23E-13	8.36E-12
3697-24-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4170-30-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10061-01-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
26140-60-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A-9 RLD33 Stream Report

Stream Number: RLD33
Stream Name: LAW Plant wash vessel vent
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	1.13E-03	g/cm³	(does not include solid phase)
Enthalpy	-3.83E+02	BTU/hr	
Mass Flow	2.49E+00	Lb/hr	
	5.97E+01	Lb/day	
Volumetric Flow	4.41E+00	GPM	(does not include solid phase)
	5.89E-01	ft³/min	(does not include solid phase)
Molar Flow	8.76E-02	Lbmol/hr	
Molecular Weight	2.84E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	3.00E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	0.00E+00	pH	
Total TRU	0.00E+00	Ci/L	
Total Activity	0.00E+00	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	1.76E-09	2.84E-10	1.68E-06	0.00E+00	3.97E-02	5.97E+01	5.97E+01	2.71E-02	3.14E-01
Ag^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
As^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br^{-1}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cl	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H_2O	1.76E-09	2.84E-10	1.68E-06	0.00E+00	1.69E-03	1.62E+00	1.62E+00	7.34E-04	8.50E-03
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
La^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Li^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-02	4.45E+01	4.45E+01	2.02E-02	2.34E-01
Na^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-27	3.01E-24	3.01E-24	1.37E-27	1.58E-26
NH4+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.98E-03	1.35E+01	1.35E+01	6.15E-03	7.12E-02
O^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OH^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OH(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{241}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{243}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{60}Co	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{243}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{244}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{137}Cs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{152}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{154}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{155}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{3}H	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{129}I	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{63}Ni	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{237}Np	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{238}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{239}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{240}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{241}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{242}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{125}Sb	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{151}Sm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{126}Sn	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{90}Sr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{99}Tc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{232}Th	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{233}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{234}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{235}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{238}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{234}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50-32-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57-14-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58-90-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59-89-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60-35-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62-75-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64-19-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-05-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-12-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83-32-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84-66-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84-74-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87-68-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88-89-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91-20-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95-50-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98-86-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100-21-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101-84-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-93-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-87-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-95-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-82-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122-39-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
126-73-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129-00-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
132-64-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
144-62-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
193-39-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
206-44-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
208-96-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
603-34-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
621-64-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1321-64-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1336-36-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3697-24-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4170-30-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10061-01-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
26140-60-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A-10 RLD34 Stream Report

Stream Number: RLD34
Stream Name: LAW C3/C5 drain/sump collection vessel vent
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Variable	Value	Units	
Density	1.13E-03	g/cm^3	(does not include solid phase)
Enthalpy	-6.81E+03	BTU/hr	
Mass Flow	4.42E+01	Lb/hr	
	1.06E+03	Lb/day	
Volumetric Flow	7.83E+01	GPM	(does not include solid phase)
	1.05E+01	ft^3/min	(does not include solid phase)
Molar Flow	1.56E+00	Lbmol/hr	
Molecular Weight	2.84E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	3.00E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	2.94E+00	pH	
Total TRU	1.41E-16	Ci/L	
Total Activity	2.45E-13	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	1.55E-09	2.38E-10	2.69E-05	5.04E-07	3.97E-02	1.06E+03	1.06E+03	4.82E-01	5.58E+00
Ag^+	0.00E+00	0.00E+00	0.00E+00	8.45E-11	0.00E+00	0.00E+00	8.45E-11	3.84E-14	4.45E-13
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	8.25E-09	0.00E+00	0.00E+00	8.25E-09	3.75E-12	4.34E-11
As^{+3}	0.00E+00	0.00E+00	0.00E+00	5.44E-10	0.00E+00	0.00E+00	5.44E-10	2.47E-13	2.86E-12
B^{+3}	0.00E+00	0.00E+00	0.00E+00	6.39E-08	0.00E+00	0.00E+00	6.39E-08	2.90E-11	3.36E-10
Be^{+2}	0.00E+00	0.00E+00	0.00E+00	5.42E-13	0.00E+00	0.00E+00	5.42E-13	2.46E-16	2.85E-15
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	4.46E-11	0.00E+00	0.00E+00	4.46E-11	2.03E-14	2.35E-13
Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	1.95E-08	0.00E+00	0.00E+00	1.95E-08	8.89E-12	1.03E-10
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	6.50E-10	0.00E+00	0.00E+00	6.50E-10	2.96E-13	3.42E-12
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	3.45E-12	0.00E+00	0.00E+00	3.45E-12	1.57E-15	1.82E-14
Cl^-	1.23E-11	3.63E-12	4.10E-07	0.00E+00	0.00E+00	0.00E+00	4.10E-07	1.86E-10	2.16E-09
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	1.32E-14	4.85E-15	5.47E-10	0.00E+00	0.00E+00	0.00E+00	5.47E-10	2.49E-13	2.88E-12
CO_3^{-2}	2.98E-12	1.49E-12	1.68E-07	0.00E+00	0.00E+00	0.00E+00	1.68E-07	7.64E-11	8.85E-10
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	4.68E-09	0.00E+00	0.00E+00	4.68E-09	2.13E-12	2.46E-11
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	7.50E-12	0.00E+00	0.00E+00	7.50E-12	3.41E-15	3.95E-14
F^-	7.55E-13	1.20E-13	1.35E-08	0.00E+00	0.00E+00	0.00E+00	1.35E-08	6.14E-12	7.11E-11
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	5.18E-09	0.00E+00	0.00E+00	5.18E-09	2.35E-12	2.72E-11
H_2O	1.50E-09	2.26E-10	2.55E-05	0.00E+00	1.69E-03	2.87E+01	2.87E+01	1.30E-02	1.51E-01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	8.70E-25	7.32E-27	8.26E-22	0.00E+00	0.00E+00	0.00E+00	8.26E-22	3.75E-25	4.34E-24
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	3.73E-24	0.00E+00	0.00E+00	3.73E-24	1.69E-27	1.96E-26
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	5.86E-12	1.85E-12	2.08E-07	0.00E+00	0.00E+00	0.00E+00	2.08E-07	9.46E-11	1.10E-09
La^{+3}	0.00E+00	0.00E+00	0.00E+00	7.74E-14	0.00E+00	0.00E+00	7.74E-14	3.52E-17	4.07E-16
Li^+	0.00E+00	0.00E+00	0.00E+00	4.17E-08	0.00E+00	0.00E+00	4.17E-08	1.89E-11	2.19E-10
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	1.48E-08	0.00E+00	0.00E+00	1.48E-08	6.72E-12	7.77E-11
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	6.61E-11	0.00E+00	0.00E+00	6.61E-11	3.00E-14	3.48E-13
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-02	7.91E+02	7.91E+02	3.60E-01	4.16E+00
Na^+	2.21E-11	4.24E-12	4.78E-07	0.00E+00	0.00E+00	0.00E+00	4.78E-07	2.17E-10	2.51E-09
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NH4+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	4.76E-10	0.00E+00	0.00E+00	4.76E-10	2.16E-13	2.50E-12
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.98E-03	2.40E+02	2.40E+02	1.09E-01	1.26E+00
$O^=$	0.00E+00	0.00E+00	0.00E+00	2.43E-07	0.00E+00	0.00E+00	2.43E-07	1.10E-10	1.28E-09
OH^-	8.75E-12	1.24E-12	1.40E-07	0.00E+00	0.00E+00	0.00E+00	1.40E-07	6.37E-11	7.37E-10
OH(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	2.82E-10	0.00E+00	0.00E+00	2.82E-10	1.28E-13	1.48E-12
Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.17E-13	0.00E+00	0.00E+00	1.17E-13	5.31E-17	6.14E-16
PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	3.14E-08	0.00E+00	0.00E+00	3.14E-08	1.43E-11	1.65E-10
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	1.16E-11	0.00E+00	0.00E+00	1.16E-11	5.27E-15	6.10E-14
Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	2.04E-10	0.00E+00	0.00E+00	2.04E-10	9.29E-14	1.08E-12
S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	0.00E+00	0.00E+00	0.00E+00	5.16E-08	0.00E+00	0.00E+00	5.16E-08	2.34E-11	2.71E-10
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	2.77E-23	0.00E+00	0.00E+00	2.77E-23	1.26E-26	1.46E-25
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	2.10E-13	0.00E+00	0.00E+00	2.10E-13	9.56E-17	1.11E-15
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl^{+4}	0.00E+00	0.00E+00	0.00E+00	2.63E-11	0.00E+00	0.00E+00	2.63E-11	1.20E-14	1.38E-13
Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	1.39E-08	0.00E+00	0.00E+00	1.39E-08	6.31E-12	7.31E-11
Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	4.49E-09	0.00E+00	0.00E+00	4.49E-09	2.04E-12	2.36E-11

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	4.61E-07	0.00E+00	0.00E+00	4.61E-07	2.10E-10	2.43E-09

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: A-21

$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	4.61E-07	0.00E+00	0.00E+00	4.61E-07	2.10E-10	2.43E-09
Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	0.00E+00	0.00E+00	0.00E+00	2.45E-13	1.05E-07	8.58E-09	2.45E-13	1.05E-07	8.58E-09
^{241}Am	0.00E+00	0.00E+00	0.00E+00	1.21E-16	5.16E-11	3.32E-14	1.21E-16	5.16E-11	3.32E-14
^{243}Am	0.00E+00	0.00E+00	0.00E+00	7.85E-20	3.35E-14	3.70E-16	7.85E-20	3.35E-14	3.70E-16
^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{60}Co	0.00E+00	0.00E+00	0.00E+00	8.38E-17	3.58E-11	6.97E-17	8.38E-17	3.58E-11	6.97E-17
^{243}Cm	0.00E+00	0.00E+00	0.00E+00	5.51E-21	2.35E-15	1.03E-19	5.51E-21	2.35E-15	1.03E-19
^{244}Cm	0.00E+00	0.00E+00	0.00E+00	1.30E-19	5.55E-14	1.51E-18	1.30E-19	5.55E-14	1.51E-18
^{137}Cs	0.00E+00	0.00E+00	0.00E+00	5.63E-14	2.40E-08	6.10E-13	5.63E-14	2.40E-08	6.10E-13
^{152}Eu	0.00E+00	0.00E+00	0.00E+00	3.60E-19	1.54E-13	1.95E-18	3.60E-19	1.54E-13	1.95E-18
^{154}Eu	0.00E+00	0.00E+00	0.00E+00	7.45E-17	3.18E-11	2.59E-16	7.45E-17	3.18E-11	2.59E-16
^{155}Eu	0.00E+00	0.00E+00	0.00E+00	2.15E-17	9.19E-12	4.17E-17	2.15E-17	9.19E-12	4.17E-17
^{3}H	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{129}I	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
^{63}Ni	0.00E+00	0.00E+00	0.00E+00	2.72E-15	1.16E-09	4.51E-14	2.72E-15	1.16E-09	4.51E-14
^{237}Np	0.00E+00	0.00E+00	0.00E+00	3.79E-20	1.62E-14	5.06E-14	3.79E-20	1.62E-14	5.06E-14
^{238}Pu	0.00E+00	0.00E+00	0.00E+00	2.14E-19	9.15E-14	1.18E-17	2.14E-19	9.15E-14	1.18E-17
^{239}Pu	0.00E+00	0.00E+00	0.00E+00	2.96E-18	1.26E-12	4.49E-14	2.96E-18	1.26E-12	4.49E-14
^{240}Pu	0.00E+00	0.00E+00	0.00E+00	7.67E-19	3.28E-13	3.18E-15	7.67E-19	3.28E-13	3.18E-15
^{241}Pu	0.00E+00	0.00E+00	0.00E+00	1.61E-17	6.88E-12	1.47E-16	1.61E-17	6.88E-12	1.47E-16
^{242}Pu	0.00E+00	0.00E+00	0.00E+00	8.12E-23	3.47E-17	1.94E-17	8.12E-23	3.47E-17	1.94E-17
^{125}Sb	0.00E+00	0.00E+00	0.00E+00	1.22E-15	5.21E-10	1.11E-15	1.22E-15	5.21E-10	1.11E-15
^{151}Sm	0.00E+00	0.00E+00	0.00E+00	5.36E-17	2.29E-11	1.92E-15	5.36E-17	2.29E-11	1.92E-15
^{126}Sn	0.00E+00	0.00E+00	0.00E+00	7.06E-19	3.01E-13	5.85E-14	7.06E-19	3.01E-13	5.85E-14
^{90}Sr	0.00E+00	0.00E+00	0.00E+00	3.10E-14	1.32E-08	2.11E-13	3.10E-14	1.32E-08	2.11E-13
^{99}Tc	0.00E+00	0.00E+00	0.00E+00	1.53E-13	6.54E-08	8.51E-09	1.53E-13	6.54E-08	8.51E-09
^{232}Th	0.00E+00	0.00E+00	0.00E+00	6.70E-22	2.86E-16	5.73E-12	6.70E-22	2.86E-16	5.73E-12
^{233}U	0.00E+00	0.00E+00	0.00E+00	3.88E-20	1.65E-14	3.79E-15	3.88E-20	1.65E-14	3.79E-15
^{234}U	0.00E+00	0.00E+00	0.00E+00	2.71E-20	1.16E-14	4.11E-15	2.71E-20	1.16E-14	4.11E-15
^{235}U	0.00E+00	0.00E+00	0.00E+00	1.07E-21	4.56E-16	4.65E-13	1.07E-21	4.56E-16	4.65E-13
^{236}U	0.00E+00	0.00E+00	0.00E+00	1.83E-21	7.81E-16	2.66E-14	1.83E-21	7.81E-16	2.66E-14
^{238}U	0.00E+00	0.00E+00	0.00E+00	2.12E-20	9.04E-15	5.93E-11	2.12E-20	9.04E-15	5.93E-11

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	1.20E-08	2.50E-08	2.82E-03	1.28E-06	1.48E-05
50-32-8	5.98E-09	1.26E-08	1.42E-03	6.46E-07	7.48E-06
56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57-14-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58-90-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59-89-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60-35-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62-75-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64-19-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-05-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-12-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83-32-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84-66-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84-74-2	4.07E-09	9.46E-09	1.07E-03	4.85E-07	5.61E-06
87-68-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88-89-1	7.86E-27	1.50E-26	1.69E-21	7.70E-25	8.91E-24
91-20-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95-50-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98-86-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100-21-0	1.36E-13	1.89E-13	2.13E-08	9.70E-12	1.12E-10
101-84-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-93-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-95-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	2.88E-11	4.28E-11	4.83E-06	2.19E-09	2.54E-08
120-82-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122-39-4	1.15E-09	1.62E-09	1.83E-04	8.30E-08	9.61E-07
126-73-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129-00-0	7.53E-10	1.27E-09	1.43E-04	6.51E-08	7.54E-07
132-64-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
144-62-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
193-39-5	1.92E-14	4.43E-14	4.99E-09	2.27E-12	2.63E-11
206-44-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
208-96-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
603-34-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
621-64-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1321-64-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1336-36-3	1.50E-15	4.04E-15	4.56E-10	2.07E-13	2.40E-12
3697-24-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4170-30-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10061-01-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
26140-60-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table A-11 HMP06 Stream Report

Stream Number: HMP06
Stream Name: Melter offgas (primary)
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Data File: H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Variable	Value	Units	
Density	4.13E-04	g/cm³	(does not include solid phase)
Enthalpy	-4.44E+06	BTU/hr	
Mass Flow	2.21E+03	Lb/hr	
	5.31E+04	Lb/day	
Volumetric Flow	1.06E+04	GPM	(does not include solid phase)
	1.42E+03	ft³/min	(does not include solid phase)
Molar Flow	9.24E+01	Lbmol/hr	
Molecular Weight	2.36E+01	Lb/Lbmol	
Pressure	9.76E+02	mbar	
Temperature	4.00E+02	C	
Na Molarity	0.00E+00	mol/L	
pH	0.00E+00	pH	
Total TRU	3.25E-07	Ci/L	
Total Activity	1.07E-04	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	1.33E+02	1.74E-02	5.25E+04	5.26E+04	2.39E+01	2.77E+02
Ag^+	0.00E+00	0.00E+00	0.00E+00	1.21E-01	0.00E+00	0.00E+00	1.21E-01	5.50E-05	6.37E-04
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	6.36E+00	0.00E+00	0.00E+00	6.36E+00	2.89E-03	3.34E-02
As^{+3}	0.00E+00	0.00E+00	0.00E+00	1.26E-02	0.00E+00	0.00E+00	1.26E-02	5.80E-06	6.72E-05
B^{+3}	0.00E+00	0.00E+00	0.00E+00	1.13E+01	0.00E+00	0.00E+00	1.13E+01	5.13E-03	5.93E-02
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	3.24E-02	0.00E+00	0.00E+00	3.24E-02	1.47E-05	1.71E-04
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	2.92E-01	0.00E+00	0.00E+00	2.92E-01	1.33E-04	1.54E-03
Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	2.67E-01	0.00E+00	0.00E+00	2.67E-01	1.21E-04	1.40E-03
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.31E+00	0.00E+00	0.00E+00	1.31E+00	5.94E-04	6.88E-03
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	2.32E-02	0.00E+00	0.00E+00	2.32E-02	1.05E-05	1.22E-04
Cl	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-06	5.65E+00	5.65E+00	2.57E-03	2.97E-02
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04	8.88E+02	8.88E+02	4.03E-01	4.67E+00
CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	1.17E-01	0.00E+00	0.00E+00	1.17E-01	5.32E-05	6.16E-04
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	8.13E-03	0.00E+00	0.00E+00	8.13E-03	3.69E-06	4.27E-05
F^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	4.83E+00	0.00E+00	0.00E+00	4.83E+00	2.20E-03	2.54E-02
H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.70E-03	1.99E+04	1.99E+04	9.07E+00	1.05E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-06	6.43E+00	6.43E+00	2.92E-03	3.38E-02
HCO3-	0.00E+00	0.00E+00	0.00E+00	7.99E-21	0.00E+00	0.00E+00	7.99E-21	3.63E-24	4.21E-23
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.57E-06	1.93E+01	1.93E+01	8.76E-03	1.01E-01
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	7.49E+00	0.00E+00	0.00E+00	7.49E+00	3.41E-03	3.94E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	0.00E+00	0.00E+00	0.00E+00	1.61E+00	0.00E+00	0.00E+00	1.61E+00	7.31E-04	8.47E-03
La^{+3}	0.00E+00	0.00E+00	0.00E+00	1.21E-01	0.00E+00	0.00E+00	1.21E-01	5.51E-05	6.38E-04
Li^+	0.00E+00	0.00E+00	0.00E+00	1.40E+00	0.00E+00	0.00E+00	1.40E+00	6.38E-04	7.38E-03
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	7.81E-02	0.00E+00	0.00E+00	7.81E-02	3.55E-05	4.11E-04
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	6.33E-01	0.00E+00	0.00E+00	6.33E-01	2.88E-04	3.33E-03
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.45E-03	2.30E+04	2.30E+04	1.05E+01	1.21E+02
Na^+	0.00E+00	0.00E+00	0.00E+00	1.26E+01	0.00E+00	0.00E+00	1.26E+01	5.72E-03	6.62E-02
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-06	2.51E+00	2.51E+00	1.14E-03	1.32E-02
NH4+	0.00E+00	0.00E+00	0.00E+00	1.23E-17	0.00E+00	0.00E+00	1.23E-17	5.58E-21	6.46E-20
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	2.39E-01	0.00E+00	0.00E+00	2.39E-01	1.08E-04	1.26E-03
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-04	3.98E+02	3.98E+02	1.80E-01	2.08E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.70E-06	5.68E+01	5.68E+01	2.58E-02	2.99E-01
NO_2^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-03	8.14E+03	8.14E+03	3.70E+00	4.28E+01
O^-	0.00E+00	0.00E+00	0.00E+00	4.98E+01	0.00E+00	0.00E+00	4.98E+01	2.27E-02	2.62E-01
OH^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OH(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	3.48E-01	0.00E+00	0.00E+00	3.48E-01	1.58E-04	1.83E-03
Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	5.71E-03	0.00E+00	0.00E+00	5.71E-03	2.60E-06	3.01E-05
PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	3.24E+00	0.00E+00	0.00E+00	3.24E+00	1.47E-03	1.71E-02
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	1.01E-02	0.00E+00	0.00E+00	1.01E-02	4.58E-06	5.30E-05
Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	8.66E-01	0.00E+00	0.00E+00	8.66E-01	3.94E-04	4.56E-03
S^{-6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SiO2	0.00E+00	0.00E+00	0.00E+00	2.74E+01	0.00E+00	0.00E+00	2.74E+01	1.24E-02	1.44E-01
SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	9.04E-09	0.00E+00	0.00E+00	9.04E-09	4.11E-12	4.76E-11
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-06	1.43E+01	1.43E+01	6.52E-03	7.54E-02
SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	1.81E-02	0.00E+00	0.00E+00	1.81E-02	8.21E-06	9.51E-05
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	1.65E-03	0.00E+00	0.00E+00	1.65E-03	7.51E-07	8.69E-06
Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	1.53E+00	0.00E+00	0.00E+00	1.53E+00	6.97E-04	8.07E-03
Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	7.68E-01	0.00E+00	0.00E+00	7.68E-01	3.49E-04	4.04E-03

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	4.79E+02	0.00E+00	0.00E+00	4.79E+02	2.18E-01	2.52E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB. NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: A-23

$C_2O_4^{2}$	0.00E+00	0.00E+00	0.00E+00	4.79E+02	0.00E+00	0.00E+00	4.79E+02	2.18E-01	2.52E+00
Formate	0.00E+00	0.00E+00	0.00E+00	9.17E-08	0.00E+00	0.00E+00	9.17E-08	4.17E-11	4.82E-10
Acetate	0.00E+00	0.00E+00	0.00E+00	9.32E-08	0.00E+00	0.00E+00	9.32E-08	4.23E-11	4.90E-10
Glycolate	0.00E+00	0.00E+00	0.00E+00	4.58E-08	0.00E+00	0.00E+00	4.58E-08	2.08E-11	2.41E-10
IDA	0.00E+00	0.00E+00	0.00E+00	1.17E-07	0.00E+00	0.00E+00	1.17E-07	5.31E-11	6.15E-10
Citrate	0.00E+00	0.00E+00	0.00E+00	1.00E-07	0.00E+00	0.00E+00	1.00E-07	4.56E-11	5.28E-10
HEDTA	0.00E+00	0.00E+00	0.00E+00	8.22E-08	0.00E+00	0.00E+00	8.22E-08	3.74E-11	4.33E-10
EDTA	0.00E+00	0.00E+00	0.00E+00	8.84E-08	0.00E+00	0.00E+00	8.84E-08	4.02E-11	4.65E-10

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	0.00E+00	0.00E+00	0.00E+00	1.07E-04	6.18E+03	2.12E+01	1.07E-04	6.18E+03	2.12E+01
^{241}Am	0.00E+00	0.00E+00	0.00E+00	2.57E-07	1.48E+01	9.55E-03	2.57E-07	1.48E+01	9.55E-03
^{243}Am	0.00E+00	0.00E+00	0.00E+00	2.09E-11	1.20E-03	1.33E-05	2.09E-11	1.20E-03	1.33E-05
^{14}C	0.00E+00	0.00E+00	0.00E+00	1.22E-09	7.01E-02	3.46E-05	1.22E-09	7.01E-02	3.46E-05
^{60}Co	0.00E+00	0.00E+00	0.00E+00	2.29E-08	1.32E+00	2.58E-06	2.29E-08	1.32E+00	2.58E-06
^{243}Cm	0.00E+00	0.00E+00	0.00E+00	2.90E-10	1.67E-02	7.29E-07	2.90E-10	1.67E-02	7.29E-07
^{244}Cm	0.00E+00	0.00E+00	0.00E+00	6.58E-09	3.80E-01	1.04E-05	6.58E-09	3.80E-01	1.04E-05
^{137}Cs	0.00E+00	0.00E+00	0.00E+00	8.84E-05	5.10E+03	1.30E-01	8.84E-05	5.10E+03	1.30E-01
^{152}Eu	0.00E+00	0.00E+00	0.00E+00	1.10E-09	6.36E-02	8.07E-07	1.10E-09	6.36E-02	8.07E-07
^{154}Eu	0.00E+00	0.00E+00	0.00E+00	1.20E-07	6.90E+00	5.63E-05	1.20E-07	6.90E+00	5.63E-05
^{155}Eu	0.00E+00	0.00E+00	0.00E+00	1.77E-08	1.02E+00	4.64E-06	1.77E-08	1.02E+00	4.64E-06
^{3}H	0.00E+00	0.00E+00	0.00E+00	2.96E-08	1.71E+00	3.91E-07	2.96E-08	1.71E+00	3.91E-07
^{129}I	0.00E+00	0.00E+00	0.00E+00	5.18E-11	2.99E-03	3.73E-02	5.18E-11	2.99E-03	3.73E-02
^{63}Ni	0.00E+00	0.00E+00	0.00E+00	3.42E-09	1.98E-01	7.66E-06	3.42E-09	1.98E-01	7.66E-06
^{237}Np	0.00E+00	0.00E+00	0.00E+00	1.70E-10	9.79E-03	3.08E-02	1.70E-10	9.79E-03	3.08E-02
^{238}Pu	0.00E+00	0.00E+00	0.00E+00	8.05E-10	4.65E-02	5.98E-06	8.05E-10	4.65E-02	5.98E-06
^{239}Pu	0.00E+00	0.00E+00	0.00E+00	7.13E-09	4.12E-01	1.46E-02	7.13E-09	4.12E-01	1.46E-02
^{240}Pu	0.00E+00	0.00E+00	0.00E+00	1.88E-09	1.09E-01	1.06E-03	1.88E-09	1.09E-01	1.06E-03
^{241}Pu	0.00E+00	0.00E+00	0.00E+00	5.05E-08	2.92E+00	6.24E-05	5.05E-08	2.92E+00	6.24E-05
^{242}Pu	0.00E+00	0.00E+00	0.00E+00	1.73E-13	1.00E-05	5.60E-06	1.73E-13	1.00E-05	5.60E-06
^{125}Sb	0.00E+00	0.00E+00	0.00E+00	5.28E-08	3.05E+00	6.47E-06	5.28E-08	3.05E+00	6.47E-06
^{151}Sm	0.00E+00	0.00E+00	0.00E+00	4.92E-07	2.84E+01	2.38E-03	4.92E-07	2.84E+01	2.38E-03
^{126}Sn	0.00E+00	0.00E+00	0.00E+00	2.07E-10	1.19E-02	2.32E-03	2.07E-10	1.19E-02	2.32E-03
^{90}Sr	0.00E+00	0.00E+00	0.00E+00	1.64E-05	9.44E+02	1.51E-02	1.64E-05	9.44E+02	1.51E-02
^{99}Tc	0.00E+00	0.00E+00	0.00E+00	1.23E-06	7.12E+01	9.26E+00	1.23E-06	7.12E+01	9.26E+00
^{232}Th	0.00E+00	0.00E+00	0.00E+00	5.61E-12	3.24E-04	6.49E+00	5.61E-12	3.24E-04	6.49E+00
^{233}U	0.00E+00	0.00E+00	0.00E+00	4.59E-10	2.65E-02	6.06E-03	4.59E-10	2.65E-02	6.06E-03
^{234}U	0.00E+00	0.00E+00	0.00E+00	2.39E-11	1.38E-03	4.91E-04	2.39E-11	1.38E-03	4.91E-04
^{235}U	0.00E+00	0.00E+00	0.00E+00	5.76E-13	3.32E-05	3.39E-02	5.76E-13	3.32E-05	3.39E-02
^{236}U	0.00E+00	0.00E+00	0.00E+00	7.93E-13	4.57E-05	1.56E-03	7.93E-13	4.57E-05	1.56E-03
^{238}U	0.00E+00	0.00E+00	0.00E+00	1.36E-11	7.82E-04	5.13E+00	1.36E-11	7.82E-04	5.13E+00

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	1.99E-06	1.54E-06	2.34E-01	1.07E-02	1.23E-01
50-32-8	9.41E-09	1.98E-08	3.02E-01	1.37E-04	1.59E-03
56-23-5	6.24E-29	8.01E-29	1.22E-21	5.55E-25	6.42E-24
57-14-7	6.36E-10	3.19E-10	4.86E-03	2.21E-06	2.56E-05
58-90-2	3.23E-10	6.25E-10	9.52E-03	4.33E-06	5.01E-05
59-89-2	9.53E-17	9.24E-17	1.41E-09	6.40E-13	7.41E-12
60-35-5	9.14E-09	4.51E-09	6.87E-02	3.12E-05	3.61E-04
62-75-9	1.17E-08	7.27E-09	1.11E-01	5.03E-05	5.83E-04
64-19-7	6.65E-14	3.33E-14	5.08E-07	2.31E-10	2.67E-09
71-43-2	2.84E-22	1.85E-22	2.82E-15	1.28E-18	1.48E-17
75-05-8	1.56E-11	5.35E-12	8.16E-05	3.71E-08	4.29E-07
75-12-7	7.17E-08	2.69E-08	4.11E-01	1.87E-04	2.16E-03
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	8.12E-24	8.90E-24	1.36E-16	6.17E-20	7.14E-19
83-32-9	7.11E-17	9.16E-17	1.40E-09	6.34E-13	7.34E-12
84-66-2	1.05E-08	1.95E-08	2.97E-01	1.35E-04	1.56E-03
84-74-2	3.71E-09	8.63E-09	1.31E-01	5.96E-05	6.92E-04
87-68-3	2.84E-24	6.19E-24	9.44E-17	4.29E-20	4.96E-19
88-89-1	1.41E-08	2.70E-08	4.11E-01	1.87E-04	2.16E-03
91-20-3	1.51E-16	1.61E-16	2.45E-09	1.12E-12	1.29E-11
95-50-1	4.97E-18	6.10E-18	9.29E-11	4.22E-14	4.89E-13
98-86-2	3.04E-10	3.06E-10	4.66E-03	2.12E-06	2.45E-05
100-21-0	2.05E-08	2.84E-08	4.33E-01	1.97E-04	2.28E-03
101-84-8	1.07E-17	1.53E-17	2.33E-10	1.06E-13	1.22E-12
106-93-4	2.86E-17	4.49E-17	6.84E-10	3.11E-13	3.60E-12
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	7.01E-23	5.39E-23	8.22E-16	3.74E-19	4.32E-18
108-95-2	3.10E-08	2.44E-08	3.71E-01	1.69E-04	1.95E-03
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	6.09E-12	9.06E-12	1.38E-04	6.28E-08	7.26E-07
120-82-1	1.39E-18	2.11E-18	3.21E-11	1.46E-14	1.69E-13
122-39-4	7.67E-10	1.08E-09	1.65E-02	7.50E-06	8.68E-05
126-73-8	8.46E-09	1.89E-08	2.87E-01	1.31E-04	1.51E-03
127-18-4	1.07E-28	1.49E-28	2.27E-21	1.03E-24	1.19E-23
129-00-0	2.56E-10	4.31E-10	6.58E-03	2.99E-06	3.46E-05
132-64-9	7.40E-14	1.04E-13	1.58E-06	7.20E-10	8.33E-09
144-62-7	1.79E-06	1.35E-06	2.05E+01	9.34E-03	1.08E-01
193-39-5	1.53E-15	3.54E-15	5.40E-08	2.45E-11	2.84E-10
206-44-0	5.46E-17	9.21E-17	1.40E-09	6.38E-13	7.39E-12
208-96-8	8.00E-13	1.02E-12	1.55E-05	7.04E-09	8.15E-08
603-34-9	7.38E-10	1.51E-09	2.30E-02	1.05E-05	1.21E-04
621-64-7	8.48E-17	9.21E-17	1.40E-09	6.38E-13	7.39E-12
1321-64-8	3.66E-17	9.17E-17	1.40E-09	6.35E-13	7.35E-12
1336-36-3	9.75E-16	2.62E-15	3.99E-08	1.82E-11	2.10E-10
3697-24-3	4.56E-17	9.22E-17	1.41E-09	6.39E-13	7.40E-12
4170-30-3	1.50E-10	8.75E-11	1.33E-03	6.06E-07	7.02E-06
10061-01-5	2.04E-20	1.89E-20	2.87E-13	1.31E-16	1.51E-15
26140-60-3	4.79E-17	9.20E-17	1.40E-09	6.37E-13	7.38E-12

Table A-12 HOP10 Stream Report

Stream Number: HOP10
Stream Name: HLW vessel ventilation header offgas
Configuration: MRQ-05-0049.acmf
Run Date / Time: 12/14/2005 - 1:42:25 PM
Run Date File: H:\ACM v9.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties Variable	Value	Units	
Density	1.15E-03	g/cm^3	(does not include solid phase)
Enthalpy	-1.25E+05	BTU/hr	
Mass Flow	1.15E+03	Lb/hr	
	2.76E+04	Lb/day	
Volumetric Flow	2.00E+03	GPM	(does not include solid phase)
	2.67E+02	ft^3/min	(does not include solid phase)
Molar Flow	4.03E+01	Lbmol/hr	
Molecular Weight	2.85E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	2.55E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	5.25E+00	pH	
Total TRU	2.10E-11	Ci/L	
Total Activity	4.66E-09	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	4.95E-07	7.58E-08	2.18E-01	3.02E-03	4.03E-02	2.76E+04	2.76E+04	1.25E+01	1.45E+02
Ag^+	8.93E-16	8.04E-16	2.31E-09	7.25E-07	0.00E+00	0.00E+00	7.27E-07	3.31E-10	3.83E-09
Al^{+3}	1.06E-11	2.43E-12	7.00E-06	1.20E-04	0.00E+00	0.00E+00	1.27E-04	5.78E-08	6.69E-07
As^{+3}	3.94E-15	2.46E-15	7.08E-09	4.67E-06	0.00E+00	0.00E+00	5.37E-06	2.44E-11	2.83E-10
B^{+3}	6.05E-12	5.46E-13	1.57E-06	6.62E-05	0.00E+00	0.00E+00	6.78E-05	3.08E-08	3.57E-07
Ba^{+2}	8.21E-16	9.41E-16	2.71E-09	6.46E-07	0.00E+00	0.00E+00	6.49E-07	2.95E-10	3.41E-09
Bi^{+3}	9.65E-16	1.68E-15	4.84E-09	3.39E-06	0.00E+00	0.00E+00	3.40E-06	1.54E-09	1.79E-08
Ca^{+2}	5.88E-14	1.97E-14	5.66E-08	3.95E-06	0.00E+00	0.00E+00	4.00E-06	1.82E-09	2.11E-08
Cd^{+2}	1.52E-15	1.43E-15	4.10E-09	2.62E-06	0.00E+00	0.00E+00	2.63E-06	1.19E-09	1.38E-08
Ce^{+3}	6.97E-11	8.15E-11	2.35E-04	8.05E-07	0.00E+00	0.00E+00	2.35E-04	1.07E-07	1.24E-06
Cl^-	3.29E-11	9.73E-12	2.80E-05	7.84E-07	0.00E+00	0.00E+00	2.88E-05	1.31E-08	1.51E-07
CO	9.78E-111	2.29E-111	6.57E-105	0.00E+00	0.00E+00	0.00E+00	6.57E-105	2.99E-108	3.46E-107
CO_2	7.54E-16	2.77E-16	7.96E-10	0.00E+00	1.18E-32	1.24E-26	7.96E-10	3.62E-13	4.19E-12
CO_3^{-2}	8.65E-12	4.33E-12	1.25E-05	2.19E-04	0.00E+00	0.00E+00	2.31E-04	1.05E-07	1.22E-06
Cr^{+3}	5.22E-12	2.27E-12	6.52E-06	2.02E-06	0.00E+00	0.00E+00	8.54E-06	3.88E-09	4.49E-08
Cu^{+2}	1.51E-15	8.00E-16	2.30E-09	2.74E-07	0.00E+00	0.00E+00	2.76E-07	1.26E-10	1.45E-09
F^-	1.16E-12	1.84E-13	5.30E-07	1.43E-05	0.00E+00	0.00E+00	1.48E-05	6.72E-09	7.78E-08
Fe^{+3}	1.73E-11	8.07E-12	2.32E-05	1.16E-04	0.00E+00	0.00E+00	1.39E-04	6.33E-08	7.32E-07
H_2O	4.85E-07	7.29E-08	2.10E-01	0.00E+00	1.21E-03	5.22E+02	5.22E+02	2.37E-01	2.74E+00
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	2.73E-12	2.29E-14	6.60E-08	0.00E+00	0.00E+00	0.00E+00	6.60E-08	3.00E-11	3.47E-10
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	6.68E-15	3.50E-15	1.01E-08	0.00E+00	0.00E+00	0.00E+00	1.01E-08	4.58E-12	5.30E-11
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	1.58E-15	2.65E-15	7.61E-09	1.55E-06	0.00E+00	0.00E+00	1.55E-06	7.06E-10	8.17E-09
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	4.51E-12	1.47E-12	4.23E-06	2.22E-06	0.00E+00	0.00E+00	6.45E-06	2.93E-09	3.40E-08
La^{+3}	4.19E-16	4.85E-16	1.40E-09	1.21E-06	0.00E+00	0.00E+00	1.21E-06	5.52E-10	6.39E-09
Li^+	7.45E-14	4.31E-15	1.24E-08	2.81E-05	0.00E+00	0.00E+00	2.81E-05	1.28E-08	1.48E-07
Mg^{+2}	1.24E-14	2.53E-15	7.26E-09	9.77E-07	0.00E+00	0.00E+00	9.85E-07	4.48E-10	5.18E-09
Mn^{+3}	1.35E-14	6.19E-15	1.78E-08	9.48E-06	0.00E+00	0.00E+00	9.50E-06	4.32E-09	5.00E-08
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	3.51E-13	8.20E-14	2.36E-07	0.00E+00	3.09E-02	2.07E+04	2.07E+04	9.43E+00	1.09E+02
Na^+	4.70E-09	9.02E-10	2.59E-03	1.74E-04	0.00E+00	0.00E+00	2.77E-03	1.26E-06	1.46E-05
NH3	5.72E-13	8.13E-14	2.34E-07	0.00E+00	0.00E+00	0.00E+00	2.34E-07	1.06E-10	1.23E-09
NH4+	4.59E-14	8.13E-14	1.99E-08	0.00E+00	0.00E+00	0.00E+00	1.99E-08	9.03E-12	1.04E-10
Ni^{+2}	2.36E-12	1.16E-12	3.33E-06	4.22E-06	0.00E+00	0.00E+00	7.55E-06	3.43E-09	3.97E-08
NO	6.16E-36	1.54E-36	4.44E-30	0.00E+00	0.00E+00	0.00E+00	4.44E-30	2.02E-33	2.33E-32
NO_3	8.69E-49	3.34E-49	9.59E-43	0.00E+00	0.00E+00	0.00E+00	9.59E-43	4.36E-46	5.05E-45
NO_2^-	2.35E-11	9.01E-12	2.59E-05	3.97E-05	0.00E+00	0.00E+00	6.56E-05	2.98E-08	3.45E-07
NO_3^-	3.14E-09	1.62E-09	4.67E-03	3.06E-05	0.00E+00	0.00E+00	4.70E-03	2.14E-06	2.47E-05
O_2	1.13E-13	3.02E-14	8.69E-06	0.00E+00	8.20E-03	6.30E+03	6.30E+03	2.86E+00	3.31E+01
O^-	0.00E+00	0.00E+00	0.00E+00	1.91E-04	0.00E+00	0.00E+00	1.91E-04	8.68E-08	1.00E-06
OH-	1.80E-09	2.55E-10	7.33E-04	6.28E-04	0.00E+00	0.00E+00	1.36E-03	6.19E-07	7.16E-06
OH(b)	2.39E-11	3.40E-12	9.77E-06	3.98E-26	0.00E+00	0.00E+00	9.77E-06	4.44E-09	5.14E-08
Pb^{+2}	5.52E-15	9.54E-15	2.74E-08	5.54E-06	0.00E+00	0.00E+00	5.57E-06	2.53E-09	2.93E-08
Pd^{+2}	4.27E-16	3.79E-16	1.09E-09	2.27E-07	0.00E+00	0.00E+00	2.29E-07	1.04E-10	1.20E-09
PO_4^{-3}	4.42E-13	3.50E-13	1.01E-06	2.50E-05	0.00E+00	0.00E+00	2.60E-05	1.18E-08	1.37E-07
Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rh^{+3}	4.13E-16	3.54E-16	1.02E-09	7.36E-06	0.00E+00	0.00E+00	7.46E-06	3.39E-11	3.93E-10
Ru^{+3}	6.13E-16	5.17E-16	1.49E-09	6.83E-07	0.00E+00	0.00E+00	6.84E-07	3.11E-10	3.60E-09
S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.70E-23	0.00E+00	0.00E+00	1.70E-23	7.75E-27	8.97E-26
SiO2	8.35E-14	4.19E-14	1.20E-07	1.26E-03	0.00E+00	0.00E+00	1.26E-03	5.72E-07	6.63E-06
SiO_4^{-4}	6.38E-26	4.90E-26	1.41E-19	4.37E-13	0.00E+00	0.00E+00	4.37E-13	1.99E-16	2.30E-15
SO_2	9.36E-52	5.00E-52	1.44E-45	0.00E+00	0.00E+00	0.00E+00	1.44E-45	6.54E-49	7.57E-48
SO_4^{-2}	1.05E-12	8.45E-13	2.43E-06	9.18E-06	0.00E+00	0.00E+00	1.16E-05	5.28E-09	6.11E-08
Sr^{+2}	2.77E-16	2.02E-16	5.82E-10	3.61E-07	0.00E+00	0.00E+00	3.62E-07	1.64E-10	1.90E-09
Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl^{+4}	6.88E-16	2.75E-16	7.91E-10	6.11E-07	0.00E+00	0.00E+00	6.11E-07	2.78E-10	3.22E-09
Zn^{+2}	2.57E-15	1.40E-15	4.04E-09	3.07E-05	0.00E+00	0.00E+00	3.07E-05	1.40E-08	1.62E-07
Zr^{+4}	1.90E-15	1.45E-15	4.16E-09	2.92E-05	0.00E+00	0.00E+00	2.92E-05	1.33E-08	1.54E-07

Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
Total	5.56E-13	4.08E-13	1.17E-06	1.09E-04	0.00E+00	0.00E+00	1.10E-04	5.01E-08	5.80E-07

$C_2O_4^{2-}$	5.56E-13	4.08E-13	1.17E-06	1.09E-04	0.00E+00	0.00E+00	1.10E-04	5.01E-08	5.80E-07
Formate	3.96E-25	1.49E-25	4.27E-19	2.02E-14	0.00E+00	0.00E+00	2.02E-14	9.17E-18	1.06E-16
Acetate	3.07E-25	1.51E-25	4.34E-19	2.05E-14	0.00E+00	0.00E+00	2.05E-14	9.32E-18	1.08E-16
Glycolate	2.04E-24	1.28E-24	3.68E-18	1.01E-14	0.00E+00	0.00E+00	1.01E-14	4.58E-18	5.30E-17
IDA	9.56E-25	1.06E-24	3.05E-18	2.57E-14	0.00E+00	0.00E+00	2.57E-14	1.17E-17	1.35E-16
Citrate	8.73E-26	1.40E-25	4.03E-19	2.21E-14	0.00E+00	0.00E+00	2.21E-14	1.00E-17	1.16E-16
HEDTA	4.09E-25	9.50E-25	2.73E-18	1.81E-14	0.00E+00	0.00E+00	1.81E-14	8.22E-18	9.52E-17
EDTA	4.92E-26	1.20E-25	3.45E-19	1.94E-14	0.00E+00	0.00E+00	1.94E-14	8.84E-18	1.02E-16

Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
Total	2.46E-09	2.68E-02	1.03E-06	2.20E-09	2.39E-02	1.75E-04	4.66E-09	5.07E-02	1.78E-04
^{241}Am	8.37E-15	9.11E-08	5.86E-11	1.58E-11	1.72E-04	1.11E-07	1.58E-11	1.72E-04	1.11E-07
^{243}Am	5.47E-18	5.95E-11	6.58E-13	1.28E-15	1.39E-08	1.54E-10	1.28E-15	1.40E-08	1.54E-10
^{14}C	1.72E-16	1.87E-09	9.23E-13	1.12E-15	1.22E-08	6.00E-12	1.29E-15	1.40E-08	6.92E-12
^{60}Co	1.13E-15	1.23E-08	2.39E-14	1.75E-12	1.90E-05	3.71E-11	1.75E-12	1.90E-05	3.71E-11
^{243}Cm	9.07E-19	9.87E-12	4.31E-16	2.21E-14	2.41E-07	1.05E-11	2.21E-14	2.41E-07	1.05E-11
^{244}Cm	2.15E-17	2.34E-10	6.37E-15	5.03E-13	5.47E-06	1.49E-10	5.03E-13	5.48E-06	1.49E-10
^{137}Cs	2.48E-09	2.68E-02	8.60E-07	3.57E-10	3.89E-03	9.87E-06	2.82E-09	3.07E-02	7.78E-07
^{152}Eu	6.30E-17	6.86E-10	8.70E-15	8.41E-14	9.16E-07	1.16E-11	8.42E-14	9.17E-07	1.16E-11
^{154}Eu	1.31E-14	1.42E-07	1.16E-12	9.12E-12	9.92E-05	8.10E-10	9.13E-12	9.94E-05	8.11E-10
^{155}Eu	3.77E-15	4.11E-08	1.87E-13	1.35E-12	1.47E-05	6.67E-11	1.35E-12	1.47E-05	6.69E-11
^{3}H	3.68E-15	4.01E-08	9.20E-15	2.84E-14	3.10E-07	7.11E-14	3.21E-14	3.50E-07	8.03E-14
^{129}I	5.27E-18	5.73E-11	7.16E-10	5.54E-17	6.03E-10	7.52E-09	6.06E-17	6.60E-10	8.24E-09
^{95}Nb	2.02E-14	2.20E-07	8.54E-12	3.03E-13	3.30E-06	1.28E-10	3.23E-13	3.52E-06	1.37E-10
^{237}Np	6.65E-18	7.24E-11	2.27E-10	1.29E-14	1.41E-07	4.41E-07	1.30E-14	1.41E-07	4.41E-07
^{238}Pu	3.75E-17	4.08E-10	5.25E-14	6.15E-14	6.69E-07	8.61E-11	6.15E-14	6.70E-07	8.62E-11
^{239}Pu	5.18E-16	5.64E-09	2.00E-10	5.44E-13	5.93E-06	2.11E-07	5.45E-13	5.93E-06	2.11E-07
^{240}Pu	1.34E-16	1.46E-09	1.42E-11	1.44E-13	1.56E-06	1.52E-08	1.44E-13	1.57E-06	1.52E-08
^{241}Pu	2.82E-15	3.07E-08	6.57E-13	3.86E-12	4.20E-05	8.99E-10	3.86E-12	4.20E-05	8.99E-10
^{242}Pu	1.42E-20	1.55E-13	8.66E-14	1.32E-17	1.44E-10	8.06E-11	1.32E-17	1.44E-10	8.07E-11
^{125}Sb	7.80E-15	8.49E-08	1.80E-13	5.59E-12	6.09E-05	1.29E-10	5.60E-12	6.10E-05	1.30E-10
^{151}Sm	1.09E-13	1.19E-06	9.97E-11	6.77E-11	7.37E-04	6.17E-08	6.78E-11	7.38E-04	6.18E-08
^{126}Sn	1.24E-16	1.35E-09	2.62E-10	2.62E-14	2.85E-07	5.54E-08	2.63E-14	2.87E-07	5.56E-08
^{90}Sr	3.25E-12	3.54E-05	5.65E-10	1.73E-09	1.88E-02	3.01E-07	1.73E-09	1.88E-02	3.01E-07
^{99}Tc	2.18E-14	2.35E-07	3.06E-08	3.97E-12	4.32E-05	5.62E-06	3.99E-12	4.34E-05	5.65E-06
^{232}Th	2.02E-19	2.20E-12	4.41E-08	4.28E-16	4.66E-09	9.35E-05	4.29E-16	4.67E-09	9.35E-05
^{233}U	6.74E-18	7.34E-11	1.68E-11	3.51E-14	3.82E-07	8.74E-06	3.51E-14	3.82E-07	8.74E-06
^{234}U	4.78E-18	5.21E-11	1.85E-11	1.82E-15	1.99E-08	7.05E-09	1.83E-15	1.99E-08	7.07E-09
^{235}U	1.88E-19	2.05E-12	2.09E-09	4.36E-17	4.77E-10	4.87E-07	4.40E-17	4.79E-10	4.89E-07
^{236}U	3.23E-19	3.51E-12	1.20E-10	6.02E-17	6.56E-10	2.24E-08	6.05E-17	6.59E-10	2.25E-08
^{238}U	3.73E-18	4.07E-11	2.67E-07	1.03E-15	1.12E-08	7.37E-05	1.04E-15	1.13E-08	7.40E-05

(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.

CAS Comp	Organic Components				
Unit	mol/L	Lb/gal	Lb/day	Mt/day	g/sec
Total	4.14E-09	4.96E-09	1.43E-02	6.49E-06	7.51E-05
50-32-8	2.29E-10	4.82E-10	1.39E-03	6.31E-07	7.30E-06
56-23-5	2.92E-25	3.76E-25	1.08E-18	4.91E-22	5.68E-21
57-14-7	4.33E-10	2.17E-10	6.24E-04	2.84E-07	3.28E-06
58-90-2	1.55E-10	3.00E-10	8.62E-04	3.92E-07	4.53E-06
59-89-2	1.63E-14	1.58E-14	4.54E-08	2.06E-11	2.39E-10
60-35-5	5.43E-12	2.68E-12	7.69E-06	3.50E-09	4.05E-08
62-75-9	1.14E-09	7.05E-10	2.03E-03	9.22E-07	1.07E-05
64-19-7	1.14E-11	5.70E-12	1.64E-05	7.45E-09	8.62E-08
71-43-2	1.15E-18	7.47E-19	2.15E-12	9.76E-16	1.13E-14
75-05-8	3.09E-11	1.06E-11	3.04E-05	1.38E-08	1.60E-07
75-12-7	5.31E-12	2.00E-12	5.74E-06	2.61E-09	3.02E-08
76-15-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79-01-6	9.82E-20	1.08E-19	3.10E-13	1.41E-16	1.63E-15
83-32-9	1.22E-14	1.56E-14	4.50E-08	2.05E-11	2.37E-10
84-66-2	3.42E-10	8.34E-10	1.82E-03	8.29E-07	9.59E-06
84-74-2	3.58E-10	8.33E-10	2.39E-03	1.09E-06	1.26E-05
87-68-3	3.80E-20	8.26E-20	2.38E-13	1.08E-16	1.25E-15
88-89-1	1.27E-14	2.44E-14	7.01E-08	3.19E-11	3.69E-10
91-20-3	7.07E-15	7.56E-15	2.18E-08	9.89E-12	1.14E-10
95-50-1	8.49E-16	1.04E-15	3.00E-09	1.36E-12	1.58E-11
98-86-2	1.72E-10	1.73E-10	4.97E-04	2.26E-07	2.61E-06
100-21-0	4.23E-16	5.86E-16	1.69E-09	7.66E-13	8.87E-12
101-84-8	1.84E-15	2.61E-15	7.50E-09	3.41E-12	3.95E-11
106-93-4	2.56E-15	4.02E-15	1.16E-08	5.25E-12	6.08E-11
106-97-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-87-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	4.01E-19	3.06E-19	8.86E-13	4.03E-16	4.66E-15
108-95-2	5.50E-10	4.32E-10	1.24E-03	5.64E-07	6.53E-06
110-54-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110-82-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111-84-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	2.03E-11	3.02E-11	8.68E-05	3.95E-08	4.57E-07
120-82-1	4.47E-16	6.77E-16	1.95E-09	8.85E-13	1.02E-11
122-39-4	1.39E-10	1.97E-10	5.65E-04	2.57E-07	2.97E-06
126-73-8	6.78E-11	1.51E-10	4.33E-04	1.97E-07	2.28E-06
127-18-4	1.68E-23	2.33E-23	6.71E-17	3.05E-20	3.53E-19
129-00-0	1.67E-10	2.82E-10	8.10E-04	3.68E-07	4.26E-06
132-64-9	1.25E-12	1.75E-12	5.04E-06	2.29E-09	2.65E-08
144-62-7	1.37E-11	1.03E-11	2.95E-05	1.34E-08	1.55E-07
193-39-5	2.62E-13	6.05E-13	1.74E-06	7.91E-10	9.15E-09
206-44-0	9.33E-15	1.57E-14	4.53E-08	2.06E-11	2.38E-10
208-96-8	6.08E-12	7.73E-12	2.22E-05	1.01E-08	1.17E-07
603-34-9	2.15E-10	4.40E-10	1.27E-03	5.76E-07	6.66E-06
621-64-7	1.45E-14	1.57E-14	4.53E-08	2.06E-11	2.38E-10
1321-64-8	6.25E-15	1.57E-14	4.51E-08	2.05E-11	2.37E-10
1336-36-3	4.19E-14	1.13E-13	3.24E-07	1.47E-10	1.70E-09
3697-24-3	7.79E-15	1.56E-14	4.53E-08	2.06E-11	2.38E-10
4170-30-3	7.88E-11	4.61E-11	1.33E-04	6.02E-08	6.97E-07
10061-01-5	2.12E-17	1.96E-17	5.64E-11	2.56E-14	2.97E-13
26140-60-3	8.18E-15	1.57E-14	4.52E-08	2.06E-11	2.38E-10

Attachment B - Calculations

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CALCULATION SHEET

BY: E. Borrios
DATE: 01/09/06

PROJECT: WTP
JOB NO: 24590
CALC NO: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO: B-2

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Table B-1 Feed Rate		Feed rate:	1.51E+00	ft3/min											
2				42.9	l/min											
3																
4								Feed Rate								
5	CAS #	COPC	Conc (mg/L)	In ACM	Group	Grouping	Phase	g/sec								
6	100-00-5	p-Nitrochlorobenzene	40.0	No		10	vapor	2.86E-02		Coplanar PCBs		PVP01				
7	100-21-0	p-Phthalic acid	60.0	Yes	1	1	vapor	4.29E-02				g/sec				
8	100-41-4	Ethyl benzene	4.0	No		20	vapor	2.86E-03		31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	1.24E-06				
9	100-42-5	Styrene	4.0	No		19	vapor	2.86E-03		32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	1.24E-06		Correction for Coplanar PCBs		
10	10061-01-5	cis-1,3-Dichloropropene	4.0	Yes	19	19	vapor	2.86E-03		32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	1.24E-06		1 as parent		
11	10061-02-6	trans-1,3-Dichloropropene	4.0	No		17	vapor	2.86E-03		32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	1.24E-06		0.01 as coplanar sum		
12	101-55-3	4-Bromophenylphenyl ether	60.0	No		14	vapor	4.29E-02		35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	1.24E-06				
13	101-84-8	Diphenyl ether	10.0	Yes	16	16	vapor	7.14E-03		35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	1.24E-06				
14	106-35-4	3-Heptanone	4.0	No		14	vapor	2.86E-03		38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	1.24E-06				
15	106-42-3	p-Xylene (Dimethyl benzene)	10.0	No		19	vapor	7.14E-03		39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1.24E-06				
16	106-46-7	1,4-Dichlorobenzene	4.0	No		18	vapor	2.86E-03		52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	1.24E-06				
17	106-88-7	1,2-Epoxybutane	10.0	No		15	vapor	7.14E-03		57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	1.24E-06				
18	106-93-4	Ethylene dibromide (Dibromethane)	4.0	Yes	16	16	vapor	2.86E-03		65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	1.24E-06				
19	106-97-8	Butane	10.0	Yes	28	28	vapor	7.14E-03		69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	1.24E-06				
20	106-99-0	1,3-Butadiene	4.0	Yes	23	23	vapor	2.86E-03		70362-50-4	3,4,4',5-Tetrachlorobiphenyl	1.24E-06				
21	107-02-8	Acrolein	10.0	No		14	vapor	7.14E-03		74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	1.24E-06				
22	107-05-1	3-Chloropropene (Allyl chloride)	4.0	No		20	vapor	2.86E-03								
23	107-06-2	1,2-Dichloroethane (Ethylene chloride)	4.0	No		17	vapor	2.86E-03		1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03				
24	107-12-0	Propionitrile	10.0	No		13	vapor	7.14E-03		1336-36-3	UnCorrected (for coplanar PCBs)	1.74E-03				
25	107-13-1	Acrylonitrile	20.0	No		14	vapor	1.43E-02								
26	107-18-6	2-Propene-1-ol	60.0	No		10	vapor	4.29E-02								
27	107-31-3	Formic acid, methyl ester	60.0	No		15	vapor	4.29E-02								
28	107-66-4	Dibutylphosphate	60.0	No		5	particle bound	4.29E-02								
29	107-87-9	2-Pentanone	20.0	No		14	vapor	1.43E-02								
30	108-03-2	1-Nitropropane	60.0	No		14	vapor	4.29E-02								
31	108-05-4	Vinyl acetate	60.0	No		16	vapor	4.29E-02								
32	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	10.0	No		14	vapor	7.14E-03								
33	108-20-3	Bis(isopropyl)ether	10.0	No		18	vapor	7.14E-03								
34	108-38-3	m-Xylene (Dimethyl benzene)	10.0	No		19	vapor	7.14E-03								
35	108-39-4	m-Cresol	10.0	No		9	vapor	7.14E-03								
36	108-87-2	Methylcyclohexane	10.0	Yes	25	25	vapor	7.14E-03								
37	108-88-3	Toluene	4.0	Yes	19	19	vapor	2.86E-03								
38	108-90-7	Chlorobenzene	4.0	No		19	vapor	2.86E-03								
39	108-93-0	Cyclohexanol	10.0	No		10	vapor	7.14E-03								
40	108-94-1	Cyclohexanone	10.0	No		11	vapor	7.14E-03								
41	108-95-2	Phenol	60.0	Yes	8	8	vapor	4.29E-02								
42	109-66-0	n-Pentane	10.0	No		28	vapor	7.14E-03								
43	109-99-9	Tetrahydrofuran	4.0	No		13	vapor	2.86E-03								
44	110-12-3	5-Methyl-2-hexanone	4.0	No		15	vapor	2.86E-03								
45	110-43-0	2-Heptanone	4.0	No		15	vapor	2.86E-03								
46	110-54-3	n-Hexane	10.0	Yes	27	27	vapor	7.14E-03								
47	110-62-3	n-Valeraldehyde	60.0	No		15	vapor	4.29E-02								
48	110-82-7	Cyclohexane	10.0	Yes	24	24	vapor	7.14E-03								
49	110-83-8	Cyclohexene	4.0	No		22	vapor	2.86E-03								
50	110-86-1	Pyridine	20.0	No		11	vapor	1.43E-02								
51	111-65-9	n-Octane	10.0	No		28	vapor	7.14E-03								
52	111-76-2	Ethylene glycol monobutyl ether	60.0	No		9	vapor	4.29E-02								
53	111-84-2	n-Nonane	10.0	Yes	28	28	vapor	7.14E-03								
54	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	60.0	No		30	particle bound	4.29E-02								
55	117-84-0	n-Dioctyl phthalate	60.0	No		32	particle bound	4.29E-02								
56	120-12-7	Anthracene	60.0	Yes	13	13	particle bound	4.29E-02								
57	120-82-1	1,2,4-Trichlorobenzene	10.0	Yes	17	17	vapor	7.14E-03								
58	120-83-2	2,4-Dichlorophenol	60.0	No		10	vapor	4.29E-02								
59	121-44-8	Triethylamine	10.0	No		15	vapor	7.14E-03								
60	121-69-7	Dimethylaniline	10.0	No		13	vapor	7.14E-03								
61	122-39-4	N,N-Diphenylamine	20.0	Yes	10	10	vapor	1.43E-02								
62	123-19-3	4-Heptanone	4.0	No		13	vapor	2.86E-03								
63	123-38-6	n-Propionaldehyde	20.0	No		14	vapor	1.43E-02								
64	123-51-3	3-Methyl-1-butanol	10.0	No		12	vapor	7.14E-03								
65	123-86-4	Acetic acid n-butyl ester	0.2	No		16	vapor	1.35E-04								
66	123-91-1	1,4-Dioxane	2.0	No		10	vapor	1.43E-03								
67	126-73-8	Tributyl phosphate	40.0	Yes	7	7	particle bound	2.86E-02								
68	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	10.0	No		16	vapor	7.14E-03								
69	127-18-4	Perchloroethylene (tetrachloroethylene)	4.0	Yes	21	21	vapor	2.86E-03								
70	127-19-5	N,N-Dimethylacetamide	10.0	No		5	vapor	7.14E-03								
71	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	20.0	No		32	vapor	1.43E-02								
72	129-00-0	Pyrene	60.0	Yes	33	33	particle bound	4.29E-02								
73	1321-64-8	Pentachloronaphthalene	60.0	Yes	14	14	particle bound	4.29E-02								
74	1321-65-9	Trichloronaphthalene	60.0	No		15	particle bound	4.29E-02								
75	132-64-9	Dibenzofuran	60.0	Yes	15	15	particle bound	4.29E-02								
76	1335-87-1	Hexachloronaphthalene	60.0	No		14	particle bound	4.29E-02								
77	1335-88-2	Tetrachloronaphthalene	60.0	No		15	particle bound	4.29E-02								
78	1336-36-3	Polychlorinated biphenyls (PCBs)	0.7	Yes	35	35	vapor	1.74E-03								
79	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	0.2	No		14	vapor	1.35E-04								
80	141-79-7	4-Methyl-3-penten-2-one	60.0	No		13	vapor	4.29E-02								
81	142-82-5	n-Heptane	10.0	No		27	vapor	7.14E-03								
82	144-62-7	Oxalic acid	3000.0	Yes	3	3	vapor	2.14E+00								
83	156-60-5	trans-1,2-Dichloroethylene	10.0	No		20	vapor	7.14E-03								
84	1634-04-4	Methyl tert-butyl ether	10.0	No		18	vapor	7.14E-03								
85	189-55-9	Dibenzo[a,i]pyrene	60.0	No		5	particle	4.29E-02								
86	189-64-0	Dibenzo[a,h]pyrene	60.0	No		5	particle	4.29E-02								
87	191-24-2	Benzo[g,h,i]perylene	60.0	No		30	particle bound	4.29E-02								
88	191-30-0	Benzo[a,l]pyrene	60.0	No		5	particle	4.29E-02								
89	192-65-4	Dibenzo[a,e]pyrene	60.0	No		5	particle	4.29E-02								
90	193-39-5	Indeno(1,2,3-cd)pyrene	60.0	Yes	30	30	particle	4.29E-02								
91	206-44-0	Fluoranthene	60.0	Yes	33	33	particle bound	4.29E-02								
92	208-96-8	Acenaphthylene	60.0	Yes	14	14	vapor	4.29E-02								
93	2234-13-1	Octachloronaphthalene	0.2	No		14	particle bound	1.35E-04								
94	224-42-0	Dibenz[a,j]acridine	60.0	No		4	particle bound	4.29E-02								
95	226-36-8	Dibenz[a,h]acridine	60.0	No		4	particle bound	4.29E-02								
96	25551-13-7	Trimethyl benzene	10.0	No		19	vapor	7.14E-03								
97	26140-60-3	Terphenyls	60.0	Yes	34	34	particle bound	4.29E-02								
98	27154-33-2	Trichlorofluoroethane	10.0	No		23	vapor	7.14E-03								
99	287-92-3	Cyclopentane	10.0	No		24	vapor	7.14E-03								
100	3697-24-3	5-Methylchrysene	60.0	Yes	32	32	particle bound	4.29E-02								
101	3825-26-1	Ammonium perfluorooctanoate	60.0	No		14	vapor	4.29E-02								
102	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	10.0	Yes	11	11	vapor	7.14E-03								
103	50-00-0	Formaldehyde	10.0	No		8	vapor	7.14E-03								
104	50-32-8	Benzo(a)pyrene	38.0	Yes	30	30	particle bound	2.72E-02								
105	53-70-3	Dibenzo(a,h)anthracene	38.0	No		7	particle bound	2.72E-02								
106	540-59-0	1,2-Dichloroethylene	10.0	No		19	vapor	7.14E-03								
107	540-84-1	2,2,4-Trimethylpentane	10.0	No		28	vapor	7.14E-03								
108	541-73-1	1,3-Dichlorobenzene	4.0	No		19	vapor	2.86E-03								
109	56-23-5	Carbon tetrachloride	4.0	Yes	22	22	vapor	2.86E-03								
110	563-80-4	3-Methyl-2-butanone	10.0	No		14	vapor	7.14E-03								
111	56-49-5	3-Methylcholanthrene	60.0	No		28	particle bound	4.29E-02								
112	57-14-7	1,1-Dimethylhydrazine	60.0	Yes	12	12	vapor	4.29E-02								
113	58-90-2	2,3,4,6-Tetrachlorophenol	60.0	Yes	11	11	vapor	4.29E-02								
114	591-78-6	2-Hexanone	10.0	No		14	vapor	7.14E-03								
115	59-50-7	4-Chloro-3-methylphenol	60.0	No		32	vapor	4.29E-02								
116	59-89-2	N-Nitrosomorpholine	60.0	Yes	6	6	vapor	4.29E-02								
117	602-87-9	5-Nitroacenaphthene	60.0	No		9	particle bound	4.29E-02								
118	60-29-7	Ethyl ether	60.0	No		17	vapor	4.29E-02								
119	603-34-9	Triphenylamine	60.0	Yes	32	32	vapor	4.29E-02								
120	60-34-4	Methylhydrazine	10.0	No		10	vapor	7.14E-03								
121	60-35-5	Acetamide	10.0	Yes	5	5	vapor	7.14E-03								
122	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	60.0	Yes	10	10	vapor	4.29E-02								
123	624-83-9	Methyl isocyanate	10.0	No		7	vapor	7.14E-03								
124	627-13-4	Nitric acid, propyl ester	5.0	No		7	vapor	3.57E-03								
125	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	60.0	Yes	9	9	vapor	4.29E-02								
126	630-20-6	1,1,1,2-Tetrachloroethane	10.0	No		18	vapor	7.14E-03								
127	64-17-5	Ethyl alcohol	10.0	No		10	vapor	7.14E-03								
128	64-18-6	Formic acid	15000.0	No		7	vapor	1.07E+01								
129	64-19-7	Acetic acid	21704.0	Yes	6	6	vapor	1.55E+01								
130	67-56-1	Methyl alcohol (Methanol)	10.0	No		10	vapor	7.14E-03								
131	67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	2.0	No		11	vapor	1.43E-03								
132	67-64-1	2-Propanone (Acetone)	20.0	No		13	vapor	1.43E-02								
133	67-66-3	Chloroform	4.0	No		19	vapor	2.86E-03								
134	67-72-1	Hexachloroethane	60.0	No		19	vapor	4.29E-02								
135	684-16-2	Hexafluoroacetone	10.0	No		19	vapor	7.14E-03								
136	71-23-8	n-Propyl alcohol	4.0	No		11	vapor	2.86E-03								
137	71-36-3	n-Butyl alcohol	10.0	No		11	vapor	7.14E-03								
138	71-43-2	Benzene	4.0	Yes	19	19	vapor	2.86E-03								
139	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	4.0	No		21	vapor	2.86E-03								
140	74-83-9	Bromomethane (Methyl bromide)	4.0	No		19	vapor	2.86E-03								
141	74-87-3	Chloromethane (Methyl chloride)	4.0	No		20	vapor	2.86E-03								
142	74-97-5	Bromochloromethane	10.0	No		17	vapor	7.14E-03								
143	74-99-7	Methylacetylene	60.0	No		20	vapor	4.29E-02								
144	75-00-3	Chloroethane	4.0	No		20	vapor	2.86E-03								
145	75-01-4	Vinyl chloride (1-Chloroethene)	4.0	No		22	vapor	2.86E-03								
146	75-05-8	Acetonitrile	10.0	Yes	13	13	vapor	7.14E-03								
147	75-07-0	Acetaldehyde	60.0	No		13	vapor	4.29E-02								
148	75-09-2	Dichloromethane (Methylene chloride)	4.0	No		19	vapor	2.86E-03								
149	75-12-7	Formamide	60.0	Yes	4	4	vapor	4.29E-02								
150	75-15-0	Carbon disulfide	10.0	No		20	vapor	7.14E-03								
151	75-21-8	Ethylene oxide (Oxirane)	2.0	No		15	vapor	1.43E-03								
152	75-27-4	Bromodichloromethane	10.0	No		18	vapor	7.14E-03								
153	75-34-3	1,1-Dichloroethane	4.0	No		19	vapor	2.86E-03								
154	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	10.0	No		22	vapor	7.14E-03								

CALCULATION SHEET

BY: E. Bernos
DATE: 01/09/06

PROJECT: WTP
JOB NO: 24590
CALC NO: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO: B-3

	A	B	C	D	E	F	G	H
4								Feed Rate
5	CAS #	COPC	Conc (mg/L)	In ACM	Group	Grouping	Phase	g/sec
155	75-43-4	Dichlorofluoromethane	4.0	No		20	vapor	2.86E-03
156	75-45-6	Chlorodifluoromethane	4.0	No		22	vapor	2.86E-03
157	75-50-3	Trimethylamine	10.0	No		14	vapor	7.14E-03
158	75-52-5	Nitromethane	60.0	No		13	vapor	4.29E-02
159	75-55-8	2-Methylaziridine	60.0	No		11	vapor	4.29E-02
160	75-61-6	Difluorodibromomethane	10.0	No		22	vapor	7.14E-03
161	75-63-8	Trifluorobromomethane	10.0	No		25	vapor	7.14E-03
162	75-65-0	2-Methyl-2-propanol	10.0	No		11	vapor	7.14E-03
163	75-69-4	Trichlorofluoromethane	10.0	No		23	vapor	7.14E-03
164	75-71-8	Dichlorodifluoromethane	10.0	No		25	vapor	7.14E-03
165	76-03-9	Trichloroacetic acid	10.0	No		5	vapor	7.14E-03
166	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	60.0	No		24	vapor	4.29E-02
167	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	60.0	No		23	vapor	4.29E-02
168	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	10.0	No		25	vapor	7.14E-03
169	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	10.0	No		28	vapor	7.14E-03
170	76-15-3	Chloropentafluoroethane	10.0	Yes	29	29	vapor	7.14E-03
171	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	60.0	No		11	vapor	4.29E-02
172	78-87-5	1,2-Dichloropropane	4.0	No		19	vapor	2.86E-03
173	78-92-2	1-Methylpropyl alcohol (2-Butanol)	4.0	No		11	vapor	2.86E-03
174	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	10.0	No		13	vapor	7.14E-03
175	79-00-5	1,1,2-Trichloroethane	10.0	No		17	vapor	7.14E-03
176	79-01-6	Trichloroethylene	10.0	Yes	20	20	vapor	7.14E-03
177	79-09-4	Propionic acid	60.0	No		8	vapor	4.29E-02
178	79-10-7	2-Propenoic acid	80.0	No		8	vapor	5.72E-02
179	79-20-9	Methyl acetate	60.0	No		14	vapor	4.29E-02
180	79-34-5	1,1,2,2-Tetrachloroethane	0.0	No		16	vapor	1.35E-05
181	83-32-9	Acenaphthene	60.0	Yes	15	15	vapor	4.29E-02
182	84-66-2	Diethyl phthalate	60.0	Yes	8	8	vapor	4.29E-02
183	84-74-2	Dibutyl phthalate	60.0	Yes	31	31	particle bound	4.29E-02
184	85-01-8	Phenanthrene	60.0	No		13	particle bound	4.29E-02
185	85-68-7	Butylbenzyl phthalate	60.0	No		31	particle bound	4.29E-02
186	86-73-7	Fluorene	60.0	No		14	vapor	4.29E-02
187	87-68-3	Hexachlorobutadiene	10.0	Yes	20	20	vapor	7.14E-03
188	88-06-2	2,4,6-Trichlorophenol	60.0	No		10	vapor	4.29E-02
189	88-72-2	2-Nitrotoluene	10.0	No		12	vapor	7.14E-03
190	88-75-5	2-Nitrophenol	60.0	No		12	vapor	4.29E-02
191	88-89-1	Picric acid	60.0	Yes	2	2	#N/A	4.29E-02
192	91-20-3	Naphthalene	2.0	Yes	16	16	vapor	1.43E-03
193	91-22-5	Quinoline	60.0	No		9	vapor	4.29E-02
194	91-58-7	2-Chloronapthalene	60.0	No		16	vapor	4.29E-02
195	92-52-4	1,1'-Biphenyl	40.0	No		16	vapor	2.86E-02
196	92-93-3	4-Nitrobiphenyl	60.0	No		10	particle bound	4.29E-02
197	95-13-6	Indene	60.0	No		18	vapor	4.29E-02
198	95-47-6	o-Xylene	4.0	No		19	vapor	2.86E-03
199	95-48-7	o-Cresol (2-Methylphenol)	10.0	No		9	vapor	7.14E-03
200	95-49-8	2-Chlorotoluene	60.0	No		19	vapor	4.29E-02
201	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	4.0	Yes	18	18	vapor	2.86E-03
202	95-57-8	2-Chlorophenol	60.0	No		11	vapor	4.29E-02
203	95-95-4	2,4,5-Trichlorophenol	60.0	No		9	vapor	4.29E-02
204	96-22-0	3-Pentanone	20.0	No		14	vapor	1.43E-02
205	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	60.0	No		19	vapor	4.29E-02
206	98-51-1	p-tert-Butyltoluene	60.0	No		21	vapor	4.29E-02
207	98-82-8	Cumene	60.0	No		20	vapor	4.29E-02
208	98-83-9	alpha-Methylstyrene	10.0	No		19	vapor	7.14E-03
209	98-86-2	Acetophenone	40.0	Yes	11	11	vapor	2.86E-02
210	98-95-3	Nitrobenzene	40.0	No		12	vapor	2.86E-02

Table B-2 PVP01 - Unabated Pretreatment Vessel Vent System

Row	CAS #	COPC	Feed Rate g/sec	In ACM	Group	Grouping	Phase	PVP01 rate g/sec	Performance factor	Adjusted PF	Calc'd rate PVP01 g/sec	Corrected PVP01 g/sec
4	100-00-5	p-Nitrochlorobenzene	2.86E-02	No		10	vapor			5.43E-01	1.55E-02	1.55E-02
5	100-21-0	p-Phthalic acid	4.29E-02	Yes	1	1	vapor	2.38E-09	5.55E-08		2.38E-09	2.38E-09
6	100-41-4	Ethyl benzene	2.86E-03	No		20	vapor			1.00E+00	2.86E-03	2.86E-03
7	100-42-5	Styrene	2.86E-03	No		19	vapor			1.00E+00	2.86E-03	2.86E-03
8	10061-01-5	cis-1,3-Dichloropropene	2.86E-03	Yes	19	19	vapor	2.85E-03	9.98E-01		2.85E-03	2.85E-03
9	10061-02-6	trans-1,3-Dichloropropene	2.86E-03	No		17	vapor			9.89E-01	2.83E-03	2.83E-03
10	101-55-3	4-Bromophenylphenyl ether	4.29E-02	No		14	vapor			8.14E-01	3.49E-02	3.49E-02
11	101-84-8	Diphenyl ether	7.14E-03	Yes	16	16	vapor	6.98E-03	9.77E-01		6.98E-03	6.98E-03
12	106-35-4	3-Heptanone	2.86E-03	No		14	vapor			8.14E-01	2.33E-03	2.33E-03
13	106-42-3	p-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			1.00E+00	7.15E-03	7.15E-03
14	106-46-7	1,4-Dichlorobenzene	2.86E-03	No		18	vapor			9.76E-01	2.79E-03	2.79E-03
15	106-88-7	1,2-Epoxybutane	7.14E-03	No		15	vapor			8.86E-01	6.33E-03	6.33E-03
16	106-93-4	Ethylene dibromide (Dibromethane)	2.86E-03	Yes	16	16	vapor	2.72E-03	9.53E-01		2.72E-03	2.72E-03
17	106-97-8	Butane	7.14E-03	Yes	26	26	vapor	7.16E-03	1.00E+00		7.16E-03	7.16E-03
18	106-99-0	1,3-Butadiene	2.86E-03	Yes	23	23	vapor	2.86E-03	1.00E+00		2.86E-03	2.86E-03
19	107-02-8	Acrolein	7.14E-03	No		14	vapor			8.14E-01	5.82E-03	5.82E-03
20	107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	No		20	vapor			1.00E+00	2.86E-03	2.86E-03
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.86E-03	No		17	vapor			9.89E-01	2.83E-03	2.83E-03
22	107-12-0	Propionitrile	7.14E-03	No		13	vapor			4.16E-01	2.97E-03	2.97E-03
23	107-13-1	Acrylonitrile	1.43E-02	No		14	vapor			8.14E-01	1.16E-02	1.16E-02
24	107-18-6	2-Propene-1-ol	4.29E-02	No		10	vapor			5.43E-01	2.33E-02	2.33E-02
25	107-31-3	Formic acid, methyl ester	4.29E-02	No		15	vapor			8.86E-01	3.80E-02	3.80E-02
26	107-66-4	Dibutylphosphate	4.29E-02	No		5	particle bound			1.18E-03	5.07E-05	5.07E-05
27	107-87-9	2-Pentanone	1.43E-02	No		14	vapor			8.14E-01	1.16E-02	1.16E-02
28	108-03-2	1-Nitropropane	4.29E-02	No		14	vapor			8.14E-01	3.49E-02	3.49E-02
29	108-05-4	Vinyl acetate	4.29E-02	No		16	vapor			9.47E-01	4.06E-02	4.06E-02
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.14E-03	No		14	vapor			8.14E-01	5.82E-03	5.82E-03
31	108-20-3	Bis(isopropyl)ether	7.14E-03	No		18	vapor			9.76E-01	6.97E-03	6.97E-03
32	108-38-3	m-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			1.00E+00	7.15E-03	7.15E-03
33	108-39-4	m-Cresol	7.14E-03	No		9	vapor			8.39E-02	6.00E-04	6.00E-04
34	108-87-2	Methylcyclohexane	7.14E-03	Yes	25	25	vapor	7.17E-03	1.00E+00		7.17E-03	7.17E-03
35	108-88-3	Toluene	2.86E-03	Yes	19	19	vapor	2.86E-03	1.00E+00		2.86E-03	2.86E-03
36	108-90-7	Chlorobenzene	2.86E-03	No		19	vapor			1.00E+00	2.86E-03	2.86E-03
37	108-93-0	Cyclohexanol	7.14E-03	No		10	vapor			5.43E-01	3.88E-03	3.88E-03
38	108-94-1	Cyclohexanone	7.14E-03	No		11	vapor			1.74E-01	1.24E-03	1.24E-03
39	108-95-2	Phenol	4.29E-02	Yes	8	8	vapor	1.31E-03	3.06E-02		1.31E-03	1.31E-03
40	109-66-0	n-Pentane	7.14E-03	No		26	vapor			1.00E+00	7.16E-03	7.16E-03
41	109-99-9	Tetrahydrofuran	2.86E-03	No		13	vapor			4.16E-01	1.19E-03	1.19E-03
42	110-12-3	5-Methyl-2-hexanone	2.86E-03	No		15	vapor			8.86E-01	2.53E-03	2.53E-03
43	110-43-0	2-Heptanone	2.86E-03	No		15	vapor			8.86E-01	2.53E-03	2.53E-03
44	110-54-3	n-Hexane	7.14E-03	Yes	27	27	vapor	7.18E-03	1.00E+00		7.18E-03	7.18E-03
45	110-62-3	n-Valeraldehyde	4.29E-02	No		15	vapor			8.86E-01	3.80E-02	3.80E-02
46	110-82-7	Cyclohexane	7.14E-03	Yes	24	24	vapor	7.17E-03	1.00E+00		7.17E-03	7.17E-03
47	110-83-8	Cyclohexene	2.86E-03	No		22	vapor			1.00E+00	2.86E-03	2.86E-03
48	110-86-1	Pyridine	1.43E-02	No		11	vapor			1.74E-01	2.48E-03	2.48E-03
49	111-65-9	n-Octane	7.14E-03	No		28	vapor			1.00E+00	7.16E-03	7.16E-03
50	111-76-2	Ethylene glycol monobutyl ether	4.29E-02	No		9	vapor			8.39E-02	3.60E-03	3.60E-03
51	111-84-2	n-Nonane	7.14E-03	Yes	28	28	vapor	7.16E-03	1.00E+00		7.16E-03	7.16E-03
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.29E-02	No		30	particle bound			3.44E+00	1.48E-01	1.48E-01
53	117-84-0	n-Dioctyl phthalate	4.29E-02	No		32	particle bound			5.55E-01	2.38E-02	2.38E-02
54	120-12-7	Anthracene	4.29E-02	Yes	13	13	particle bound	2.02E-02	4.70E-01		2.02E-02	2.02E-02
55	120-82-1	1,2,4-Trichlorobenzene	7.14E-03	Yes	17	17	vapor	7.07E-03	9.89E-01		7.07E-03	7.07E-03
56	120-83-2	2,4-Dichlorophenol	4.29E-02	No		10	vapor			5.43E-01	2.33E-02	2.33E-02
57	121-44-8	Triethylamine	7.14E-03	No		15	vapor			8.86E-01	6.33E-03	6.33E-03
58	121-69-7	Dimethylaniline	7.14E-03	No		13	vapor			4.16E-01	2.97E-03	2.97E-03
59	122-39-4	N,N-Diphenylamine	1.43E-02	Yes	10	10	vapor	1.57E-03	1.10E-01		1.57E-03	1.57E-03
60	123-19-3	4-Heptanone	2.86E-03	No		13	vapor			4.16E-01	1.19E-03	1.19E-03
61	123-38-6	n-Propionaldehyde	1.43E-02	No		14	vapor			8.14E-01	1.16E-02	1.16E-02
62	123-51-3	3-Methyl-1-butanol	7.14E-03	No		12	vapor			1.99E-01	1.42E-03	1.42E-03
63	123-86-4	Acetic acid n-butyl ester	1.36E-04	No		16	vapor			9.47E-01	1.28E-04	1.28E-04
64	123-91-1	1,4-Dioxane	1.43E-03	No		10	vapor			5.43E-01	7.76E-04	7.76E-04
65	126-73-8	Tributyl phosphate	2.86E-02	Yes	7	7	particle bound	4.56E-04	1.59E-02		4.56E-04	4.56E-04
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	7.14E-03	No		16	vapor			9.47E-01	6.77E-03	8.77E-03
67	127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	Yes	21	21	vapor	2.86E-03	1.00E+00		2.86E-03	2.86E-03
68	127-19-5	N,N-Dimethylacetamide	7.14E-03	No		5	vapor			1.18E-03	8.46E-06	8.46E-06
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.43E-02	No		32	vapor			5.56E-01	7.93E-03	7.93E-03
70	129-00-0	Pyrene	4.29E-02	Yes	33	33	particle bound	9.35E-03	2.18E-01		9.35E-03	9.35E-03
71	1321-64-8	Pentachloronaphthalene	4.29E-02	Yes	14	14	particle bound	4.19E-02	9.78E-01		4.19E-02	4.19E-02
72	1321-65-9	Trichloronaphthalene	4.29E-02	No		15	particle bound			8.86E-01	3.80E-02	3.80E-02
73	132-64-9	Dibenzofuran	4.29E-02	Yes	15	15	particle bound	3.41E-02	7.96E-01		3.41E-02	3.41E-02
74	1335-87-1	Hexachloronaphthalene	4.29E-02	No		14	particle bound			8.14E-01	3.49E-02	3.49E-02
75	1335-88-2	Tetrachloronaphthalene	4.29E-02	No		15	particle bound			8.86E-01	3.80E-02	3.80E-02
76	1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03	Yes	35	35	vapor	4.31E-03	2.48E+00		4.26E-03	4.26E-03
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.36E-04	No		14	vapor			8.14E-01	1.10E-04	1.10E-04
78	141-79-7	4-Methyl-3-penten-2-one	4.29E-02	No		13	vapor			4.16E-01	1.78E-02	1.78E-02
79	142-82-5	n-Heptane	7.14E-03	No		27	vapor			1.00E+00	7.16E-03	7.16E-03
80	144-62-7	Oxalic acid	2.14E+00	Yes	3	3	vapor	3.27E-05	1.52E-05		3.27E-05	3.27E-05
81	156-60-5	trans-1,2-Dichloroethylene	7.14E-03	No		20	vapor			1.00E+00	7.15E-03	7.15E-03
82	1634-04-4	Methyl tert-butyl ether	7.14E-03	No		16	vapor			9.47E-01	6.77E-03	6.77E-03
83	189-55-9	Dibenzo(a,i)pyrene	4.29E-02	No		5	particle			1.18E-03	5.07E-05	5.07E-05
84	189-64-0	Dibenzo(a,h)pyrene	4.29E-02	No		5	particle			1.18E-03	5.07E-05	5.07E-05
85	191-24-2	Benzo(g,h,i)perylene	4.29E-02	No		30	particle bound			3.44E+00	1.48E-01	1.48E-01
86	191-30-0	Benzo(a,l)pyrene	4.29E-02	No		5	particle			1.18E-03	5.07E-05	5.07E-05
87	192-65-4	Dibenzo(a,e)pyrene	4.29E-02	No		5	particle			1.18E-03	5.07E-05	5.07E-05
88	193-39-5	Indeno(1,2,3-cd)pyrene	4.29E-02	Yes	30	30	particle	2.93E-01	6.83E+00		2.93E-01	2.93E-01
89	206-44-0	Fluoranthene	4.29E-02	Yes	33	33	particle bound	4.19E-02	9.77E-01		4.19E-02	4.19E-02
90	208-96-8	Acenaphthylene	4.29E-02	Yes	14	14	vapor	2.79E-02	6.51E-01		2.79E-02	2.79E-02
91	2234-13-1	Octachloronaphthalene	1.36E-04	No		14	particle bound			8.14E-01	1.10E-04	1.10E-04
92	224-42-0	Dibenz[a,j]acridine	4.29E-02	No		4	particle bound			1.48E-04	6.34E-06	6.34E-06
93	226-36-8	Dibenz[a,h]acridine	4.29E-02	No		4	particle bound			1.48E-04	6.34E-06	6.34E-06
94	25551-13-7	Trimethyl benzene	7.14E-03	No		19	vapor			1.00E+00	7.15E-03	7.15E-03
95	26140-60-3	Terphenyls	4.29E-02	Yes	34	34	particle bound	4.19E-02	9.78E-01		4.19E-02	4.19E-02
96	27154-33-2	Trichlorofluoroethane	7.14E-03	No		23	vapor			1.00E+00	7.15E-03	7.15E-03
97	287-92-3	Cyclopentane	7.14E-03	No		24	vapor			1.00E+00	7.17E-03	7.17E-03
98	3697-24-3	5-Methylchrysene	4.29E-02	Yes	32	32	particle bound	4.19E-02	9.78E-01		4.19E-02	4.19E-02
99	3825-26-1	Ammonium perfluorooctanoate	4.29E-02	No		14	vapor			8.14E-01	3.49E-02	3.49E-02
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	7.14E-03	Yes	11	11	vapor	1.25E-03	1.74E-01		1.25E-03	1.25E-03
101	50-00-0	Formaldehyde	7.14E-03	No		8	vapor			3.92E-02	2.80E-04	2.80E-04
102	50-32-8	Benzo(a)pyrene	2.72E-02	Yes	30	30	particle bound	1.40E-03	5.16E-02		1.40E-03	1.40E-03
103	53-70-3	Dibenzo(a,h)anthracene	2.72E-02	No		7	particle bound			1.59E-02	4.33E-04	4.33E-04
104	540-59-0	1,2-Dichloroethylene	7.14E-03	No		19	vapor			1.00E+00	7.15E-03	7.15E-03
105	540-84-1	2,2,4-Trimethylpentane	7.14E-03	No		28	vapor			1.00E+00	7.16E-03	7.16E-03
106	541-73-1	1,3-Dichlorobenzene	2.86E-03	No		19	vapor			1.00E+00	2.86E-03	2.86E-03
107	56-23-5	Carbon tetrachloride	2.86E-03	Yes	22	22	vapor	2.86E-03	1.00E+00		2.86E-03	2.86E-03
108	563-80-4	3-Methyl-2-butanone	7.14E-03	No		14	vapor			8.14E-01	5.82E-03	5.82E-03
109	56-49-5	3-Methylcholanthrene	4.29E-02	No		28	particle bound			1.00E+00	4.30E-02	4.30E-02
110	57-14-7	1,1-Dimethylhydrazine	4.29E-02	Yes	12	12	vapor	8.54E-03	1.99E-01		8.54E-03	8.54E-03
111	58-90-2	2,3,4,6-Tetrachlorophenol	4.29E-02	Yes	11	11	vapor	7.12E-03	1.66E-01		7.12E-03	7.12E-03
112	591-78-6	2-Hexanone	7.14E-03	No		14	vapor			8.14E-01	5.82E-03	5.82E-03
113	59-50-7	4-Chloro-3-methylphenol	4.29E-02	No		32	vapor			5.55E-01	2.38E-02	2.38E-02
114	59-89-2	N-Nitrosomorpholine	4.29E-02	Yes	6	6	vapor	4.19E-02	9.77E-01		4.19E-02	4.19E-02
115	602-87-9	5-Nitroacenaphthene	4.29E-02	No		9	particle bound			8.39E-02	3.60E-03	3.60E-03
116	60-29-7	Ethyl ether	4.29E-02	No		17	vapor			9.89E-01	4.24E-02	4.24E-02
117	603-34-9	Triphenylamine	4.29E-02	Yes	32	32	vapor	5.65E-03	1.32E-01		5.65E-03	5.65E-03
118	60-34-4	Methylhydrazine	7.14E-03	No		10	vapor			5.43E-01	3.88E-03	3.88E-03
119	60-35-5	Acetamide	7.14E-03	Yes	5	5	vapor	8.46E-06	1.18E-03		8.46E-06	8.46E-06
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.29E-02	Yes	10	10	vapor	4.19E-02	9.76E-01		4.19E-02	4.19E-02
121	624-83-9	Methyl isocyanate	7.14E-03	No		17	vapor			9.89E-01	7.07E-03	7.07E-03
122	627-13-4	Nitric acid, propyl ester	3.57E-03	No		17	vapor			9.89E-01	3.53E-03	3.53E-03
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.29E-02	Yes	9	9	vapor	3.60E-03	8.39E-02		3.60E-03	3.60E-03
124	630-20-6	1,1,1,2-Tetrachloroethane	7.14E-03	No		18	vapor			9.76E-01	6.97E-03	6.97E-03
125	64-17-5	Ethyl alcohol	7.14E-03	No		10	vapor			5.43E-01	3.88E-03	3.88E-03
126	64-18-6	Formic acid	1.07E+01	No		7	vapor			1.59E-02	1.71E-01	1.71E-01
127	64-19-7	Acetic acid	1.55E+01	Yes	6	6	vapor	1.51E+01	9.75E-01		1.51E+01	1.51E+01
128	67-56-1	Methyl alcohol (Methanol)	7.14E-03	No		10	vapor			5.43E-01	3.88E-03	3.88E-03
129	67-63-0	2-Propyl alcohol (Isopropanol, Propan-2-01)	1.43E-03	No		11	vapor			1.74E-01	2.48E-04	2.48E-04
130	67-64-1	2-Propanone (Acetone)	1.43E-02	No		13	vapor			4.16E-01	5.94E-03	5.94E-03
131	67-66-3	Chloroform	2.86E-03	No		19	vapor			1.00E+00	2.86E-03	2.86E-03
132	67-72-1	Hexachloroethane	4.29E-02	No		19	vapor			1.00E+00	4.29E-02	4.29E-02
133	684-16-2	Hexafluoroacetone	7.14E-03	No		19	vapor			1.00E+00	7.15E-03	7.15E-03
134	71-23-8	n-Propyl alcohol	2.86E-03	No		11	vapor			1.74E-01	4.98E-04	4.98E-04
135	71-36-3	n-Butyl alcohol	7.14E-03	No		11	vapor			1.74E-01	1.24E-03	1.24E-03
136	71-43-2	Benzene	2.86E-03	Yes	19	19	vapor	2.86E-03	1.00E+00		2.86E-03	2.86E-03
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	No		21	vapor			1.00E+00	2.86E-03	2.86E-03
138	74-83-9	Bromomethane (Methyl bromide)	2.86E-03	No		19	vapor			1.00E+00	2.86E-03	2.86E-03
139	74-87-3	Chloromethane (Methyl chloride)	2.86E-03	No		20	vapor			1.00E+00	2.86E-03	2.86E-03
140	74-97-5	Bromochloromethane	7.14E-03	No		17	vapor			9.89E-01	7.07E-03	7.07E-03
141	74-99-7	Methylacetylene	4.29E-02	No		20	vapor			1.00E+00	4.29E-02	4.29E-02
142	75-00-3	Chloroethane	2.86E-03	No		20	vapor			1.00E+00	2.86E-03	2.86E-03
143	75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	No		22	vapor			1.00E+00	2.86E-03	2.86E-03
144	75-05-8	Acetonitrile	7.14E-03	Yes	13	13	vapor	2.58E-03	3.61E-01		2.58E-03	2.58E-03
145	75-07-0	Acetaldehyde	4.29E-02	No		13	vapor			4.16E-01	1.78E-02	1.78E-02
146	75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	No		19	vapor			1.00E+00	2.86E-03	2.86E-03
147	75-12-7	Formamide	4.29E-02	Yes	4	4	vapor	6.34E-06	1.48E-04		6.34E-06	6.34E-06
148	75-15-0	Carbon disulfide	7.14E-03	No		20	vapor			1.00E+00	7.15E-03	7.15E-03
149	75-21-8	Ethylene oxide (Oxirane)	1.43E-03	No		15	vapor			8.86E-01	1.27E-03	1.27E-03
150	75-27-4	Bromodichloromethane	7.14E-03	No		18	vapor			9.76E-01	6.97E-03	6.97E-03
151	75-34-3	1,1-Dichloroethane	2.86E-03	No		19	vapor			1.00E+00	2.86E-03	2.86E-03
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.14E-03	No		22	vapor			1.00E+00	7.16E-03	7.16E-03
153	75-43-4	Dichlorofluoromethane	2.86E-03	No		20	vapor			1.00E+00	2.86E-03	2.86E-03
154	75-45-6	Chlorodifluoromethane	2.86E-03	No		22	vapor			1.00E+00	2.86E-03	2.86E-03
155	75-50-3	Trimethylamine	7.14E-03	No		14	vapor			8.14E-01	5.82E-03	5.82E-03
156	75-52-5	Nitromethane	4.29E-02	No		13	vapor			4.16E-01	1.78E-02	1.78E-02
157	75-55-8	2-Methylaziridine	4.29E-02	No		11	vapor			1.74E-01	7.45E-03	7.45E-03
158	75-61-6	Difluorodibromomethane	7.14E-03	No		22	vapor			1.00E+00	7.16E-03	7.16E-03
159	75-63-8	Trifluorobromomethane	7.14E-03	No		25	vapor			1.00E+00	7.17E-03	7.17E-03
160	75-65-0	2-Methyl-2-propanol	7.14E-03	No		11	vapor			1.74E-01	1.24E-03	1.24E-03
161	75-69-4	Trichlorofluoromethane	7.14E-03	No		23	vapor			1.00E+00	7.15E-03	7.15E-03
162	75-71-8	Dichlorodifluoromethane	7.14E-03	No		25	vapor			1.00E+00	7.17E-03	7.17E-03
163	76-03-9	Trichloroacetic acid	7.14E-03	No		5	vapor			1.18E-03	8.46E-06	8.46E-06
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.29E-02	No		24	vapor			1.00E+00	4.30E-02	4.30E-02
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	No		23	vapor			1.00E+00	4.29E-02	4.29E-02
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.14E-03	No		25	vapor			1.00E+00	7.17E-03	7.17E-03
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.14E-03	No		28	vapor			1.00E+00	7.16E-03	7.16E-03
168	76-15-3	Chloropentafluoroethane	7.14E-03	Yes	29	29	vapor	7.16E-03	1.00E+00		7.16E-03	7.16E-03
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.29E-02	No		11	vapor			1.74E-01	7.45E-03	7.45E-03
170	78-87-5	1,2-Dichloropropane	2.86E-03	No		19	vapor			1.00E+00	2.86E-03	2.86E-03
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.86E-03	No		11	vapor			1.74E-01	4.96E-04	4.96E-04
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	7.14E-03	No		13	vapor			4.16E-01	2.97E-03	2.97E-03
173	79-00-5	1,1,2-Trichloroethane	7.14E-03	No		17	vapor			9.89E-01	7.07E-03	7.07E-03
174	79-01-6	Trichloroethylene	7.14E-03	Yes	20	20	vapor	7.16E-03	1.00E+00		7.16E-03	7.16E-03
175	79-09-4	Propionic acid	4.29E-02	No		8	vapor			3.92E-02	1.68E-03	1.68E-03
176	79-10-7	2-Propenoic acid	5.72E-02	No		8	vapor			3.92E-02	2.24E-03	2.24E-03
177	79-20-9	Methyl acetate	4.29E-02	No		14	vapor			8.14E-01	3.49E-02	3.49E-02
178	79-34-5	1,1,2,2-Tetrachloroethane	1.35E-05	No		16	vapor			9.47E-01	1.28E-05	1.28E-05
179	83-32-9	Acenaphthene	4.29E-02	Yes	15	15	vapor	4.18E-02	9.73E-01		4.18E-02	4.18E-02
180	84-66-2	Diethyl phthalate	4.29E-02	Yes	8	8	vapor	2.05E-03	4.73E-02		2.05E-03	2.05E-03
181	84-74-2	Dibutyl phthalate	4.29E-02	Yes	31	31	particle bound	4.09E-03	9.54E-02		4.09E-03	4.09E-03
182	85-01-8	Phenanthrene	4.29E-02	No		13	particle bound			4.16E-01	1.78E-02	1.78E-02
183	85-68-7	Butylbenzyl phthalate	4.29E-02	No		31	particle bound			9.54E-02	4.09E-03	4.09E-03
184	86-73-7	Fluorene	4.29E-02	No		14	vapor			8.14E-01	3.49E-02	3.49E-02
185	87-68-3	Hexachlorobutadiene	7.14E-03	Yes	20	20	vapor	7.15E-03	1.00E+00		7.15E-03	7.15E-03
186	88-06-2	2,4,6-Trichlorophenol	4.29E-02	No		10	vapor			5.43E-01	2.33E-02	2.33E-02
187	88-72-2	2-Nitrotoluene	7.14E-03	No		12	vapor			1.99E-01	1.42E-03	1.42E-03
188	88-75-5	2-Nitrophenol	4.29E-02	No		12	vapor			1.99E-01	8.54E-03	8.54E-03
189	88-89-1	Picric acid	4.29E-02	Yes	2	2	#N/A	7.76E-08	1.81E-06		7.76E-08	7.76E-08
190	91-20-3	Naphthalene	1.43E-03	Yes	16	16	vapor	1.30E-03	9.11E-01		1.30E-03	1.30E-03
191	91-22-5	Quinoline	4.29E-02	No		9	vapor			8.39E-02	3.60E-03	3.60E-03
192	91-58-7	2-Chloronapthalene	4.29E-02	No		16	vapor			9.47E-01	4.06E-02	4.06E-02
193	92-52-4	1,1'-Biphenyl	2.86E-02	No		16	vapor			9.47E-01	2.71E-02	2.71E-02
194	92-93-3	4-Nitrobiphenyl	4.29E-02	No		10	particle bound			5.43E-01	2.33E-02	2.33E-02
195	95-13-6	Indene	4.29E-02	No		18	vapor			9.76E-01	4.18E-02	4.18E-02
196	95-47-6	o-Xylene	2.86E-03	No		19	vapor			1.00E+00	2.86E-03	2.86E-03
197	95-48-7	o-Cresol (2-Methylphenol)	7.14E-03	No		9	vapor			8.39E-02	6.00E-04	6.00E-04
198	95-49-8	2-Chlorotoluene	4.29E-02	No		19	vapor			1.00E+00	4.29E-02	4.29E-02
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.86E-03	Yes	18	18	vapor	2.79E-03	9.76E-01		2.79E-03	2.79E-03
200	95-57-8	2-Chlorophenol	4.29E-02	No		11	vapor			1.74E-01	7.45E-03	7.45E-03
201	95-95-4	2,4,5-Trichlorophenol	4.29E-02	No		9	vapor			8.39E-02	3.60E-03	3.60E-03
202	96-22-0	3-Pentanone	1.43E-02	No		14	vapor			8.14E-01	1.16E-02	1.16E-02
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	No		19	vapor			1.00E+00	4.29E-02	4.29E-02
204	98-51-1	p-tert-Butyltoluene	4.29E-02	No		21	vapor			1.00E+00	4.29E-02	4.29E-02
205	98-82-8	Cumene	4.29E-02	No		20	vapor			1.00E+00	4.29E-02	4.29E-02
206	98-83-9	alpha-Methylstyrene	7.14E-03	No		19	vapor			1.00E+00	7.15E-03	7.15E-03
207	98-86-2	Acetophenone	2.86E-02	Yes	11	11	vapor	5.16E-03	1.80E-01		5.16E-03	5.16E-03
208	98-95-3	Nitrobenzene	2.86E-02	No		12	vapor			1.99E-01	5.69E-03	5.69E-03
209											1.81E+01	

Adjusted Performance Factors

Group	PF
1	5.55E-08
2	1.81E-06
3	1.52E-05
4	1.48E-04
5	1.18E-03
6	9.76E-01
7	1.59E-02
8	3.92E-02
9	8.39E-02
10	5.43E-01
11	1.74E-01
12	1.99E-01
13	4.16E-01
14	8.14E-01
15	8.86E-01
16	9.47E-01
17	9.89E-01
18	9.76E-01
19	1.00E+00
20	1.00E+00
21	1.00E+00
22	1.00E+00
23	1.00E+00
24	1.00E+00
25	1.00E+00
26	1.00E+00
27	1.00E+00
28	1.00E+00
29	1.00E+00
30	3.44E+00
31	9.54E-02
32	5.55E-01
33	5.98E-01
34	9.78E-01
35	2.48E+00

Coplanar PCBs

CAS #	Compound	PVP01 g/sec	Corrected PVP01 g/sec
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	3.08E-06	3.08E-06
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	3.08E-06	3.08E-06
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	3.08E-06	3.08E-06
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	3.08E-06	3.08E-06
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	3.08E-06	3.08E-06
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	3.08E-06	3.08E-06
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	3.08E-06	3.08E-06
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	3.08E-06	3.08E-06
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	3.08E-06	3.08E-06
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	3.08E-06	3.08E-06
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	3.08E-06	3.08E-06
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	3.08E-06	3.08E-06
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	3.08E-06	3.08E-06
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	3.08E-06	3.08E-06
1336-36-3	Polychlorinated biphenyls (PCBs)	4.26E-03	
1336-36-3	UnCorrected (for coplanar PCBs)	4.31E-03	

Correction for Coplanar PCBs
0.99 as parent
0.01 as coplanar sum

	A	B	C	D	E	F	G	L	M	N	O	P	Q
1	Table B-3 PVP12 - Abated Pretreatment Vessel Vent System					Fraction				PVP12	PVP12	Total	Corrected
2			PVP01		Fv	vapor	Fraction	TO	Carbon Bed	g/sec	g/sec	PVP12	PVP12
3	CAS #	COPC	g/sec	Phase		adjusted	particle	DF	DF	vapor	particle	g/sec	g/sec
4	100-00-5	p-Nitrochlorobenzene	1.55E-02	vapor	1.000	1.000	0.000	10000	5	3.10E-07	0.00E+00	3.10E-07	3.10E-07
5	100-21-0	p-Phthalic acid	2.38E-09	vapor	1.000	1.000	0.000	20	50	2.38E-12	0.00E+00	2.38E-12	2.38E-12
6	100-41-4	Ethyl benzene	2.86E-03	vapor	1.000	1.000	0.000	10000	1	2.86E-07	0.00E+00	2.86E-07	2.86E-07
7	100-42-5	Styrene	2.86E-03	vapor	1.000	1.000	0.000	10000	1	2.86E-07	0.00E+00	2.86E-07	2.86E-07
8	10061-01-5	cis-1,3-Dichloropropene	2.85E-03	vapor	1.000	1.000	0.000	100	1	2.85E-05	0.00E+00	2.85E-05	2.85E-05
9	10061-02-6	trans-1,3-Dichloropropene	2.83E-03	vapor	1.000	1.000	0.000	50	1	5.65E-05	0.00E+00	5.66E-05	5.65E-05
10	101-55-3	4-Bromophenylphenyl ether	3.49E-02	vapor	1.000	1.000	0.000	3.333333	50	2.09E-04	0.00E+00	2.09E-04	2.09E-04
11	101-84-8	Diphenyl ether	6.98E-03	vapor	1.000	1.000	0.000	50	5	2.79E-05	0.00E+00	2.79E-05	2.79E-05
12	106-35-4	3-Heptanone	2.33E-03	vapor	1.000	1.000	0.000	10000	1	2.33E-07	0.00E+00	2.33E-07	2.33E-07
13	106-42-3	p-Xylene (Dimethyl benzene)	7.15E-03	vapor	1.000	1.000	0.000	1000	1	7.15E-06	0.00E+00	7.15E-06	7.15E-06
14	106-46-7	1,4-Dichlorobenzene	2.79E-03	vapor	1.000	1.000	0.000	50	2	2.79E-05	0.00E+00	2.79E-05	2.79E-05
15	106-88-7	1,2-Epoxybutane	6.33E-03	vapor	1.000	1.000	0.000	10000	1	6.33E-07	0.00E+00	6.33E-07	6.33E-07
16	106-93-4	Ethylene dibromide (Dibromethane)	2.72E-03	vapor	1.000	1.000	0.000	1	10	2.72E-04	0.00E+00	2.72E-04	2.72E-04
17	106-97-8	Butane	7.16E-03	vapor	1.000	1.000	0.000	10000	1	7.16E-07	0.00E+00	7.16E-07	7.16E-07
18	106-99-0	1,3-Butadiene	2.86E-03	vapor	1.000	1.000	0.000	10000	1	2.86E-07	0.00E+00	2.86E-07	2.86E-07
19	107-02-8	Acrolein	5.82E-03	vapor	1.000	1.000	0.000	10000	1	5.82E-07	0.00E+00	5.82E-07	5.82E-07
20	107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	vapor	1.000	1.000	0.000	10000	1	2.86E-07	0.00E+00	2.86E-07	2.86E-07
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.83E-03	vapor	1.000	1.000	0.000	10000	1	2.83E-07	0.00E+00	2.83E-07	2.83E-07
22	107-12-0	Propionitrile	2.97E-03	vapor	1.000	1.000	0.000	10000	1	2.97E-07	0.00E+00	2.97E-07	2.97E-07
23	107-13-1	Acrylonitrile	1.16E-02	vapor	1.000	1.000	0.000	10000	1	1.16E-06	0.00E+00	1.16E-06	1.16E-06
24	107-18-6	2-Propene-1-ol	2.33E-02	vapor	1.000	1.000	0.000	10000	1	2.33E-06	0.00E+00	2.33E-06	2.33E-06
25	107-31-3	Formic acid, methyl ester	3.80E-02	vapor	1.000	1.000	0.000	10000	1	3.80E-06	0.00E+00	3.80E-06	3.80E-06
26	107-66-4	Dibutylphosphate	5.07E-05	particle bound	0.995	0.995	0.005	10000	1	5.05E-09	1.92E-19	5.05E-09	5.05E-09
27	107-87-9	2-Pentanone	1.16E-02	vapor	1.000	1.000	0.000	10000	1	1.16E-06	0.00E+00	1.16E-06	1.16E-06
28	108-03-2	1-Nitropropane	3.49E-02	vapor	1.000	1.000	0.000	10000	1	3.49E-06	0.00E+00	3.49E-06	3.49E-06
29	108-05-4	Vinyl acetate	4.06E-02	vapor	1.000	1.000	0.000	10000	1	4.06E-06	0.00E+00	4.06E-06	4.06E-06
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	5.82E-03	vapor	1.000	1.000	0.000	10000	1	5.82E-07	0.00E+00	5.82E-07	5.82E-07
31	108-20-3	Bis(isopropyl)ether	6.97E-03	vapor	1.000	1.000	0.000	10000	1	6.97E-07	0.00E+00	6.97E-07	6.97E-07
32	108-38-3	m-Xylene (Dimethyl benzene)	7.15E-03	vapor	1.000	1.000	0.000	1000	1	7.15E-06	0.00E+00	7.15E-06	7.15E-06
33	108-39-4	m-Cresol	6.00E-04	vapor	1.000	1.000	0.000	1000	2	3.00E-07	0.00E+00	3.00E-07	3.00E-07
34	108-87-2	Methylcyclohexane	7.17E-03	vapor	1.000	1.000	0.000	10000	1	7.17E-07	0.00E+00	7.17E-07	7.17E-07
35	108-88-3	Toluene	2.86E-03	vapor	1.000	1.000	0.000	10000	1	2.86E-07	0.00E+00	2.86E-07	2.86E-07
36	108-90-7	Chlorobenzene	2.86E-03	vapor	1.000	1.000	0.000	20	5	2.86E-05	0.00E+00	2.86E-05	2.86E-05
37	108-93-0	Cyclohexanol	3.88E-03	vapor	1.000	1.000	0.000	10000	2	1.94E-07	0.00E+00	1.94E-07	1.94E-07
38	108-94-1	Cyclohexanone	1.24E-03	vapor	1.000	1.000	0.000	10000	2	6.20E-08	0.00E+00	6.20E-08	6.20E-08
39	108-95-2	Phenol	1.31E-03	vapor	1.000	1.000	0.000	10	20	6.56E-06	0.00E+00	6.56E-06	6.56E-06
40	109-66-0	n-Pentane	7.16E-03	vapor	1.000	1.000	0.000	10000	1	7.16E-07	0.00E+00	7.16E-07	7.16E-07
41	109-99-9	Tetrahydrofuran	1.19E-03	vapor	1.000	1.000	0.000	10000	1	1.19E-07	0.00E+00	1.19E-07	1.19E-07
42	110-12-3	5-Methyl-2-hexanone	2.53E-03	vapor	1.000	1.000	0.000	10000	1	2.53E-07	0.00E+00	2.53E-07	2.53E-07
43	110-43-0	2-Heptanone	2.53E-03	vapor	1.000	1.000	0.000	10000	1	2.53E-07	0.00E+00	2.53E-07	2.53E-07
44	110-54-3	n-Hexane	7.16E-03	vapor	1.000	1.000	0.000	10000	1	7.16E-07	0.00E+00	7.16E-07	7.16E-07
45	110-62-3	n-Valeraldehyde	3.80E-02	vapor	1.000	1.000	0.000	10000	1	3.80E-06	0.00E+00	3.80E-06	3.80E-06
46	110-82-7	Cyclohexane	7.17E-03	vapor	1.000	1.000	0.000	10000	1	7.17E-07	0.00E+00	7.17E-07	7.17E-07
47	110-83-8	Cyclohexene	2.86E-03	vapor	1.000	1.000	0.000	10000	1	2.86E-07	0.00E+00	2.86E-07	2.86E-07
48	110-86-1	Pyridine	2.48E-03	vapor	1.000	1.000	0.000	10000	1	2.48E-07	0.00E+00	2.48E-07	2.48E-07
49	111-65-9	n-Octane	7.16E-03	vapor	1.000	1.000	0.000	10000	1	7.16E-07	0.00E+00	7.16E-07	7.16E-07
50	111-76-2	Ethylene glycol monobutyl ether	3.60E-03	vapor	1.000	1.000	0.000	10000	2	1.80E-07	0.00E+00	1.80E-07	1.80E-07
51	111-84-2	n-Nonane	7.16E-03	vapor	1.000	1.000	0.000	10000	2	3.58E-07	0.00E+00	3.58E-07	3.58E-07
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	1.46E-01	particle bound	0.130	0.130	0.870	10000	5	3.84E-07	1.94E-14	3.84E-07	3.84E-07
53	117-84-0	n-Dioctyl phthalate	2.38E-02	particle bound	0.852	0.852	0.148	10000	5	4.05E-07	5.33E-18	4.05E-07	4.05E-07
54	120-12-7	Anthracene	2.02E-02	particle bound	0.998	0.998	0.002	1000	5	4.02E-06	6.11E-17	4.02E-06	4.02E-06
55	120-82-1	1,2,4-Trichlorobenzene	7.07E-03	vapor	1.000	1.000	0.000	100	5	1.41E-05	0.00E+00	1.41E-05	1.41E-05
56	120-83-2	2,4-Dichlorophenol	2.33E-02	vapor	1.000	1.000	0.000	3.333333	50	1.40E-04	0.00E+00	1.40E-04	1.40E-04
57	121-44-8	Triethylamine	6.33E-03	vapor	1.000	1.000	0.000	10000	1	6.33E-07	0.00E+00	6.33E-07	6.33E-07
58	121-69-7	Dimethylaniline	2.97E-03	vapor	1.000	1.000	0.000	10000	2	1.49E-07	0.00E+00	1.49E-07	1.49E-07
59	122-39-4	N,N-Diphenylamine	1.57E-03	vapor	1.000	1.000	0.000	50	5	6.27E-06	0.00E+00	6.27E-06	6.27E-06
60	123-19-3	4-Heptanone	1.19E-03	vapor	1.000	1.000	0.000	10000	1	1.19E-07	0.00E+00	1.19E-07	1.19E-07
61	123-38-6	n-Propionaldehyde	1.16E-02	vapor	1.000	1.000	0.000	10000	1	1.16E-06	0.00E+00	1.16E-06	1.16E-06
62	123-51-3	3-Methyl-1-butanol	1.42E-03	vapor	1.000	1.000	0.000	10000	1	1.42E-07	0.00E+00	1.42E-07	1.42E-07
63	123-86-4	Acetic acid n-butyl ester	1.28E-04	vapor	1.000	1.000	0.000	10000	1	1.28E-08	0.00E+00	1.28E-08	1.28E-08
64	123-91-1	1,4-Dioxane	7.76E-04	vapor	1.000	1.000	0.000	10000	1	7.76E-08	0.00E+00	7.76E-08	7.76E-08
65	126-73-8	Tributyl phosphate	4.56E-04	particle bound	0.996	0.996	0.004	10000	5	9.08E-09	2.76E-19	9.08E-09	9.08E-09
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	6.77E-03	vapor	1.000	1.000	0.000	10000	1	6.77E-07	0.00E+00	6.77E-07	6.77E-07
67	127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	vapor	1.000	1.000	0.000	1	10	2.86E-04	0.00E+00	2.86E-04	2.86E-04
68	127-19-5	N,N-Dimethylacetamide	8.46E-06	vapor	1.000	1.000	0.000	10000	1	8.46E-10	0.00E+00	8.46E-10	8.46E-10
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	7.93E-03	vapor	1.000	1.000	0.000	10000	5	1.59E-07	0.00E+00	1.59E-07	1.59E-07
70	129-00-0	Pyrene	9.35E-03	particle bound	0.994	0.994	0.006	3.333333	50	5.57E-05	2.55E-15	5.57E-05	5.57E-05
71	1321-64-8	Pentachloronaphthalene	4.19E-02	particle bound	0.971	0.971	0.029	3.333333	50	2.44E-04	5.52E-14	2.44E-04	2.44E-04
72	1321-65-9	Trichloronaphthalene	3.80E-02	particle bound	0.999	0.999	0.001	3.333333	50	2.28E-04	1.73E-15	2.28E-04	2.28E-04
73	132-64-9	Dibenzofuran	3.41E-02	particle bound	0.999	0.999	0.001	3.333333	50	2.05E-04	1.55E-15	2.05E-04	2.05E-04
74	1335-87-1	Hexachloronaphthalene	3.46E-02	particle bound	0.984	0.984	0.016	3.333333	50	2.06E-04	2.54E-14	2.06E-04	2.06E-04
75	1335-88-2	Tetrachloronaphthalene	3.80E-02	particle bound	0.991	0.991	0.009	3.333333	50	2.26E-04	1.55E-14	2.26E-04	2.26E-04
76	1336-36-3	Polychlorinated biphenyls (PCBs)	4.26E-03	vapor	1.000	1.000	0.000	3.333333	50	2.56E-05	0.00E+00	2.56E-05	2.56E-05
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.10E-04	vapor	1.000	1.000	0.000	10000	1	1.10E-08	0.00E+00	1.10E-08	1.10E-08
78	141-79-7	4-Methyl-3-penten-2-one	1.78E-02	vapor	1.000	1.000	0.000	10000	1	1.78E-06	0.00E+00	1.78E-06	1.78E-06
79	142-82-5	n-Heptane	7.16E-03	vapor	1.000	1.000	0.000	10000	1	7.16E-07	0.00E+00	7.16E-07	7.16E-07
80	144-62-7	Oxalic acid	3.27E-05	vapor	1.000	1.000	0.000	10	20	1.63E-07	0.00E+00	1.63E-07	1.63E-07
81	156-60-5	trans-1,2-Dichloroethylene	7.15E-03	vapor	1.000	1.000	0.000	10000	1	7.15E-07	0.00E+00	7.15E-07	7.15E-07
82	1634-04-4	Methyl tert-butyl ether	6.77E-03	vapor	1.000	1.000	0.000	10000	1	6.77E-07	0.00E+00	6.77E-07	6.77E-07
83	189-55-9	Dibenzo(a,i)pyrene	5.07E-05	particle	0.002	0.000	1.000	3.333333	50	0.00E+00	2.31E-15	2.31E-15	2.31E-15
84	189-64-0	Dibenzo(a,h)pyrene	5.07E-05	particle	0.011	0.000	1.000	3.333333	50	0.00E+00	2.31E-15	2.31E-15	2.31E-15
85	191-24-2	Benzo(g,h,i)perylene	1.46E-01	particle bound	0.065	0.065	0.935	3.333333	50	5.75E-05	6.27E-12	5.75E-05	5.75E-05
86	191-30-0	Benzo(a,l)pyrene	5.07E-05	particle	0.024	0.000	1.000	3.333333	50	0.00E+00	2.31E-15	2.31E-15	2.31E-15
87	192-65-4	Dibenzo(a,e)pyrene	5.07E-05	particle	0.018	0.000	1.000	3.333333	50	0.00E+00	2.31E-15	2.31E-15	2.31E-15
88	193-39-5	Indeno(1,2,3-cd)pyrene	2.93E-01	particle	0.005	0.000	1.000	3.333333	50	0.00E+00	1.33E-11	1.33E-11	1.33E-11
89	206-44-0	Fluoranthene	4.19E-02	particle bound	0.992	0.992	0.008	3.333333	50	2.49E-04	1.52E-14	2.49E-04	2.49E-04
90	208-96-8	Acenaphthylene	2.79E-02	vapor	1.000	1.000	0.000	3.333333	50	1.67E-04	0.00E+00	1.67E-04	1.67E-04
91	2234-13-1	Octachloronaphthalene	1.10E-04	particle bound	0.629	0.629	0.371	3.333333	50	4.16E-07	1.86E-15	4.16E-07	4.16E-07
92	224-42-0	Dibenz(a,j)acridine	6.34E-06	particle bound	0.241	0.241	0.759	3.333333	50	9.17E-09	2.19E-16	9.17E-09	9.17E-09
93	226-36-8	Dibenz(a,h)acridine	6.34E-06	particle bound	0.285	0.285	0.715	3.333333	50	1.08E-08	2.06E-16	1.08E-08	1.08E-08
94	25551-13-7	Trimethyl benzene	7.15E-03	vapor	1.000	1.000	0.000	1000	2	3.57E-06	0.00E+00	3.57E-06	3.57E-06
95	26140-60-3	Terphenyls	4.19E-02	particle bound	0.872	0.872	0.128	3.333333	50	2.19E-04	2.44E-13	2.19E-04	2.19E-04
96	27154-33-2	Trichlorofluoroethane	7.15E-03	vapor	1.000	1.000	0.000	1	10	7.15E-04	0.00E+00	7.15E-04	7.15E-04
97	287-92-3	Cyclopentane	7.17E-03	vapor	1.000	1.000	0.000	10000	1	7.17E-07	0.00E+00	7.17E-07	7.17E-07
98	3697-24-3	5-Methylchrysene	4.19E-02	particle bound	0.823	0.823	0.177	3.333333	50	2.07E-04	3.37E-13	2.07E-04	2.07E-04
99	3825-26-1	Ammonium perfluorooctanoate	3.49E-02	vapor	1.000	1.000	0.000	3.333333	50	2.09E-04	0.00E+00	2.09E-04	2.09E-04
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	1.25E-03	vapor	1.000	1.000	0.000	10000	1	1.25E-07	0.00E+00	1.25E-07	1.25E-07
101	50-00-0	Formaldehyde	2.80E-04	vapor	1.000	1.000	0.000	10000	1	2.80E-08	0.00E+00	2.80E-08	2.80E-08
102	50-32-8	Benzo(a)pyrene	1.40E-03	particle bound	0.290	0.290	0.710	3.333333	50	2.44E-06	4.52E-14	2.44E-06	2.44E-06
103	53-70-3	Dibenzo(a,h)anthracene	4.33E-04	particle bound	0.054	0.054	0.946	3.333333	50	1.40E-07	1.86E-14	1.40E-07	1.40E-07
104	540-59-0	1,2-Dichloroethylene	7.15E-03	vapor	1.000	1.000	0.000	10000	1	7.15E-07	0.00E+00	7.15E-07	7.15E-07
105	540-84-1	2,2,4-Trimethylpentane	7.16E-03	vapor	1.000	1.000	0.000	10000	1	7.16E-07	0.00E+00	7.16E-07	7.16E-07
106	541-73-1	1,3-Dichlorobenzene	2.86E-03	vapor	1.000	1.000	0.000	50	2	2.86E-05	0.00E+00	2.86E-05	2.86E-05
107	56-23-5	Carbon tetrachloride	2.86E-03	vapor	1.000	1.000	0.000	1	5	5.73E-04	0.00E+00	5.73E-04	5.73E-04
108	563-80-4	3-Methyl-2-butanone	5.82E-03	vapor	1.000	1.000	0.000	10000	1	5.82E-07	0.00E+00	5.82E-07	5.82E-07
109	56-49-5	3-Methylcholanthrene	4.30E-02	particle bound	0.364	0.364	0.636	3.333333	50	9.39E-05	1.24E-12	9.39E-05	9.39E-05
110	57-14-7	1,1-Dimethylhydrazine	8.54E-03	vapor	1.000	1.000	0.000	10000	1	8.54E-07	0.00E+00	8.54E-07	8.54E-07
111	58-90-2	2,3,4,6-Tetrachlorophenol	7.12E-03	vapor	1.000	1.000	0.000	3.333333	10	2.14E-04	0.00E+00	2.14E-04	2.14E-04
112	591-78-6	2-Hexanone	5.82E-03	vapor	1.000	1.000	0.000	1000	1	5.82E-06	0.00E+00	5.82E-06	5.82E-06
113	59-50-7	4-Chloro-3-methylphenol	2.38E-02	vapor	1.000	1.000	0.000	3.333333	20	3.57E-04	0.00E+00	3.57E-04	3.57E-04
114	59-89-2	N-Nitrosomorpholine	4.19E-02	vapor	1.000	1.000	0.000	10000	2	2.09E-06	0.00E+00	2.09E-06	2.09E-06
115	602-87-9	5-Nitroacenaphthene	3.60E-03	particle bound	0.997	0.997	0.003	3.333333	50	2.15E-05	4.91E-18	2.15E-05	2.15E-05
116	60-29-7	Ethyl ether	4.24E-02	vapor	1.000	1.000	0.000	10000	1	4.24E-06	0.00E+00	4.24E-06	4.24E-06
117	603-34-9	Triphenylamine	5.65E-03	vapor	1.000	1.000	0.000	3.333333	50	3.39E-05	0.00E+00	3.39E-05	3.39E-05
118	60-34-4	Methylhydrazine	3.88E-03	vapor	1.000	1.000	0.000	10000	1	3.88E-07	0.00E+00	3.88E-07	3.88E-07
119	60-35-5	Acetamide	8.46E-06	vapor	1.000	1.000	0.000	10000	2	4.23E-10	0.00E+00	4.23E-10	4.23E-10
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.19E-02	vapor	1.000	1.000	0.000	10000	2	2.09E-06	0.00E+00	2.09E-06	2.09E-06
121	624-83-9	Methyl isocyanate	7.07E-03	vapor	1.000	1.000	0.000	1000	1	7.07E-06	0.00E+00	7.07E-06	7.07E-06
122	627-13-4	Nitric acid, propyl ester	3.53E-03	vapor	1.000	1.000	0.000	10000	1	3.53E-07	0.00E+00	3.53E-07	3.53E-07
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	3.60E-03	vapor	1.000	1.000	0.000	10000	2	1.80E-07	0.00E+00	1.80E-07	1.80E-07
124	630-20-6	1,1,1,2-Tetrachloroethane	6.97E-03	vapor	1.000	1.000	0.000	1	10	6.97E-04	0.00E+00	6.97E-04	6.97E-04
125	64-17-5	Ethyl alcohol	3.88E-03	vapor	1.000	1.000	0.000	10000	1	3.88E-07	0.00E+00	3.88E-07	3.88E-07
126	64-18-6	Formic acid	1.71E-01	vapor	1.000	1.000	0.000	10000	1	1.71E-05	0.00E+00	1.71E-05	1.71E-05
127	64-19-7	Acetic acid	1.51E+01	vapor	1.000	1.000	0.000	10000	1	1.51E-03	0.00E+00	1.51E-03	1.51E-03
128	67-56-1	Methyl alcohol (Methanol)	3.88E-03	vapor	1.000	1.000	0.000	10000	1	3.88E-07	0.00E+00	3.88E-07	3.88E-07
129	67-63-0	2-Propyl alcohol (Isopropanol, Propan-2-01)	2.48E-04	vapor	1.000	1.000	0.000	10000	1	2.48E-08	0.00E+00	2.48E-08	2.48E-08
130	67-64-1	2-Propanone (Acetone)	5.94E-03	vapor	1.000	1.000	0.000	10000	1	5.94E-07	0.00E+00	5.94E-07	5.94E-07
131	67-66-3	Chloroform	2.86E-03	vapor	1.000	1.000	0.000	1	2	1.43E-03	0.00E+00	1.43E-03	1.43E-03
132	67-72-1	Hexachloroethane	4.29E-02	vapor	1.000	1.000	0.000	1	50	8.58E-04	0.00E+00	8.58E-04	8.58E-04
133	684-16-2	Hexafluoroacetone	7.15E-03	vapor	1.000	1.000	0.000	1	1	7.15E-03	0.00E+00	7.15E-03	7.15E-03
134	71-23-8	n-Propyl alcohol	4.96E-04	vapor	1.000	1.000	0.000	10000	1	4.96E-08	0.00E+00	4.96E-08	4.96E-08
135	71-36-3	n-Butyl alcohol	1.24E-03	vapor	1.000	1.000	0.000	10000	1	1.24E-07	0.00E+00	1.24E-07	1.24E-07
136	71-43-2	Benzene	2.86E-03	vapor	1.000	1.000	0.000	100	1	2.86E-05	0.00E+00	2.86E-05	2.86E-05
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	vapor	1.000	1.000	0.000	1000	1	2.86E-06	0.00E+00	2.86E-06	2.86E-06
138	74-83-9	Bromomethane (Methyl bromide)	2.86E-03	vapor	1.000	1.000	0.000	1000	1	2.86E-06	0.00E+00	2.86E-06	2.86E-06
139	74-87-3	Chloromethane (Methyl chloride)	2.86E-03	vapor	1.000	1.000	0.000	20	1	1.43E-04	0.00E+00	1.43E-04	1.43E-04
140	74-97-5	Bromochloromethane	7.07E-03	vapor	1.000	1.000	0.000	1	2	3.53E-03	0.00E+00	3.53E-03	3.53E-03
141	74-99-7	Methylacetylene	4.29E-02	vapor	1.000	1.000	0.000	10000	1	4.29E-06	0.00E+00	4.29E-06	4.29E-06
142	75-00-3	Chloroethane	2.86E-03	vapor	1.000	1.000	0.000	1000	1	2.86E-06	0.00E+00	2.86E-06	2.86E-06
143	75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	vapor	1.000	1.000	0.000	10000	1	2.86E-07	0.00E+00	2.86E-07	2.86E-07
144	75-05-8	Acetonitrile	2.58E-03	vapor	1.000	1.000	0.000	1000	1	2.58E-06	0.00E+00	2.58E-06	2.58E-06
145	75-07-0	Acetaldehyde	1.78E-02	vapor	1.000	1.000	0.000	10000	1	1.78E-06	0.00E+00	1.78E-06	1.78E-06
146	75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	vapor	1.000	1.000	0.000	50	1	5.72E-05	0.00E+00	5.72E-05	5.72E-05
147	75-12-7	Formamide	6.34E-06	vapor	1.000	1.000	0.000	10000	1	6.34E-10	0.00E+00	6.34E-10	6.34E-10
148	75-15-0	Carbon disulfide	7.15E-03	vapor	1.000	1.000	0.000	10000	1	7.15E-07	0.00E+00	7.15E-07	7.15E-07
149	75-21-8	Ethylene oxide (Oxirane)	1.27E-03	vapor	1.000	1.000	0.000	10000	1	1.27E-07	0.00E+00	1.27E-07	1.27E-07
150	75-27-4	Bromodichloromethane	6.97E-03	vapor	1.000	1.000	0.000	1	5	1.39E-03	0.00E+00	1.39E-03	1.39E-03
151	75-34-3	1,1-Dichloroethane	2.86E-03	vapor	1.000	1.000	0.000	10000	1	2.86E-07	0.00E+00	2.86E-07	2.86E-07
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.16E-03	vapor	1.000	1.000	0.000	10000	1	7.16E-07	0.00E+00	7.16E-07	7.16E-07
153	75-43-4	Dichlorofluoromethane	2.86E-03	vapor	1.000	1.000	0.000	1000	1	2.86E-06	0.00E+00	2.86E-06	2.86E-06
154	75-45-6	Chlorodifluoromethane	2.86E-03	vapor	1.000	1.000	0.000	50	1	5.73E-05	0.00E+00	5.73E-05	5.73E-05
155	75-50-3	Trimethylamine	5.82E-03	vapor	1.000	1.000	0.000	10000	1	5.82E-07	0.00E+00	5.82E-07	5.82E-07
156	75-52-5	Nitromethane	1.78E-02	vapor	1.000	1.000	0.000	10000	1	1.78E-06	0.00E+00	1.78E-06	1.78E-06
157	75-55-8	2-Methylaziridine	7.45E-03	vapor	1.000	1.000	0.000	10000	1	7.45E-07	0.00E+00	7.45E-07	7.45E-07
158	75-61-6	Difluorodibromomethane	7.16E-03	vapor	1.000	1.000	0.000	1	1	7.16E-03	0.00E+00	7.16E-03	7.16E-03
159	75-63-8	Trifluorobromomethane	7.17E-03	vapor	1.000	1.000	0.000	1	1	7.17E-03	0.00E+00	7.17E-03	7.17E-03
160	75-65-0	2-Methyl-2-propanol	1.24E-03	vapor	1.000	1.000	0.000	10000	1	1.24E-07	0.00E+00	1.24E-07	1.24E-07
161	75-69-4	Trichlorofluoromethane	7.15E-03	vapor	1.000	1.000	0.000	1	1	7.15E-03	0.00E+00	7.15E-03	7.15E-03
162	75-71-8	Dichlorodifluoromethane	7.17E-03	vapor	1.000	1.000	0.000	1	1	7.17E-03	0.00E+00	7.17E-03	7.17E-03
163	76-03-9	Trichloroacetic acid	8.46E-06	vapor	1.000	1.000	0.000	1	50	1.69E-07	0.00E+00	1.69E-07	1.69E-07
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.30E-02	vapor	1.000	1.000	0.000	20	5	4.30E-04	0.00E+00	4.30E-04	4.30E-04
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	vapor	1.000	1.000	0.000	20	5	4.29E-04	0.00E+00	4.29E-04	4.29E-04
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.17E-03	vapor	1.000	1.000	0.000	20	2	1.79E-04	0.00E+00	1.79E-04	1.79E-04
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.16E-03	vapor	1.000	1.000	0.000	1	1	7.16E-03	0.00E+00	7.16E-03	7.16E-03
168	76-15-3	Chloropentafluoroethane	7.16E-03	vapor	1.000	1.000	0.000	1	1	7.16E-03	0.00E+00	7.16E-03	7.16E-03
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	7.45E-03	vapor	1.000	1.000	0.000	10000	1	7.45E-07	0.00E+00	7.45E-07	7.45E-07
170	78-87-5	1,2-Dichloropropane	2.86E-03	vapor	1.000	1.000	0.000	1000	1	2.86E-06	0.00E+00	2.86E-06	2.86E-06
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	4.96E-04	vapor	1.000	1.000	0.000	10000	1	4.96E-08	0.00E+00	4.96E-08	4.96E-08
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	2.97E-03	vapor	1.000	1.000	0.000	1000	1	2.97E-06	0.00E+00	2.97E-06	2.97E-06
173	79-00-5	1,1,2-Trichloroethane	7.07E-03	vapor	1.000	1.000	0.000	10000	1	7.07E-07	0.00E+00	7.07E-07	7.07E-07
174	79-01-6	Trichloroethylene	7.16E-03	vapor	1.000	1.000	0.000	10000	1	7.16E-07	0.00E+00	7.16E-07	7.16E-07
175	79-09-4	Propionic acid	1.68E-03	vapor	1.000	1.000	0.000	10000	1	1.68E-07	0.00E+00	1.68E-07	1.68E-07
176	79-10-7	2-Propenoic acid	2.24E-03	vapor	1.000	1.000	0.000	10000	1	2.24E-07	0.00E+00	2.24E-07	2.24E-07
177	79-20-9	Methyl acetate	3.49E-02	vapor	1.000	1.000	0.000	10000	1	3.49E-06	0.00E+00	3.49E-06	3.49E-06
178	79-34-5	1,1,2,2-Tetrachloroethane	1.28E-06	vapor	1.000	1.000	0.000	1	10	1.28E-06	0.00E+00	1.28E-06	1.28E-06
179	83-32-9	Acenaphthene	4.18E-02	vapor	1.000	1.000	0.000	3.333333	50	2.51E-04	0.00E+00	2.51E-04	2.51E-04
180	84-66-2	Diethyl phthalate	2.05E-03	vapor	1.000	1.000	0.000	10000	5	4.11E-08	0.00E+00	4.11E-08	4.11E-08
181	84-74-2	Dibutyl phthalate	4.09E-03	particle bound	0.994	0.994	0.006	10000	5	8.13E-08	3.72E-18	8.13E-08	8.13E-08
182	85-01-8	Phenanthrene	1.78E-02	particle bound	0.999	0.999	0.001	3.333333	50	1.07E-04	8.10E-16	1.07E-04	1.07E-04
183	85-68-7	Butylbenzyl phthalate	4.09E-03	particle bound	0.948	0.948	0.052	10000	5	7.75E-08	3.22E-17	7.75E-08	7.75E-08
184	86-73-7	Fluorene	3.49E-02	vapor	1.000	1.000	0.000	3.333333	50	2.09E-04	0.00E+00	2.09E-04	2.09E-04
185	87-68-3	Hexachlorobutadiene	7.15E-03	vapor	1.000	1.000	0.000	50	5	2.86E-06	0.00E+00	2.86E-06	2.86E-05
186	88-06-2	2,4,6-Trichlorophenol	7.33E-02	vapor	1.000	1.000	0.000	3.333333	50	1.40E-04	0.00E+00	1.40E-04	1.40E-04
187	88-72-2	2-Nitrotoluene	1.42E-03	vapor	1.000	1.000	0.000	10000	2	7.12E-08	0.00E+00	7.12E-08	7.12E-08
188	88-75-5	2-Nitrophenol	8.54E-03	vapor	1.000	1.000	0.000	3.333333	20	1.28E-04	0.00E+00	1.28E-04	1.28E-04
189	88-89-1	Picric acid	7.76E-06	particle bound	0.934	0.934	0.066	10000	5	1.45E-12	7.76E-22	1.45E-12	1.45E-12
190	91-20-3	Naphthalene	1.30E-03	vapor	1.000	1.000	0.000	100	2	6.51E-06	0.00E+00	6.51E-06	6.51E-06
191	91-22-5	Quinoline	3.60E-03	vapor	1.000	1.000	0.000	10000	2	1.80E-07	0.00E+00	1.80E-07	1.80E-07
192	91-58-7	2-Chloronapthalene	4.06E-02	vapor	1.000	1.000	0.000	3.333333	50	2.44E-04	0.00E+00	2.44E-04	2.44E-04
193	92-52-4	1,1'-Biphenyl	2.71E-02	vapor	1.000	1.000	0.000	1000	5	5.41E-06	0.00E+00	5.41E-06	5.41E-06
194	92-93-3	4-Nitrobiphenyl	2.33E-02	particle bound	0.999	0.999	0.001	3.333333	50	1.40E-04	1.08E-15	1.40E-04	1.40E-04
195	95-13-6	Indene	4.18E-02	vapor	1.000	1.000	0.000	1000	2	2.09E-05	0.00E+00	2.09E-05	2.09E-05
196	95-47-6	o-Xylene	2.86E-03	vapor	1.000	1.000	0.000	10000	1	2.86E-07	0.00E+00	2.86E-07	2.86E-07
197	95-48-7	o-Cresol (2-Methylphenol)	6.00E-04	vapor	1.000	1.000	0.000	1000	2	3.00E-07	0.00E+00	3.00E-07	3.00E-07
198	95-49-8	2-Chlorotoluene	4.29E-02	vapor	1.000	1.000	0.000	10000	2	2.14E-06	0.00E+00	2.14E-06	2.14E-06
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.79E-03	vapor	1.000	1.000	0.000	50	2	2.79E-05	0.00E+00	2.79E-05	2.79E-05
200	95-57-8	2-Chlorophenol	7.45E-03	vapor	1.000	1.000	0.000	10000	2	3.72E-07	0.00E+00	3.72E-07	3.72E-07
201	95-95-4	2,4,5-Trichlorophenol	3.60E-03	vapor	1.000	1.000	0.000	3.333333	50	2.16E-05	0.00E+00	2.16E-05	2.16E-05
202	96-22-0	3-Pentanone	1.16E-02	vapor	1.000	1.000	0.000	10000	1	1.16E-06	0.00E+00	1.16E-06	1.16E-06
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	vapor	1.000	1.000	0.000	3.333333	50	2.57E-04	0.00E+00	2.57E-04	2.57E-04
204	98-51-1	p-tert-Butyltoluene	4.29E-02	vapor	1.000	1.000	0.000	10000	2	2.15E-06	0.00E+00	2.15E-06	2.15E-06
205	98-82-8	Cumene	4.29E-02	vapor	1.000	1.000	0.000	10000	2	2.15E-06	0.00E+00	2.15E-06	2.15E-06
206	98-83-9	alpha-Methylstyrene	7.15E-03	vapor	1.000	1.000	0.000	100	2	3.57E-05	0.00E+00	3.57E-05	3.57E-05
207	98-86-2	Acetophenone	5.16E-03	vapor	1.000	1.000	0.000	100	2	2.58E-05	0.00E+00	2.58E-05	2.58E-05
208	98-95-3	Nitrobenzene	5.69E-03	vapor	1.000	1.000	0.000	10000	2	2.85E-07	0.00E+00	2.85E-07	2.85E-07
209												8.81E-02	

S	T	U	V
Coplanar PCBs		PVP12 g/sec	Corrected PVP12 g/sec
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	1.85E-08	1.85E-08
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	1.85E-08	1.85E-08
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	1.85E-08	1.85E-08
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	1.85E-08	1.85E-08
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	1.85E-08	1.85E-08
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	1.85E-08	1.85E-08
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	1.85E-08	1.85E-08
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1.85E-08	1.85E-08
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	1.85E-08	1.85E-08
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	1.85E-08	1.85E-08
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	1.85E-08	1.85E-08
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	1.85E-08	1.85E-08
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	1.85E-08	1.85E-08
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	1.85E-08	1.85E-08
1336-36-3	Polychlorinated biphenyls (PCBs)	2.56E-05	
1336-36-3	UnCorrected (for coplanar PCBs)	2.56E-05	

Correction for Coplanar PCBs
0.99 as parent
0.01 as coplanar sum

General DFs

Phase	NaOH Scrubber DF	HEME DF	HEPA 1 DF	HEPA 2 DF	Total DF
Vapor	1	1	1	1	1
Particle	3.3	200	2000	100	1.32E+08

Table B-4 PJV04 - Unabated Pretreatment PJM/RFD

Row	CAS #	COPC	Feed Rate g/sec	In ACM	Group	Grouping	Phase	PJV04 rate g/sec	Performance factor	Adjusted PF	Calc'd rate PJV04 g/sec	Corrected PJV04 g/sec
4	100-00-5	p-Nitrochlorobenzene	2.86E-02	No		10	vapor			7.69E-07	2.20E-08	2.20E-08
5	100-21-0	p-Phthalic acid	4.29E-02	Yes	1	1	vapor	1.90E-07	4.44E-06		1.90E-07	1.90E-07
6	100-41-4	Ethyl benzene	2.86E-03	No		20	vapor			5.80E-07	1.66E-09	1.66E-09
7	100-42-5	Styrene	2.86E-03	No		19	vapor			5.81E-07	1.66E-09	1.66E-09
8	10061-01-5	cis-1,3-Dichloropropene	2.86E-03	Yes	19	19	vapor	1.66E-09	5.81E-07		1.66E-09	1.66E-09
9	10061-02-6	trans-1,3-Dichloropropene	2.86E-03	No		17	vapor			5.85E-07	1.67E-09	1.67E-09
10	101-55-3	4-Bromophenylphenyl ether	4.29E-02	No		14	vapor			6.27E-07	2.69E-08	2.69E-08
11	101-84-8	Diphenyl ether	7.14E-03	Yes	16	16	vapor	4.21E-09	5.89E-07		4.21E-09	4.21E-09
12	106-35-4	3-Heptanone	2.86E-03	No		14	vapor			6.27E-07	1.79E-09	1.79E-09
13	106-42-3	p-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			5.81E-07	4.15E-09	4.15E-09
14	106-46-7	1,4-Dichlorobenzene	2.86E-03	No		18	vapor			5.89E-07	1.68E-09	1.68E-09
15	106-88-7	1,2-Epoxybutane	7.14E-03	No		15	vapor			6.10E-07	4.36E-09	4.36E-09
16	106-93-4	Ethylene dibromide (Dibromethane)	2.86E-03	Yes	16	16	vapor	1.70E-09	5.95E-07		1.70E-09	1.70E-09
17	106-97-8	Butane	7.14E-03	Yes	28	28	vapor	4.14E-09	5.80E-07		4.14E-09	4.14E-09
18	106-99-0	1,3-Butadiene	2.86E-03	Yes	23	23	vapor	1.66E-09	5.79E-07		1.66E-09	1.66E-09
19	107-02-8	Acrolein	7.14E-03	No		14	vapor			6.27E-07	4.48E-09	4.48E-09
20	107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	No		20	vapor			5.80E-07	1.66E-09	1.66E-09
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.86E-03	No		17	vapor			5.85E-07	1.67E-09	1.67E-09
22	107-12-0	Propionitrile	7.14E-03	No		13	vapor			7.24E-07	5.17E-09	5.17E-09
23	107-13-1	Acrylonitrile	1.43E-02	No		14	vapor			6.27E-07	8.95E-09	8.95E-09
24	107-18-6	2-Propene-1-ol	4.29E-02	No		10	vapor			7.69E-07	3.30E-08	3.30E-08
25	107-31-3	Formic acid, methyl ester	4.29E-02	No		15	vapor			6.10E-07	2.61E-08	2.61E-08
26	107-66-4	Dibutylphosphate	4.29E-02	No		5	particle bound			1.58E-06	6.77E-08	6.77E-08
27	107-87-9	2-Pentanone	1.43E-02	No		14	vapor			6.27E-07	8.95E-09	8.95E-09
28	108-03-2	1-Nitropropane	4.29E-02	No		14	vapor			6.27E-07	2.69E-08	2.69E-08
29	108-05-4	Vinyl acetate	4.29E-02	No		16	vapor			5.98E-07	2.56E-08	2.56E-08
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.14E-03	No		14	vapor			6.27E-07	4.48E-09	4.48E-09
31	108-20-3	Bis(isopropyl)ether	7.14E-03	No		16	vapor			5.89E-07	4.21E-09	4.21E-09
32	108-38-3	m-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			5.81E-07	4.15E-09	4.15E-09
33	108-39-4	m-Cresol	7.14E-03	No		9	vapor			1.04E-06	7.44E-09	7.44E-09
34	108-87-2	Methylcyclohexane	7.14E-03	Yes	25	25	vapor	4.15E-09	5.81E-07		4.15E-09	4.15E-09
35	108-88-3	Toluene	2.86E-03	Yes	19	19	vapor	1.66E-09	5.80E-07		1.66E-09	1.66E-09
36	108-90-7	Chlorobenzene	2.86E-03	No		19	vapor			5.81E-07	1.66E-09	1.66E-09
37	108-93-0	Cyclohexanol	7.14E-03	No		10	vapor			7.69E-07	5.49E-09	5.49E-09
38	108-94-1	Cyclohexanone	7.14E-03	No		11	vapor			8.23E-07	5.88E-09	5.88E-09
39	108-95-2	Phenol	4.29E-02	Yes	8	8	vapor	5.94E-08	1.39E-06		5.94E-08	5.94E-08
40	109-66-0	n-Pentane	7.14E-03	No		28	vapor			5.80E-07	4.14E-09	4.14E-09
41	109-99-9	Tetrahydrofuran	2.86E-03	No		13	vapor			7.24E-07	2.07E-09	2.07E-09
42	110-12-3	5-Methyl-2-hexanone	2.86E-03	No		15	vapor			6.10E-07	1.74E-09	1.74E-09
43	110-43-0	2-Heptanone	2.86E-03	No		15	vapor			6.10E-07	1.74E-09	1.74E-09
44	110-54-3	n-Hexane	7.14E-03	Yes	27	27	vapor	4.14E-09	5.80E-07		4.14E-09	4.14E-09
45	110-62-3	n-Valeraldehyde	4.29E-02	No		15	vapor			6.10E-07	2.61E-08	2.61E-08
46	110-82-7	Cyclohexane	7.14E-03	Yes	24	24	vapor	4.15E-09	5.81E-07		4.15E-09	4.15E-09
47	110-83-8	Cyclohexene	2.86E-03	No		22	vapor			5.80E-07	1.66E-09	1.66E-09
48	110-86-1	Pyridine	1.43E-02	No		11	vapor			8.23E-07	1.18E-08	1.18E-08
49	111-65-9	n-Octane	7.14E-03	No		28	vapor			5.80E-07	4.14E-09	4.14E-09
50	111-76-2	Ethylene glycol monobutyl ether	4.29E-02	No		9	vapor			1.04E-06	4.47E-08	4.47E-08
51	111-84-2	n-Nonane	7.14E-03	Yes	28	28	vapor	4.14E-09	5.80E-07		4.14E-09	4.14E-09
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.29E-02	No		30	particle bound			1.67E-06	7.17E-08	7.17E-08
53	117-84-0	n-Dioctyl phthalate	4.29E-02	No		32	particle bound			7.35E-07	3.15E-08	3.15E-08
54	120-12-7	Anthracene	4.29E-02	Yes	13	13	particle bound	3.04E-08	7.09E-07		3.04E-08	3.04E-08
55	120-82-1	1,2,4-Trichlorobenzene	7.14E-03	Yes	17	17	vapor	4.18E-09	5.85E-07		4.18E-09	4.18E-09
56	120-83-2	2,4-Dichlorophenol	4.29E-02	No		10	vapor			7.69E-07	3.30E-08	3.30E-08
57	121-44-8	Triethylamine	7.14E-03	No		15	vapor			6.10E-07	4.36E-09	4.36E-09
58	121-69-7	Dimethylaniline	7.14E-03	No		13	vapor			7.24E-07	5.17E-09	5.17E-09
59	122-39-4	N,N-Diphenylamine	1.43E-02	Yes	10	10	vapor	1.36E-08	9.48E-07		1.36E-08	1.36E-08
60	123-19-3	4-Heptanone	2.86E-03	No		13	vapor			7.24E-07	2.07E-09	2.07E-09
61	123-38-6	n-Propionaldehyde	1.43E-02	No		14	vapor			6.27E-07	8.95E-09	8.95E-09
62	123-51-3	3-Methyl-1-butanol	7.14E-03	No		12	vapor			8.03E-07	5.73E-09	5.73E-09
63	123-86-4	Acetic acid n-butyl ester	1.35E-04	No		16	vapor			5.98E-07	8.06E-11	8.06E-11
64	123-91-1	1,4-Dioxane	1.43E-03	No		10	vapor			7.69E-07	1.10E-09	1.10E-09
65	126-73-8	Tributyl phosphate	2.86E-02	Yes	7	7	particle bound	4.43E-08	1.55E-06		4.43E-08	4.43E-08
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	7.14E-03	No		16	vapor			5.98E-07	4.26E-09	4.26E-09
67	127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	Yes	21	21	vapor	1.66E-09	5.80E-07		1.66E-09	1.66E-09
68	127-19-5	N,N-Dimethylacetamide	7.14E-03	No		5	vapor			1.58E-06	1.13E-08	1.13E-08
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.43E-02	No		32	vapor			7.35E-07	1.05E-08	1.05E-08
70	129-00-0	Pyrene	4.29E-02	Yes	33	33	particle bound	3.79E-08	8.84E-07		3.79E-08	3.79E-08
71	1321-64-8	Pentachloronaphthalene	4.29E-02	Yes	14	14	particle bound	2.53E-08	5.90E-07		2.53E-08	2.53E-08
72	1321-65-9	Trichloronaphthalene	4.29E-02	No		15	particle bound			6.10E-07	2.61E-08	2.61E-08
73	132-64-9	Dibenzofuran	4.29E-02	Yes	15	15	particle bound	2.71E-08	6.31E-07		2.71E-08	2.71E-08
74	1335-87-1	Hexachloronaphthalene	4.29E-02	No		14	particle bound			6.27E-07	2.69E-08	2.69E-08
75	1335-88-2	Tetrachloronaphthalene	4.29E-02	No		15	particle bound			6.10E-07	2.61E-08	2.61E-08
76	1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03	Yes	35	35	vapor	1.37E-09	7.91E-07		1.36E-09	1.36E-09
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.35E-04	No		14	vapor			6.27E-07	8.48E-11	8.48E-11
78	141-79-7	4-Methyl-3-penten-2-one	4.29E-02	No		13	vapor			7.24E-07	3.10E-08	3.10E-08
79	142-82-5	n-Heptane	7.14E-03	No		27	vapor			5.80E-07	4.14E-09	4.14E-09
80	144-62-7	Oxalic acid	2.14E+00	Yes	3	3	vapor	3.41E-06	1.59E-06		3.41E-06	3.41E-06
81	156-60-5	trans-1,2-Dichloroethylene	7.14E-03	No		20	vapor			5.80E-07	4.14E-09	4.14E-09
82	1634-04-4	Methyl tert-butyl ether	7.14E-03	No		16	vapor			5.98E-07	4.26E-09	4.26E-09
83	189-55-9	Dibenzo(a,i)pyrene	4.29E-02	No		5	particle			1.58E-06	6.77E-08	6.77E-08
84	189-64-0	Dibenzo(a,h)pyrene	4.29E-02	No		5	particle			1.58E-06	6.77E-08	6.77E-08
85	191-24-2	Benzo(g,h,i)perylene	4.29E-02	No		30	particle bound			1.67E-06	7.17E-08	7.17E-08
86	191-30-0	Benzo(a,l)pyrene	4.29E-02	No		5	particle			1.58E-06	6.77E-08	6.77E-08
87	192-65-4	Dibenzo(a,e)pyrene	4.29E-02	No		5	particle			1.58E-06	6.77E-08	6.77E-08
88	193-39-5	Indeno(1,2,3-cd)pyrene	4.29E-02	Yes	30	30	particle	6.86E-08	1.60E-06		6.86E-08	6.86E-08
89	206-44-0	Fluoranthene	4.29E-02	Yes	33	33	particle bound	2.53E-08	5.90E-07		2.53E-08	2.53E-08
90	208-96-8	Acenaphthylene	4.29E-02	Yes	14	14	vapor	2.85E-08	6.64E-07		2.85E-08	2.85E-08
91	2234-13-1	Octachloronaphthalene	1.35E-04	No		14	particle bound			6.27E-07	8.48E-11	8.48E-11
92	224-42-0	Dibenz(a,j)acridine	4.29E-02	No		4	particle bound			1.59E-06	6.80E-08	6.80E-08
93	226-36-8	Dibenz(a,h)acridine	4.29E-02	No		4	particle bound			1.59E-06	6.80E-08	6.80E-08
94	25551-13-7	Trimethyl benzene	7.14E-03	No		19	vapor			5.81E-07	4.15E-09	4.15E-09
95	26140-60-3	Terphenyls	4.29E-02	Yes	34	34	particle bound	2.53E-08	5.90E-07		2.53E-08	2.53E-08
96	27154-33-2	Trichlorofluoroethane	7.14E-03	No		23	vapor			5.79E-07	4.14E-09	4.14E-09
97	287-92-3	Cyclopentane	7.14E-03	No		24	vapor			5.81E-07	4.15E-09	4.15E-09
98	3697-24-3	5-Methylchrysene	4.29E-02	Yes	32	32	particle bound	2.53E-08	5.90E-07		2.53E-08	2.53E-08
99	3825-26-1	Ammonium perfluorooctanoate	4.29E-02	No		14	vapor			6.27E-07	2.69E-08	2.69E-08
100	4170-30-3	2-Butenaldehyde (2-Butenal) or Crotonaldehyde)	7.14E-03	Yes	11	11	vapor	5.88E-09	8.24E-07		5.88E-09	5.88E-09
101	50-00-0	Formaldehyde	7.14E-03	No		6	vapor			1.33E-06	9.50E-09	9.50E-09
102	50-32-8	Benzo(a)pyrene	2.72E-02	Yes	30	30	particle bound	4.73E-08	1.74E-06		4.73E-08	4.73E-08
103	53-70-3	Dibenzo(a,h)anthracene	2.72E-02	No		7	particle bound			1.55E-06	4.21E-08	4.21E-08
104	540-59-0	1,2-Dichloroethylene	7.14E-03	No		19	vapor			5.81E-07	4.15E-09	4.15E-09
105	540-84-1	2,2,4-Trimethylpentane	7.14E-03	No		28	vapor			5.80E-07	4.14E-09	4.14E-09
106	541-73-1	1,3-Dichlorobenzene	2.86E-03	No		19	vapor			5.81E-07	1.66E-09	1.66E-09
107	56-23-5	Carbon tetrachloride	2.86E-03	Yes	22	22	vapor	1.66E-09	5.80E-07		1.66E-09	1.66E-09
108	563-80-4	3-Methyl-2-butanone	7.14E-03	No		14	vapor			6.27E-07	4.48E-09	4.48E-09
109	56-49-5	3-Methylcholanthrene	4.29E-02	No		28	particle bound			5.80E-07	2.49E-08	2.49E-08
110	57-14-7	1,1-Dimethylhydrazine	4.29E-02	Yes	12	12	vapor	3.44E-08	8.03E-07		3.44E-08	3.44E-08
111	58-90-2	2,3,4,6-Tetrachlorophenol	4.29E-02	Yes	11	11	vapor	3.56E-08	8.30E-07		3.56E-08	3.56E-08
112	591-78-6	2-Hexanone	7.14E-03	No		14	vapor			6.27E-07	4.48E-09	4.48E-09
113	59-50-7	4-Chloro-3-methylphenol	4.29E-02	No		32	vapor			7.35E-07	3.15E-08	3.15E-08
114	59-89-2	N-Nitrosomorpholine	4.29E-02	Yes	6	6	vapor	2.53E-08	5.90E-07		2.53E-08	2.53E-08
115	602-87-9	5-Nitroacenaphthene	4.29E-02	No		9	particle bound			1.04E-06	4.47E-08	4.47E-08
116	60-29-7	Ethyl ether	4.29E-02	No		17	vapor			5.85E-07	2.51E-08	2.51E-08
117	603-34-9	Triphenylamine	4.29E-02	Yes	32	32	vapor	3.77E-08	8.79E-07		3.77E-08	3.77E-08
118	60-34-4	Methylhydrazine	7.14E-03	No		10	vapor			7.69E-07	5.49E-09	5.49E-09
119	60-35-5	Acetamide	7.14E-03	Yes	5	5	vapor	1.13E-08	1.58E-06		1.13E-08	1.13E-08
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.29E-02	Yes	10	10	vapor	2.53E-08	5.90E-07		2.53E-08	2.53E-08
121	624-83-9	Methyl isocyanate	7.14E-03	No		17	vapor			5.85E-07	4.18E-09	4.18E-09
122	627-13-4	Nitric acid, propyl ester	3.57E-03	No		17	vapor			5.85E-07	2.09E-09	2.09E-09
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.29E-02	Yes	9	9	vapor	4.47E-08	1.04E-06		4.47E-08	4.47E-08
124	630-20-6	1,1,1,2-Tetrachloroethane	7.14E-03	No		16	vapor			5.89E-07	4.21E-09	4.21E-09
125	64-17-5	Ethyl alcohol	7.14E-03	No		10	vapor			7.69E-07	5.49E-09	5.49E-09
126	64-18-6	Formic acid	1.07E+01	No		7	vapor			1.55E-06	1.66E-05	1.66E-05
127	64-19-7	Acetic acid	1.55E+01	Yes	6	8	vapor	9.12E-06	5.88E-07		9.12E-06	9.12E-06
128	67-56-1	Methyl alcohol (Methanol)	7.14E-03	No		10	vapor			7.69E-07	5.49E-09	5.49E-09
129	67-63-0	2-Propyl alcohol (Isopropanol, Propen-2-01)	1.43E-03	No		11	vapor			8.23E-07	1.18E-09	1.18E-09
130	67-64-1	2-Propanone (Acetone)	1.43E-02	No		13	vapor			7.24E-07	1.03E-08	1.03E-08
131	67-66-3	Chloroform	2.86E-03	No		19	vapor			5.81E-07	1.66E-09	1.66E-09
132	67-72-1	Hexachloroethane	4.29E-02	No		19	vapor			5.81E-07	2.49E-08	2.49E-08
133	684-16-2	Hexafluoroacetone	7.14E-03	No		19	vapor			5.81E-07	4.15E-09	4.15E-09
134	71-23-8	n-Propyl alcohol	2.86E-03	No		11	vapor			8.23E-07	2.35E-09	2.35E-09
135	71-36-3	n-Butyl alcohol	7.14E-03	No		11	vapor			8.23E-07	5.88E-09	5.88E-09
136	71-43-2	Benzene	2.86E-03	Yes	19	19	vapor	1.66E-09	5.81E-07		1.66E-09	1.66E-09
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	No		21	vapor			5.80E-07	1.66E-09	1.66E-09
138	74-83-9	Bromomethane (Methyl bromide)	2.86E-03	No		19	vapor			5.81E-07	1.66E-09	1.66E-09
139	74-87-3	Chloromethane (Methyl chloride)	2.86E-03	No		20	vapor			5.80E-07	1.66E-09	1.66E-09
140	74-97-5	Bromochloromethane	7.14E-03	No		17	vapor			5.85E-07	4.18E-09	4.18E-09
141	74-99-7	Methylacetylene	4.29E-02	No		20	vapor			5.80E-07	2.49E-08	2.49E-08
142	75-00-3	Chloroethane	2.86E-03	No		20	vapor			5.80E-07	1.66E-09	1.66E-09
143	75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	No		22	vapor			5.80E-07	1.66E-09	1.66E-09
144	75-05-8	Acetonitrile	7.14E-03	Yes	13	13	vapor	5.28E-09	7.39E-07		5.28E-09	5.28E-09
145	75-07-0	Acetaldehyde	4.29E-02	No		13	vapor			7.24E-07	3.10E-08	3.10E-08
146	75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	No		19	vapor			5.81E-07	1.66E-09	1.66E-09
147	75-12-7	Formamide	4.29E-02	Yes	4	4	vapor	6.80E-08	1.59E-06		6.80E-08	6.80E-08
148	75-15-0	Carbon disulfide	7.14E-03	No		20	vapor			5.80E-07	4.14E-09	4.14E-09
149	75-21-8	Ethylene oxide (Oxirane)	1.43E-03	No		15	vapor			6.10E-07	8.72E-10	8.72E-10
150	75-27-4	Bromodichloromethane	7.14E-03	No		16	vapor			5.89E-07	4.21E-09	4.21E-09
151	75-34-3	1,1-Dichloroethane	2.86E-03	No		19	vapor			5.81E-07	1.66E-09	1.66E-09
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.14E-03	No		22	vapor			5.80E-07	4.14E-09	4.14E-09
153	75-43-4	Dichlorofluoromethane	2.86E-03	No		20	vapor			5.80E-07	1.66E-09	1.66E-09
154	75-45-6	Chlorodifluoromethane	2.86E-03	No		22	vapor			5.80E-07	1.66E-09	1.66E-09
155	75-50-3	Trimethylamine	7.14E-03	No		14	vapor			6.27E-07	4.48E-09	4.48E-09
156	75-52-5	Nitromethane	4.29E-02	No		13	vapor			7.24E-07	3.10E-08	3.10E-08
157	75-55-8	2-Methylaziridine	4.29E-02	No		11	vapor			8.23E-07	3.53E-08	3.53E-08
158	75-61-6	Difluorodibromomethane	7.14E-03	No		22	vapor			5.80E-07	4.14E-09	4.14E-09
159	75-63-8	Trifluorobromomethane	7.14E-03	No		25	vapor			5.81E-07	4.15E-09	4.15E-09
160	75-65-0	2-Methyl-2-propanol	7.14E-03	No		11	vapor			8.23E-07	5.88E-09	5.88E-09
161	75-69-4	Trichlorofluoromethane	7.14E-03	No		23	vapor			5.79E-07	4.14E-09	4.14E-09
162	75-71-8	Dichlorodifluoromethane	7.14E-03	No		25	vapor			5.81E-07	4.15E-09	4.15E-09
163	76-03-9	Trichloroacetic acid	7.14E-03	No		5	vapor			1.58E-06	1.13E-08	1.13E-08
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.29E-02	No		24	vapor			5.81E-07	2.49E-08	2.49E-08
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	No		23	vapor			5.79E-07	2.48E-08	2.48E-08
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.14E-03	No		25	vapor			5.81E-07	4.15E-09	4.15E-09
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.14E-03	No		28	vapor			5.80E-07	4.14E-09	4.14E-09
168	76-15-3	Chloropentafluoroethane	7.14E-03	Yes	29	29	vapor	4.14E-09	5.79E-07		4.14E-09	4.14E-09
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.29E-02	No		11	vapor			8.23E-07	3.53E-08	3.53E-08
170	78-87-5	1,2-Dichloropropane	2.86E-03	No		19	vapor			5.81E-07	1.66E-09	1.66E-09
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.86E-03	No		11	vapor			8.23E-07	2.35E-09	2.35E-09
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	7.14E-03	No		13	vapor			7.24E-07	5.17E-09	5.17E-09
173	79-00-5	1,1,2-Trichloroethane	7.14E-03	No		17	vapor			5.85E-07	4.18E-09	4.18E-09
174	79-01-6	Trichloroethylene	7.14E-03	Yes	20	20	vapor	4.15E-09	5.81E-07		4.15E-09	4.15E-09
175	79-09-4	Propionic acid	4.29E-02	No		6	vapor			1.33E-06	5.70E-08	5.70E-08
176	79-10-7	2-Propenoic acid	5.72E-02	No		6	vapor			1.33E-06	7.60E-08	7.60E-08
177	79-20-9	Methyl acetate	4.29E-02	No		14	vapor			6.27E-07	2.69E-08	2.69E-08
178	79-34-5	1,1,2,2-Tetrachloroethane	1.35E-05	No		16	vapor			5.98E-07	8.06E-12	8.06E-12
179	83-32-9	Acenaphthene	4.29E-02	Yes	15	15	vapor	2.52E-08	5.88E-07		2.52E-08	2.52E-08
180	84-66-2	Diethyl phthalate	4.29E-02	Yes	8	8	vapor	5.46E-08	1.27E-06		5.46E-08	5.46E-08
181	84-74-2	Dibutyl phthalate	4.29E-02	Yes	31	31	particle bound	4.93E-08	1.15E-06		4.93E-08	4.93E-08
182	85-01-8	Phenanthrene	4.29E-02	No		13	particle bound			7.24E-07	3.10E-08	3.10E-08
183	85-68-7	Butylbenzyl phthalate	4.29E-02	No		31	particle bound			1.15E-06	4.93E-08	4.93E-08
184	86-73-7	Fluorene	4.29E-02	No		14	vapor			6.27E-07	2.69E-08	2.69E-08
185	87-68-3	Hexachlorobutadiene	7.14E-03	Yes	20	20	vapor	4.14E-09	5.80E-07		4.14E-09	4.14E-09
186	88-06-2	2,4,6-Trichlorophenol	4.29E-02	No		10	vapor			7.69E-07	3.30E-08	3.30E-08
187	88-72-2	2-Nitrotoluene	7.14E-03	No		12	vapor			8.03E-07	5.73E-09	5.73E-09
188	88-75-5	2-Nitrophenol	4.29E-02	No		12	vapor			8.03E-07	3.44E-08	3.44E-08
189	88-89-1	Picric acid	4.29E-02	Yes	2	2	#N/A	6.82E-08	1.59E-06		6.82E-08	6.82E-08
190	91-20-3	Naphthalene	1.43E-03	Yes	16	16	vapor	8.63E-10	6.04E-07		8.63E-10	8.63E-10
191	91-22-5	Quinoline	4.29E-02	No		9	vapor			1.04E-06	4.47E-08	4.47E-08
192	91-58-7	2-Chloronapthalene	4.29E-02	No		16	vapor			5.96E-07	2.56E-08	2.56E-08
193	92-52-4	1,1'-Biphenyl	2.86E-02	No		16	vapor			5.96E-07	1.70E-08	1.70E-08
194	92-93-3	4-Nitrobiphenyl	4.29E-02	No		10	particle bound			7.69E-07	3.30E-08	3.30E-08
195	95-13-6	Indene	4.29E-02	No		18	vapor			5.89E-07	2.52E-08	2.52E-08
196	95-47-6	o-Xylene	2.86E-03	No		19	vapor			5.81E-07	1.66E-09	1.66E-09
197	95-48-7	o-Cresol (2-Methylphenol)	7.14E-03	No		9	vapor			1.04E-06	7.44E-09	7.44E-09
198	95-49-8	2-Chlorotoluene	4.29E-02	No		19	vapor			5.81E-07	2.49E-08	2.49E-08
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.86E-03	Yes	18	18	vapor	1.68E-09	5.89E-07		1.68E-09	1.68E-09
200	95-57-8	2-Chlorophenol	4.29E-02	No		11	vapor			8.23E-07	3.53E-08	3.53E-08
201	95-95-4	2,4,5-Trichlorophenol	4.29E-02	No		9	vapor			1.04E-06	4.47E-08	4.47E-08
202	96-22-0	3-Pentanone	1.43E-02	No		14	vapor			6.27E-07	8.95E-09	8.95E-09
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	No		19	vapor			5.81E-07	2.49E-08	2.49E-08
204	98-51-1	p-tert-Butyltoluene	4.29E-02	No		21	vapor			5.80E-07	2.48E-08	2.48E-08
205	98-82-8	Cumene	4.29E-02	No		20	vapor			5.80E-07	2.49E-08	2.49E-08
206	98-83-9	alpha-Methylstyrene	7.14E-03	No		19	vapor			5.81E-07	4.15E-09	4.15E-09
207	98-86-2	Acetophenone	2.86E-02	Yes	11	11	vapor	2.33E-08	8.16E-07		2.33E-08	2.33E-08
208	98-95-3	Nitrobenzene	2.86E-02	No		12	vapor			8.03E-07	2.29E-08	2.29E-08
209											3.29E-05	

Adjusted Performance Factors

Group	PF
1	4.44E-06
2	1.59E-06
3	1.59E-06
4	1.59E-06
5	1.58E-06
6	5.88E-07
7	1.55E-06
8	1.33E-06
9	1.04E-06
10	7.69E-07
11	8.23E-07
12	8.03E-07
13	7.24E-07
14	6.27E-07
15	6.10E-07
16	5.98E-07
17	5.85E-07
18	5.89E-07
19	5.81E-07
20	5.80E-07
21	5.80E-07
22	5.80E-07
23	5.79E-07
24	5.81E-07
25	5.81E-07
26	5.80E-07
27	5.80E-07
28	5.80E-07
29	5.79E-07
30	1.67E-06
31	1.15E-06
32	7.35E-07
33	7.37E-07
34	5.90E-07
35	7.91E-07

Coplanar PCBs

CAS #	Name	PJV04 g/sec	Corrected PJV04 g/sec	
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	9.81E-13	9.81E-13	Correction for Coplanar PCBs
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	9.81E-13	9.81E-13	0.99 as parent
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	9.81E-13	9.81E-13	0.01 as coplanar sum
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	9.81E-13	9.81E-13	
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	9.81E-13	9.81E-13	
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	9.81E-13	9.81E-13	
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	9.81E-13	9.81E-13	
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	9.81E-13	9.81E-13	
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	9.81E-13	9.81E-13	
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	9.81E-13	9.81E-13	
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	9.81E-13	9.81E-13	
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	9.81E-13	9.81E-13	
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	9.81E-13	9.81E-13	
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	9.81E-13	9.81E-13	
1336-36-3	Polychlorinated biphenyls (PCBs)	1.36E-09		
1336-36-3	UnCorrected (for coplanar PCBs)	1.37E-09		

	A	B	C	D	E	F	G	K	L	M	N
1	Table B-6 PJV11 - Abated Pretreatment PJM/RFD					Fraction		PJV11	PJV11	Total	Corrected
2			PJV04		Fv	vapor	Fraction	g/sec	g/sec	PJV11	PJV11
3	CAS #	COPC	g/sec	Phase		adjusted	particle	vapor	particle	g/sec	g/sec
4	100-00-5	p-Nitrochlorobenzene	2.20E-08	vapor	1.000	1.000	0.000	2.20E-08	0.00E+00	2.20E-08	2.20E-08
5	100-21-0	p-Phthalic acid	1.90E-07	vapor	1.000	1.000	0.000	1.90E-07	0.00E+00	1.90E-07	1.90E-07
6	100-41-4	Ethyl benzene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
7	100-42-5	Styrene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
8	10061-01-5	cis-1,3-Dichloropropene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
9	10061-02-6	trans-1,3-Dichloropropene	1.67E-09	vapor	1.000	1.000	0.000	1.67E-09	0.00E+00	1.67E-09	1.67E-09
10	101-55-3	4-Bromophenylphenyl ether	2.69E-08	vapor	1.000	1.000	0.000	2.69E-08	0.00E+00	2.69E-08	2.69E-08
11	101-84-8	Diphenyl ether	4.21E-09	vapor	1.000	1.000	0.000	4.21E-09	0.00E+00	4.21E-09	4.21E-09
12	106-35-4	3-Heptanone	1.79E-09	vapor	1.000	1.000	0.000	1.79E-09	0.00E+00	1.79E-09	1.79E-09
13	106-42-3	p-Xylene (Dimethyl benzene)	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
14	106-46-7	1,4-Dichlorobenzene	1.68E-09	vapor	1.000	1.000	0.000	1.68E-09	0.00E+00	1.68E-09	1.68E-09
15	106-88-7	1,2-Epoxybutane	4.36E-09	vapor	1.000	1.000	0.000	4.36E-09	0.00E+00	4.36E-09	4.36E-09
16	106-93-4	Ethylene dibromide (Dibromethane)	1.70E-09	vapor	1.000	1.000	0.000	1.70E-09	0.00E+00	1.70E-09	1.70E-09
17	106-97-8	Butane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
18	106-99-0	1,3-Butadiene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
19	107-02-8	Acrolein	4.48E-09	vapor	1.000	1.000	0.000	4.48E-09	0.00E+00	4.48E-09	4.48E-09
20	107-05-1	3-Chloropropene (Allyl chloride)	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	1.67E-09	vapor	1.000	1.000	0.000	1.67E-09	0.00E+00	1.67E-09	1.67E-09
22	107-12-0	Propionitrile	5.17E-09	vapor	1.000	1.000	0.000	5.17E-09	0.00E+00	5.17E-09	5.17E-09
23	107-13-1	Acrylonitrile	8.95E-09	vapor	1.000	1.000	0.000	8.95E-09	0.00E+00	8.95E-09	8.95E-09
24	107-18-6	2-Propene-1-ol	3.30E-08	vapor	1.000	1.000	0.000	3.30E-08	0.00E+00	3.30E-08	3.30E-08
25	107-31-3	Formic acid, methyl ester	2.61E-08	vapor	1.000	1.000	0.000	2.61E-08	0.00E+00	2.61E-08	2.61E-08
26	107-66-4	Dibutylphosphate	6.77E-08	particle bound	0.995	0.995	0.005	6.74E-08	3.38E-16	6.74E-08	6.74E-08
27	107-87-9	2-Pentanone	8.95E-09	vapor	1.000	1.000	0.000	8.95E-09	0.00E+00	8.95E-09	8.95E-09
28	108-03-2	1-Nitropropane	2.69E-08	vapor	1.000	1.000	0.000	2.69E-08	0.00E+00	2.69E-08	2.69E-08
29	108-05-4	Vinyl acetate	2.56E-08	vapor	1.000	1.000	0.000	2.56E-08	0.00E+00	2.56E-08	2.56E-08
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	4.48E-09	vapor	1.000	1.000	0.000	4.48E-09	0.00E+00	4.48E-09	4.48E-09
31	108-20-3	Bis(isopropyl)ether	4.21E-09	vapor	1.000	1.000	0.000	4.21E-09	0.00E+00	4.21E-09	4.21E-09
32	108-38-3	m-Xylene (Dimethyl benzene)	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
33	108-39-4	m-Cresol	7.44E-09	vapor	1.000	1.000	0.000	7.44E-09	0.00E+00	7.44E-09	7.44E-09
34	108-87-2	Methylcyclohexane	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
35	108-88-3	Toluene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
36	108-90-7	Chlorobenzene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
37	108-93-0	Cyclohexanol	5.49E-09	vapor	1.000	1.000	0.000	5.49E-09	0.00E+00	5.49E-09	5.49E-09
38	108-94-1	Cyclohexanone	5.88E-09	vapor	1.000	1.000	0.000	5.88E-09	0.00E+00	5.88E-09	5.88E-09
39	108-95-2	Phenol	5.94E-08	vapor	1.000	1.000	0.000	5.94E-08	0.00E+00	5.94E-08	5.94E-08
40	109-66-0	n-Pentane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
41	109-99-9	Tetrahydrofuran	2.07E-09	vapor	1.000	1.000	0.000	2.07E-09	0.00E+00	2.07E-09	2.07E-09
42	110-12-3	5-Methyl-2-hexanone	1.74E-09	vapor	1.000	1.000	0.000	1.74E-09	0.00E+00	1.74E-09	1.74E-09
43	110-43-0	2-Heptanone	1.74E-09	vapor	1.000	1.000	0.000	1.74E-09	0.00E+00	1.74E-09	1.74E-09
44	110-54-3	n-Hexane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
45	110-62-3	n-Valeraldehyde	2.61E-08	vapor	1.000	1.000	0.000	2.61E-08	0.00E+00	2.61E-08	2.61E-08
46	110-82-7	Cyclohexane	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
47	110-83-8	Cyclohexene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
48	110-86-1	Pyridine	1.18E-08	vapor	1.000	1.000	0.000	1.18E-08	0.00E+00	1.18E-08	1.18E-08
49	111-65-9	n-Octane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
50	111-76-2	Ethylene glycol monobutyl ether	4.47E-08	vapor	1.000	1.000	0.000	4.47E-08	0.00E+00	4.47E-08	4.47E-08
51	111-84-2	n-Nonane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	7.17E-08	particle bound	0.130	0.130	0.870	9.32E-09	6.24E-14	9.32E-09	9.32E-09
53	117-84-0	n-Dioctyl phthalate	3.15E-08	particle bound	0.852	0.852	0.148	2.68E-08	4.66E-15	2.68E-08	2.68E-08
54	120-12-7	Anthracene	3.04E-08	particle bound	0.998	0.998	0.002	3.03E-08	6.08E-17	3.03E-08	3.03E-08
55	120-82-1	1,2,4-Trichlorobenzene	4.18E-09	vapor	1.000	1.000	0.000	4.18E-09	0.00E+00	4.18E-09	4.18E-09
56	120-83-2	2,4-Dichlorophenol	3.30E-08	vapor	1.000	1.000	0.000	3.30E-08	0.00E+00	3.30E-08	3.30E-08
57	121-44-8	Triethylamine	4.36E-09	vapor	1.000	1.000	0.000	4.36E-09	0.00E+00	4.36E-09	4.36E-09
58	121-69-7	Dimethylaniline	5.17E-09	vapor	1.000	1.000	0.000	5.17E-09	0.00E+00	5.17E-09	5.17E-09
59	122-39-4	N,N-Diphenylamine	1.36E-08	vapor	1.000	1.000	0.000	1.36E-08	0.00E+00	1.36E-08	1.36E-08
60	123-19-3	4-Heptanone	2.07E-09	vapor	1.000	1.000	0.000	2.07E-09	0.00E+00	2.07E-09	2.07E-09
61	123-38-6	n-Propionaldehyde	8.95E-09	vapor	1.000	1.000	0.000	8.95E-09	0.00E+00	8.95E-09	8.95E-09
62	123-51-3	3-Methyl-1-butanol	5.73E-09	vapor	1.000	1.000	0.000	5.73E-09	0.00E+00	5.73E-09	5.73E-09
63	123-86-4	Acetic acid n-butyl ester	8.06E-11	vapor	1.000	1.000	0.000	8.06E-11	0.00E+00	8.06E-11	8.06E-11
64	123-91-1	1,4-Dioxane	1.10E-09	vapor	1.000	1.000	0.000	1.10E-09	0.00E+00	1.10E-09	1.10E-09
65	126-73-8	Tributyl phosphate	4.43E-08	particle bound	0.996	0.996	0.004	4.42E-08	1.77E-16	4.42E-08	4.42E-08
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	4.26E-09	vapor	1.000	1.000	0.000	4.26E-09	0.00E+00	4.26E-09	4.26E-09
67	127-18-4	Perchloroethylene (tetrachloroethylene)	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
68	127-19-5	N,N-Dimethylacetamide	1.13E-08	vapor	1.000	1.000	0.000	1.13E-08	0.00E+00	1.13E-08	1.13E-08
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.05E-08	vapor	1.000	1.000	0.000	1.05E-08	0.00E+00	1.05E-08	1.05E-08
70	129-00-0	Pyrene	3.79E-08	particle bound	0.994	0.994	0.006	3.77E-08	2.27E-16	3.77E-08	3.77E-08
71	1321-64-8	Pentachloronaphthalene	2.53E-08	particle bound	0.971	0.971	0.029	2.45E-08	7.33E-16	2.45E-08	2.45E-08
72	1321-65-9	Trichloronaphthalene	2.61E-08	particle bound	0.999	0.999	0.001	2.61E-08	2.61E-17	2.61E-08	2.61E-08
73	132-64-9	Dibenzofuran	2.71E-08	particle bound	0.999	0.999	0.001	2.70E-08	2.71E-17	2.70E-08	2.70E-08
74	1335-87-1	Hexachloronaphthalene	2.69E-08	particle bound	0.984	0.984	0.016	2.64E-08	4.30E-16	2.64E-08	2.64E-08
75	1335-88-2	Tetrachloronaphthalene	2.61E-08	particle bound	0.991	0.991	0.009	2.59E-08	2.35E-16	2.59E-08	2.59E-08
76	1336-36-3	Polychlorinated biphenyls (PCBs)	1.36E-09	vapor	1.000	1.000	0.000	1.36E-09	0.00E+00	1.36E-09	1.36E-09
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	8.48E-11	vapor	1.000	1.000	0.000	8.48E-11	0.00E+00	8.48E-11	8.48E-11
78	141-79-7	4-Methyl-3-penten-2-one	3.10E-08	vapor	1.000	1.000	0.000	3.10E-08	0.00E+00	3.10E-08	3.10E-08
79	142-82-5	n-Heptane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
80	144-62-7	Oxalic acid	3.41E-08	vapor	1.000	1.000	0.000	3.41E-08	0.00E+00	3.41E-08	3.41E-08
81	156-60-5	trans-1,2-Dichloroethylene	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
82	1634-04-4	Methyl tert-butyl ether	4.26E-09	vapor	1.000	1.000	0.000	4.26E-09	0.00E+00	4.26E-09	4.26E-09
83	189-55-9	Dibenzo[a,i]pyrene	6.77E-08	particle	0.000	0.000	1.000	0.00E+00	6.77E-14	6.77E-14	6.77E-14
84	189-64-0	Dibenzo[a,h]pyrene	6.77E-08	particle	0.000	0.000	1.000	0.00E+00	6.77E-14	6.77E-14	6.77E-14
85	191-24-2	Benzo(g,h,i)perylene	7.17E-08	particle bound	0.065	0.065	0.935	4.66E-09	6.70E-14	4.66E-09	4.66E-09
86	191-30-0	Benzo[a,i]pyrene	6.77E-08	particle	0.000	0.000	1.000	0.00E+00	6.77E-14	6.77E-14	6.77E-14
87	192-65-4	Dibenzo[a,e]pyrene	6.77E-08	particle	0.000	0.000	1.000	0.00E+00	6.77E-14	6.77E-14	6.77E-14
88	193-39-5	Indeno(1,2,3-cd)pyrene	6.86E-08	particle	0.000	0.000	1.000	0.00E+00	6.86E-14	6.86E-14	6.86E-14
89	206-44-0	Fluoranthene	2.53E-08	particle bound	0.992	0.992	0.008	2.51E-08	2.02E-16	2.51E-08	2.51E-08
90	208-96-8	Acenaphthylene	2.85E-08	vapor	1.000	1.000	0.000	2.85E-08	0.00E+00	2.85E-08	2.85E-08
91	2234-13-1	Octachloronaphthalene	8.48E-11	particle bound	0.629	0.629	0.371	5.33E-11	3.15E-17	5.33E-11	5.33E-11
92	224-42-0	Dibenz[a,j]acridine	6.80E-08	particle bound	0.241	0.241	0.759	1.64E-08	5.16E-14	1.64E-08	1.64E-08
93	226-36-8	Dibenz[a,h]acridine	6.80E-08	particle bound	0.285	0.285	0.715	1.94E-08	4.86E-14	1.94E-08	1.94E-08
94	25551-13-7	Trimethyl benzene	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
95	26140-60-3	Terphenyls	2.53E-08	particle bound	0.872	0.872	0.128	2.21E-08	3.24E-15	2.21E-08	2.21E-08
96	27154-33-2	Trichlorofluoroethane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
97	287-92-3	Cyclopentane	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
98	3697-24-3	5-Methylchrysene	2.53E-08	particle bound	0.823	0.823	0.177	2.08E-08	4.48E-15	2.08E-08	2.08E-08
99	3825-26-1	Ammonium perfluorooctanoate	2.69E-08	vapor	1.000	1.000	0.000	2.69E-08	0.00E+00	2.69E-08	2.69E-08
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	5.88E-09	vapor	1.000	1.000	0.000	5.88E-09	0.00E+00	5.88E-09	5.88E-09
101	50-00-0	Formaldehyde	9.50E-09	vapor	1.000	1.000	0.000	9.50E-09	0.00E+00	9.50E-09	9.50E-09
102	50-32-8	Benzo(a)pyrene	4.73E-08	particle bound	0.290	0.290	0.710	1.37E-08	3.36E-14	1.37E-08	1.37E-08
103	53-70-3	Dibenzo(a,h)anthracene	4.21E-08	particle bound	0.054	0.054	0.946	2.27E-09	3.99E-14	2.27E-09	2.27E-09
104	540-59-0	1,2-Dichloroethylene	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
105	540-84-1	2,2,4-Trimethylpentane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
106	541-73-1	1,3-Dichlorobenzene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
107	56-23-5	Carbon tetrachloride	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
108	563-80-4	3-Methyl-2-butanone	4.48E-09	vapor	1.000	1.000	0.000	4.48E-09	0.00E+00	4.48E-09	4.48E-09
109	56-49-5	3-Methylcholanthrene	2.49E-08	particle bound	0.364	0.364	0.636	9.05E-09	1.58E-14	9.05E-09	9.05E-09
110	57-14-7	1,1-Dimethylhydrazine	3.44E-08	vapor	1.000	1.000	0.000	3.44E-08	0.00E+00	3.44E-08	3.44E-08
111	58-90-2	2,3,4,6-Tetrachlorophenol	3.56E-08	vapor	1.000	1.000	0.000	3.56E-08	0.00E+00	3.56E-08	3.56E-08
112	591-78-6	2-Hexanone	4.48E-09	vapor	1.000	1.000	0.000	4.48E-09	0.00E+00	4.48E-09	4.48E-09
113	59-50-7	4-Chloro-3-methylphenol	3.15E-08	vapor	1.000	1.000	0.000	3.15E-08	0.00E+00	3.15E-08	3.15E-08
114	59-89-2	N-Nitrosomorpholine	2.53E-08	vapor	1.000	1.000	0.000	2.53E-08	0.00E+00	2.53E-08	2.53E-08
115	602-87-9	5-Nitroacenaphthene	4.47E-08	particle bound	0.997	0.997	0.003	4.45E-08	1.34E-16	4.45E-08	4.45E-08
116	60-29-7	Ethyl ether	2.51E-08	vapor	1.000	1.000	0.000	2.51E-08	0.00E+00	2.51E-08	2.51E-08
117	603-34-9	Triphenylamine	3.77E-08	vapor	1.000	1.000	0.000	3.77E-08	0.00E+00	3.77E-08	3.77E-08
118	60-34-4	Methylhydrazine	5.49E-09	vapor	1.000	1.000	0.000	5.49E-09	0.00E+00	5.49E-09	5.49E-09
119	60-35-5	Acetamide	1.13E-08	vapor	1.000	1.000	0.000	1.13E-08	0.00E+00	1.13E-08	1.13E-08
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	2.53E-08	vapor	1.000	1.000	0.000	2.53E-08	0.00E+00	2.53E-08	2.53E-08
121	624-83-9	Methyl isocyanate	4.18E-09	vapor	1.000	1.000	0.000	4.18E-09	0.00E+00	4.18E-09	4.18E-09
122	627-13-4	Nitric acid, propyl ester	2.09E-09	vapor	1.000	1.000	0.000	2.09E-09	0.00E+00	2.09E-09	2.09E-09
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.47E-08	vapor	1.000	1.000	0.000	4.47E-08	0.00E+00	4.47E-08	4.47E-08
124	630-20-6	1,1,1,2-Tetrachloroethane	4.21E-09	vapor	1.000	1.000	0.000	4.21E-09	0.00E+00	4.21E-09	4.21E-09
125	64-17-5	Ethyl alcohol	5.49E-09	vapor	1.000	1.000	0.000	5.49E-09	0.00E+00	5.49E-09	5.49E-09
126	64-18-6	Formic acid	1.66E-05	vapor	1.000	1.000	0.000	1.66E-05	0.00E+00	1.66E-05	1.66E-05
127	64-19-7	Acetic acid	9.12E-06	vapor	1.000	1.000	0.000	9.12E-06	0.00E+00	9.12E-06	9.12E-06
128	67-56-1	Methyl alcohol (Methanol)	5.49E-09	vapor	1.000	1.000	0.000	5.49E-09	0.00E+00	5.49E-09	5.49E-09
129	67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	1.18E-09	vapor	1.000	1.000	0.000	1.18E-09	0.00E+00	1.18E-09	1.18E-09
130	67-64-1	2-Propanone (Acetone)	1.03E-08	vapor	1.000	1.000	0.000	1.03E-08	0.00E+00	1.03E-08	1.03E-08
131	67-66-3	Chloroform	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
132	67-72-1	Hexachloroethane	2.49E-08	vapor	1.000	1.000	0.000	2.49E-08	0.00E+00	2.49E-08	2.49E-08
133	684-16-2	Hexafluoroacetone	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
134	71-23-8	n-Propyl alcohol	2.35E-09	vapor	1.000	1.000	0.000	2.35E-09	0.00E+00	2.35E-09	2.35E-09
135	71-36-3	n-Butyl alcohol	5.88E-09	vapor	1.000	1.000	0.000	5.88E-09	0.00E+00	5.88E-09	5.88E-09
136	71-43-2	Benzene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
138	74-83-9	Bromomethane (Methyl bromide)	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
139	74-87-3	Chloromethane (Methyl chloride)	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
140	74-97-5	Bromochloromethane	4.18E-09	vapor	1.000	1.000	0.000	4.18E-09	0.00E+00	4.18E-09	4.18E-09
141	74-99-7	Methylacetylene	2.49E-08	vapor	1.000	1.000	0.000	2.49E-08	0.00E+00	2.49E-08	2.49E-08
142	75-00-3	Chloroethane	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
143	75-01-4	Vinyl chloride (1-Chloroethene)	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
144	75-05-8	Acetonitrile	5.28E-09	vapor	1.000	1.000	0.000	5.28E-09	0.00E+00	5.28E-09	5.28E-09
145	75-07-0	Acetaldehyde	3.10E-08	vapor	1.000	1.000	0.000	3.10E-08	0.00E+00	3.10E-08	3.10E-08
146	75-09-2	Dichloromethane (Methylene chloride)	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
147	75-12-7	Formamide	6.80E-08	vapor	1.000	1.000	0.000	6.80E-08	0.00E+00	6.80E-08	6.80E-08
148	75-15-0	Carbon disulfide	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
149	75-21-8	Ethylene oxide (Oxirane)	8.72E-10	vapor	1.000	1.000	0.000	8.72E-10	0.00E+00	8.72E-10	8.72E-10
150	75-27-4	Bromodichloromethane	4.21E-09	vapor	1.000	1.000	0.000	4.21E-09	0.00E+00	4.21E-09	4.21E-09
151	75-34-3	1,1-Dichloroethane	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
153	75-43-4	Dichlorofluoromethane	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
154	75-45-6	Chlorodifluoromethane	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
155	75-50-3	Trimethylamine	4.48E-09	vapor	1.000	1.000	0.000	4.48E-09	0.00E+00	4.48E-09	4.48E-09
156	75-52-5	Nitromethane	3.10E-08	vapor	1.000	1.000	0.000	3.10E-08	0.00E+00	3.10E-08	3.10E-08
157	75-55-8	2-Methylaziridine	3.53E-08	vapor	1.000	1.000	0.000	3.53E-08	0.00E+00	3.53E-08	3.53E-08
158	75-61-6	Difluorodibromomethane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
159	75-63-8	Trifluorobromomethane	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
160	75-65-0	2-Methyl-2-propanol	5.88E-09	vapor	1.000	1.000	0.000	5.88E-09	0.00E+00	5.88E-09	5.88E-09
161	75-69-4	Trichlorofluoromethane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
162	75-71-8	Dichlorodifluoromethane	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
163	76-03-9	Trichloroacetic acid	1.13E-08	vapor	1.000	1.000	0.000	1.13E-08	0.00E+00	1.13E-08	1.13E-08
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	2.49E-08	vapor	1.000	1.000	0.000	2.49E-08	0.00E+00	2.49E-08	2.49E-08
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	2.48E-08	vapor	1.000	1.000	0.000	2.48E-08	0.00E+00	2.48E-08	2.48E-08
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
168	76-15-3	Chloropentafluoroethane	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09
169	78-83-1	2-Methylpropyl alcohol (isobutyl alcohol)	3.53E-08	vapor	1.000	1.000	0.000	3.53E-08	0.00E+00	3.53E-08	3.53E-08
170	78-87-5	1,2-Dichloropropane	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.35E-09	vapor	1.000	1.000	0.000	2.35E-09	0.00E+00	2.35E-09	2.35E-09
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	5.17E-09	vapor	1.000	1.000	0.000	5.17E-09	0.00E+00	5.17E-09	5.17E-09
173	79-00-5	1,1,2-Trichloroethane	4.18E-09	vapor	1.000	1.000	0.000	4.18E-09	0.00E+00	4.18E-09	4.18E-09
174	79-01-6	Trichloroethylene	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09
175	79-09-4	Propionic acid	5.70E-08	vapor	1.000	1.000	0.000	5.70E-08	0.00E+00	5.70E-08	5.70E-08
176	79-10-7	2-Propenoic acid	7.60E-08	vapor	1.000	1.000	0.000	7.60E-08	0.00E+00	7.60E-08	7.60E-08
177	79-20-9	Methyl acetate	2.69E-08	vapor	1.000	1.000	0.000	2.69E-08	0.00E+00	2.69E-08	2.69E-08
178	79-34-5	1,1,2,2-Tetrachloroethane	8.06E-12	vapor	1.000	1.000	0.000	8.06E-12	0.00E+00	8.06E-12	8.06E-12
179	83-32-9	Acenaphthene	2.52E-08	vapor	1.000	1.000	0.000	2.52E-08	0.00E+00	2.52E-08	2.52E-08
180	84-66-2	Diethyl phthalate	5.46E-08	vapor	1.000	1.000	0.000	5.46E-08	0.00E+00	5.46E-08	5.46E-08

P	Q	R	S
			Corrected
Coplanar PCBs		PJV11	PJV11
		g/sec	g/sec
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	9.81E-13	9.81E-13
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	9.81E-13	9.81E-13
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	9.81E-13	9.81E-13
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	9.81E-13	9.81E-13
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	9.81E-13	9.81E-13
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	9.81E-13	9.81E-13
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	9.81E-13	9.81E-13
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	9.81E-13	9.81E-13
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	9.81E-13	9.81E-13
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	9.81E-13	9.81E-13
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	9.81E-13	9.81E-13
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	9.81E-13	9.81E-13
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	9.81E-13	9.81E-13
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	9.81E-13	9.81E-13
1336-36-3	Polychlorinated biphenyls (PCBs)	1.36E-09	
1336-36-3	UnCorrected (for coplanar PCBs)	1.37E-09	

Correction for Coplanar PCBs
0.99 as parent
0.01 as coplanar sum

General DFs	Demisters	HEPA 1	HEPA 2	Total DF
Vapor	1	1	1	1
Particle	5	2000	100	1.00E+06

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV: C
SHEET NO.: B-8

	A	B	C	D	E	F	G	K	L	M	N	O	P	Q	R	S	T	U	V
1	Table B-5 PJV11 - Abated Pretreatment PJM/RFD					Fraction		PJV11	PJV11	Total	Corrected								
2			PJV04		Fv	vapor	Fraction	g/sec	g/sec	PJV11	PJV11								
3	CAS #	COPC	g/sec	Phase		adjusted	particle	vapor	particle	g/sec	g/sec					Corrected			
181	84-74-2	Dibutyl phthalate	4.93E-08	particle bound	0.994	0.994	0.006	4.90E-08	2.96E-16	4.90E-08	4.90E-08								
182	85-01-8	Phenanthrene	3.10E-08	particle bound	0.999	0.999	0.001	3.10E-08	3.10E-17	3.10E-08	3.10E-08								
183	85-68-7	Butylbenzyl phthalate	4.93E-08	particle bound	0.948	0.948	0.052	4.67E-08	2.56E-15	4.67E-08	4.67E-08								
184	86-73-7	Fluorene	2.69E-08	vapor	1.000	1.000	0.000	2.69E-08	0.00E+00	2.69E-08	2.69E-08								
185	87-68-3	Hexachlorobutadiene	4.14E-09	vapor	1.000	1.000	0.000	4.14E-09	0.00E+00	4.14E-09	4.14E-09								
186	88-06-2	2,4,6-Trichlorophenol	3.30E-08	vapor	1.000	1.000	0.000	3.30E-08	0.00E+00	3.30E-08	3.30E-08								
187	88-72-2	2-Nitrotoluene	5.73E-09	vapor	1.000	1.000	0.000	5.73E-09	0.00E+00	5.73E-09	5.73E-09								
188	88-75-5	2-Nitrophenol	3.44E-08	vapor	1.000	1.000	0.000	3.44E-08	0.00E+00	3.44E-08	3.44E-08								
189	88-89-1	Picric acid	6.82E-08	#N/A	0.934	0.934	0.066	6.37E-08	4.50E-15	6.37E-08	6.37E-08								
190	91-20-3	Naphthalene	8.63E-10	vapor	1.000	1.000	0.000	8.63E-10	0.00E+00	8.63E-10	8.63E-10								
191	91-22-5	Quinoline	4.47E-08	vapor	1.000	1.000	0.000	4.47E-08	0.00E+00	4.47E-08	4.47E-08								
192	91-58-7	2-Chloronaphthalene	2.56E-08	vapor	1.000	1.000	0.000	2.56E-08	0.00E+00	2.56E-08	2.56E-08								
193	92-52-4	1,1'-Biphenyl	1.70E-08	vapor	1.000	1.000	0.000	1.70E-08	0.00E+00	1.70E-08	1.70E-08								
194	92-93-3	4-Nitrobiphenyl	3.30E-08	particle bound	0.999	0.999	0.001	3.29E-08	3.30E-17	3.29E-08	3.29E-08								
195	95-13-6	Indene	2.52E-08	vapor	1.000	1.000	0.000	2.52E-08	0.00E+00	2.52E-08	2.52E-08								
196	95-47-6	o-Xylene	1.66E-09	vapor	1.000	1.000	0.000	1.66E-09	0.00E+00	1.66E-09	1.66E-09								
197	95-48-7	o-Cresol (2-Methylphenol)	7.44E-09	vapor	1.000	1.000	0.000	7.44E-09	0.00E+00	7.44E-09	7.44E-09								
198	95-49-8	2-Chlorotoluene	2.49E-08	vapor	1.000	1.000	0.000	2.49E-08	0.00E+00	2.49E-08	2.49E-08								
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	1.68E-09	vapor	1.000	1.000	0.000	1.68E-09	0.00E+00	1.68E-09	1.68E-09								
200	95-57-8	2-Chlorophenol	3.53E-08	vapor	1.000	1.000	0.000	3.53E-08	0.00E+00	3.53E-08	3.53E-08								
201	95-95-4	2,4,5-Trichlorophenol	4.47E-08	vapor	1.000	1.000	0.000	4.47E-08	0.00E+00	4.47E-08	4.47E-08								
202	96-22-0	3-Pentanone	8.95E-09	vapor	1.000	1.000	0.000	8.95E-09	0.00E+00	8.95E-09	8.95E-09								
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	2.49E-08	vapor	1.000	1.000	0.000	2.49E-08	0.00E+00	2.49E-08	2.49E-08								
204	98-51-1	p-tert-Butyltoluene	2.48E-08	vapor	1.000	1.000	0.000	2.48E-08	0.00E+00	2.48E-08	2.48E-08								
205	98-82-8	Cumene	2.49E-08	vapor	1.000	1.000	0.000	2.49E-08	0.00E+00	2.49E-08	2.49E-08								
206	98-83-9	alpha-Methylstyrene	4.15E-09	vapor	1.000	1.000	0.000	4.15E-09	0.00E+00	4.15E-09	4.15E-09								
207	98-86-2	Acetophenone	2.33E-08	vapor	1.000	1.000	0.000	2.33E-08	0.00E+00	2.33E-08	2.33E-08								
208	98-95-3	Nitrobenzene	2.29E-08	vapor	1.000	1.000	0.000	2.29E-08	0.00E+00	2.29E-08	2.29E-08								
209										3.22E-05									

Table B-6 LMP08 - Unabated LAW Melter

Row	CAS #	COPC	Feed Rate g/sec	In ACM	Group	Grouping	Phase	LMP08 rate g/sec	Performance Factor	Adjusted PF	Calc'd rate LMP08 g/sec	Corrected LMP08 g/sec
4	100-00-5	p-Nitrochlorobenzene	2.86E-02	No		10	vapor			1.49E-02	4.26E-04	4.26E-04
5	100-21-0	p-Phthalic acid	4.29E-02	Yes	1	1	vapor	4.14E-01	9.66E+00		4.14E-01	4.14E-01
6	100-41-4	Ethyl benzene	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
7	100-42-5	Styrene	2.86E-03	No		19	vapor			1.81E-18	5.18E-21	0.00E+00
8	10061-01-5	cis-1,3-Dichloropropene	2.86E-03	Yes	19	19	vapor	1.55E-20	5.44E-18		1.55E-20	0.00E+00
9	10061-02-6	trans-1,3-Dichloropropene	2.86E-03	No		17	vapor			2.84E-17	8.13E-20	0.00E+00
10	101-55-3	4-Bromophenylphenyl ether	4.29E-02	No		14	vapor			1.01E-06	4.33E-08	4.33E-08
11	101-84-8	Diphenyl ether	7.14E-03	Yes	16	16	vapor	2.72E-13	3.80E-11		2.72E-13	2.72E-13
12	106-35-4	3-Heptanone	2.86E-03	No		14	vapor			1.01E-06	2.88E-09	2.88E-09
13	106-42-3	p-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			1.81E-18	1.30E-20	0.00E+00
14	106-46-7	1,4-Dichlorobenzene	2.86E-03	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
15	106-88-7	1,2-Epoxybutane	7.14E-03	No		15	vapor			6.13E-08	4.38E-10	4.38E-10
16	106-93-4	Ethylene dibromide (Dibromoethane)	2.86E-03	Yes	16	16	vapor	4.42E-13	1.56E-10		4.42E-13	4.42E-13
17	106-97-8	Butane	7.14E-03	Yes	26	26	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
18	106-99-0	1,3-Butadiene	2.86E-03	Yes	23	23	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
19	107-02-8	Acrolein	7.14E-03	No		14	vapor			1.01E-06	7.21E-09	7.21E-09
20	107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.86E-03	No		17	vapor			2.84E-17	8.13E-20	0.00E+00
22	107-12-0	Propionitrile	7.14E-03	No		13	vapor			7.48E-05	5.34E-07	5.34E-07
23	107-13-1	Acrylonitrile	1.43E-02	No		14	vapor			1.01E-06	1.44E-08	1.44E-08
24	107-18-6	2-Propene-1-ol	4.29E-02	No		10	vapor			1.49E-02	6.40E-04	6.40E-04
25	107-31-3	Formic acid, methyl ester	4.29E-02	No		15	vapor			6.13E-08	2.63E-09	2.63E-09
26	107-66-4	Dibutylphosphate	4.29E-02	No		5	particle bound			8.30E-01	3.56E-02	3.56E-02
27	107-87-9	2-Pentanone	1.43E-02	No		14	vapor			1.01E-06	1.44E-08	1.44E-08
28	108-03-2	1-Nitropropane	4.29E-02	No		14	vapor			1.01E-06	4.33E-08	4.33E-08
29	108-05-4	Vinyl acetate	4.29E-02	No		16	vapor			8.33E-10	3.57E-11	3.57E-11
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.14E-03	No		14	vapor			1.01E-06	7.21E-09	7.21E-09
31	108-20-3	Bis(isopropyl)ether	7.14E-03	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
32	108-38-3	m-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			1.81E-18	1.30E-20	0.00E+00
33	108-39-4	m-Cresol	7.14E-03	No		9	vapor			6.99E-02	4.99E-04	4.99E-04
34	108-87-2	Methylcyclohexane	7.14E-03	Yes	25	25	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
35	108-88-3	Toluene	2.86E-03	Yes	19	19	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
36	108-90-7	Chlorobenzene	2.86E-03	No		19	vapor			1.81E-18	5.18E-21	0.00E+00
37	108-93-0	Cyclohexanol	7.14E-03	No		10	vapor			1.49E-02	1.07E-04	1.07E-04
38	108-94-1	Cyclohexanone	7.14E-03	No		11	vapor			3.14E-03	2.24E-05	2.24E-05
39	108-95-2	Phenol	4.29E-02	Yes	8	8	vapor	1.78E-02	4.16E-01		1.78E-02	1.78E-02
40	109-66-0	n-Pentane	7.14E-03	No		26	vapor			0.00E+00	0.00E+00	0.00E+00
41	109-99-9	Tetrahydrofuran	2.86E-03	No		13	vapor			7.48E-05	2.14E-07	2.14E-07
42	110-12-3	5-Methyl-2-hexanone	2.86E-03	No		15	vapor			6.13E-08	1.75E-10	1.75E-10
43	110-43-0	2-Heptanone	2.86E-03	No		15	vapor			6.13E-08	1.75E-10	1.75E-10
44	110-54-3	n-Hexane	7.14E-03	Yes	27	27	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
45	110-62-3	n-Valeraldehyde	4.29E-02	No		15	vapor			6.13E-08	2.63E-09	2.63E-09
46	110-82-7	Cyclohexane	7.14E-03	Yes	24	24	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
47	110-83-8	Cyclohexene	2.86E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
48	110-86-1	Pyridine	1.43E-02	No		11	vapor			3.14E-03	4.49E-05	4.49E-05
49	111-65-9	n-Octane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
50	111-76-2	Ethylene glycol monobutyl ether	4.29E-02	No		9	vapor			6.99E-02	3.00E-03	3.00E-03
51	111-84-2	n-Nonane	7.14E-03	Yes	28	28	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.29E-02	No		30	particle bound			4.34E-01	1.86E-02	1.86E-02
53	117-84-0	n-Dioctyl phthalate	4.29E-02	No		32	particle bound			5.20E-03	2.23E-04	2.23E-04
54	120-12-7	Anthracene	4.29E-02	Yes	13	13	particle bound	1.19E-06	2.77E-05		1.19E-06	1.19E-06
55	120-82-1	1,2,4-Trichlorobenzene	7.14E-03	Yes	17	17	vapor	2.03E-19	2.84E-17		2.03E-19	0.00E+00
56	120-83-2	2,4-Dichlorophenol	4.29E-02	No		10	vapor			1.49E-02	6.40E-04	6.40E-04
57	121-44-8	Triethylamine	7.14E-03	No		15	vapor			6.13E-08	4.38E-10	4.38E-10
58	121-69-7	Dimethylaniline	7.14E-03	No		13	vapor			7.48E-05	5.34E-07	5.34E-07
59	122-39-4	N,N-Diphenylamine	1.43E-02	Yes	10	10	vapor	4.26E-04	2.98E-02		4.26E-04	4.26E-04
60	123-19-3	4-Heptanone	2.86E-03	No		13	vapor			7.48E-05	2.14E-07	2.14E-07
61	123-38-6	n-Propionaldehyde	1.43E-02	No		14	vapor			1.01E-06	1.44E-08	1.44E-08
62	123-51-3	3-Methyl-1-butanol	7.14E-03	No		12	vapor			1.73E-03	1.23E-05	1.23E-05
63	123-86-4	Acetic acid n-butyl ester	1.35E-04	No		16	vapor			8.33E-10	1.13E-13	1.13E-13
64	123-91-1	1,4-Dioxane	1.43E-03	No		10	vapor			1.49E-02	2.13E-05	2.13E-05
65	126-73-8	Tributyl phosphate	2.86E-02	Yes	7	7	particle bound	1.81E-02	6.32E-01		1.81E-02	1.81E-02
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	7.14E-03	No		16	vapor			8.33E-10	5.95E-12	5.95E-12
67	127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	Yes	21	21	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
68	127-19-5	N,N-Dimethylacetamide	7.14E-03	No		5	vapor			8.30E-01	5.93E-03	5.93E-03
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.43E-02	No		32	vapor			5.20E-03	7.43E-05	7.43E-05
70	129-00-0	Pyrene	4.29E-02	Yes	33	33	particle bound	1.06E-04	2.48E-03		1.06E-04	1.06E-04
71	1321-64-8	Pentachloronaphthalene	4.29E-02	Yes	14	14	particle bound	2.78E-12	6.43E-11		2.78E-12	2.78E-12
72	1321-65-9	Trichloronaphthalene	4.29E-02	No		15	particle bound			6.13E-08	2.63E-09	2.63E-09
73	132-64-9	Dibenzofuran	4.29E-02	Yes	15	15	particle bound	5.25E-09	1.23E-07		5.25E-09	5.25E-09
74	1335-87-1	Hexachloronaphthalene	4.29E-02	No		14	particle bound			1.01E-06	4.33E-08	4.33E-08
75	1335-88-2	Tetrachloronaphthalene	4.29E-02	No		15	particle bound			6.13E-08	2.63E-09	2.63E-09
76	1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03	Yes	35	35	vapor	5.88E-11	3.38E-08		5.82E-11	5.82E-11
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.35E-04	No		14	vapor			1.01E-06	1.37E-10	1.37E-10
78	141-79-7	4-Methyl-3-penten-2-one	4.29E-02	No		13	vapor			7.48E-05	3.20E-06	3.20E-06
79	142-82-5	n-Heptane	7.14E-03	No		27	vapor			0.00E+00	0.00E+00	0.00E+00
80	144-62-7	Oxalic acid	2.14E+00	Yes	3	3	vapor	1.83E+00	8.54E-01		1.83E+00	1.83E+00
81	156-60-5	trans-1,2-Dichloroethylene	7.14E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
82	1634-04-4	Methyl tert-butyl ether	7.14E-03	No		16	vapor			8.33E-10	5.95E-12	5.95E-12
83	189-55-9	Dibenzo(a,i)pyrene	4.29E-02	No		5	particle			8.30E-01	3.56E-02	3.56E-02
84	189-64-0	Dibenzo(a,h)pyrene	4.29E-02	No		5	particle			8.30E-01	3.56E-02	3.56E-02
85	191-24-2	Benzo(g,h,i)perylene	4.29E-02	No		30	particle bound			4.34E-01	1.86E-02	1.86E-02
86	191-30-0	Benzo(a,l)pyrene	4.29E-02	No		5	particle			8.30E-01	3.56E-02	3.56E-02
87	192-65-4	Dibenzo(a,e)pyrene	4.29E-02	No		5	particle			8.30E-01	3.56E-02	3.56E-02
88	193-39-5	Indeno(1,2,3-cd)pyrene	4.29E-02	Yes	30	30	particle	5.91E-10	1.18E-08		5.91E-10	5.91E-10
89	206-44-0	Fluoranthene	4.29E-02	Yes	33	33	particle bound	1.27E-11	2.07E-10		1.27E-11	1.27E-11
90	208-96-8	Acenaphthylene	4.29E-02	Yes	14	14	vapor	8.65E-08	2.02E-06		8.65E-08	8.65E-08
91	2234-13-1	Octachloronaphthalene	1.35E-04	No		14	particle bound			1.01E-06	1.37E-10	1.37E-10
92	224-42-0	Dibenz(a,j)acridine	4.29E-02	No		4	particle bound			8.51E-01	3.65E-02	3.65E-02
93	226-36-8	Dibenz(a,h)acridine	4.29E-02	No		4	particle bound			8.51E-01	3.65E-02	3.65E-02
94	25551-13-7	Trimethyl benzene	7.14E-03	No		19	vapor			1.81E-18	1.30E-20	0.00E+00
95	26140-60-3	Terphenyls	4.29E-02	Yes	34	34	particle bound	8.58E-12	2.00E-10		8.58E-12	8.58E-12
96	27154-33-2	Trichlorofluoroethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
97	287-92-3	Cyclopentane	7.14E-03	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
98	3697-24-3	5-Methylchrysene	4.29E-02	Yes	32	32	particle bound	1.37E-11	3.19E-10		1.37E-11	1.37E-11
99	3825-26-1	Ammonium perfluorooctanoate	4.29E-02	No		14	vapor			1.01E-06	4.33E-08	4.33E-08
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	7.14E-03	Yes	11	11	vapor	2.19E-05	3.06E-03		2.19E-05	2.19E-05
101	50-00-0	Formaldehyde	7.14E-03	No		6	vapor			3.39E-01	2.42E-03	2.42E-03
102	50-32-8	Benzo(a)pyrene	2.72E-02	Yes	30	30	particle bound	2.36E-02	8.68E-01		2.36E-02	2.36E-02
103	53-70-3	Dibenzo(a,h)anthracene	2.72E-02	No		7	particle bound			6.32E-01	1.72E-02	1.72E-02
104	540-59-0	1,2-Dichloroethylene	7.14E-03	No		19	vapor			1.81E-18	1.30E-20	0.00E+00
105	540-84-1	2,2,4-Trimethylpentane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
106	541-73-1	1,3-Dichlorobenzene	2.86E-03	No		19	vapor			1.81E-18	5.18E-21	0.00E+00
107	56-23-5	Carbon tetrachloride	2.86E-03	Yes	22	22	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
108	563-80-4	3-Methyl-2-butanone	7.14E-03	No		14	vapor			1.01E-06	7.21E-09	7.21E-09
109	56-49-5	3-Methylcholanthrene	4.29E-02	No		28	particle bound			0.00E+00	0.00E+00	0.00E+00
110	57-14-7	1,1-Dimethylhydrazine	4.29E-02	Yes	12	12	vapor	7.41E-05	1.73E-03		7.41E-05	7.41E-05
111	58-90-2	2,3,4,6-Tetrachlorophenol	4.29E-02	Yes	11	11	vapor	1.60E-04	3.74E-03		1.60E-04	1.60E-04
112	591-78-6	2-Hexanone	7.14E-03	No		14	vapor			1.01E-06	7.21E-09	7.21E-09
113	59-50-7	4-Chloro-3-methylphenol	4.29E-02	No		32	vapor			5.20E-03	2.23E-04	2.23E-04
114	59-89-2	N-Nitrosomorpholine	4.29E-02	Yes	6	6	vapor	1.55E-11	3.63E-10		1.55E-11	1.55E-11
115	602-87-9	5-Nitroacenaphthene	4.29E-02	No		9	particle bound			6.99E-02	3.00E-03	3.00E-03
116	60-29-7	Ethyl ether	4.29E-02	No		17	vapor			2.84E-17	1.22E-18	0.00E+00
117	603-34-9	Triphenylamine	4.29E-02	Yes	32	32	vapor	4.46E-04	1.04E-02		4.46E-04	4.46E-04
118	60-34-4	Methylhydrazine	7.14E-03	No		10	vapor			1.49E-02	1.07E-04	1.07E-04
119	60-35-5	Acetamide	7.14E-03	Yes	5	5	vapor	5.93E-03	8.30E-01		5.93E-03	5.93E-03
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.29E-02	Yes	10	10	vapor	1.37E-11	3.19E-10		1.37E-11	1.37E-11
121	624-83-9	Methyl isocyanate	7.14E-03	No		17	vapor			2.84E-17	2.03E-19	0.00E+00
122	627-13-4	Nitric acid, propyl ester	3.57E-03	No		17	vapor			2.84E-17	1.02E-19	0.00E+00
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.29E-02	Yes	9	9	vapor	3.00E-03	6.99E-02		3.00E-03	3.00E-03
124	630-20-6	1,1,1,2-Tetrachloroethane	7.14E-03	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
125	64-17-5	Ethyl alcohol	7.14E-03	No		10	vapor			1.49E-02	1.07E-04	1.07E-04
126	64-18-6	Formic acid	1.07E+01	No		7	vapor			6.32E-01	6.77E+00	6.77E+00
127	64-19-7	Acetic acid	1.55E+01	Yes	6	6	vapor	5.60E-09	3.6[illegible]E-10		5.60E-09	5.60E-09
128	67-56-1	Methyl alcohol (Methanol)	7.14E-03	No		10	vapor			1.49E-02	1.07E-04	1.07E-04
129	67-63-0	2-Propyl alcohol (Isopropanol, Propan-2-01)	1.43E-03	No		11	vapor			3.14E-03	4.49E-06	4.49E-06
130	67-64-1	2-Propanone (Acetone)	1.43E-02	No		13	vapor			7.48E-05	1.07E-06	1.07E-06
131	67-66-3	Chloroform	2.86E-03	No		19	vapor			1.81E-18	5.18E-21	0.00E+00
132	67-72-1	Hexachloroethane	4.29E-02	No		19	vapor			1.81E-18	7.77E-20	0.00E+00
133	684-16-2	Hexafluoroacetone	7.14E-03	No		19	vapor			1.81E-18	1.30E-20	0.00E+00
134	71-23-8	n-Propyl alcohol	2.86E-03	No		11	vapor			3.14E-03	8.97E-06	8.97E-06
135	71-36-3	n-Butyl alcohol	7.14E-03	No		11	vapor			3.14E-03	2.24E-05	2.24E-05
136	71-43-2	Benzene	2.86E-03	Yes	19	19	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	No		21	vapor			0.00E+00	0.00E+00	0.00E+00
138	74-83-9	Bromomethane (Methyl bromide)	2.86E-03	No		19	vapor			1.81E-18	5.18E-21	0.00E+00
139	74-87-3	Chloromethane (Methyl chloride)	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
140	74-97-5	Bromochloromethane	7.14E-03	No		17	vapor			2.84E-17	2.03E-19	0.00E+00
141	74-99-7	Methylacetylene	4.29E-02	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
142	75-00-3	Chloroethane	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
143	75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
144	75-05-8	Acetonitrile	7.14E-03	Yes	13	13	vapor	8.70E-07	1.22E-04		8.70E-07	8.70E-07
145	75-07-0	Acetaldehyde	4.29E-02	No		13	vapor			7.48E-05	3.20E-06	3.20E-06
146	75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	No		19	vapor			1.81E-18	5.18E-21	0.00E+00
147	75-12-7	Formamide	4.29E-02	Yes	4	4	vapor	3.65E-02	8.51E-01		3.65E-02	3.65E-02
148	75-15-0	Carbon disulfide	7.14E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
149	75-21-8	Ethylene oxide (Oxirane)	1.43E-03	No		15	vapor			6.13E-08	8.76E-11	8.76E-11
150	75-27-4	Bromodichloromethane	7.14E-03	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
151	75-34-3	1,1-Dichloroethane	2.86E-03	No		19	vapor			1.81E-18	5.18E-21	0.00E+00
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.14E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
153	75-43-4	Dichlorofluoromethane	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
154	75-45-6	Chlorodifluoromethane	2.86E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
155	75-50-3	Trimethylamine	7.14E-03	No		14	vapor			1.01E-06	7.21E-09	7.21E-09
156	75-52-5	Nitromethane	4.29E-02	No		13	vapor			7.48E-05	3.20E-06	3.20E-06
157	75-55-8	2-Methylaziridine	4.29E-02	No		11	vapor			3.14E-03	1.35E-04	1.35E-04
158	75-61-6	Difluorodibromomethane	7.14E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
159	75-63-8	Trifluorobromomethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
160	75-65-0	2-Methyl-2-propanol	7.14E-03	No		11	vapor			3.14E-03	2.24E-05	2.24E-05
161	75-69-4	Trichlorofluoromethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
162	75-71-8	Dichlorodifluoromethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
163	76-03-9	Trichloroacetic acid	7.14E-03	No		5	vapor			8.30E-01	5.93E-03	5.93E-03
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.29E-02	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
168	76-15-3	Chloropentafluoroethane	7.14E-03	Yes	29	29	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.29E-02	No		11	vapor			3.14E-03	1.35E-04	1.35E-04
170	78-87-5	1,2-Dichloropropane	2.86E-03	No		19	vapor			1.81E-18	5.18E-21	0.00E+00
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.86E-03	No		11	vapor			3.14E-03	8.97E-06	8.97E-06
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	7.14E-03	No		13	vapor			7.48E-05	5.34E-07	5.34E-07
173	79-00-5	1,1,2-Trichloroethane	7.14E-03	No		17	vapor			2.84E-17	2.03E-19	0.00E+00
174	79-01-6	Trichloroethylene	7.14E-03	Yes	20	20	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
175	79-09-4	Propionic acid	4.29E-02	No		6	vapor			3.39E-01	1.45E-02	1.45E-02
176	79-10-7	2-Propenoic acid	5.72E-02	No		6	vapor			3.39E-01	1.94E-02	1.94E-02
177	79-20-9	Methyl acetate	4.29E-02	No		14	vapor			1.01E-06	4.33E-08	4.33E-08
178	79-34-5	1,1,2,2-Tetrachloroethane	1.35E-05	No		16	vapor			8.33E-10	1.13E-14	1.13E-14
179	83-32-9	Acenaphthene	4.29E-02	Yes	15	15	vapor	2.45E-12	5.72E-11		2.45E-12	2.45E-12
180	84-66-2	Diethyl phthalate	4.29E-02	Yes	8	8	vapor	1.12E-02	2.62E-01		1.12E-02	1.12E-02
181	84-74-2	Dibutyl phthalate	4.29E-02	Yes	31	31	particle bound	4.56E-03	1.06E-01		4.56E-03	4.56E-03
182	85-01-8	Phenanthrene	4.29E-02	No		13	particle bound			7.48E-05	3.20E-06	3.20E-06
183	85-68-7	Butylbenzyl phthalate	4.29E-02	No		31	particle bound			1.06E-01	4.56E-03	4.56E-03
184	86-73-7	Fluorene	4.29E-02	No		14	vapor			1.01E-06	4.33E-08	4.33E-08
185	87-68-3	Hexachlorobutadiene	7.14E-03	Yes	20	20	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
186	88-06-2	2,4,6-Trichlorophenol	4.29E-02	No		10	vapor			1.49E-02	6.40E-04	6.40E-04
187	88-72-2	2-Nitrotoluene	7.14E-03	No		12	vapor			1.73E-03	1.23E-05	1.23E-05
188	88-75-5	2-Nitrophenol	4.29E-02	No		12	vapor			1.73E-03	7.41E-05	7.41E-05
189	88-89-1	Picric acid	4.29E-02	Yes	2	2	#N/A	3.67E-02	8.56E-01		3.67E-02	3.67E-02
190	91-20-3	Naphthalene	1.43E-03	Yes	16	16	vapor	3.29E-12	2.31E-09		3.29E-12	3.29E-12
191	91-22-5	Quinoline	4.29E-02	No		9	vapor			6.99E-02	3.00E-03	3.00E-03
192	91-58-7	2-Chloronapthalene	4.29E-02	No		16	vapor			8.33E-10	3.57E-11	3.57E-11
193	92-52-4	1,1'-Biphenyl	2.86E-02	No		16	vapor			8.33E-10	2.38E-11	2.38E-11
194	92-93-3	4-Nitrobiphenyl	4.29E-02	No		10	particle bound			1.49E-02	6.40E-04	6.40E-04
195	95-13-6	Indene	4.29E-02	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
196	95-47-6	o-Xylene	2.86E-03	No		19	vapor			1.81E-18	5.18E-21	0.00E+00
197	95-48-7	o-Cresol (2-Methylphenol)	7.14E-03	No		9	vapor			6.99E-02	4.99E-04	4.99E-04
198	95-49-8	2-Chlorotoluene	4.29E-02	No		19	vapor			1.81E-18	7.77E-20	0.00E+00
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.86E-03	Yes	18	18	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
200	95-57-8	2-Chlorophenol	4.29E-02	No		11	vapor			3.14E-03	1.35E-04	1.35E-04
201	95-95-4	2,4,5-Trichlorophenol	4.29E-02	No		9	vapor			6.99E-02	3.00E-03	3.00E-03
202	96-22-0	3-Pentanone	1.43E-02	No		14	vapor			1.01E-06	1.44E-08	1.44E-08
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	No		19	vapor			1.81E-18	7.77E-20	0.00E+00
204	98-51-1	p-tert-Butyltoluene	4.29E-02	No		21	vapor			0.00E+00	0.00E+00	0.00E+00
205	98-82-8	Cumene	4.29E-02	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
206	98-83-9	alpha-Methylstyrene	7.14E-03	No		19	vapor			1.81E-18	1.30E-20	0.00E+00
207	98-86-2	Acetophenone	2.86E-02	Yes	11	11	vapor	7.50E-05	2.62E-03		7.50E-05	7.50E-05
208	98-95-3	Nitrobenzene	2.86E-02	No		12	vapor			1.73E-03	4.94E-05	4.94E-05
209											9.55E+00	

Adjusted Performance Factors

Group	PF
1	9.66E+00
2	8.56E-01
3	8.54E-01
4	8.51E-01
5	8.30E-01
6	3.62E-10
7	6.32E-01
8	3.39E-01
9	6.99E-02
10	1.49E-02
11	3.14E-03
12	1.73E-03
13	7.48E-05
14	1.01E-06
15	6.13E-08
16	8.33E-10
17	2.84E-17
18	0.00E+00
19	1.81E-18
20	0.00E+00
21	0.00E+00
22	0.00E+00
23	0.00E+00
24	0.00E+00
25	0.00E+00
26	0.00E+00
27	0.00E+00
28	0.00E+00
29	0.00E+00
30	4.34E-01
31	1.06E-01
32	5.20E-03
33	1.24E-03
34	2.00E-10
35	3.38E-08

Coplanar PCBs		LMP08 g/sec	Corrected LMP08 g/sec
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	4.20E-14	4.20E-14
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	4.20E-14	4.20E-14
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	4.20E-14	4.20E-14
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	4.20E-14	4.20E-14
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	4.20E-14	4.20E-14
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	4.20E-14	4.20E-14
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	4.20E-14	4.20E-14
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	4.20E-14	4.20E-14
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	4.20E-14	4.20E-14
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	4.20E-14	4.20E-14
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	4.20E-14	4.20E-14
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	4.20E-14	4.20E-14
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	4.20E-14	4.20E-14
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	4.20E-14	4.20E-14
1336-36-3	Polychlorinated biphenyls (PCBs)	5.82E-11	
1336-36-3	UnCorrected (for coplanar PCBs)	5.88E-11	

Correction for Coplanar PCBs
0.99 as parent
0.01 as coplanar sum

Table B-7 LVP01 - LAW Vessel Ventilation

Row	CAS #	COPC	Feed Rate g/sec	In ACM	Group	Grouping	Phase	LVP01 rate g/sec	Performance Factor	Adjusted PF	Calc'd rate LVP01 g/sec	Corrected LVP01 g/sec
4	100-00-5	p-Nitrochlorobenzene	2.86E-02	No		10	vapor			2.56E-04	7.33E-06	7.33E-06
5	100-21-0	p-Phthalic acid	4.29E-02	Yes	1	1	vapor	8.19E-10	1.91E-08		8.19E-10	8.19E-10
6	100-41-4	Ethyl benzene	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
7	100-42-5	Styrene	2.86E-03	No		19	vapor			2.04E-14	5.83E-17	0.00E+00
8	10061-01-5	cis-1,3-Dichloropropene	2.86E-03	Yes	19	19	vapor	1.75E-16	8.12E-14		1.75E-16	0.00E+00
9	10061-02-6	trans-1,3-Dichloropropene	2.86E-03	No		17	vapor			7.14E-12	2.04E-14	2.04E-14
10	101-55-3	4-Bromophenylphenyl ether	4.29E-02	No		14	vapor			5.03E-07	2.16E-08	2.16E-08
11	101-84-8	Diphenyl ether	7.14E-03	Yes	16	16	vapor	2.22E-12	3.11E-10		2.22E-12	2.22E-12
12	106-35-4	3-Heptanone	2.86E-03	No		14	vapor			5.03E-07	1.44E-09	1.44E-09
13	106-42-3	p-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			2.04E-14	1.46E-16	0.00E+00
14	106-46-7	1,4-Dichlorobenzene	2.86E-03	No		18	vapor			3.43E-11	9.79E-14	9.79E-14
15	106-88-7	1,2-Epoxybutane	7.14E-03	No		15	vapor			6.25E-08	4.46E-10	4.46E-10
16	106-93-4	Ethylene dibromide (Dibromethane)	2.86E-03	Yes	16	16	vapor	1.98E-12	6.92E-10		1.98E-12	1.98E-12
17	106-97-8	Butane	7.14E-03	Yes	26	26	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
18	106-99-0	1,3-Butadiene	2.86E-03	Yes	23	23	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
19	107-02-8	Acrolein	7.14E-03	No		14	vapor			5.03E-07	3.59E-09	3.59E-09
20	107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.86E-03	No		17	vapor			7.14E-12	2.04E-14	2.04E-14
22	107-12-0	Propionitrile	7.14E-03	No		13	vapor			1.24E-05	8.88E-08	8.88E-08
23	107-13-1	Acrylonitrile	1.43E-02	No		14	vapor			5.03E-07	7.18E-09	7.18E-09
24	107-18-6	2-Propene-1-ol	4.29E-02	No		10	vapor			2.56E-04	1.10E-05	1.10E-05
25	107-31-3	Formic acid, methyl ester	4.29E-02	No		15	vapor			6.25E-08	2.68E-09	2.68E-09
26	107-66-4	Dibutylphosphate	4.29E-02	No		5	particle bound			3.68E-05	1.58E-06	1.58E-06
27	107-87-9	2-Pentanone	1.43E-02	No		14	vapor			5.03E-07	7.18E-09	7.18E-09
28	108-03-2	1-Nitropropane	4.29E-02	No		14	vapor			5.03E-07	2.16E-08	2.16E-08
29	108-05-4	Vinyl acetate	4.29E-02	No		16	vapor			2.26E-09	9.69E-11	9.69E-11
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.14E-03	No		14	vapor			5.03E-07	3.59E-09	3.59E-09
31	108-20-3	Bis(isopropyl)ether	7.14E-03	No		18	vapor			3.43E-11	2.45E-13	2.45E-13
32	108-38-3	m-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			2.04E-14	1.46E-16	0.00E+00
33	108-39-4	m-Cresol	7.14E-03	No		9	vapor			5.06E-04	3.61E-06	3.61E-06
34	108-87-2	Methylcyclohexane	7.14E-03	Yes	25	25	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
35	108-88-3	Toluene	2.86E-03	Yes	19	19	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
36	108-90-7	Chlorobenzene	2.86E-03	No		19	vapor			2.04E-14	5.83E-17	0.00E+00
37	108-93-0	Cyclohexanol	7.14E-03	No		10	vapor			2.56E-04	1.83E-06	1.83E-06
38	108-94-1	Cyclohexanone	7.14E-03	No		11	vapor			1.20E-04	8.58E-07	8.58E-07
39	108-95-2	Phenol	4.29E-02	Yes	8	8	vapor	2.36E-05	5.51E-04		2.36E-05	2.36E-05
40	109-66-0	n-Pentane	7.14E-03	No		26	vapor			0.00E+00	0.00E+00	0.00E+00
41	109-99-9	Tetrahydrofuran	2.86E-03	No		13	vapor			1.24E-05	3.55E-08	3.55E-08
42	110-12-3	5-Methyl-2-hexanone	2.86E-03	No		15	vapor			6.25E-08	1.78E-10	1.78E-10
43	110-43-0	2-Heptanone	2.86E-03	No		15	vapor			6.25E-08	1.78E-10	1.78E-10
44	110-54-3	n-Hexane	7.14E-03	Yes	27	27	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
45	110-62-3	n-Valeraldehyde	4.29E-02	No		15	vapor			6.25E-08	2.68E-09	2.68E-09
46	110-82-7	Cyclohexane	7.14E-03	Yes	24	24	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
47	110-83-8	Cyclohexene	2.86E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
48	110-86-1	Pyridine	1.43E-02	No		11	vapor			1.20E-04	1.72E-06	1.72E-06
49	111-65-9	n-Octane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
50	111-76-2	Ethylene glycol monobutyl ether	4.29E-02	No		9	vapor			5.06E-04	2.17E-05	2.17E-05
51	111-84-2	n-Nonane	7.14E-03	Yes	28	28	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.29E-02	No		30	particle bound			1.01E-03	4.33E-05	4.33E-05
53	117-84-0	n-Dioctyl phthalate	4.29E-02	No		32	particle bound			1.12E-04	4.82E-06	4.82E-06
54	120-12-7	Anthracene	4.29E-02	Yes	13	13	particle bound	3.28E-07	7.65E-06		3.28E-07	3.28E-07
55	120-82-1	1,2,4-Trichlorobenzene	7.14E-03	Yes	17	17	vapor	5.10E-14	7.14E-12		5.10E-14	5.10E-14
56	120-83-2	2,4-Dichlorophenol	4.29E-02	No		10	vapor			2.56E-04	1.10E-05	1.10E-05
57	121-44-8	Triethylamine	7.14E-03	No		15	vapor			6.25E-08	4.46E-10	4.46E-10
58	121-69-7	Dimethylaniline	7.14E-03	No		13	vapor			1.24E-05	8.88E-08	8.88E-08
59	122-39-4	N,N-Diphenylamine	1.43E-02	Yes	10	10	vapor	7.33E-08	5.13E-04		7.33E-08	7.33E-08
60	123-19-3	4-Heptanone	2.86E-03	No		13	vapor			1.24E-05	3.55E-08	3.55E-08
61	123-38-6	n-Propionaldehyde	1.43E-02	No		14	vapor			5.03E-07	7.18E-09	7.18E-09
62	123-51-3	3-Methyl-1-butanol	7.14E-03	No		12	vapor			8.64E-05	6.17E-07	6.17E-07
63	123-86-4	Acetic acid n-butyl ester	1.35E-04	No		16	vapor			2.26E-09	3.06E-13	3.06E-13
64	123-91-1	1,4-Dioxane	1.43E-03	No		10	vapor			2.56E-04	3.66E-07	3.66E-07
65	126-73-8	Tributyl phosphate	2.86E-02	Yes	7	7	particle bound	1.08E-05	3.77E-04		1.08E-05	1.08E-05
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	7.14E-03	No		16	vapor			2.26E-09	1.61E-11	1.61E-11
67	127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	Yes	21	21	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
68	127-19-5	N,N-Dimethylacetamide	7.14E-03	No		5	vapor			3.68E-05	2.63E-07	2.63E-07
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.43E-02	No		32	vapor			1.12E-04	1.61E-06	1.61E-06
70	129-00-0	Pyrene	4.29E-02	Yes	33	33	particle bound	6.38E-06	1.49E-04		6.38E-06	6.38E-06
71	1321-64-8	Pentachloronaphthalene	4.29E-02	Yes	14	14	particle bound	2.26E-11	5.26E-10		2.26E-11	2.26E-11
72	1321-65-9	Trichloronaphthalene	4.29E-02	No		15	particle bound			6.25E-08	2.68E-09	2.68E-09
73	132-64-9	Dibenzofuran	4.29E-02	Yes	15	15	particle bound	5.33E-09	1.24E-07		5.33E-09	5.33E-09
74	1335-87-1	Hexachloronaphthalene	4.29E-02	No		14	particle bound			5.03E-07	2.16E-08	2.16E-08
75	1335-88-2	Tetrachloronaphthalene	4.29E-02	No		15	particle bound			6.25E-08	2.68E-09	2.68E-09
76	1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03	Yes	35	35	vapor	1.47E-10	8.45E-08		1.45E-10	1.45E-10
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.35E-04	No		14	vapor			5.03E-07	6.80E-11	6.80E-11
78	141-79-7	4-Methyl-3-penten-2-one	4.29E-02	No		13	vapor			1.24E-05	5.33E-07	5.33E-07
79	142-82-5	n-Heptane	7.14E-03	No		27	vapor			0.00E+00	0.00E+00	0.00E+00
80	144-62-7	Oxalic acid	2.14E+00	Yes	3	3	vapor	1.04E-06	4.86E-07		1.04E-06	1.04E-06
81	156-60-5	trans-1,2-Dichloroethylene	7.14E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
82	1634-04-4	Methyl tert-butyl ether	7.14E-03	No		16	vapor			2.26E-09	1.61E-11	1.61E-11
83	189-55-9	Dibenzo[a,i]pyrene	4.29E-02	No		5	particle			3.68E-05	1.58E-06	1.58E-06
84	189-64-0	Dibenzo[a,h]pyrene	4.29E-02	No		5	particle			3.68E-05	1.58E-06	1.58E-06
85	191-24-2	Benzo(g,h,i)perylene	4.29E-02	No		30	particle bound			1.01E-03	4.33E-05	4.33E-05
86	191-30-0	Benzo[a,l]pyrene	4.29E-02	No		5	particle			3.68E-05	1.58E-06	1.58E-06
87	192-65-4	Dibenzo[a,e]pyrene	4.29E-02	No		5	particle			3.68E-05	1.58E-06	1.58E-06
88	193-39-5	Indeno(1,2,3-cd)pyrene	4.29E-02	Yes	30	30	particle	5.03E-09	1.17E-07		5.03E-09	5.03E-09
89	206-44-0	Fluoranthene	4.29E-02	Yes	33	33	particle bound	1.04E-10	2.43E-09		1.04E-10	1.04E-10
90	208-96-8	Acenaphthylene	4.29E-02	Yes	14	14	vapor	4.31E-08	1.00E-06		4.31E-08	4.31E-08
91	2234-13-1	Octachloronaphthalene	1.35E-04	No		14	particle bound			5.03E-07	6.80E-11	6.80E-11
92	224-42-0	Dibenz[a,j]acridine	4.29E-02	No		4	particle bound			4.71E-06	2.02E-07	2.02E-07
93	226-36-8	Dibenz[a,h]acridine	4.29E-02	No		4	particle bound			4.71E-06	2.02E-07	2.02E-07
94	25551-13-7	Trimethyl benzene	7.14E-03	No		19	vapor			2.04E-14	1.46E-16	0.00E+00
95	26140-60-3	Terphenyls	4.29E-02	Yes	34	34	particle bound	7.03E-11	1.64E-09		7.03E-11	7.03E-11
96	27154-33-2	Trichlorofluoroethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
97	287-92-3	Cyclopentane	7.14E-03	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
98	3697-24-3	5-Methylchrysene	4.29E-02	Yes	32	32	particle bound	1.12E-10	2.61E-09		1.12E-10	1.12E-10
99	3825-26-1	Ammonium perfluorooctanoate	4.29E-02	No		14	vapor			5.03E-07	2.16E-08	2.16E-08
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	7.14E-03	Yes	11	11	vapor	8.49E-07	1.19E-04		8.49E-07	8.49E-07
101	50-00-0	Formaldehyde	7.14E-03	No		8	vapor			5.93E-04	4.24E-06	4.24E-06
102	50-32-8	Benzo(a)pyrene	2.72E-02	Yes	30	30	particle bound	5.49E-05	2.02E-03		5.49E-05	5.49E-05
103	53-70-3	Dibenzo(a,h)anthracene	2.72E-02	No		7	particle bound			3.77E-04	1.02E-05	1.02E-05
104	540-59-0	1,2-Dichloroethylene	7.14E-03	No		19	vapor			2.04E-14	1.46E-16	0.00E+00
105	540-84-1	2,2,4-Trimethylpentane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
106	541-73-1	1,3-Dichlorobenzene	2.86E-03	No		19	vapor			2.04E-14	5.83E-17	0.00E+00
107	56-23-5	Carbon tetrachloride	2.86E-03	Yes	22	22	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
108	563-80-4	3-Methyl-2-butanone	7.14E-03	No		14	vapor			5.03E-07	3.59E-09	3.59E-09
109	56-49-5	3-Methylcholanthrene	4.29E-02	No		28	particle bound			0.00E+00	0.00E+00	0.00E+00
110	57-14-7	1,1-Dimethylhydrazine	4.29E-02	Yes	12	12	vapor	3.70E-06	8.64E-05		3.70E-06	3.70E-06
111	58-90-2	2,3,4,6-Tetrachlorophenol	4.29E-02	Yes	11	11	vapor	5.68E-06	1.32E-04		5.66E-06	5.68E-06
112	591-78-6	2-Hexanone	7.14E-03	No		14	vapor			5.03E-07	3.59E-09	3.59E-09
113	59-50-7	4-Chloro-3-methylphenol	4.29E-02	No		32	vapor			1.12E-04	4.82E-06	4.82E-06
114	59-89-2	N-Nitrosomorpholine	4.29E-02	Yes	6	6	vapor	1.27E-10	2.97E-09		1.27E-10	1.27E-10
115	602-87-9	5-Nitroacenaphthene	4.29E-02	No		9	particle bound			5.06E-04	2.17E-05	2.17E-05
116	60-29-7	Ethyl ether	4.29E-02	No		17	vapor			7.14E-12	3.06E-13	3.06E-13
117	603-34-9	Triphenylamine	4.29E-02	Yes	32	32	vapor	9.63E-06	2.25E-04		9.63E-06	9.63E-06
118	60-34-4	Methylhydrazine	7.14E-03	No		10	vapor			2.56E-04	1.83E-06	1.83E-06
119	60-35-5	Acetamide	7.14E-03	Yes	5	5	vapor	2.63E-07	3.68E-05		2.63E-07	2.63E-07
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.29E-02	Yes	10	10	vapor	1.12E-10	2.62E-09	2.56E-04	1.10E-05	1.10E-05
121	624-83-9	Methyl isocyanate	7.14E-03	No		17	vapor			7.14E-12	5.10E-14	5.10E-14
122	627-13-4	Nitric acid, propyl ester	3.57E-03	No		17	vapor			7.14E-12	2.55E-14	2.55E-14
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.29E-02	Yes	9	9	vapor	2.17E-05	5.06E-04		2.17E-05	2.17E-05
124	630-20-6	1,1,1,2-Tetrachloroethane	7.14E-03	No		18	vapor			3.43E-11	2.45E-13	2.45E-13
125	64-17-5	Ethyl alcohol	7.14E-03	No		10	vapor			2.56E-04	1.83E-06	1.83E-06
126	64-18-6	Formic acid	1.07E+01	No		7	vapor			3.77E-04	4.04E-03	4.04E-03
127	64-19-7	Acetic acid	1.55E+01	Yes	6	6	vapor	4.59E-08	2.96E-09		4.59E-08	4.59E-08
128	67-56-1	Methyl alcohol (Methanol)	7.14E-03	No		10	vapor			2.56E-04	1.83E-06	1.83E-06
129	67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	1.43E-03	No		11	vapor			1.20E-04	1.72E-07	1.72E-07
130	67-64-1	2-Propanone (Acetone)	1.43E-02	No		13	vapor			1.24E-05	1.78E-07	1.78E-07
131	67-66-3	Chloroform	2.86E-03	No		19	vapor			2.04E-14	5.83E-17	0.00E+00
132	67-72-1	Hexachloroethane	4.29E-02	No		19	vapor			2.04E-14	8.75E-16	0.00E+00
133	684-16-2	Hexafluoroacetone	7.14E-03	No		19	vapor			2.04E-14	1.46E-16	0.00E+00
134	71-23-8	n-Propyl alcohol	2.86E-03	No		11	vapor			1.20E-04	3.43E-07	3.43E-07
135	71-36-3	n-Butyl alcohol	7.14E-03	No		11	vapor			1.20E-04	8.58E-07	8.58E-07
136	71-43-2	Benzene	2.86E-03	Yes	19	19	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	No		21	vapor			0.00E+00	0.00E+00	0.00E+00
138	74-83-9	Bromomethane (Methyl bromide)	2.86E-03	No		19	vapor			2.04E-14	5.83E-17	0.00E+00
139	74-87-3	Chloromethane (Methyl chloride)	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
140	74-97-5	Bromochloromethane	7.14E-03	No		17	vapor			7.14E-12	5.10E-14	5.10E-14
141	74-99-7	Methylacetylene	4.29E-02	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
142	75-00-3	Chloroethane	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
143	75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
144	75-05-8	Acetonitrile	7.14E-03	Yes	13	13	vapor	1.23E-07	1.72E-05		1.23E-07	1.23E-07
145	75-07-0	Acetaldehyde	4.29E-02	No		13	vapor			1.24E-05	5.33E-07	5.33E-07
146	75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	No		19	vapor			2.04E-14	5.83E-17	0.00E+00
147	75-12-7	Formamide	4.29E-02	Yes	4	4	vapor	2.02E-07	4.71E-06		2.02E-07	2.02E-07
148	75-15-0	Carbon disulfide	7.14E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
149	75-21-8	Ethylene oxide (Oxirane)	1.43E-03	No		15	vapor			6.25E-08	8.92E-11	8.92E-11
150	75-27-4	Bromodichloromethane	7.14E-03	No		18	vapor			3.43E-11	2.45E-13	2.45E-13
151	75-34-3	1,1-Dichloroethane	2.86E-03	No		19	vapor			2.04E-14	5.83E-17	0.00E+00
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.14E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
153	75-43-4	Dichlorofluoromethane	2.86E-03	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
154	75-45-6	Chlorodifluoromethane	2.86E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
155	75-50-3	Trimethylamine	7.14E-03	No		14	vapor			5.03E-07	3.59E-09	3.59E-09
156	75-52-5	Nitromethane	4.29E-02	No		13	vapor			1.24E-05	5.33E-07	5.33E-07
157	75-55-8	2-Methylaziridine	4.29E-02	No		11	vapor			1.20E-04	5.15E-06	5.15E-06
158	75-61-6	Difluorodibromomethane	7.14E-03	No		22	vapor			0.00E+00	0.00E+00	0.00E+00
159	75-63-8	Trifluorobromomethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
160	75-65-0	2-Methyl-2-propanol	7.14E-03	No		11	vapor			1.20E-04	8.58E-07	8.58E-07
161	75-69-4	Trichlorofluoromethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
162	75-71-8	Dichlorodifluoromethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
163	76-03-9	Trichloroacetic acid	7.14E-03	No		5	vapor			3.68E-05	2.63E-07	2.63E-07
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.29E-02	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.14E-03	No		26	vapor			0.00E+00	0.00E+00	0.00E+00
168	76-15-3	Chloropentafluoroethane	7.14E-03	Yes	29	29	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.29E-02	No		11	vapor			1.20E-04	5.15E-06	5.15E-06
170	78-87-5	1,2-Dichloropropane	2.86E-03	No		19	vapor			2.04E-14	5.83E-17	0.00E+00
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.86E-03	No		11	vapor			1.20E-04	3.43E-07	3.43E-07
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	7.14E-03	No		13	vapor			1.24E-05	8.88E-08	8.88E-08
173	79-00-5	1,1,2-Trichloroethane	7.14E-03	No		17	vapor			7.14E-12	5.10E-14	5.10E-14
174	79-01-6	Trichloroethylene	7.14E-03	Yes	20	20	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
175	79-09-4	Propionic acid	4.29E-02	No		8	vapor			5.93E-04	2.54E-05	2.54E-05
176	79-10-7	2-Propenoic acid	5.72E-02	No		8	vapor			5.93E-04	3.39E-05	3.39E-05
177	79-20-9	Methyl acetate	4.29E-02	No		14	vapor			5.03E-07	2.16E-08	2.16E-08
178	79-34-5	1,1,2,2-Tetrachloroethane	1.35E-05	No		16	vapor			2.26E-09	3.06E-14	3.06E-14
179	83-32-9	Acenaphthene	4.29E-02	Yes	15	15	vapor	2.01E-11	4.69E-10		2.01E-11	2.01E-11
180	84-66-2	Diethyl phthalate	4.29E-02	Yes	8	8	vapor	2.72E-05	6.35E-04		2.72E-05	2.72E-05
181	84-74-2	Dibutyl phthalate	4.29E-02	Yes	31	31	particle bound	4.19E-05	9.78E-04		4.19E-05	4.19E-05
182	85-01-8	Phenanthrene	4.29E-02	No		13	particle bound			1.24E-05	5.33E-07	5.33E-07
183	85-68-7	Butylbenzyl phthalate	4.29E-02	No		31	particle bound			9.78E-04	4.19E-05	4.19E-05
184	86-73-7	Fluorene	4.29E-02	No		14	vapor			5.03E-07	2.16E-08	2.16E-08
185	87-68-3	Hexachlorobutadiene	7.14E-03	Yes	20	20	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
186	88-06-2	2,4,6-Trichlorophenol	4.29E-02	No		10	vapor			2.56E-04	1.10E-05	1.10E-05
187	88-72-2	2-Nitrotoluene	7.14E-03	No		12	vapor			8.64E-05	6.17E-07	6.17E-07
188	88-75-5	2-Nitrophenol	4.29E-02	No		12	vapor			8.64E-05	3.70E-06	3.70E-06
189	88-89-1	Picric acid	4.29E-02	Yes	2	2	#N/A	2.48E-09	5.78E-08		2.48E-09	2.48E-09
190	91-20-3	Naphthalene	1.43E-03	Yes	16	16	vapor	8.25E-12	5.77E-09		8.25E-12	8.25E-12
191	91-22-5	Quinoline	4.29E-02	No		9	vapor			5.06E-04	2.17E-05	2.17E-05
192	91-58-7	2-Chloronapthalene	4.29E-02	No		16	vapor			2.26E-09	9.69E-11	9.69E-11
193	92-52-4	1,1'-Biphenyl	2.86E-02	No		16	vapor			2.26E-09	6.46E-11	6.46E-11
194	92-93-3	4-Nitrobiphenyl	4.29E-02	No		10	particle bound			2.56E-04	1.10E-05	1.10E-05
195	95-13-6	Indene	4.29E-02	No		18	vapor			3.43E-11	1.47E-12	1.47E-12
196	95-47-6	o-Xylene	2.86E-03	No		19	vapor			2.04E-14	5.83E-17	0.00E+00
197	95-48-7	o-Cresol (2-Methylphenol)	7.14E-03	No		9	vapor			5.06E-04	3.61E-06	3.61E-06
198	95-49-8	2-Chlorotoluene	4.29E-02	No		19	vapor			2.04E-14	8.75E-16	0.00E+00
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.86E-03	Yes	18	18	vapor	9.79E-14	3.43E-11		9.79E-14	9.79E-14
200	95-57-8	2-Chlorophenol	4.29E-02	No		11	vapor			1.20E-04	5.15E-06	5.15E-06
201	95-95-4	2,4,5-Trichlorophenol	4.29E-02	No		9	vapor			5.06E-04	2.17E-05	2.17E-05
202	96-22-0	3-Pentanone	1.43E-02	No		14	vapor			5.03E-07	7.18E-09	7.18E-09
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	No		19	vapor			2.04E-14	8.75E-16	0.00E+00
204	98-51-1	p-tert-Butyltoluene	4.29E-02	No		21	vapor			0.00E+00	0.00E+00	0.00E+00
205	98-82-8	Cumene	4.29E-02	No		20	vapor			0.00E+00	0.00E+00	0.00E+00
206	98-83-9	alpha-Methylstyrene	7.14E-03	No		19	vapor			2.04E-14	1.46E-16	0.00E+00
207	98-86-2	Acetophenone	2.86E-02	Yes	11	11	vapor	3.12E-06	1.09E-04		3.12E-06	3.12E-06
208	98-95-3	Nitrobenzene	2.86E-02	No		12	vapor			8.64E-05	2.47E-06	2.47E-06
209											4.68E-03	

Adjusted Performance Factors

Group	PF
1	1.91E-08
2	5.78E-08
3	4.86E-07
4	4.71E-06
5	3.68E-05
6	2.96E-09
7	3.77E-04
8	5.93E-04
9	5.06E-04
10	2.56E-04
11	1.20E-04
12	8.64E-05
13	1.24E-05
14	5.03E-07
15	6.25E-08
16	2.26E-09
17	7.14E-12
18	3.43E-11
19	2.04E-14
20	0.00E+00
21	0.00E+00
22	0.00E+00
23	0.00E+00
24	0.00E+00
25	0.00E+00
26	0.00E+00
27	0.00E+00
28	0.00E+00
29	0.00E+00
30	1.01E-03
31	9.78E-04
32	1.12E-04
33	7.44E-05
34	1.64E-09
35	8.45E-08

Coplanar PCBs

CAS #	Name	LVP01 g/sec	Corrected LVP01 g/sec
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	1.05E-13	1.05E-13
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	1.05E-13	1.05E-13
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	1.05E-13	1.05E-13
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	1.05E-13	1.05E-13
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	1.05E-13	1.05E-13
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	1.05E-13	1.05E-13
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	1.05E-13	1.05E-13
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1.05E-13	1.05E-13
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	1.05E-13	1.05E-13
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	1.05E-13	1.05E-13
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	1.05E-13	1.05E-13
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	1.05E-13	1.05E-13
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	1.05E-13	1.05E-13
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	1.05E-13	1.05E-13
1336-36-3	Polychlorinated biphenyls (PCBs)	1.45E-10	
1336-36-3	UnCorrected (for coplanar PCBs)	1.47E-10	

Correction for Coplanar PCBs
0.99 as parent
0.01 as coplanar sum

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Table B-8 LVP18 - Abated LAW Melter Offgas System					Fraction		LOP08	LOP08				LVP03	LVP03		Corrected
2			LMP08		Fv	vapor	Fraction	g/sec	g/sec	LOP08	LVP01	LVP03	g/sec	g/sec	LVP18	LVP18
3	CAS #	COPC	g/sec	Phase		adjusted	particle	vapor	particle	g/sec	g/sec	g/sec	vapor	particle	g/sec	g/sec
4	100-00-5	p-Nitrochlorobenzene	4.26E-04	vapor	1.000	1.000	0.000	4.26E-04	0.00E+00	4.26E-04	7.33E-06	4.34E-04	2.17E-05	0.00E+00	2.17E-05	2.17E-05
5	100-21-0	p-Phthalic acid	4.14E-01	vapor	1.000	1.000	0.000	4.14E-01	0.00E+00	4.14E-01	8.19E-10	4.14E-01	2.07E-02	0.00E+00	2.07E-02	2.07E-02
6	100-41-4	Ethyl benzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7	100-42-5	Styrene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	10061-01-5	cis-1,3-Dichloropropene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	10061-02-6	trans-1,3-Dichloropropene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	2.04E-14	2.04E-14	1.02E-15	0.00E+00	1.02E-15	1.02E-15
10	101-55-3	4-Bromophenylphenyl ether	4.33E-08	vapor	1.000	1.000	0.000	4.33E-08	0.00E+00	4.33E-08	2.16E-08	6.48E-08	3.24E-09	0.00E+00	3.24E-09	3.24E-09
11	101-84-8	Diphenyl ether	2.72E-13	vapor	1.000	1.000	0.000	2.72E-13	0.00E+00	2.72E-13	2.22E-12	2.50E-12	1.25E-13	0.00E+00	1.25E-13	1.25E-13
12	106-35-4	3-Heptanone	2.88E-09	vapor	1.000	1.000	0.000	2.88E-09	0.00E+00	2.88E-09	1.44E-09	4.32E-09	2.16E-10	0.00E+00	2.16E-10	2.16E-10
13	106-42-3	p-Xylene (Dimethyl benzene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
14	106-46-7	1,4-Dichlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	9.79E-14	9.79E-14	4.90E-15	0.00E+00	4.90E-15	4.90E-15
15	106-88-7	1,2-Epoxybutane	4.38E-10	vapor	1.000	1.000	0.000	4.38E-10	0.00E+00	4.38E-10	4.46E-10	8.84E-10	4.42E-11	0.00E+00	4.42E-11	4.42E-11
16	106-93-4	Ethylene dibromide (Dibromethane)	4.42E-13	vapor	1.000	1.000	0.000	4.42E-13	0.00E+00	4.42E-13	1.98E-12	2.42E-12	1.21E-13	0.00E+00	1.21E-13	1.21E-13
17	106-97-8	Butane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
18	106-99-0	1,3-Butadiene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
19	107-02-8	Acrolein	7.21E-09	vapor	1.000	1.000	0.000	7.21E-09	0.00E+00	7.21E-09	3.59E-09	1.08E-08	5.40E-10	0.00E+00	5.40E-10	5.40E-10
20	107-05-1	3-Chloropropene (Allyl chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	2.04E-14	2.04E-14	1.02E-15	0.00E+00	1.02E-15	1.02E-15
22	107-12-0	Propionitrile	5.34E-07	vapor	1.000	1.000	0.000	5.34E-07	0.00E+00	5.34E-07	8.88E-08	6.23E-07	3.11E-08	0.00E+00	3.11E-08	3.11E-08
23	107-13-1	Acrylonitrile	1.44E-08	vapor	1.000	1.000	0.000	1.44E-08	0.00E+00	1.44E-08	7.18E-09	2.16E-08	1.08E-09	0.00E+00	1.08E-09	1.08E-09
24	107-18-6	2-Propene-1-ol	6.40E-04	vapor	1.000	1.000	0.000	6.40E-04	0.00E+00	6.40E-04	1.10E-05	6.51E-04	3.25E-05	0.00E+00	3.25E-05	3.25E-05
25	107-31-3	Formic acid, methyl ester	2.63E-09	vapor	1.000	1.000	0.000	2.63E-09	0.00E+00	2.63E-09	2.68E-09	5.31E-09	2.65E-10	0.00E+00	2.65E-10	2.65E-10
26	107-66-4	Dibutylphosphate	3.56E-02	particle bound	0.995	0.995	0.005	3.54E-02	4.45E-07	3.54E-02	1.58E-06	3.54E-02	1.76E-03	4.43E-11	1.76E-03	1.76E-03
27	107-87-9	2-Pentanone	1.44E-08	vapor	1.000	1.000	0.000	1.44E-08	0.00E+00	1.44E-08	7.18E-09	2.16E-08	1.08E-09	0.00E+00	1.08E-09	1.08E-09
28	108-03-2	1-Nitropropane	4.33E-08	vapor	1.000	1.000	0.000	4.33E-08	0.00E+00	4.33E-08	2.16E-08	6.48E-08	3.24E-09	0.00E+00	3.24E-09	3.24E-09
29	108-05-4	Vinyl acetate	3.57E-11	vapor	1.000	1.000	0.000	3.57E-11	0.00E+00	3.57E-11	9.69E-11	1.33E-10	6.63E-12	0.00E+00	6.63E-12	6.63E-12
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.21E-09	vapor	1.000	1.000	0.000	7.21E-09	0.00E+00	7.21E-09	3.59E-09	1.08E-08	5.40E-10	0.00E+00	5.40E-10	5.40E-10
31	108-20-3	Bis(isopropyl)ether	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	2.45E-13	2.45E-13	1.22E-14	0.00E+00	1.22E-14	1.22E-14
32	108-38-3	m-Xylene (Dimethyl benzene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
33	108-39-4	m-Cresol	4.99E-04	vapor	1.000	1.000	0.000	4.99E-04	0.00E+00	4.99E-04	3.61E-06	5.03E-04	2.51E-05	0.00E+00	2.51E-05	2.51E-05
34	108-87-2	Methylcyclohexane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
35	108-88-3	Toluene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
36	108-90-7	Chlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
37	108-93-0	Cyclohexanol	1.07E-04	vapor	1.000	1.000	0.000	1.07E-04	0.00E+00	1.07E-04	1.83E-06	1.08E-04	5.42E-06	0.00E+00	5.42E-06	5.42E-06
38	108-94-1	Cyclohexanone	2.24E-05	vapor	1.000	1.000	0.000	2.24E-05	0.00E+00	2.24E-05	8.58E-07	2.33E-05	1.16E-06	0.00E+00	1.16E-06	1.16E-06
39	108-95-2	Phenol	1.78E-02	vapor	1.000	1.000	0.000	1.78E-02	0.00E+00	1.78E-02	2.36E-05	1.79E-02	8.93E-04	0.00E+00	8.93E-04	8.93E-04
40	109-66-0	n-Pentane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	109-99-9	Tetrahydrofuran	2.14E-07	vapor	1.000	1.000	0.000	2.14E-07	0.00E+00	2.14E-07	3.55E-08	2.49E-07	1.25E-08	0.00E+00	1.25E-08	1.25E-08
42	110-12-3	5-Methyl-2-hexanone	1.75E-10	vapor	1.000	1.000	0.000	1.75E-10	0.00E+00	1.75E-10	1.78E-10	3.54E-10	1.77E-11	0.00E+00	1.77E-11	1.77E-11
43	110-43-0	2-Heptanone	1.75E-10	vapor	1.000	1.000	0.000	1.75E-10	0.00E+00	1.75E-10	1.78E-10	3.54E-10	1.77E-11	0.00E+00	1.77E-11	1.77E-11
44	110-54-3	n-Hexane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
45	110-62-3	n-Valeraldehyde	2.63E-09	vapor	1.000	1.000	0.000	2.63E-09	0.00E+00	2.63E-09	2.68E-09	5.31E-09	2.65E-10	0.00E+00	2.65E-10	2.65E-10
46	110-82-7	Cyclohexane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
47	110-83-8	Cyclohexene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	110-86-1	Pyridine	4.49E-05	vapor	1.000	1.000	0.000	4.49E-05	0.00E+00	4.49E-05	1.72E-06	4.66E-05	2.33E-06	0.00E+00	2.33E-06	2.33E-06
49	111-65-9	n-Octane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	111-76-2	Ethylene glycol monobutyl ether	3.00E-03	vapor	1.000	1.000	0.000	3.00E-03	0.00E+00	3.00E-03	2.17E-05	3.02E-03	1.51E-04	0.00E+00	1.51E-04	1.51E-04
51	111-84-2	n-Nonane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	1.86E-02	particle bound	0.130	0.130	0.870	2.42E-03	4.05E-05	2.46E-03	4.33E-05	2.50E-03	1.63E-05	5.44E-10	1.63E-05	1.63E-05
53	117-84-0	n-Dioctyl phthalate	2.23E-04	particle bound	0.852	0.852	0.148	1.90E-04	8.24E-08	1.90E-04	4.82E-06	1.95E-04	8.29E-06	7.20E-12	8.29E-06	8.29E-06
54	120-12-7	Anthracene	1.19E-06	particle bound	0.998	0.998	0.002	1.19E-06	5.94E-12	1.19E-06	3.28E-07	1.51E-06	7.56E-08	7.57E-18	7.56E-08	7.56E-08
55	120-82-1	1,2,4-Trichlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	5.10E-14	5.10E-14	2.55E-15	0.00E+00	2.55E-15	2.55E-15
56	120-83-2	2,4-Dichlorophenol	6.40E-04	vapor	1.000	1.000	0.000	6.40E-04	0.00E+00	6.40E-04	1.10E-05	6.51E-04	3.25E-05	0.00E+00	3.25E-05	3.25E-05
57	121-44-8	Triethylamine	4.38E-10	vapor	1.000	1.000	0.000	4.38E-10	0.00E+00	4.38E-10	4.46E-10	8.84E-10	4.42E-11	0.00E+00	4.42E-11	4.42E-11
58	121-69-7	Dimethylaniline	5.34E-07	vapor	1.000	1.000	0.000	5.34E-07	0.00E+00	5.34E-07	8.88E-08	6.23E-07	3.11E-08	0.00E+00	3.11E-08	3.11E-08
59	122-39-4	N,N-Diphenylamine	4.26E-04	vapor	1.000	1.000	0.000	4.26E-04	0.00E+00	4.26E-04	7.33E-06	4.34E-04	2.17E-05	0.00E+00	2.17E-05	2.17E-05
60	123-19-3	4-Heptanone	2.14E-07	vapor	1.000	1.000	0.000	2.14E-07	0.00E+00	2.14E-07	3.55E-08	2.49E-07	1.25E-08	0.00E+00	1.25E-08	1.25E-08
61	123-38-6	n-Propionaldehyde	1.44E-08	vapor	1.000	1.000	0.000	1.44E-08	0.00E+00	1.44E-08	7.18E-09	2.16E-08	1.08E-09	0.00E+00	1.08E-09	1.08E-09
62	123-51-3	3-Methyl-1-butanol	1.23E-05	vapor	1.000	1.000	0.000	1.23E-05	0.00E+00	1.23E-05	6.17E-07	1.30E-05	6.48E-07	0.00E+00	6.48E-07	6.48E-07
63	123-86-4	Acetic acid n-butyl ester	1.13E-13	vapor	1.000	1.000	0.000	1.13E-13	0.00E+00	1.13E-13	3.06E-13	4.18E-13	2.09E-14	0.00E+00	2.09E-14	2.09E-14
64	123-91-1	1,4-Dioxane	2.13E-05	vapor	1.000	1.000	0.000	2.13E-05	0.00E+00	2.13E-05	3.66E-07	2.17E-05	1.08E-06	0.00E+00	1.08E-06	1.08E-06
65	126-73-8	Tributyl phosphate	1.81E-02	particle bound	0.996	0.996	0.004	1.80E-02	1.81E-07	1.80E-02	1.08E-05	1.80E-02	8.96E-04	1.80E-11	8.96E-04	8.96E-04
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	5.96E-12	vapor	1.000	1.000	0.000	5.96E-12	0.00E+00	5.96E-12	1.61E-11	2.21E-11	1.10E-12	0.00E+00	1.10E-12	1.10E-12
67	127-18-4	Perchloroethylene (tetrachloroethylene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	127-19-5	N,N-Dimethylacetamide	5.93E-03	vapor	1.000	1.000	0.000	5.93E-03	0.00E+00	5.93E-03	2.63E-07	5.93E-03	2.97E-04	0.00E+00	2.97E-04	2.97E-04
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	7.43E-05	vapor	1.000	1.000	0.000	7.43E-05	0.00E+00	7.43E-05	1.61E-06	7.59E-05	3.79E-06	0.00E+00	3.79E-06	3.79E-06
70	129-00-0	Pyrene	1.06E-04	particle bound	0.994	0.994	0.006	1.06E-04	1.59E-09	1.06E-04	6.38E-06	1.12E-04	5.56E-06	1.68E-13	5.56E-06	5.56E-06
71	1321-64-8	Pentachloronaphthalene	2.76E-12	particle bound	0.971	0.971	0.029	2.68E-12	2.00E-16	2.68E-12	2.26E-11	2.52E-11	1.23E-12	1.83E-19	1.23E-12	1.23E-12
72	1321-65-9	Trichloronaphthalene	2.63E-09	particle bound	0.999	0.999	0.001	2.63E-09	6.57E-15	2.63E-09	2.68E-09	5.30E-09	2.65E-10	1.33E-18	2.65E-10	2.65E-10
73	132-64-9	Dibenzofuran	5.25E-09	particle bound	0.999	0.999	0.001	5.25E-09	1.31E-14	5.26E-09	5.33E-09	1.06E-08	5.29E-10	2.65E-18	5.29E-10	5.29E-10
74	1335-87-1	Hexachloronaphthalene	4.33E-08	particle bound	0.984	0.984	0.016	4.26E-08	1.73E-12	4.26E-08	2.16E-08	6.41E-08	3.16E-09	2.57E-16	3.16E-09	3.16E-09
75	1335-88-2	Tetrachloronaphthalene	2.63E-09	particle bound	0.991	0.991	0.009	2.60E-09	5.91E-14	2.60E-09	2.68E-09	5.28E-09	2.62E-10	1.19E-17	2.62E-10	2.62E-10
76	1336-36-3	Polychlorinated biphenyls (PCBs)	5.82E-11	vapor	1.000	1.000	0.000	5.82E-11	0.00E+00	5.82E-11	1.45E-10	2.03E-10	1.02E-11	0.00E+00	1.02E-11	1.02E-11
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.37E-10	vapor	1.000	1.000	0.000	1.37E-10	0.00E+00	1.37E-10	6.80E-11	2.05E-10	1.02E-11	0.00E+00	1.02E-11	1.02E-11
78	141-79-7	4-Methyl-3-penten-2-one	3.20E-06	vapor	1.000	1.000	0.000	3.20E-06	0.00E+00	3.20E-06	5.33E-07	3.74E-06	1.87E-07	0.00E+00	1.87E-07	1.87E-07
79	142-82-5	n-Heptane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
80	144-62-7	Oxalic acid	1.83E+00	vapor	1.000	1.000	0.000	1.83E+00	0.00E+00	1.83E+00	1.04E-08	1.83E+00	9.16E-02	0.00E+00	9.16E-02	9.16E-02
81	156-60-5	trans-1,2-Dichloroethylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
82	1634-04-4	Methyl tert-butyl ether	5.95E-12	vapor	1.000	1.000	0.000	5.95E-12	0.00E+00	5.95E-12	1.61E-11	2.21E-11	1.10E-12	0.00E+00	1.10E-12	1.10E-12
83	189-55-9	Dibenzo[a,i]pyrene	3.56E-02	particle	0.000	0.000	1.000	0.00E+00	8.90E-05	8.90E-05	1.58E-06	9.05E-05	0.00E+00	2.26E-11	2.26E-11	2.26E-11
84	189-64-0	Dibenzo[a,h]pyrene	3.56E-02	particle	0.000	0.000	1.000	0.00E+00	8.90E-05	8.90E-05	1.58E-06	9.05E-05	0.00E+00	2.26E-11	2.26E-11	2.26E-11
85	191-24-2	Benzo(g,h,i)perylene	1.86E-02	particle bound	0.065	0.065	0.935	1.21E-03	4.35E-05	1.25E-03	4.33E-05	1.30E-03	4.21E-06	3.03E-10	4.21E-06	4.21E-06
86	191-30-0	Benzo[a,l]pyrene	3.56E-02	particle	0.000	0.000	1.000	0.00E+00	8.90E-05	8.90E-05	1.58E-06	9.05E-05	0.00E+00	2.26E-11	2.26E-11	2.26E-11
87	192-65-4	Dibenzo[a,e]pyrene	3.56E-02	particle	0.000	0.000	1.000	0.00E+00	8.90E-05	8.90E-05	1.58E-06	9.05E-05	0.00E+00	2.26E-11	2.26E-11	2.26E-11
88	193-39-5	Indeno(1,2,3-cd)pyrene	5.91E-10	particle	0.000	0.000	1.000	0.00E+00	1.48E-12	1.48E-12	5.03E-09	5.03E-09	0.00E+00	1.26E-15	1.26E-15	1.26E-15
89	206-44-0	Fluoranthene	1.27E-11	particle bound	0.992	0.992	0.008	1.26E-11	2.54E-16	1.26E-11	1.04E-10	1.17E-10	5.79E-12	2.34E-19	5.79E-12	5.79E-12
90	208-96-8	Acenaphthylene	8.65E-08	vapor	1.000	1.000	0.000	8.65E-08	0.00E+00	8.65E-08	4.31E-08	1.30E-07	6.48E-09	0.00E+00	6.48E-09	6.48E-09
91	2234-13-1	Octachloronaphthalene	1.37E-10	particle bound	0.629	0.629	0.371	8.59E-11	1.27E-13	8.60E-11	6.80E-11	1.54E-10	4.84E-12	1.43E-17	4.84E-12	4.84E-12
92	224-42-0	Dibenz[a,j]acridine	3.65E-02	particle bound	0.241	0.241	0.759	8.79E-03	6.92E-06	8.86E-03	2.02E-07	8.86E-03	1.07E-04	1.68E-09	1.07E-04	1.07E-04
93	226-36-8	Dibenz[a,h]acridine	3.65E-02	particle bound	0.285	0.285	0.715	1.04E-02	6.52E-06	1.05E-02	2.02E-07	1.05E-02	1.49E-04	1.87E-09	1.49E-04	1.49E-04
94	25551-13-7	Trimethyl benzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95	26140-60-3	Terphenyls	8.58E-12	particle bound	0.872	0.872	0.128	7.46E-12	2.74E-15	7.48E-12	7.03E-11	7.77E-11	3.39E-12	2.49E-18	3.39E-12	3.39E-12
96	27154-33-2	Trichlorofluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	287-92-3	Cyclopentane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	3697-24-3	5-Methylchrysene	1.37E-11	particle bound	0.823	0.823	0.177	1.12E-11	6.05E-15	1.13E-11	1.12E-10	1.23E-10	5.07E-12	5.45E-18	5.07E-12	5.07E-12
99	3825-26-1	Ammonium perfluorooctanoate	4.33E-08	vapor	1.000	1.000	0.000	4.33E-08	0.00E+00	4.33E-08	2.16E-08	6.48E-08	3.24E-09	0.00E+00	3.24E-09	3.24E-09
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	2.19E-05	vapor	1.000	1.000	0.000	2.19E-05	0.00E+00	2.19E-05	8.49E-07	2.27E-05	1.14E-06	0.00E+00	1.14E-06	1.14E-06
101	50-00-0	Formaldehyde	2.42E-03	vapor	1.000	1.000	0.000	2.42E-03	0.00E+00	2.42E-03	4.24E-06	2.43E-03	1.21E-04	0.00E+00	1.21E-04	1.21E-04
102	50-32-8	Benzo(a)pyrene	2.36E-02	particle bound	0.290	0.290	0.710	6.84E-03	4.18E-05	6.88E-03	5.49E-05	6.93E-03	1.01E-04	1.23E-09	1.01E-04	1.01E-04
103	53-70-3	Dibenzo(a,h)anthracene	1.72E-02	particle bound	0.054	0.054	0.946	9.26E-04	4.06E-05	9.67E-04	1.02E-05	9.77E-04	2.64E-06	2.31E-10	2.64E-06	2.64E-06
104	540-59-0	1,2-Dichloroethylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
105	540-84-1	2,2,4-Trimethylpentane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106	541-73-1	1,3-Dichlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107	56-23-5	Carbon tetrachloride	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108	563-80-4	3-Methyl-2-butanone	7.21E-09	vapor	1.000	1.000	0.000	7.21E-09	0.00E+00	7.21E-09	3.59E-09	1.08E-08	5.40E-10	0.00E+00	5.40E-10	5.40E-10
109	56-49-5	3-Methylcholanthrene	0.00E+00	particle bound	0.364	0.364	0.636	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110	57-14-7	1,1-Dimethylhydrazine	7.41E-05	vapor	1.000	1.000	0.000	7.41E-05	0.00E+00	7.41E-05	3.70E-06	7.78E-05	3.89E-06	0.00E+00	3.89E-06	3.89E-06
111	58-90-2	2,3,4,6-Tetrachlorophenol	1.60E-04	vapor	1.000	1.000	0.000	1.60E-04	0.00E+00	1.60E-04	5.88E-06	1.66E-04	8.30E-06	0.00E+00	8.30E-06	8.30E-06
112	591-78-6	2-Hexanone	7.21E-09	vapor	1.000	1.000	0.000	7.21E-09	0.00E+00	7.21E-09	3.59E-09	1.08E-08	5.40E-10	0.00E+00	5.40E-10	5.40E-10
113	59-50-7	4-Chloro-3-methylphenol	2.23E-04	vapor	1.000	1.000	0.000	2.23E-04	0.00E+00	2.23E-04	4.82E-06	2.28E-04	1.14E-05	0.00E+00	1.14E-05	1.14E-05
114	59-89-2	N-Nitrosomorpholine	1.55E-11	vapor	1.000	1.000	0.000	1.55E-11	0.00E+00	1.55E-11	1.27E-10	1.43E-10	7.14E-12	0.00E+00	7.14E-12	7.14E-12
115	602-87-9	5-Nitroacenaphthene	3.00E-03	particle bound	0.997	0.997	0.003	2.99E-03	2.25E-08	2.99E-03	2.17E-05	3.01E-03	1.50E-04	2.26E-12	1.50E-04	1.50E-04
116	60-29-7	Ethyl ether	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	3.06E-13	3.06E-13	1.53E-14	0.00E+00	1.53E-14	1.53E-14
117	603-34-9	Triphenylamine	4.46E-04	vapor	1.000	1.000	0.000	4.46E-04	0.00E+00	4.46E-04	9.63E-06	4.55E-04	2.28E-05	0.00E+00	2.28E-05	2.28E-05
118	60-34-4	Methylhydrazine	1.07E-04	vapor	1.000	1.000	0.000	1.07E-04	0.00E+00	1.07E-04	1.83E-06	1.08E-04	5.42E-06	0.00E+00	5.42E-06	5.42E-06
119	60-35-5	Acetamide	5.93E-03	vapor	1.000	1.000	0.000	5.93E-03	0.00E+00	5.93E-03	2.63E-07	5.93E-03	2.97E-04	0.00E+00	2.97E-04	2.97E-04
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	1.37E-11	vapor	1.000	1.000	0.000	1.37E-11	0.00E+00	1.37E-11	1.10E-05	1.10E-05	5.49E-07	0.00E+00	5.49E-07	5.49E-07
121	624-83-9	Methyl isocyanate	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	5.10E-14	5.10E-14	2.55E-15	0.00E+00	2.55E-15	2.55E-15
122	627-13-4	Nitric acid, propyl ester	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	2.55E-14	2.55E-14	1.28E-15	0.00E+00	1.28E-15	1.28E-15
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	3.00E-03	vapor	1.000	1.000	0.000	3.00E-03	0.00E+00	3.00E-03	2.17E-05	3.02E-03	1.51E-04	0.00E+00	1.51E-04	1.51E-04
124	630-20-6	1,1,1,2-Tetrachloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	2.45E-13	2.45E-13	1.22E-14	0.00E+00	1.22E-14	1.22E-14
125	64-17-5	Ethyl alcohol	1.07E-04	vapor	1.000	1.000	0.000	1.07E-04	0.00E+00	1.07E-04	1.83E-06	1.08E-04	5.42E-06	0.00E+00	5.42E-06	5.42E-06
126	64-18-6	Formic acid	6.77E+00	vapor	1.000	1.000	0.000	6.77E+00	0.00E+00	6.77E+00	4.04E-03	6.78E+00	3.39E-01	0.00E+00	3.39E-01	3.39E-01
127	64-19-7	Acetic acid	5.60E-09	vapor	1.000	1.000	0.000	5.60E-09	0.00E+00	5.60E-09	4.59E-08	5.15E-08	2.57E-09	0.00E+00	2.57E-09	2.57E-09
128	67-56-1	Methyl alcohol (Methanol)	1.07E-04	vapor	1.000	1.000	0.000	1.07E-04	0.00E+00	1.07E-04	1.83E-06	1.08E-04	5.42E-06	0.00E+00	5.42E-06	5.42E-06
129	67-63-0	2-Propyl alcohol (Isopropanol, Propan-2-01)	4.49E-06	vapor	1.000	1.000	0.000	4.49E-06	0.00E+00	4.49E-06	1.72E-07	4.66E-06	2.33E-07	0.00E+00	2.33E-07	2.33E-07
130	67-64-1	2-Propanone (Acetone)	1.07E-06	vapor	1.000	1.000	0.000	1.07E-06	0.00E+00	1.07E-06	1.78E-07	1.25E-06	6.23E-08	0.00E+00	6.23E-08	6.23E-08
131	67-66-3	Chloroform	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
132	67-72-1	Hexachloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
133	684-16-2	Hexafluoroacetone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
134	71-23-8	n-Propyl alcohol	8.97E-06	vapor	1.000	1.000	0.000	8.97E-06	0.00E+00	8.97E-06	3.43E-07	9.32E-06	4.66E-07	0.00E+00	4.66E-07	4.66E-07
135	71-36-3	n-Butyl alcohol	2.24E-05	vapor	1.000	1.000	0.000	2.24E-05	0.00E+00	2.24E-05	8.58E-07	2.33E-05	1.16E-06	0.00E+00	1.16E-06	1.16E-06
136	71-43-2	Benzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
138	74-83-9	Bromomethane (Methyl bromide)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
139	74-87-3	Chloromethane (Methyl chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
140	74-97-5	Bromochloromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	5.10E-14	5.10E-14	2.55E-15	0.00E+00	2.55E-15	2.55E-15
141	74-99-7	Methylacetylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
142	75-00-3	Chloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
143	75-01-4	Vinyl chloride (1-Chloroethene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
144	75-05-8	Acetonitrile	8.70E-07	vapor	1.000	1.000	0.000	8.70E-07	0.00E+00	8.70E-07	1.23E-07	9.93E-07	4.96E-08	0.00E+00	4.96E-08	4.96E-08
145	75-07-0	Acetaldehyde	3.20E-06	vapor	1.000	1.000	0.000	3.20E-06	0.00E+00	3.20E-06	5.33E-07	3.74E-06	1.87E-07	0.00E+00	1.87E-07	1.87E-07
146	75-09-2	Dichloromethane (Methylene chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
147	75-12-7	Formamide	3.65E-02	vapor	1.000	1.000	0.000	3.65E-02	0.00E+00	3.65E-02	2.02E-07	3.65E-02	1.82E-03	0.00E+00	1.82E-03	1.82E-03
148	75-15-0	Carbon disulfide	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
149	75-21-8	Ethylene oxide (Oxirane)	8.76E-11	vapor	1.000	1.000	0.000	8.76E-11	0.00E+00	8.76E-11	8.92E-11	1.77E-10	8.84E-12	0.00E+00	8.84E-12	8.84E-12
150	75-27-4	Bromodichloromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	2.45E-13	2.45E-13	1.22E-14	0.00E+00	1.22E-14	1.22E-14
151	75-34-3	1,1-Dichloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
153	75-43-4	Dichlorofluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
154	75-45-6	Chlorodifluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
155	75-50-3	Trimethylamine	7.21E-09	vapor	1.000	1.000	0.000	7.21E-09	0.00E+00	7.21E-09	3.59E-09	1.08E-08	5.40E-10	0.00E+00	5.40E-10	5.40E-10
156	75-52-5	Nitromethane	3.20E-06	vapor	1.000	1.000	0.000	3.20E-06	0.00E+00	3.20E-06	5.33E-07	3.74E-06	1.87E-07	0.00E+00	1.87E-07	1.87E-07
157	75-55-8	2-Methylaziridine	1.35E-04	vapor	1.000	1.000	0.000	1.35E-04	0.00E+00	1.35E-04	5.15E-06	1.40E-04	6.99E-06	0.00E+00	6.99E-06	6.99E-06
158	75-61-6	Difluorodibromomethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
159	75-63-8	Trifluorobromomethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
160	75-65-0	2-Methyl-2-propanol	2.24E-05	vapor	1.000	1.000	0.000	2.24E-05	0.00E+00	2.24E-05	8.58E-07	2.33E-05	1.16E-06	0.00E+00	1.16E-06	1.16E-06
161	75-69-4	Trichlorofluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
162	75-71-8	Dichlorodifluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
163	76-03-9	Trichloroacetic acid	5.93E-03	vapor	1.000	1.000	0.000	5.93E-03	0.00E+00	5.93E-03	2.63E-07	5.93E-03	2.97E-04	0.00E+00	2.97E-04	2.97E-04
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
168	76-15-3	Chloropentafluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	1.35E-04	vapor	1.000	1.000	0.000	1.35E-04	0.00E+00	1.35E-04	5.15E-06	1.40E-04	6.99E-06	0.00E+00	6.99E-06	6.99E-06
170	78-87-5	1,2-Dichloropropane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	8.97E-06	vapor	1.000	1.000	0.000	8.97E-06	0.00E+00	8.97E-06	3.43E-07	9.32E-06	4.66E-07	0.00E+00	4.66E-07	4.66E-07
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	5.34E-07	vapor	1.000	1.000	0.000	5.34E-07	0.00E+00	5.34E-07	8.88E-08	6.23E-07	3.11E-08	0.00E+00	3.11E-08	3.11E-08
173	79-00-5	1,1,2-Trichloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	5.10E-14	5.10E-14	2.55E-15	0.00E+00	2.55E-15	2.55E-15
174	79-01-6	Trichloroethylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
175	79-09-4	Propionic acid	1.45E-02	vapor	1.000	1.000	0.000	1.45E-02	0.00E+00	1.45E-02	2.54E-05	1.46E-02	7.28E-04	0.00E+00	7.28E-04	7.28E-04
176	79-10-7	2-Propenoic acid	1.94E-02	vapor	1.000	1.000	0.000	1.94E-02	0.00E+00	1.94E-02	3.39E-05	1.94E-02	9.70E-04	0.00E+00	9.70E-04	9.70E-04
177	79-20-9	Methyl acetate	4.33E-08	vapor	1.000	1.000	0.000	4.33E-08	0.00E+00	4.33E-08	2.16E-08	6.48E-08	3.24E-09	0.00E+00	3.24E-09	3.24E-09
178	79-34-5	1,1,2,2-Tetrachloroethane	1.13E-14	vapor	1.000	1.000	0.000	1.13E-14	0.00E+00	1.13E-14	3.06E-14	4.18E-14	2.09E-15	0.00E+00	2.09E-15	2.09E-15
179	83-32-9	Acenaphthene	2.45E-12	vapor	1.000	1.000	0.000	2.45E-12	0.00E+00	2.45E-12	2.01E-11	2.26E-11	1.13E-12	0.00E+00	1.13E-12	1.13E-12
180	84-66-2	Diethyl phthalate	1.12E-02	vapor	1.000	1.000	0.000	1.12E-02	0.00E+00	1.12E-02	2.72E-05	1.12E-02	5.62E-04	0.00E+00	5.62E-04	5.62E-04
181	84-74-2	Dibutyl phthalate	4.56E-03	particle bound	0.994	0.994	0.006	4.54E-03	6.85E-08	4.54E-03	4.19E-05	4.58E-03	2.28E-04	6.87E-12	2.28E-04	2.28E-04
182	85-01-8	Phenanthrene	3.20E-06	particle bound	0.999	0.999	0.001	3.20E-06	8.01E-12	3.20E-06	5.33E-07	3.73E-06	1.87E-07	9.34E-16	1.87E-07	1.87E-07
183	85-68-7	Butylbenzyl phthalate	4.56E-03	particle bound	0.948	0.948	0.052	4.33E-03	5.93E-07	4.33E-03	4.19E-05	4.37E-03	2.07E-04	5.68E-11	2.07E-04	2.07E-04
184	86-73-7	Fluorene	4.33E-08	vapor	1.000	1.000	0.000	4.33E-08	0.00E+00	4.33E-08	2.16E-08	6.48E-08	3.24E-09	0.00E+00	3.24E-09	3.24E-09
185	87-68-3	Hexachlorobutadiene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
186	88-06-2	2,4,6-Trichlorophenol	6.40E-04	vapor	1.000	1.000	0.000	6.40E-04	0.00E+00	6.40E-04	1.10E-05	6.51E-04	3.25E-05	0.00E+00	3.25E-05	3.25E-05
187	88-72-2	2-Nitrotoluene	1.23E-05	vapor	1.000	1.000	0.000	1.23E-05	0.00E+00	1.23E-05	6.17E-07	1.30E-05	6.48E-07	0.00E+00	6.48E-07	6.48E-07
188	88-75-5	2-Nitrophenol	7.41E-05	vapor	1.000	1.000	0.000	7.41E-05	0.00E+00	7.41E-05	3.70E-06	7.78E-05	3.89E-06	0.00E+00	3.89E-06	3.89E-06
189	88-89-1	Picric acid	3.67E-02	#N/A	0.934	0.934	0.066	3.43E-02	6.05E-06	3.43E-02	2.48E-09	3.43E-02	1.60E-03	5.65E-10	1.60E-03	1.60E-03

SBS and WESP general DF

	SBS	WESP	Total
Vapor	1	1	1
Particle	20	20	400

2ry Offgas General DF

	HEPA	S-AC	VOC Ox	SCR	NaOH Scr	Total
Vapor	1	1	20	1	1	20
Particle	200000	1	20	1	1	4,000,000

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV. C
SHEET NO.: B-12

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Table B-8 LVP18 - Abated LAW Melter Offgas System					Fraction		LOP08	LOP08				LVP03	LVP03		Corrected
2			LMP08		Fv	vapor	Fraction	g/sec	g/sec	LOP08	LVP01	LVP03	g/sec	g/sec	LVP18	LVP18
3	CAS #	COPC	g/sec	Phase		adjusted	particle	vapor	particle	g/sec	g/sec	g/sec	vapor	particle	g/sec	g/sec
190	91-20-3	Naphthalene	3.29E-12	vapor	1.000	1.000	0.000	3.29E-12	0.00E+00	3.29E-12	8.25E-12	1.15E-11	5.77E-13	0.00E+00	5.77E-13	5.77E-13
191	91-22-5	Quinoline	3.00E-03	vapor	1.000	1.000	0.000	3.00E-03	0.00E+00	3.00E-03	2.17E-05	3.02E-03	1.51E-04	0.00E+00	1.51E-04	1.51E-04
192	91-58-7	2-Chloronaphthalene	3.57E-11	vapor	1.000	1.000	0.000	3.57E-11	0.00E+00	3.57E-11	9.69E-11	1.33E-10	6.63E-12	0.00E+00	6.63E-12	6.63E-12
193	92-52-4	1,1'-Biphenyl	2.38E-11	vapor	1.000	1.000	0.000	2.38E-11	0.00E+00	2.38E-11	6.46E-11	8.84E-11	4.42E-12	0.00E+00	4.42E-12	4.42E-12
194	92-93-3	4-Nitrobiphenyl	6.40E-04	particle bound	0.999	0.999	0.001	6.39E-04	1.60E-06	6.39E-04	1.10E-05	6.50E-04	3.25E-05	1.62E-13	3.25E-05	3.25E-05
195	95-13-6	Indene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.47E-12	1.47E-12	7.35E-14	0.00E+00	7.35E-14	7.35E-14
196	95-47-6	o-Xylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
197	95-48-7	o-Cresol (2-Methylphenol)	4.99E-04	vapor	1.000	1.000	0.000	4.99E-04	0.00E+00	4.99E-04	3.61E-06	5.03E-04	2.51E-05	0.00E+00	2.51E-05	2.51E-05
198	95-49-8	2-Chlorotoluene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	9.79E-14	9.79E-14	4.90E-15	0.00E+00	4.90E-15	4.90E-15
200	95-57-8	2-Chlorophenol	1.35E-04	vapor	1.000	1.000	0.000	1.35E-04	0.00E+00	1.35E-04	5.15E-06	1.40E-04	6.99E-06	0.00E+00	6.99E-06	6.99E-06
201	95-95-4	2,4,5-Trichlorophenol	3.00E-03	vapor	1.000	1.000	0.000	3.00E-03	0.00E+00	3.00E-03	2.17E-05	3.02E-03	1.51E-04	0.00E+00	1.51E-04	1.51E-04
202	96-22-0	3-Pentanone	1.44E-08	vapor	1.000	1.000	0.000	1.44E-08	0.00E+00	1.44E-08	7.18E-09	2.16E-08	1.08E-09	0.00E+00	1.08E-09	1.08E-09
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
204	98-51-1	p-tert-Butyltoluene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
205	98-82-8	Cumene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
206	98-83-9	alpha-Methylstyrene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
207	98-86-2	Acetophenone	7.50E-05	vapor	1.000	1.000	0.000	7.50E-05	0.00E+00	7.50E-05	3.12E-06	7.81E-05	3.90E-06	0.00E+00	3.90E-06	3.90E-06
208	98-95-3	Nitrobenzene	4.94E-05	vapor	1.000	1.000	0.000	4.94E-05	0.00E+00	4.94E-05	2.47E-06	5.18E-05	2.59E-06	0.00E+00	2.59E-06	2.59E-06
209										9.29E-00						
210																Corrected
211	Coplanar PCBs									LOP08	LVP01	LVP03			LVP18	LVP18
212										g/sec	g/sec	g/sec			g/sec	g/sec
213	31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
214	32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
215	32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
216	32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
217	35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
218	35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
219	38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
220	39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
221	52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
222	57465-28-8	3,3',4,4',5-Pentachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
223	65510-44-3	2',3,4,4',5-Pentachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
224	69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
225	70362-50-4	3,4,4',5-Tetrachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
226	74472-37-0	2,3,4,4',5-Pentachlorobiphenyl								4.20E-14	1.05E-13	1.47E-13			7.34E-15	7.34E-15
227																
228	1336-36-3	Polychlorinated biphenyls (PCBs)								5.82E-11	Correction for Coplanar PCBs					
229	1336-36-3	UnCorrected (for coplanar PCBs)								5.88E-11	0.99 : as parent					
230											0.01 : as coplanar sum					

Table 6-3 HMP06 - Unabated HLW Melter

Row	CAS #	COPC	Feed Rate g/sec	in ACM	Group	Grouping	Phase	HMP06 rate g/sec	Performance Factor	Adjusted PF	Calc'd rate HMP06 g/sec	Corrected HMP06 g/sec
4	100-00-5	p-Nitrochlorobenzene	2.86E-02	No		10	vapor			3.04E-03	8.68E-05	8.68E-05
5	100-21-0	p-Phthalic acid	4.29E-02	Yes	1	1	vapor	2.28E-03	5.31E-02		2.28E-03	2.28E-03
6	100-41-4	Ethyl benzene	2.86E-03	No		20	vapor			8.47E-17	2.42E-19	0.00E+00
7	100-42-5	Styrene	2.86E-03	No		19	vapor			1.79E-13	5.10E-16	0.00E+00
8	10061-01-5	cis-1,3-Dichloropropene	2.86E-03	Yes	19	19	vapor	1.51E-15	5.29E-13		1.51E-15	1.51E-15
9	10061-02-6	trans-1,3-Dichloropropene	2.86E-03	No		17	vapor			2.37E-11	6.76E-14	6.76E-14
10	101-55-3	4-Bromophenylphenyl ether	4.29E-02	No		14	vapor			9.51E-07	4.07E-08	4.07E-08
11	101-84-8	Diphenyl ether	7.14E-03	Yes	16	16	vapor	1.22E-12	1.71E-10		1.22E-12	1.22E-12
12	106-35-4	3-Heptanone	2.86E-03	No		14	vapor			9.51E-07	2.72E-09	2.72E-09
13	106-42-3	p-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			1.79E-13	1.28E-15	1.28E-15
14	106-46-7	1,4-Dichlorobenzene	2.86E-03	No		18	vapor			1.71E-10	4.89E-13	4.89E-13
15	106-88-7	1,2-Epoxybutane	7.14E-03	No		15	vapor			9.73E-08	6.95E-10	6.95E-10
16	106-93-4	Ethylene dibromide (Dibromethane)	2.86E-03	Yes	18	18	vapor	3.60E-12	1.26E-09		3.60E-12	3.60E-12
17	106-97-8	Butane	7.14E-03	Yes	26	26	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
18	106-99-0	1,3-Butadiene	2.86E-03	Yes	23	23	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
19	107-02-8	Acrolein	7.14E-03	No		14	vapor			9.51E-07	6.79E-09	6.79E-09
20	107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	No		20	vapor			8.47E-17	2.42E-19	0.00E+00
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.86E-03	No		17	vapor			2.37E-11	6.78E-14	6.78E-14
22	107-12-0	Propionitrile	7.14E-03	No		13	vapor			3.85E-05	2.75E-07	2.75E-07
23	107-13-1	Acrylonitrile	1.43E-02	No		14	vapor			9.51E-07	1.36E-08	1.36E-08
24	107-18-6	2-Propene-1-ol	4.29E-02	No		10	vapor			3.04E-03	1.30E-04	1.30E-04
25	107-31-3	Formic acid, methyl ester	4.29E-02	No		15	vapor			9.73E-08	4.17E-09	4.17E-09
26	107-66-4	Dibutylphosphate	4.29E-02	No		5	particle bound			5.06E-02	2.17E-03	2.17E-03
27	107-87-9	2-Pentanone	1.43E-02	No		14	vapor			9.51E-07	1.36E-08	1.36E-08
28	108-03-2	1-Nitropropane	4.29E-02	No		14	vapor			9.51E-07	4.07E-08	4.07E-08
29	108-05-4	Vinyl acetate	4.29E-02	No		16	vapor			3.49E-09	1.50E-10	1.50E-10
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.14E-03	No		14	vapor			9.51E-07	6.79E-09	6.79E-09
31	108-20-3	Bis(isopropyl)ether	7.14E-03	No		18	vapor			1.71E-10	1.22E-12	1.22E-12
32	108-38-3	m-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			1.79E-13	1.28E-15	1.28E-15
33	108-39-4	m-Cresol	7.14E-03	No		9	vapor			1.36E-02	9.71E-05	9.71E-05
34	108-87-2	Methylcyclohexane	7.14E-03	Yes	25	25	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
35	108-88-3	Toluene	2.86E-03	Yes	19	19	vapor	4.32E-18	1.51E-15		4.32E-18	0.00E+00
36	108-90-7	Chlorobenzene	2.86E-03	No		19	vapor			1.79E-13	5.10E-16	0.00E+00
37	108-93-0	Cyclohexanol	7.14E-03	No		10	vapor			3.04E-03	2.17E-05	2.17E-05
38	108-94-1	Cyclohexanone	7.14E-03	No		11	vapor			1.00E-03	7.17E-06	7.17E-06
39	108-95-2	Phenol	4.29E-02	Yes	8	8	vapor	1.95E-03	4.56E-02		1.95E-03	1.95E-03
40	109-66-0	n-Pentane	7.14E-03	No		26	vapor			0.00E+00	0.00E+00	0.00E+00
41	109-99-9	Tetrahydrofuran	2.86E-03	No		13	vapor			3.85E-05	1.10E-07	1.10E-07
42	110-12-3	5-Methyl-2-hexanone	2.86E-03	No		15	vapor			9.73E-08	2.78E-10	2.78E-10
43	110-43-0	2-Heptanone	2.86E-03	No		15	vapor			9.73E-08	2.78E-10	2.78E-10
44	110-54-3	n-Hexane	7.14E-03	Yes	27	27	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
45	110-62-3	n-Valeraldehyde	4.29E-02	No		15	vapor			9.73E-08	4.17E-09	4.17E-09
46	110-82-7	Cyclohexane	7.14E-03	Yes	24	24	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
47	110-83-8	Cyclohexene	2.86E-03	No		22	vapor			2.25E-21	6.42E-24	0.00E+00
48	110-86-1	Pyridine	1.43E-02	No		11	vapor			1.00E-03	1.43E-05	1.43E-05
49	111-65-9	n-Octane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
50	111-76-2	Ethylene glycol monobutyl ether	4.29E-02	No		9	vapor			1.36E-02	5.83E-04	5.83E-04
51	111-84-2	n-Nonane	7.14E-03	Yes	28	28	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.29E-02	No		30	particle bound			2.93E-02	1.25E-03	1.25E-03
53	117-84-0	n-Dioctyl phthalate	4.29E-02	No		32	particle bound			1.41E-03	6.06E-05	6.06E-05
54	120-12-7	Anthracene	4.29E-02	Yes	13	13	particle bound	7.28E-07	1.69E-05		7.28E-07	7.28E-07
55	120-82-1	1,2,4-Trichlorobenzene	7.14E-03	Yes	17	17	vapor	1.69E-13	2.37E-11		1.69E-13	1.69E-13
56	120-83-2	2,4-Dichlorophenol	4.29E-02	No		10	vapor			3.04E-03	1.30E-04	1.30E-04
57	121-44-8	Triethylamine	7.14E-03	No		15	vapor			9.73E-08	6.95E-10	6.95E-10
58	121-69-7	Dimethylaniline	7.14E-03	No		13	vapor			3.85E-05	2.75E-07	2.75E-07
59	122-39-4	N,N-Diphenylamine	1.43E-02	Yes	10	10	vapor	8.68E-05	6.08E-03		8.68E-05	8.68E-05
60	123-19-3	4-Heptanone	2.86E-03	No		13	vapor			3.85E-05	1.10E-07	1.10E-07
61	123-38-6	n-Propionaldehyde	1.43E-02	No		14	vapor			9.51E-07	1.36E-08	1.36E-08
62	123-51-3	3-Methyl-1-butanol	7.14E-03	No		12	vapor			5.98E-04	4.26E-06	4.26E-06
63	123-86-4	Acetic acid n-butyl ester	1.35E-04	No		16	vapor			3.49E-09	4.72E-13	4.72E-13
64	123-91-1	1,4-Dioxane	1.43E-03	No		10	vapor			3.04E-03	4.34E-06	4.34E-06
65	126-73-8	Tributyl phosphate	2.86E-02	Yes	7	7	particle bound	1.51E-03	5.29E-02		1.51E-03	1.51E-03
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	7.14E-03	No		16	vapor			3.49E-09	2.49E-11	2.49E-11
67	127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	Yes	21	21	vapor	1.19E-23	4.17E-21		1.19E-23	0.00E+00
68	127-19-5	N,N-Dimethylacetamide	7.14E-03	No		5	vapor			5.06E-02	3.61E-04	3.61E-04
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.43E-02	No		32	vapor			1.41E-03	2.02E-05	2.02E-05
70	129-00-0	Pyrene	4.29E-02	Yes	33	33	particle bound	3.46E-05	8.07E-04		3.46E-05	3.46E-05
71	1321-64-8	Pentachloronaphthalene	4.29E-02	Yes	14	14	particle bound	7.35E-12	1.72E-10		7.35E-12	7.35E-12
72	1321-65-9	Trichloronaphthalene	4.29E-02	No		15	particle bound			9.73E-08	4.17E-09	4.17E-09
73	132-64-9	Dibenzofuran	4.29E-02	Yes	15	15	particle bound	8.33E-09	1.94E-07		8.33E-09	8.33E-09
74	1335-87-1	Hexachloronaphthalene	4.29E-02	No		14	particle bound			9.51E-07	4.07E-08	4.07E-08
75	1335-88-2	Tetrachloronaphthalene	4.29E-02	No		15	particle bound			9.73E-08	4.17E-09	4.17E-09
76	1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03	Yes	35	35	vapor	2.10E-10	1.21E-07		2.08E-10	2.08E-10
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.35E-04	No		14	vapor			9.51E-07	1.29E-10	1.29E-10
78	141-79-7	4-Methyl-3-penten-2-one	4.29E-02	No		13	vapor			3.85E-05	1.65E-06	1.65E-06
79	142-82-5	n-Heptane	7.14E-03	No		27	vapor			0.00E+00	0.00E+00	0.00E+00
80	144-62-7	Oxalic acid	2.14E+00	Yes	3	3	vapor	1.08E-01	5.04E-02		1.08E-01	1.08E-01
81	156-60-5	trans-1,2-Dichloroethylene	7.14E-03	No		20	vapor			8.47E-17	6.05E-19	0.00E+00
82	1634-04-4	Methyl tert-butyl ether	7.14E-03	No		16	vapor			3.49E-09	2.49E-11	2.49E-11
83	189-55-9	Dibenzo(a,i)pyrene	4.29E-02	No		5	particle			5.06E-02	2.17E-03	2.17E-03
84	189-64-0	Dibenzo(a,h)pyrene	4.29E-02	No		5	particle			5.06E-02	2.17E-03	2.17E-03
85	191-24-2	Benzo(g,h,i)perylene	4.29E-02	No		30	particle bound			2.93E-02	1.25E-03	1.25E-03
86	191-30-0	Benzo(a,l)pyrene	4.29E-02	No		5	particle			5.06E-02	2.17E-03	2.17E-03
87	192-65-4	Dibenzo(a,e)pyrene	4.29E-02	No		5	particle			5.06E-02	2.17E-03	2.17E-03
88	193-39-5	Indeno(1,2,3-cd)pyrene	4.29E-02	Yes	30	30	particle	2.84E-10	6.62E-09		2.84E-10	2.84E-10
89	206-44-0	Fluoranthene	4.29E-02	Yes	33	33	particle bound	7.39E-12	1.72E-10		7.39E-12	7.39E-12
90	208-96-8	Acenaphthylene	4.29E-02	Yes	14	14	vapor	8.15E-08	1.90E-06		8.15E-08	8.15E-08
91	2234-13-1	Octachloronaphthalene	1.35E-04	No		14	particle bound			9.51E-07	1.29E-10	1.29E-10
92	224-42-0	Dibenz[a,j]acridine	4.29E-02	No		4	particle bound			5.04E-02	2.16E-03	2.16E-03
93	226-36-8	Dibenz[a,h]acridine	4.29E-02	No		4	particle bound			5.04E-02	2.16E-03	2.16E-03
94	25551-13-7	Trimethyl benzene	7.14E-03	No		19	vapor			1.79E-13	1.28E-15	1.28E-15
95	26140-60-3	Terphenyls	4.29E-02	Yes	34	34	particle bound	7.38E-12	1.72E-10		7.38E-12	7.38E-12
96	27154-33-2	Trichlorofluoroethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
97	287-92-3	Cyclopentane	7.14E-03	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
98	3697-24-3	5-Methylchrysene	4.29E-02	Yes	32	32	particle bound	7.40E-12	1.73E-10		7.40E-12	7.40E-12
99	3825-26-1	Ammonium perfluorooctanoate	4.29E-02	No		14	vapor			9.51E-07	4.07E-08	4.07E-08
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	7.14E-03	Yes	11	11	vapor	7.02E-06	9.82E-04		7.02E-06	7.02E-06
101	50-00-0	Formaldehyde	7.14E-03	No		8	vapor			4.10E-02	2.93E-04	2.93E-04
102	50-32-8	Benzo(a)pyrene	2.72E-02	Yes	30	30	particle bound	1.59E-03	5.85E-02		1.59E-03	1.59E-03
103	53-70-3	Dibenzo(a,h)anthracene	2.72E-02	No		7	particle bound			5.29E-02	1.44E-03	1.44E-03
104	540-59-0	1,2-Dichloroethylene	7.14E-03	No		19	vapor			1.79E-13	1.28E-15	1.28E-15
105	540-84-1	2,2,4-Trimethylpentane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
106	541-73-1	1,3-Dichlorobenzene	2.86E-03	No		19	vapor			1.79E-13	5.10E-16	0.00E+00
107	56-23-5	Carbon tetrachloride	2.86E-03	Yes	22	22	vapor	6.42E-24	2.25E-21		6.42E-24	0.00E+00
108	563-80-4	3-Methyl-2-butanone	7.14E-03	No		14	vapor			9.51E-07	6.79E-09	6.79E-09
109	56-49-5	3-Methylcholanthrene	4.29E-02	No		28	particle bound			0.00E+00	0.00E+00	0.00E+00
110	57-14-7	1,1-Dimethylhydrazine	4.29E-02	Yes	12	12	vapor	2.56E-05	5.98E-04		2.56E-05	2.56E-05
111	58-90-2	2,3,4,6-Tetrachlorophenol	4.29E-02	Yes	11	11	vapor	5.01E-05	1.17E-03		5.01E-05	5.01E-05
112	591-78-6	2-Hexanone	7.14E-03	No		14	vapor			9.51E-07	6.79E-09	6.79E-09
113	59-50-7	4-Chloro-3-methylphenol	4.29E-02	No		32	vapor			1.41E-03	6.06E-05	6.06E-05
114	59-89-2	N-Nitrosomorpholine	4.29E-02	Yes	6	6	vapor	7.41E-12	1.73E-10		7.41E-12	7.41E-12
115	602-87-9	5-Nitroacenaphthene	4.29E-02	No		9	particle bound			1.36E-02	5.83E-04	5.83E-04
116	60-29-7	Ethyl ether	4.29E-02	No		17	vapor			2.37E-11	1.01E-12	1.01E-12
117	603-34-9	Triphenylamine	4.29E-02	Yes	32	32	vapor	1.21E-04	2.83E-03		1.21E-04	1.21E-04
118	60-34-4	Methylhydrazine	7.14E-03	No		10	vapor			3.04E-03	2.17E-05	2.17E-05
119	60-35-5	Acetamide	7.14E-03	Yes	5	5	vapor	3.61E-04	5.06E-02		3.61E-04	3.61E-04
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.29E-02	Yes	10	10	vapor	7.39E-12	1.72E-10		7.39E-12	7.39E-12
121	624-83-9	Methyl isocyanate	7.14E-03	No		17	vapor			2.37E-11	1.69E-13	1.69E-13
122	627-13-4	Nitric acid, propyl ester	3.57E-03	No		17	vapor			2.37E-11	8.45E-14	8.45E-14
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.29E-02	Yes	9	9	vapor	5.83E-04	1.36E-02		5.83E-04	5.83E-04
124	630-20-6	1,1,1,2-Tetrachloroethane	7.14E-03	No		18	vapor			1.71E-10	1.22E-12	1.22E-12
125	64-17-5	Ethyl alcohol	7.14E-03	No		10	vapor			3.04E-03	2.17E-05	2.17E-05
126	64-18-6	Formic acid	1.07E+01	No		7	vapor			5.29E-02	5.67E-01	5.67E-01
127	64-19-7	Acetic acid	1.56E+01	Yes	6	6	vapor	2.67E-09	1.72E-10		2.67E-09	2.67E-09
128	67-56-1	Methyl alcohol (Methanol)	7.14E-03	No		10	vapor			3.04E-03	2.17E-05	2.17E-05
129	67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	1.43E-03	No		11	vapor			1.00E-03	1.43E-06	1.43E-06
130	67-64-1	2-Propanone (Acetone)	1.43E-02	No		13	vapor			3.85E-05	5.50E-07	5.50E-07
131	67-66-3	Chloroform	2.86E-03	No		19	vapor			1.79E-13	5.10E-16	0.00E+00
132	67-72-1	Hexachloroethane	4.29E-02	No		19	vapor			1.79E-13	7.66E-15	7.66E-15
133	684-16-2	Hexafluoroacetone	7.14E-03	No		19	vapor			1.79E-13	1.28E-15	1.28E-15
134	71-23-8	n-Propyl alcohol	2.86E-03	No		11	vapor			1.00E-03	2.87E-06	2.87E-06
135	71-36-3	n-Butyl alcohol	7.14E-03	No		11	vapor			1.00E-03	7.17E-06	7.17E-06
136	71-43-2	Benzene	2.86E-03	Yes	19	19	vapor	1.48E-17	5.20E-15		1.48E-17	0.00E+00
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	No		21	vapor			4.17E-21	1.19E-23	0.00E+00
138	74-83-9	Bromomethane (Methyl bromide)	2.86E-03	No		19	vapor			1.79E-13	5.10E-16	0.00E+00
139	74-87-3	Chloromethane (Methyl chloride)	2.86E-03	No		20	vapor			8.47E-17	2.42E-19	0.00E+00
140	74-97-5	Bromochloromethane	7.14E-03	No		17	vapor			2.37E-11	1.69E-13	1.69E-13
141	74-99-7	Methylacetylene	4.29E-02	No		20	vapor			8.47E-17	3.63E-18	0.00E+00
142	75-00-3	Chloroethane	2.86E-03	No		20	vapor			8.47E-17	2.42E-19	0.00E+00
143	75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	No		22	vapor			2.25E-21	6.42E-24	0.00E+00
144	75-05-8	Acetonitrile	7.14E-03	Yes	13	13	vapor	4.29E-07	6.01E-05		4.29E-07	4.29E-07
145	75-07-0	Acetaldehyde	4.29E-02	No		13	vapor			3.85E-05	1.65E-06	1.65E-06
146	75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	No		19	vapor			1.79E-13	5.10E-16	0.00E+00
147	75-12-7	Formamide	4.29E-02	Yes	4	4	vapor	2.16E-03	5.04E-02		2.16E-03	2.16E-03
148	75-15-0	Carbon disulfide	7.14E-03	No		20	vapor			8.47E-17	6.05E-19	0.00E+00
149	75-21-8	Ethylene oxide (Oxirane)	1.43E-03	No		15	vapor			9.73E-08	1.39E-10	1.39E-10
150	75-27-4	Bromodichloromethane	7.14E-03	No		18	vapor			1.71E-10	1.22E-12	1.22E-12
151	75-34-3	1,1-Dichloroethane	2.86E-03	No		19	vapor			1.79E-13	5.10E-16	0.00E+00
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.14E-03	No		22	vapor			2.25E-21	1.61E-23	0.00E+00
153	75-43-4	Dichlorofluoromethane	2.86E-03	No		20	vapor			8.47E-17	2.42E-19	0.00E+00
154	75-45-6	Chlorodifluoromethane	2.86E-03	No		22	vapor			2.25E-21	6.42E-24	0.00E+00
155	75-50-3	Trimethylamine	7.14E-03	No		14	vapor			9.51E-07	6.79E-09	6.79E-09
156	75-52-5	Nitromethane	4.29E-02	No		13	vapor			3.85E-05	1.65E-06	1.65E-06
157	75-55-8	2-Methylaziridine	4.29E-02	No		11	vapor			1.00E-03	4.30E-05	4.30E-05
158	75-61-6	Difluorodibromomethane	7.14E-03	No		22	vapor			2.25E-21	1.61E-23	0.00E+00
159	75-63-8	Trifluorobromomethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
160	75-65-0	2-Methyl-2-propanol	7.14E-03	No		11	vapor			1.00E-03	7.17E-06	7.17E-06
161	75-69-4	Trichlorofluoromethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
162	75-71-8	Dichlorodifluoromethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
163	76-03-9	Trichloroacetic acid	7.14E-03	No		5	vapor			5.06E-02	3.61E-04	3.61E-04
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.29E-02	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
168	76-15-3	Chloropentafluoroethane	7.14E-03	Yes	29	29	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.29E-02	No		11	vapor			1.00E-03	4.30E-05	4.30E-05
170	78-87-5	1,2-Dichloropropane	2.86E-03	No		19	vapor			1.79E-13	5.10E-16	0.00E+00
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.86E-03	No		11	vapor			1.00E-03	2.87E-06	2.87E-06
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	7.14E-03	No		13	vapor			3.85E-05	2.75E-07	2.75E-07
173	79-00-5	1,1,2-Trichloroethane	7.14E-03	No		17	vapor			2.37E-11	1.69E-13	1.69E-13
174	79-01-6	Trichloroethylene	7.14E-03	Yes	20	20	vapor	7.14E-19	9.99E-17		7.14E-19	0.00E+00
175	79-09-4	Propionic acid	4.29E-02	No		8	vapor			4.10E-02	1.76E-03	1.76E-03
176	79-10-7	2-Propenoic acid	5.72E-02	No		8	vapor			4.10E-02	2.35E-03	2.35E-03
177	79-20-9	Methyl acetate	4.29E-02	No		14	vapor			9.51E-07	4.07E-08	4.07E-08
178	79-34-5	1,1,2,2-Tetrachloroethane	1.35E-05	No		16	vapor			3.49E-09	4.72E-14	4.72E-14
179	83-32-9	Acenaphthene	4.29E-02	Yes	15	15	vapor	7.34E-12	1.71E-10		7.34E-12	7.34E-12
180	84-66-2	Diethyl phthalate	4.29E-02	Yes	8	8	vapor	1.56E-03	3.65E-02		1.56E-03	1.56E-03
181	84-74-2	Dibutyl phthalate	4.29E-02	Yes	31	31	particle bound	6.92E-04	1.61E-02		6.92E-04	6.92E-04
182	85-01-8	Phenanthrene	4.29E-02	No		13	particle bound			3.85E-05	1.65E-06	1.65E-06
183	85-68-7	Butylbenzyl phthalate	4.29E-02	No		31	particle bound			1.61E-02	6.92E-04	6.92E-04
184	86-73-7	Fluorene	4.29E-02	No		14	vapor			9.51E-07	4.07E-08	4.07E-08
185	87-68-3	Hexachlorobutadiene	7.14E-03	Yes	20	20	vapor	4.96E-19	6.95E-17		4.96E-19	0.00E+00
186	88-06-2	2,4,6-Trichlorophenol	4.29E-02	No		10	vapor			3.04E-03	1.30E-04	1.30E-04
187	88-72-2	2-Nitrotoluene	7.14E-03	No		12	vapor			5.98E-04	4.26E-06	4.26E-06
188	88-75-5	2-Nitrophenol	4.29E-02	No		12	vapor			5.98E-04	2.56E-05	2.56E-05
189	88-89-1	Picric acid	4.29E-02	Yes	2	2	#N/A	2.16E-03	5.05E-02		2.16E-03	2.16E-03
190	91-20-3	Naphthalene	1.43E-03	Yes	16	16	vapor	1.29E-11	9.04E-09		1.29E-11	1.29E-11
191	91-22-5	Quinoline	4.29E-02	No		9	vapor			1.36E-02	5.83E-04	5.83E-04
192	91-58-7	2-Chloronapthalene	4.29E-02	No		16	vapor			3.49E-09	1.50E-10	1.50E-10
193	92-52-4	1,1'-Biphenyl	2.86E-02	No		16	vapor			3.49E-09	9.97E-11	9.97E-11
194	92-93-3	4-Nitrobiphenyl	4.29E-02	No		10	particle bound			3.04E-03	1.30E-04	1.30E-04
195	95-13-6	Indene	4.29E-02	No		18	vapor			1.71E-10	7.33E-12	7.33E-12
196	95-47-6	o-Xylene	2.86E-03	No		19	vapor			1.79E-13	5.10E-16	0.00E+00
197	95-48-7	o-Cresol (2-Methylphenol)	7.14E-03	No		9	vapor			1.36E-02	9.71E-05	9.71E-05
198	95-49-8	2-Chlorotoluene	4.29E-02	No		19	vapor			1.79E-13	7.66E-15	7.66E-15
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.86E-03	Yes	18	18	vapor	4.89E-13	1.71E-10		4.89E-13	4.89E-13
200	95-57-8	2-Chlorophenol	4.29E-02	No		11	vapor			1.00E-03	4.30E-05	4.30E-05
201	95-95-4	2,4,5-Trichlorophenol	4.29E-02	No		9	vapor			1.36E-02	5.83E-04	5.83E-04
202	96-22-0	3-Pentanone	1.43E-02	No		14	vapor			9.51E-07	1.36E-08	1.36E-08
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	No		19	vapor			1.79E-13	7.66E-15	7.66E-15
204	98-51-1	p-tert-Butyltoluene	4.29E-02	No		21	vapor			4.17E-21	1.79E-22	0.00E+00
205	98-82-8	Cumene	4.29E-02	No		20	vapor			8.47E-17	3.63E-18	0.00E+00
206	98-83-9	alpha-Methylstyrene	7.14E-03	No		19	vapor			1.79E-13	1.28E-15	1.28E-15
207	98-86-2	Acetophenone	2.86E-02	Yes	11	11	vapor	2.45E-05	8.59E-04		2.45E-05	2.45E-05
208	98-95-3	Nitrobenzene	2.86E-02	No		12	vapor			5.98E-04	1.70E-05	1.70E-05
209											7.19E-01	

Adjusted Performance Factors

Row	Group	PF
5	1	5.31E-02
6	2	5.05E-02
7	3	5.04E-02
8	4	5.04E-02
9	5	5.06E-02
10	6	1.73E-10
11	7	5.29E-02
12	8	4.10E-02
13	9	1.36E-02
14	10	3.04E-03
15	11	1.00E-03
16	12	5.98E-04
17	13	3.85E-05
18	14	9.51E-07
19	15	9.73E-08
20	16	3.49E-09
21	17	2.37E-11
22	18	1.71E-10
23	19	1.79E-13
24	20	8.47E-17
25	21	4.17E-21
26	22	2.25E-21
27	23	0.00E+00
28	24	0.00E+00
29	25	0.00E+00
30	26	0.00E+00
31	27	0.00E+00
32	28	0.00E+00
33	29	0.00E+00
34	30	2.93E-02
35	31	1.61E-02
36	32	1.41E-03
37	33	4.04E-04
38	34	1.72E-10
39	35	1.21E-07

Coplanar PCBs

CAS #	Congener	HMP06 g/sec	Corrected HMP06 g/sec
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	1.50E-13	1.50E-13
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	1.50E-13	1.50E-13
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	1.50E-13	1.50E-13
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	1.50E-13	1.50E-13
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	1.50E-13	1.50E-13
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	1.50E-13	1.50E-13
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	1.50E-13	1.50E-13
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1.50E-13	1.50E-13
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	1.50E-13	1.50E-13
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	1.50E-13	1.50E-13
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	1.50E-13	1.50E-13
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	1.50E-13	1.50E-13
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	1.50E-13	1.50E-13
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	1.50E-13	1.50E-13
1336-36-3	Polychlorinated biphenyls (PCBs)	2.08E-10	
1336-36-3	UnCorrected (for coplanar PCBs)	2.10E-10	

Correction for Coplanar PCBs
0.99 as parent
0.01 as coplanar sum

Table B-10 HOP10 - HLW Vessel Ventilation

Row	CAS #	COPC	Feed Rate g/sec	In ACM	Group	Grouping	Phase	HOP10 rate g/sec	Performance Factor	Adjusted PF	Calc'd rate HOP10 g/sec	Corrected HOP10 g/sec
4	100-00-5	p-Nitrochlorobenzene	2.86E-02	No		10	vapor			1.04E-04	2.97E-06	2.97E-06
5	100-21-0	p-Phthalic acid	4.29E-02	Yes	1	1	vapor	8.87E-12	2.07E-10		8.87E-12	8.87E-12
6	100-41-4	Ethyl benzene	2.86E-03	No		20	vapor			2.02E-13	5.78E-16	0.00E+00
7	100-42-5	Styrene	2.86E-03	No		19	vapor			3.64E-11	1.04E-13	1.04E-13
8	10061-01-5	cis-1,3-Dichloropropene	2.86E-03	Yes	19	19	vapor	2.97E-13	1.04E-10		2.97E-13	2.97E-13
9	10061-02-6	trans-1,3-Dichloropropene	2.86E-03	No		17	vapor			1.43E-09	4.10E-12	4.10E-12
10	101-55-3	4-Bromophenylphenyl ether	4.29E-02	No		14	vapor			1.37E-06	5.86E-08	5.86E-08
11	101-84-8	Diphenyl ether	7.14E-03	Yes	16	16	vapor	3.95E-11	5.53E-09		3.95E-11	3.95E-11
12	106-35-4	3-Heptanone	2.86E-03	No		14	vapor			1.37E-06	3.91E-09	3.91E-09
13	106-42-3	p-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			3.64E-11	2.60E-13	2.60E-13
14	106-46-7	1,4-Dichlorobenzene	2.86E-03	No		18	vapor			5.51E-09	1.58E-11	1.58E-11
15	106-88-7	1,2-Epoxybutane	7.14E-03	No		15	vapor			3.12E-07	2.23E-09	2.23E-09
16	106-93-4	Ethylene dibromide (Dibromethane)	2.86E-03	Yes	18	18	vapor	6.08E-11	2.13E-08		6.08E-11	6.08E-11
17	106-97-8	Butane	7.14E-03	Yes	26	26	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
18	106-99-0	1,3-Butadiene	2.86E-03	Yes	23	23	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
19	107-02-8	Acrolein	7.14E-03	No		14	vapor			1.37E-06	9.78E-09	9.78E-09
20	107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	No		20	vapor			2.02E-13	5.78E-16	0.00E+00
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.86E-03	No		17	vapor			1.43E-09	4.10E-12	4.10E-12
22	107-12-0	Propionitrile	7.14E-03	No		13	vapor			1.65E-05	1.18E-07	1.18E-07
23	107-13-1	Acrylonitrile	1.43E-02	No		14	vapor			1.37E-06	1.96E-08	1.96E-08
24	107-18-6	2-Propene-1-ol	4.29E-02	No		10	vapor			1.04E-04	4.46E-06	4.46E-06
25	107-31-3	Formic acid, methyl ester	4.29E-02	No		15	vapor			3.12E-07	1.34E-08	1.34E-08
26	107-66-4	Dibutylphosphate	4.29E-02	No		5	particle bound			5.67E-06	2.43E-07	2.43E-07
27	107-87-9	2-Pentanone	1.43E-02	No		14	vapor			1.37E-06	1.96E-08	1.96E-08
28	108-03-2	1-Nitropropane	4.29E-02	No		14	vapor			1.37E-06	5.86E-08	5.86E-08
29	108-05-4	Vinyl acetate	4.29E-02	No		16	vapor			3.56E-08	1.53E-09	1.53E-09
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.14E-03	No		14	vapor			1.37E-06	9.78E-09	9.78E-09
31	108-20-3	Bis(isopropyl)ether	7.14E-03	No		18	vapor			5.51E-09	3.94E-11	3.94E-11
32	108-38-3	m-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			3.64E-11	2.60E-13	2.60E-13
33	108-39-4	m-Cresol	7.14E-03	No		9	vapor			2.49E-04	1.78E-06	1.78E-06
34	108-87-2	Methylcyclohexane	7.14E-03	Yes	25	25	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
35	108-88-3	Toluene	2.86E-03	Yes	19	19	vapor	4.66E-15	1.63E-12		4.66E-15	4.66E-15
36	108-90-7	Chlorobenzene	2.86E-03	No		19	vapor			3.64E-11	1.04E-13	1.04E-13
37	108-93-0	Cyclohexanol	7.14E-03	No		10	vapor			1.04E-04	7.44E-07	7.44E-07
38	108-94-1	Cyclohexanone	7.14E-03	No		11	vapor			9.83E-05	7.02E-07	7.02E-07
39	108-95-2	Phenol	4.29E-02	Yes	8	8	vapor	6.53E-06	1.52E-04		6.53E-06	6.53E-06
40	109-66-0	n-Pentane	7.14E-03	No		26	vapor			0.00E+00	0.00E+00	0.00E+00
41	109-99-9	Tetrahydrofuran	2.86E-03	No		13	vapor			1.65E-05	4.73E-08	4.73E-08
42	110-12-3	5-Methyl-2-hexanone	2.86E-03	No		15	vapor			3.12E-07	8.92E-10	8.92E-10
43	110-43-0	2-Heptanone	2.86E-03	No		15	vapor			3.12E-07	8.92E-10	8.92E-10
44	110-54-3	n-Hexane	7.14E-03	Yes	27	27	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
45	110-62-3	n-Valeraldehyde	4.29E-02	No		15	vapor			3.12E-07	1.34E-08	1.34E-08
46	110-82-7	Cyclohexane	7.14E-03	Yes	24	24	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
47	110-83-8	Cyclohexene	2.86E-03	No		22	vapor			1.99E-18	5.68E-21	0.00E+00
48	110-86-1	Pyridine	1.43E-02	No		11	vapor			9.83E-05	1.40E-06	1.40E-06
49	111-65-9	n-Octane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
50	111-76-2	Ethylene glycol monobutyl ether	4.29E-02	No		9	vapor			2.49E-04	1.07E-05	1.07E-05
51	111-84-2	n-Nonane	7.14E-03	Yes	28	28	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.29E-02	No		30	particle bound			1.34E-04	5.77E-06	5.77E-06
53	117-84-0	n-Dioctyl phthalate	4.29E-02	No		32	particle bound			7.77E-05	3.33E-06	3.33E-06
54	120-12-7	Anthracene	4.29E-02	Yes	13	13	particle bound	4.57E-07	1.07E-05		4.57E-07	4.57E-07
55	120-82-1	1,2,4-Trichlorobenzene	7.14E-03	Yes	17	17	vapor	1.02E-11	1.43E-09		1.02E-11	1.02E-11
56	120-83-2	2,4-Dichlorophenol	4.29E-02	No		10	vapor			1.04E-04	4.46E-06	4.46E-06
57	121-44-8	Triethylamine	7.14E-03	No		15	vapor			3.12E-07	2.23E-09	2.23E-09
58	121-69-7	Dimethylaniline	7.14E-03	No		13	vapor			1.65E-05	1.18E-07	1.18E-07
59	122-39-4	N,N-Diphenylamine	1.43E-02	Yes	10	10	vapor	2.97E-06	2.08E-04		2.97E-06	2.97E-06
60	123-19-3	4-Heptanone	2.86E-03	No		13	vapor			1.65E-05	4.73E-08	4.73E-08
61	123-38-6	n-Propionaldehyde	1.43E-02	No		14	vapor			1.37E-06	1.96E-08	1.96E-08
62	123-51-3	3-Methyl-1-butanol	7.14E-03	No		12	vapor			7.66E-05	5.47E-07	5.47E-07
63	123-86-4	Acetic acid n-butyl ester	1.35E-04	No		16	vapor			3.56E-08	4.82E-12	4.82E-12
64	123-91-1	1,4-Dioxane	1.43E-03	No		10	vapor			1.04E-04	1.49E-07	1.49E-07
65	126-73-8	Tributyl phosphate	2.86E-02	Yes	7	7	particle bound	2.28E-06	7.97E-05		2.28E-06	2.28E-06
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	7.14E-03	No		16	vapor			3.56E-08	2.55E-10	2.55E-10
67	127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	Yes	21	21	vapor	3.53E-19	1.23E-16		3.53E-19	0.00E+00
68	127-19-5	N,N-Dimethylacetamide	7.14E-03	No		5	vapor			5.67E-06	4.05E-08	4.05E-08
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.43E-02	No		32	vapor			7.77E-05	1.11E-06	1.11E-06
70	129-00-0	Pyrene	4.29E-02	Yes	33	33	particle bound	4.26E-06	9.94E-05		4.26E-06	4.26E-06
71	1321-64-8	Pentachloronaphthalene	4.29E-02	Yes	14	14	particle bound	2.37E-10	5.53E-09		2.37E-10	2.37E-10
72	1321-65-9	Trichloronaphthalene	4.29E-02	No		15	particle bound			3.12E-07	1.34E-08	1.34E-08
73	132-64-9	Dibenzofuran	4.29E-02	Yes	15	15	particle bound	2.65E-08	6.19E-07		2.65E-08	2.65E-08
74	1335-87-1	Hexachloronaphthalene	4.29E-02	No		14	particle bound			1.37E-06	5.86E-08	5.86E-08
75	1335-88-2	Tetrachloronaphthalene	4.29E-02	No		15	particle bound			3.12E-07	1.34E-08	1.34E-08
76	1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03	Yes	35	35	vapor	1.70E-09	9.81E-07		1.69E-09	1.69E-09
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.35E-04	No		14	vapor			1.37E-06	1.85E-10	1.85E-10
78	141-79-7	4-Methyl-3-penten-2-one	4.29E-02	No		13	vapor			1.65E-05	7.08E-07	7.08E-07
79	142-82-5	n-Heptane	7.14E-03	No		27	vapor			0.00E+00	0.00E+00	0.00E+00
80	144-62-7	Oxalic acid	2.14E+00	Yes	3	3	vapor	1.55E-07	7.25E-08		1.55E-07	1.55E-07
81	156-60-5	trans-1,2-Dichloroethylene	7.14E-03	No		20	vapor			2.02E-13	1.44E-15	1.44E-15
82	1634-04-4	Methyl tert-butyl ether	7.14E-03	No		16	vapor			3.56E-08	2.55E-10	2.55E-10
83	189-55-9	Dibenzo(a,i)pyrene	4.29E-02	No		5	particle			5.67E-06	2.43E-07	2.43E-07
84	189-64-0	Dibenzo(a,h)pyrene	4.29E-02	No		5	particle			5.67E-06	2.43E-07	2.43E-07
85	191-24-2	Benzo(g,h,i)perylene	4.29E-02	No		30	particle bound			1.34E-04	5.77E-06	5.77E-06
86	191-30-0	Benzo(a,l)pyrene	4.29E-02	No		5	particle			5.67E-06	2.43E-07	2.43E-07
87	192-65-4	Dibenzo(a,e)pyrene	4.29E-02	No		5	particle			5.67E-06	2.43E-07	2.43E-07
88	193-39-5	Indeno(1,2,3-cd)pyrene	4.29E-02	Yes	30	30	particle	9.15E-09	2.13E-07		9.15E-09	9.15E-09
89	206-44-0	Fluoranthene	4.29E-02	Yes	33	33	particle bound	2.38E-10	5.56E-09		2.38E-10	2.38E-10
90	208-96-8	Acenaphthylene	4.29E-02	Yes	14	14	vapor	1.17E-07	2.73E-06		1.17E-07	1.17E-07
91	2234-13-1	Octachloronaphthalene	1.35E-04	No		14	particle bound			1.37E-06	1.85E-10	1.85E-10
92	224-42-0	Dibenz(a,j)acridine	4.29E-02	No		4	particle bound			7.04E-07	3.02E-08	3.02E-08
93	226-36-8	Dibenz(a,h)acridine	4.29E-02	No		4	particle bound			7.04E-07	3.02E-08	3.02E-08
94	25551-13-7	Trimethyl benzene	7.14E-03	No		19	vapor			3.64E-11	2.60E-13	2.60E-13
95	26140-60-3	Terphenyls	4.29E-02	Yes	34	34	particle bound	2.38E-10	5.56E-09		2.38E-10	2.38E-10
96	27154-33-2	Trichlorofluoroethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
97	287-92-3	Cyclopentane	7.14E-03	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
98	3697-24-3	5-Methylchrysene	4.29E-02	Yes	32	32	particle bound	2.38E-10	5.56E-09		2.38E-10	2.38E-10
99	3825-26-1	Ammonium perfluorooctanoate	4.29E-02	No		14	vapor			1.37E-06	5.86E-08	5.86E-08
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	7.14E-03	Yes	11	11	vapor	6.97E-07	9.76E-05		6.97E-07	6.97E-07
101	50-00-0	Formaldehyde	7.14E-03	No		8	vapor			1.88E-04	1.34E-06	1.34E-06
102	50-32-8	Benzo(a)pyrene	2.72E-02	Yes	30	30	particle bound	7.30E-06	2.69E-04		7.30E-06	7.30E-06
103	53-70-3	Dibenzo(a,h)anthracene	2.72E-02	No		7	particle bound			7.97E-05	2.16E-06	2.16E-06
104	540-59-0	1,2-Dichloroethylene	7.14E-03	No		19	vapor			3.64E-11	2.60E-13	2.60E-13
105	540-84-1	2,2,4-Trimethylpentane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
106	541-73-1	1,3-Dichlorobenzene	2.86E-03	No		19	vapor			3.64E-11	1.04E-13	1.04E-13
107	56-23-5	Carbon tetrachloride	2.86E-03	Yes	22	22	vapor	5.68E-21	1.99E-18		5.68E-21	0.00E+00
108	563-80-4	3-Methyl-2-butanone	7.14E-03	No		14	vapor			1.37E-06	9.78E-09	9.78E-09
109	56-49-5	3-Methylcholanthrene	4.29E-02	No		28	particle bound			0.00E+00	0.00E+00	0.00E+00
110	57-14-7	1,1-Dimethylhydrazine	4.29E-02	Yes	12	12	vapor	3.28E-06	7.66E-05		3.28E-06	3.28E-06
111	58-90-2	2,3,4,6-Tetrachlorophenol	4.29E-02	Yes	11	11	vapor	4.53E-06	1.06E-04		4.53E-06	4.53E-06
112	591-78-6	2-Hexanone	7.14E-03	No		14	vapor			1.37E-06	9.78E-09	9.78E-09
113	59-50-7	4-Chloro-3-methylphenol	4.29E-02	No		32	vapor			7.77E-05	3.33E-06	3.33E-06
114	59-89-2	N-Nitrosomorpholine	4.29E-02	Yes	6	6	vapor	2.39E-10	5.57E-09		2.39E-10	2.39E-10
115	602-87-9	5-Nitroacenaphthene	4.29E-02	No		9	particle bound			2.49E-04	1.07E-05	1.07E-05
116	60-29-7	Ethyl ether	4.29E-02	No		17	vapor			1.43E-09	6.14E-11	6.14E-11
117	603-34-9	Triphenylamine	4.29E-02	Yes	32	32	vapor	6.66E-06	1.55E-04		6.66E-06	6.66E-06
118	60-34-4	Methylhydrazine	7.14E-03	No		10	vapor			1.04E-04	7.44E-07	7.44E-07
119	60-35-5	Acetamide	7.14E-03	Yes	5	5	vapor	4.05E-08	5.67E-06		4.05E-08	4.05E-08
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.29E-02	Yes	10	10	vapor	2.38E-10	5.56E-09		2.38E-10	2.38E-10
121	624-83-9	Methyl isocyanate	7.14E-03	No		17	vapor			1.43E-09	1.02E-11	1.02E-11
122	627-13-4	Nitric acid, propyl ester	3.57E-03	No		17	vapor			1.43E-09	5.12E-12	5.12E-12
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.29E-02	Yes	9	9	vapor	1.07E-05	2.49E-04		1.07E-05	1.07E-05
124	630-20-6	1,1,1,2-Tetrachloroethane	7.14E-03	No		18	vapor			5.51E-09	3.94E-11	3.94E-11
125	64-17-5	Ethyl alcohol	7.14E-03	No		10	vapor			1.04E-04	7.44E-07	7.44E-07
126	64-18-6	Formic acid	1.07E+01	No		7	vapor			7.97E-05	8.54E-04	8.54E-04
127	64-19-7	Acetic acid	1.55E+01	Yes	6	6	vapor	8.62E-08	5.56E-09		8.62E-08	8.62E-08
128	67-56-1	Methyl alcohol (Methanol)	7.14E-03	No		10	vapor			1.04E-04	7.44E-07	7.44E-07
129	67-63-0	2-Propyl alcohol (Isopropanol, Propan-2-01)	1.43E-03	No		11	vapor			9.83E-05	1.40E-07	1.40E-07
130	67-64-1	2-Propanone (Acetone)	1.43E-02	No		13	vapor			1.65E-05	2.36E-07	2.36E-07
131	67-66-3	Chloroform	2.86E-03	No		19	vapor			3.64E-11	1.04E-13	1.04E-13
132	67-72-1	Hexachloroethane	4.29E-02	No		19	vapor			3.64E-11	1.56E-12	1.56E-12
133	684-16-2	Hexafluoroacetone	7.14E-03	No		19	vapor			3.64E-11	2.60E-13	2.60E-13
134	71-23-8	n-Propyl alcohol	2.86E-03	No		11	vapor			9.83E-05	2.81E-07	2.81E-07
135	71-36-3	n-Butyl alcohol	7.14E-03	No		11	vapor			9.83E-05	7.02E-07	7.02E-07
136	71-43-2	Benzene	2.86E-03	Yes	19	19	vapor	1.13E-14	3.95E-12		1.13E-14	1.13E-14
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	No		21	vapor			1.23E-16	3.53E-19	0.00E+00
138	74-83-9	Bromomethane (Methyl bromide)	2.86E-03	No		19	vapor			3.64E-11	1.04E-13	1.04E-13
139	74-87-3	Chloromethane (Methyl chloride)	2.86E-03	No		20	vapor			2.02E-13	5.78E-16	0.00E+00
140	74-97-5	Bromochloromethane	7.14E-03	No		17	vapor			1.43E-09	1.02E-11	1.02E-11
141	74-99-7	Methylacetylene	4.29E-02	No		20	vapor			2.02E-13	8.64E-15	8.64E-15
142	75-00-3	Chloroethane	2.86E-03	No		20	vapor			2.02E-13	5.78E-16	0.00E+00
143	75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	No		22	vapor			1.99E-18	5.68E-21	0.00E+00
144	75-05-8	Acetonitrile	7.14E-03	Yes	13	13	vapor	1.60E-07	2.24E-05		1.60E-07	1.60E-07
145	75-07-0	Acetaldehyde	4.29E-02	No		13	vapor			1.65E-05	7.08E-07	7.08E-07
146	75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	No		19	vapor			3.64E-11	1.04E-13	1.04E-13
147	75-12-7	Formamide	4.29E-02	Yes	4	4	vapor	3.02E-08	7.04E-07		3.02E-08	3.02E-08
148	75-15-0	Carbon disulfide	7.14E-03	No		20	vapor			2.02E-13	1.44E-15	1.44E-15
149	75-21-8	Ethylene oxide (Oxirane)	1.43E-03	No		15	vapor			3.12E-07	4.46E-10	4.46E-10
150	75-27-4	Bromodichloromethane	7.14E-03	No		18	vapor			5.51E-09	3.94E-11	3.94E-11
151	75-34-3	1,1-Dichloroethane	2.86E-03	No		19	vapor			3.64E-11	1.04E-13	1.04E-13
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.14E-03	No		22	vapor			1.99E-18	1.42E-20	0.00E+00
153	75-43-4	Dichlorofluoromethane	2.86E-03	No		20	vapor			2.02E-13	5.78E-16	0.00E+00
154	75-45-6	Chlorodifluoromethane	2.86E-03	No		22	vapor			1.99E-18	5.68E-21	0.00E+00
155	75-50-3	Trimethylamine	7.14E-03	No		14	vapor			1.37E-06	9.78E-09	9.78E-09
156	75-52-5	Nitromethane	4.29E-02	No		13	vapor			1.65E-05	7.08E-07	7.08E-07
157	75-55-8	2-Methylaziridine	4.29E-02	No		11	vapor			9.83E-05	4.21E-06	4.21E-06
158	75-61-6	Difluorodibromomethane	7.14E-03	No		22	vapor			1.99E-18	1.42E-20	0.00E+00
159	75-63-8	Trifluorobromomethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
160	75-65-0	2-Methyl-2-propanol	7.14E-03	No		11	vapor			9.83E-05	7.02E-07	7.02E-07
161	75-69-4	Trichlorofluoromethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
162	75-71-8	Dichlorodifluoromethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
163	76-03-9	Trichloroacetic acid	7.14E-03	No		5	vapor			5.67E-06	4.05E-08	4.05E-08
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.29E-02	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.14E-03	No		26	vapor			0.00E+00	0.00E+00	0.00E+00
168	76-15-3	Chloropentafluoroethane	7.14E-03	Yes	29	29	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.29E-02	No		11	vapor			9.83E-05	4.21E-06	4.21E-06
170	78-87-5	1,2-Dichloropropane	2.86E-03	No		19	vapor			3.64E-11	1.04E-13	1.04E-13
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.86E-03	No		11	vapor			9.83E-05	2.81E-07	2.81E-07
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	7.14E-03	No		13	vapor			1.65E-05	1.18E-07	1.18E-07
173	79-00-5	1,1,2-Trichloroethane	7.14E-03	No		17	vapor			1.43E-09	1.02E-11	1.02E-11
174	79-01-6	Trichloroethylene	7.14E-03	Yes	20	20	vapor	1.63E-15	2.28E-13		1.63E-15	1.63E-15
175	79-09-4	Propionic acid	4.29E-02	No		8	vapor			1.88E-04	8.06E-06	8.06E-06
176	79-10-7	2-Propenoic acid	5.72E-02	No		8	vapor			1.88E-04	1.08E-05	1.08E-05
177	79-20-9	Methyl acetate	4.29E-02	No		14	vapor			1.37E-06	5.86E-08	5.86E-08
178	79-34-5	1,1,2,2-Tetrachloroethane	1.35E-05	No		16	vapor			3.56E-08	4.82E-13	4.82E-13
179	83-32-9	Acenaphthene	4.29E-02	Yes	15	15	vapor	2.37E-10	5.52E-09		2.37E-10	2.37E-10
180	84-66-2	Diethyl phthalate	4.29E-02	Yes	6	6	vapor	9.59E-06	2.24E-04		9.59E-06	9.59E-06
181	84-74-2	Dibutyl phthalate	4.29E-02	Yes	31	31	particle bound	1.26E-05	2.94E-04		1.26E-05	1.26E-05
182	85-01-8	Phenanthrene	4.29E-02	No		13	particle bound			1.65E-05	7.08E-07	7.08E-07
183	85-68-7	Butylbenzyl phthalate	4.29E-02	No		31	particle bound			2.94E-04	1.26E-05	1.26E-05
184	86-73-7	Fluorene	4.29E-02	No		14	vapor			1.37E-06	5.86E-08	5.86E-08
185	87-68-3	Hexachlorobutadiene	7.14E-03	Yes	20	20	vapor	1.25E-15	1.75E-13		1.25E-15	1.25E-15
186	88-06-2	2,4,6-Trichlorophenol	4.29E-02	No		10	vapor			1.04E-04	4.46E-06	4.46E-06
187	88-72-2	2-Nitrotoluene	7.14E-03	No		12	vapor			7.66E-05	5.47E-07	5.47E-07
188	88-75-5	2-Nitrophenol	4.29E-02	No		12	vapor			7.66E-05	3.28E-06	3.28E-06
189	88-89-1	Picric acid	4.29E-02	Yes	2	2	#N/A	3.69E-10	8.60E-09		3.69E-10	3.69E-10
190	91-20-3	Naphthalene	1.43E-03	Yes	16	16	vapor	1.14E-10	8.01E-08		1.14E-10	1.14E-10
191	91-22-5	Quinoline	4.29E-02	No		9	vapor			2.49E-04	1.07E-05	1.07E-05
192	91-58-7	2-Chloronapthalene	4.29E-02	No		16	vapor			3.56E-08	1.53E-09	1.53E-09
193	92-52-4	1,1'-Biphenyl	2.86E-02	No		16	vapor			3.56E-08	1.02E-09	1.02E-09
194	92-93-3	4-Nitrobiphenyl	4.29E-02	No		10	particle bound			1.04E-04	4.46E-06	4.46E-06
195	95-13-6	Indene	4.29E-02	No		18	vapor			5.51E-09	2.36E-10	2.36E-10
196	95-47-6	o-Xylene	2.86E-03	No		19	vapor			3.64E-11	1.04E-13	1.04E-13
197	95-48-7	o-Cresol (2-Methylphenol)	7.14E-03	No		9	vapor			2.49E-04	1.78E-06	1.78E-06
198	95-49-8	2-Chlorotoluene	4.29E-02	No		19	vapor			3.64E-11	1.56E-12	1.56E-12
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.86E-03	Yes	18	18	vapor	1.58E-11	5.51E-09		1.58E-11	1.58E-11
200	95-57-8	2-Chlorophenol	4.29E-02	No		11	vapor			9.83E-05	4.21E-06	4.21E-06
201	95-95-4	2,4,5-Trichlorophenol	4.29E-02	No		9	vapor			2.49E-04	1.07E-05	1.07E-05
202	96-22-0	3-Pentanone	1.43E-02	No		14	vapor			1.37E-06	1.96E-08	1.96E-08
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	No		19	vapor			3.64E-11	1.56E-12	1.56E-12
204	98-51-1	p-tert-Butyltoluene	4.29E-02	No		21	vapor			1.23E-16	5.29E-18	0.00E+00
205	98-82-8	Cumene	4.29E-02	No		20	vapor			2.02E-13	8.64E-15	8.64E-15
206	98-83-9	alpha-Methylstyrene	7.14E-03	No		19	vapor			3.64E-11	2.60E-13	2.60E-13
207	98-86-2	Acetophenone	2.86E-02	Yes	11	11	vapor	2.61E-06	9.15E-05		2.61E-06	2.61E-06
208	98-95-3	Nitrobenzene	2.86E-02	No		12	vapor			7.66E-05	2.19E-06	2.19E-06
209											1.08E-03	

Adjusted Performance Factors

Group	PF
1	2.07E-10
2	8.60E-09
3	7.25E-08
4	7.04E-07
5	5.67E-06
6	5.56E-09
7	7.97E-05
8	1.88E-04
9	2.49E-04
10	1.04E-04
11	9.83E-05
12	7.66E-05
13	1.65E-05
14	1.37E-06
15	3.12E-07
16	3.56E-08
17	1.43E-09
18	5.51E-09
19	3.64E-11
20	2.02E-13
21	1.23E-16
22	1.99E-18
23	0.00E+00
24	0.00E+00
25	0.00E+00
26	0.00E+00
27	0.00E+00
28	0.00E+00
29	0.00E+00
30	1.34E-04
31	2.94E-04
32	7.77E-05
33	4.97E-05
34	5.56E-09
35	9.81E-07

Coplanar PCBs

CAS	Name	HOP10 g/sec	Corrected HOP10 g/sec
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	1.22E-12	1.22E-12
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	1.22E-12	1.22E-12
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	1.22E-12	1.22E-12
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	1.22E-12	1.22E-12
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	1.22E-12	1.22E-12
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	1.22E-12	1.22E-12
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	1.22E-12	1.22E-12
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1.22E-12	1.22E-12
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	1.22E-12	1.22E-12
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	1.22E-12	1.22E-12
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	1.22E-12	1.22E-12
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	1.22E-12	1.22E-12
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	1.22E-12	1.22E-12
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	1.22E-12	1.22E-12
1336-36-3	Polychlorinated biphenyls (PCBs)	1.69E-09	
1336-36-3	UnCorrected (for coplanar PCBs)	1.70E-09	

Correction for Coplanar PCBs

0.99	as parent
0.01	as coplanar sum

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Table 8-11 HOP31 - Abated HLW Melter Offgas System					Fraction		HOP07	HOP07				HOP31	HOP31		Corrected
2			HMP06		Fv	vapor	Fraction	g/sec	g/sec	HOP07	HOP10	HOP11	g/sec	g/sec	HOP31	HOP31
3	CAS #	COPC	g/sec	Phase		adjusted	particle	vapor	particle	g/sec	g/sec	g/sec	vapor	particle	g/sec	g/sec
4	100-00-5	p-Nitrochlorobenzene	8.68E-05	vapor	1.000	1.000	0.000	8.68E-05	0.00E+00	8.68E-05	2.97E-06	8.98E-05	4.49E-06	0.00E+00	4.49E-06	4.49E-06
5	100-21-0	p-Phthalic acid	2.28E-03	vapor	1.000	1.000	0.000	2.28E-03	0.00E+00	2.28E-03	8.67E-12	2.28E-03	1.14E-04	0.00E+00	1.14E-04	1.14E-04
6	100-41-4	Ethyl benzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7	100-42-5	Styrene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.04E-13	1.04E-13	5.21E-15	0.00E+00	5.21E-15	5.21E-15
8	10061-01-5	cis-1,3-Dichloropropene	1.51E-15	vapor	1.000	1.000	0.000	1.51E-15	0.00E+00	1.51E-15	2.97E-13	2.98E-13	1.49E-14	0.00E+00	1.49E-14	1.49E-14
9	10061-02-6	trans-1,3-Dichloropropene	6.76E-14	vapor	1.000	1.000	0.000	6.76E-14	0.00E+00	6.76E-14	4.10E-12	4.18E-12	2.08E-13	0.00E+00	2.08E-13	2.08E-13
10	101-55-3	4-Bromophenylphenyl ether	4.07E-08	vapor	1.000	1.000	0.000	4.07E-08	0.00E+00	4.07E-08	5.86E-08	9.93E-08	4.97E-09	0.00E+00	4.97E-09	4.97E-09
11	101-84-8	Diphenyl ether	1.22E-12	vapor	1.000	1.000	0.000	1.22E-12	0.00E+00	1.22E-12	3.95E-11	4.07E-11	2.03E-12	0.00E+00	2.03E-12	2.03E-12
12	106-35-4	3-Heptanone	2.72E-09	vapor	1.000	1.000	0.000	2.72E-09	0.00E+00	2.72E-09	3.91E-09	6.62E-09	3.31E-10	0.00E+00	3.31E-10	3.31E-10
13	106-42-3	p-Xylene (Dimethyl benzene)	1.28E-15	vapor	1.000	1.000	0.000	1.28E-15	0.00E+00	1.28E-15	2.60E-13	2.62E-13	1.31E-14	0.00E+00	1.31E-14	1.31E-14
14	106-46-7	1,4-Dichlorobenzene	4.89E-13	vapor	1.000	1.000	0.000	4.89E-13	0.00E+00	4.89E-13	1.58E-11	1.63E-11	8.13E-13	0.00E+00	8.13E-13	8.13E-13
15	106-88-7	1,2-Epoxybutane	6.95E-10	vapor	1.000	1.000	0.000	6.95E-10	0.00E+00	6.95E-10	2.23E-09	2.93E-09	1.46E-10	0.00E+00	1.46E-10	1.46E-10
16	106-93-4	Ethylene dibromide (Dibromethane)	3.60E-12	vapor	1.000	1.000	0.000	3.60E-12	0.00E+00	3.60E-12	6.08E-11	6.44E-11	3.22E-12	0.00E+00	3.22E-12	3.22E-12
17	106-97-8	Butane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
18	106-99-0	1,3-Butadiene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
19	107-02-8	Acrolein	6.79E-09	vapor	1.000	1.000	0.000	6.79E-09	0.00E+00	6.79E-09	9.76E-09	1.66E-08	8.28E-10	0.00E+00	8.28E-10	8.28E-10
20	107-05-1	3-Chloropropene (Allyl chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	6.76E-14	vapor	1.000	1.000	0.000	6.76E-14	0.00E+00	6.76E-14	4.10E-12	4.18E-12	2.08E-13	0.00E+00	2.08E-13	2.08E-13
22	107-12-0	Propionitrile	2.75E-07	vapor	1.000	1.000	0.000	2.75E-07	0.00E+00	2.75E-07	1.18E-07	3.93E-07	1.97E-08	0.00E+00	1.97E-08	1.97E-08
23	107-13-1	Acrylonitrile	1.36E-08	vapor	1.000	1.000	0.000	1.36E-08	0.00E+00	1.36E-08	1.95E-08	3.31E-08	1.66E-09	0.00E+00	1.66E-09	1.66E-09
24	107-18-6	2-Propene-1-ol	1.30E-04	vapor	1.000	1.000	0.000	1.30E-04	0.00E+00	1.30E-04	4.46E-06	1.35E-04	6.73E-06	0.00E+00	6.73E-06	6.73E-06
25	107-31-3	Formic acid, methyl ester	4.17E-09	vapor	1.000	1.000	0.000	4.17E-09	0.00E+00	4.17E-09	1.34E-08	1.76E-08	8.78E-10	0.00E+00	8.78E-10	8.78E-10
26	107-66-4	Dibutylphosphate	2.17E-03	particle bound	0.995	0.995	0.005	2.16E-03	2.71E-08	2.16E-03	2.43E-07	2.16E-03	1.07E-04	3.00E-14	1.07E-04	1.07E-04
27	107-87-9	2-Pentanone	1.36E-08	vapor	1.000	1.000	0.000	1.36E-08	0.00E+00	1.36E-08	1.95E-08	3.31E-08	1.66E-09	0.00E+00	1.66E-09	1.66E-09
28	108-03-2	1-Nitropropane	4.07E-08	vapor	1.000	1.000	0.000	4.07E-08	0.00E+00	4.07E-08	5.86E-08	9.83E-08	4.97E-09	0.00E+00	4.97E-09	4.97E-09
29	108-05-4	Vinyl acetate	1.50E-10	vapor	1.000	1.000	0.000	1.50E-10	0.00E+00	1.50E-10	1.53E-09	1.68E-09	8.39E-11	0.00E+00	8.39E-11	8.39E-11
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	6.79E-09	vapor	1.000	1.000	0.000	6.79E-09	0.00E+00	6.79E-09	9.76E-09	1.66E-08	8.28E-10	0.00E+00	8.28E-10	8.28E-10
31	108-20-3	Bis(isopropyl)ether	1.22E-12	vapor	1.000	1.000	0.000	1.22E-12	0.00E+00	1.22E-12	3.94E-11	4.06E-11	2.03E-12	0.00E+00	2.03E-12	2.03E-12
32	108-38-3	m-Xylene (Dimethyl benzene)	1.28E-15	vapor	1.000	1.000	0.000	1.28E-15	0.00E+00	1.28E-15	2.60E-13	2.62E-13	1.31E-14	0.00E+00	1.31E-14	1.31E-14
33	108-39-4	m-Cresol	9.71E-05	vapor	1.000	1.000	0.000	9.71E-05	0.00E+00	9.71E-05	1.76E-06	9.89E-05	4.94E-06	0.00E+00	4.94E-06	4.94E-06
34	108-87-2	Methylcyclohexane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
35	108-88-3	Toluene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	4.66E-15	4.66E-15	2.33E-16	0.00E+00	2.33E-16	0.00E+00
36	108-90-7	Chlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.04E-13	1.04E-13	5.21E-15	0.00E+00	5.21E-15	5.21E-15
37	108-93-0	Cyclohexanol	2.17E-05	vapor	1.000	1.000	0.000	2.17E-05	0.00E+00	2.17E-05	7.44E-07	2.24E-05	1.12E-06	0.00E+00	1.12E-06	1.12E-06
38	108-94-1	Cyclohexanone	7.17E-06	vapor	1.000	1.000	0.000	7.17E-06	0.00E+00	7.17E-06	7.02E-07	7.87E-06	3.93E-07	0.00E+00	3.93E-07	3.93E-07
39	108-95-2	Phenol	1.95E-03	vapor	1.000	1.000	0.000	1.95E-03	0.00E+00	1.95E-03	6.53E-06	1.96E-03	9.80E-05	0.00E+00	9.80E-05	9.80E-05
40	109-66-0	n-Pentane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	109-99-9	Tetrahydrofuran	1.10E-07	vapor	1.000	1.000	0.000	1.10E-07	0.00E+00	1.10E-07	4.73E-08	1.57E-07	7.87E-09	0.00E+00	7.87E-09	7.87E-09
42	110-12-3	5-Methyl-2-hexanone	2.78E-10	vapor	1.000	1.000	0.000	2.78E-10	0.00E+00	2.78E-10	8.92E-10	1.17E-09	5.85E-11	0.00E+00	5.85E-11	5.85E-11
43	110-43-0	2-Heptanone	2.78E-10	vapor	1.000	1.000	0.000	2.78E-10	0.00E+00	2.78E-10	8.92E-10	1.17E-09	5.85E-11	0.00E+00	5.85E-11	5.85E-11
44	110-54-3	n-Hexane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
45	110-62-3	n-Valeraldehyde	4.17E-09	vapor	1.000	1.000	0.000	4.17E-09	0.00E+00	4.17E-09	1.34E-08	1.76E-08	8.78E-10	0.00E+00	8.78E-10	8.78E-10
46	110-82-7	Cyclohexane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
47	110-83-8	Cyclohexene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	110-86-1	Pyridine	1.43E-05	vapor	1.000	1.000	0.000	1.43E-05	0.00E+00	1.43E-05	1.40E-06	1.57E-05	7.87E-07	0.00E+00	7.87E-07	7.87E-07
49	111-65-9	n-Octane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	111-76-2	Ethylene glycol monobutyl ether	5.83E-04	vapor	1.000	1.000	0.000	5.83E-04	0.00E+00	5.83E-04	1.07E-05	5.93E-04	2.97E-05	0.00E+00	2.97E-05	2.97E-05
51	111-84-2	n-Nonane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	1.25E-03	particle bound	0.130	0.130	0.870	1.63E-04	2.73E-06	1.66E-04	5.77E-06	1.72E-04	1.11E-06	4.15E-13	1.11E-06	1.11E-06
53	117-84-0	n-Dioctyl phthalate	6.06E-05	particle bound	0.852	0.852	0.148	5.16E-05	2.24E-08	5.16E-05	3.33E-06	5.50E-05	2.34E-06	2.26E-14	2.34E-06	2.34E-06
54	120-12-7	Anthracene	7.26E-07	particle bound	0.998	0.998	0.002	7.25E-07	3.63E-12	7.25E-07	4.57E-07	1.18E-06	5.90E-08	8.66E-18	5.90E-08	5.90E-08
55	120-82-1	1,2,4-Trichlorobenzene	1.69E-13	vapor	1.000	1.000	0.000	1.69E-13	0.00E+00	1.69E-13	1.02E-11	1.04E-11	5.20E-13	0.00E+00	5.20E-13	5.20E-13
56	120-83-2	2,4-Dichlorophenol	1.30E-04	vapor	1.000	1.000	0.000	1.30E-04	0.00E+00	1.30E-04	4.46E-06	1.35E-04	6.73E-06	0.00E+00	6.73E-06	6.73E-06
57	121-44-8	Triethylamine	6.95E-10	vapor	1.000	1.000	0.000	6.95E-10	0.00E+00	6.95E-10	2.23E-09	2.93E-09	1.46E-10	0.00E+00	1.46E-10	1.46E-10
58	121-69-7	Dimethylaniline	2.75E-07	vapor	1.000	1.000	0.000	2.75E-07	0.00E+00	2.75E-07	1.18E-07	3.93E-07	1.97E-08	0.00E+00	1.97E-08	1.97E-08
59	122-39-4	N,N-Diphenylamine	8.68E-05	vapor	1.000	1.000	0.000	8.68E-05	0.00E+00	8.68E-05	2.97E-06	8.98E-05	4.49E-06	0.00E+00	4.49E-06	4.49E-06
60	123-19-3	4-Heptanone	1.10E-07	vapor	1.000	1.000	0.000	1.10E-07	0.00E+00	1.10E-07	4.73E-08	1.57E-07	7.87E-09	0.00E+00	7.87E-09	7.87E-09
61	123-38-6	n-Propionaldehyde	1.36E-08	vapor	1.000	1.000	0.000	1.36E-08	0.00E+00	1.36E-08	1.95E-08	3.31E-08	1.66E-09	0.00E+00	1.66E-09	1.66E-09
62	123-51-3	3-Methyl-1-butanol	4.26E-06	vapor	1.000	1.000	0.000	4.26E-06	0.00E+00	4.26E-06	5.47E-07	4.81E-06	2.40E-07	0.00E+00	2.40E-07	2.40E-07
63	123-86-4	Acetic acid n-butyl ester	4.72E-13	vapor	1.000	1.000	0.000	4.72E-13	0.00E+00	4.72E-13	4.82E-12	5.29E-12	2.65E-13	0.00E+00	2.65E-13	2.65E-13
64	123-91-1	1,4-Dioxane	4.34E-06	vapor	1.000	1.000	0.000	4.34E-06	0.00E+00	4.34E-06	1.49E-07	4.49E-06	2.24E-07	0.00E+00	2.24E-07	2.24E-07
65	126-73-8	Tributyl phosphate	1.51E-03	particle bound	0.996	0.996	0.004	1.51E-03	1.51E-08	1.51E-03	2.26E-08	1.51E-03	7.51E-05	1.88E-14	7.51E-05	7.51E-05
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	2.49E-11	vapor	1.000	1.000	0.000	2.49E-11	0.00E+00	2.49E-11	2.55E-10	2.80E-10	1.40E-11	0.00E+00	1.40E-11	1.40E-11
67	127-18-4	Perchloroethylene (tetrachloroethylene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	127-19-5	N,N-Dimethylacetamide	3.61E-04	vapor	1.000	1.000	0.000	3.61E-04	0.00E+00	3.61E-04	4.05E-06	3.61E-04	1.81E-05	0.00E+00	1.81E-05	1.81E-05
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	2.02E-05	vapor	1.000	1.000	0.000	2.02E-05	0.00E+00	2.02E-05	1.11E-06	2.13E-05	1.07E-06	0.00E+00	1.07E-06	1.07E-06
70	129-00-0	Pyrene	3.46E-05	particle bound	0.994	0.994	0.006	3.44E-05	5.19E-10	3.44E-05	4.26E-06	3.87E-05	1.92E-06	6.44E-16	1.92E-06	1.92E-06
71	1321-64-8	Pentachloronaphthalene	7.35E-12	particle bound	0.971	0.971	0.029	7.14E-12	5.33E-16	7.14E-12	2.37E-10	2.44E-10	1.19E-11	1.97E-20	1.19E-11	1.19E-11
72	1321-65-9	Trichloronaphthalene	4.17E-09	particle bound	0.999	0.999	0.001	4.17E-09	1.04E-14	4.17E-09	1.34E-08	1.75E-08	8.78E-10	4.87E-20	8.78E-10	8.78E-10
73	132-64-9	Dibenzofuran	8.33E-09	particle bound	0.999	0.999	0.001	8.33E-09	2.08E-14	8.33E-09	2.65E-08	3.48E-08	1.74E-09	9.88E-20	1.74E-09	1.74E-09
74	1335-87-1	Hexachloronaphthalene	4.07E-08	particle bound	0.984	0.984	0.016	4.01E-08	1.63E-12	4.01E-08	5.86E-08	9.87E-08	4.88E-09	4.39E-18	4.88E-09	4.88E-09
75	1335-88-2	Tetrachloronaphthalene	4.17E-09	particle bound	0.991	0.991	0.009	4.13E-09	9.38E-14	4.13E-09	1.34E-08	1.75E-08	8.68E-10	4.36E-19	8.68E-10	8.68E-10
76	1336-36-3	Polychlorinated biphenyls (PCBs)	2.08E-10	vapor	1.000	1.000	0.000	2.08E-10	0.00E+00	2.08E-10	1.69E-09	1.89E-09	9.47E-11	0.00E+00	9.47E-11	9.47E-11
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.29E-10	vapor	1.000	1.000	0.000	1.29E-10	0.00E+00	1.29E-10	1.85E-10	3.13E-10	1.57E-11	0.00E+00	1.57E-11	1.57E-11
78	141-79-7	4-Methyl-3-penten-2-one	1.65E-06	vapor	1.000	1.000	0.000	1.65E-06	0.00E+00	1.65E-06	7.09E-07	2.36E-06	1.18E-07	0.00E+00	1.18E-07	1.18E-07
79	142-82-5	n-Heptane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
80	144-62-7	Oxalic acid	1.08E-01	vapor	1.000	1.000	0.000	1.08E-01	0.00E+00	1.08E-01	1.55E-07	1.08E-01	5.40E-03	0.00E+00	5.40E-03	5.40E-03
81	156-60-5	trans-1,2-Dichloroethylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.44E-15	1.44E-15	7.20E-17	0.00E+00	7.20E-17	0.00E+00
82	1634-04-4	Methyl tert-butyl ether	2.49E-11	vapor	1.000	1.000	0.000	2.49E-11	0.00E+00	2.49E-11	2.55E-10	2.80E-10	1.40E-11	0.00E+00	1.40E-11	1.40E-11
83	189-55-9	Dibenzo(a,i)pyrene	2.17E-03	particle	0.000	0.000	1.000	0.00E+00	5.42E-06	5.42E-06	2.43E-07	5.66E-06	0.00E+00	1.57E-14	1.57E-14	1.57E-14
84	189-64-0	Dibenzo(a,h)pyrene	2.17E-03	particle	0.000	0.000	1.000	0.00E+00	5.42E-06	5.42E-06	2.43E-07	5.66E-06	0.00E+00	1.57E-14	1.57E-14	1.57E-14
85	191-24-2	Benzo(g,h,i)perylene	1.25E-03	particle bound	0.065	0.065	0.935	8.15E-05	2.93E-06	8.45E-05	5.77E-06	9.02E-05	2.93E-07	2.34E-13	2.93E-07	2.93E-07
86	191-30-0	Benzo(a,l)pyrene	2.17E-03	particle	0.000	0.000	1.000	0.00E+00	5.42E-06	5.42E-06	2.43E-07	5.66E-06	0.00E+00	1.57E-14	1.57E-14	1.57E-14
87	192-65-4	Dibenzo(a,e)pyrene	2.17E-03	particle	0.000	0.000	1.000	0.00E+00	5.42E-06	5.42E-06	2.43E-07	5.66E-06	0.00E+00	1.57E-14	1.57E-14	1.57E-14
88	193-39-5	Indeno(1,2,3-cd)pyrene	2.84E-10	particle	0.000	0.000	1.000	0.00E+00	7.10E-13	7.10E-13	9.15E-09	9.15E-09	0.00E+00	2.54E-17	2.54E-17	0.00E+00
89	206-44-0	Fluoranthene	7.39E-12	particle bound	0.992	0.992	0.008	7.33E-12	1.48E-16	7.33E-12	2.38E-10	2.46E-10	1.22E-11	5.46E-21	1.22E-11	1.22E-11
90	208-96-8	Acenaphthylene	8.15E-08	vapor	1.000	1.000	0.000	8.15E-08	0.00E+00	8.15E-08	1.17E-07	1.98E-07	9.92E-09	0.00E+00	9.92E-09	9.92E-09
91	2234-13-1	Octachloronaphthalene	1.29E-10	particle bound	0.629	0.629	0.371	8.09E-11	1.19E-13	8.10E-11	1.85E-10	2.66E-10	8.36E-12	2.74E-19	8.36E-12	8.36E-12
92	224-42-0	Dibenz(a,j)acridine	2.16E-03	particle bound	0.241	0.241	0.759	5.21E-04	4.10E-06	5.25E-04	3.02E-08	5.25E-04	6.32E-06	1.11E-12	6.32E-06	6.32E-06
93	226-36-8	Dibenz(a,h)acridine	2.16E-03	particle bound	0.285	0.285	0.715	6.16E-04	3.86E-06	6.20E-04	3.02E-08	6.20E-04	8.83E-06	1.23E-12	8.83E-06	8.83E-06
94	25551-13-7	Trimethyl benzene	1.28E-15	vapor	1.000	1.000	0.000	1.28E-15	0.00E+00	1.28E-15	2.60E-13	2.62E-13	1.31E-14	0.00E+00	1.31E-14	1.31E-14
95	26140-60-3	Terphenyls	7.38E-12	particle bound	0.872	0.872	0.128	6.43E-12	2.36E-15	6.44E-12	2.38E-10	2.44E-10	1.07E-11	8.69E-20	1.07E-11	1.07E-11
96	27154-33-2	Trichlorofluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	287-92-3	Cyclopentane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	3697-24-3	5-Methylchrysene	7.40E-12	particle bound	0.823	0.823	0.177	6.09E-12	3.27E-15	6.09E-12	2.38E-10	2.45E-10	1.01E-11	1.20E-19	1.01E-11	1.01E-11
99	3825-26-1	Ammonium perfluorooctanoate	4.07E-08	vapor	1.000	1.000	0.000	4.07E-08	0.00E+00	4.07E-08	5.86E-08	9.93E-08	4.97E-09	0.00E+00	4.97E-09	4.97E-09
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	7.02E-06	vapor	1.000	1.000	0.000	7.02E-06	0.00E+00	7.02E-06	6.97E-07	7.71E-06	3.86E-07	0.00E+00	3.86E-07	3.86E-07
101	50-00-0	Formaldehyde	2.93E-04	vapor	1.000	1.000	0.000	2.93E-04	0.00E+00	2.93E-04	1.34E-06	2.95E-04	1.47E-05	0.00E+00	1.47E-05	1.47E-05
102	50-32-8	Benzo(a)pyrene	1.59E-03	particle bound	0.290	0.290	0.710	4.61E-04	2.82E-06	4.64E-04	7.30E-06	4.71E-04	6.83E-06	9.29E-13	6.83E-06	6.83E-06
103	53-70-3	Dibenzo(a,h)anthracene	1.44E-03	particle bound	0.054	0.054	0.946	7.76E-05	3.40E-06	8.10E-05	2.16E-06	8.31E-05	2.24E-07	2.18E-13	2.24E-07	2.24E-07
104	540-59-0	1,2-Dichloroethylene	1.28E-15	vapor	1.000	1.000	0.000	1.28E-15	0.00E+00	1.28E-15	2.60E-13	2.62E-13	1.31E-14	0.00E+00	1.31E-14	1.31E-14
105	540-84-1	2,2,4-Trimethylpentane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106	541-73-1	1,3-Dichlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.04E-13	1.04E-13	5.21E-15	0.00E+00	5.21E-15	5.21E-15
107	56-23-5	Carbon tetrachloride	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108	563-80-4	3-Methyl-2-butanone	6.79E-09	vapor	1.000	1.000	0.000	6.79E-09	0.00E+00	6.79E-09	9.76E-09	1.66E-08	8.28E-10	0.00E+00	8.28E-10	8.28E-10
109	56-49-5	3-Methylcholanthrene	0.00E+00	particle bound	0.364	0.364	0.636	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110	57-14-7	1,1-Dimethylhydrazine	2.56E-05	vapor	1.000	1.000	0.000	2.56E-05	0.00E+00	2.56E-05	3.28E-06	2.89E-05	1.44E-06	0.00E+00	1.44E-06	1.44E-06
111	58-90-2	2,3,4,6-Tetrachlorophenol	5.01E-05	vapor	1.000	1.000	0.000	5.01E-05	0.00E+00	5.01E-05	4.53E-06	5.46E-05	2.73E-06	0.00E+00	2.73E-06	2.73E-06
112	591-78-6	2-Hexanone	6.79E-09	vapor	1.000	1.000	0.000	6.79E-09	0.00E+00	6.79E-09	9.76E-09	1.66E-08	8.28E-10	0.00E+00	8.28E-10	8.28E-10
113	59-50-7	4-Chloro-3-methylphenol	6.08E-05	vapor	1.000	1.000	0.000	6.08E-05	0.00E+00	6.08E-05	3.33E-06	6.39E-05	3.20E-06	0.00E+00	3.20E-06	3.20E-06
114	59-89-2	N-Nitrosomorpholine	7.41E-12	vapor	1.000	1.000	0.000	7.41E-12	0.00E+00	7.41E-12	2.39E-10	2.46E-10	1.23E-11	0.00E+00	1.23E-11	1.23E-11
115	602-87-9	5-Nitroacenaphthene	5.83E-04	particle bound	0.997	0.997	0.003	5.81E-04	4.37E-09	5.81E-04	1.07E-05	5.92E-04	2.95E-05	4.93E-15	2.95E-05	2.95E-05
116	60-29-7	Ethyl ether	1.01E-12	vapor	1.000	1.000	0.000	1.01E-12	0.00E+00	1.01E-12	6.14E-11	6.25E-11	3.12E-12	0.00E+00	3.12E-12	3.12E-12
117	603-34-9	Triphenylamine	1.21E-04	vapor	1.000	1.000	0.000	1.21E-04	0.00E+00	1.21E-04	6.66E-06	1.28E-04	6.39E-06	0.00E+00	6.39E-06	6.39E-06
118	60-34-4	Methylhydrazine	2.17E-05	vapor	1.000	1.000	0.000	2.17E-05	0.00E+00	2.17E-05	7.44E-07	2.24E-05	1.12E-06	0.00E+00	1.12E-06	1.12E-06
119	60-35-5	Acetamide	3.61E-04	vapor	1.000	1.000	0.000	3.61E-04	0.00E+00	3.61E-04	4.05E-06	3.61E-04	1.81E-05	0.00E+00	1.81E-05	1.81E-05
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	7.39E-12	vapor	1.000	1.000	0.000	7.39E-12	0.00E+00	7.39E-12	2.38E-10	2.46E-10	1.23E-11	0.00E+00	1.23E-11	1.23E-11
121	624-83-9	Methyl isocyanate	1.69E-13	vapor	1.000	1.000	0.000	1.69E-13	0.00E+00	1.69E-13	1.02E-11	1.04E-11	5.20E-13	0.00E+00	5.20E-13	5.20E-13
122	627-13-4	Nitric acid, propyl ester	8.45E-14	vapor	1.000	1.000	0.000	8.45E-14	0.00E+00	8.45E-14	5.12E-12	5.20E-12	2.60E-13	0.00E+00	2.60E-13	2.60E-13
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	5.83E-04	vapor	1.000	1.000	0.000	5.83E-04	0.00E+00	5.83E-04	1.07E-05	5.93E-04	2.97E-05	0.00E+00	2.97E-05	2.97E-05
124	630-20-6	1,1,1,2-Tetrachloroethane	1.22E-12	vapor	1.000	1.000	0.000	1.22E-12	0.00E+00	1.22E-12	3.94E-11	4.06E-11	2.03E-12	0.00E+00	2.03E-12	2.03E-12
125	64-17-5	Ethyl alcohol	2.17E-05	vapor	1.000	1.000	0.000	2.17E-05	0.00E+00	2.17E-05	7.44E-07	2.24E-05	1.12E-06	0.00E+00	1.12E-06	1.12E-06
126	64-18-6	Formic acid	5.67E-01	vapor	1.000	1.000	0.000	5.67E-01	0.00E+00	5.67E-01	8.54E-04	5.68E-01	2.84E-02	0.00E+00	2.84E-02	2.84E-02
127	64-19-7	Acetic acid	2.87E-09	vapor	1.000	1.000	0.000	2.87E-09	0.00E+00	2.87E-09	8.62E-08	8.89E-08	4.44E-09	0.00E+00	4.44E-09	4.44E-09
128	67-56-1	Methyl alcohol (Methanol)	2.17E-05	vapor	1.000	1.000	0.000	2.17E-05	0.00E+00	2.17E-05	7.44E-07	2.24E-05	1.12E-06	0.00E+00	1.12E-06	1.12E-06
129	67-63-0	2-Propyl alcohol (isopropanol; Propan-2-01)	1.43E-06	vapor	1.000	1.000	0.000	1.43E-06	0.00E+00	1.43E-06	1.40E-07	1.57E-06	7.87E-08	0.00E+00	7.87E-08	7.87E-08
130	67-64-1	2-Propanone (Acetone)	5.50E-07	vapor	1.000	1.000	0.000	5.50E-07	0.00E+00	5.50E-07	2.38E-07	7.87E-07	3.93E-08	0.00E+00	3.93E-08	3.93E-08
131	67-66-3	Chloroform	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.04E-13	1.04E-13	5.21E-15	0.00E+00	5.21E-15	5.21E-15
132	67-72-1	Hexachloroethane	7.66E-15	vapor	1.000	1.000	0.000	7.66E-15	0.00E+00	7.66E-15	1.56E-12	1.57E-12	7.85E-14	0.00E+00	7.85E-14	7.85E-14
133	684-16-2	Hexafluoroacetone	1.28E-15	vapor	1.000	1.000	0.000	1.28E-15	0.00E+00	1.28E-15	2.60E-13	2.62E-13	1.31E-14	0.00E+00	1.31E-14	1.31E-14
134	71-23-8	n-Propyl alcohol	2.87E-06	vapor	1.000	1.000	0.000	2.87E-06	0.00E+00	2.87E-06	2.81E-07	3.15E-06	1.57E-07	0.00E+00	1.57E-07	1.57E-07
135	71-36-3	n-Butyl alcohol	7.17E-06	vapor	1.000	1.000	0.000	7.17E-06	0.00E+00	7.17E-06	7.02E-07	7.87E-06	3.93E-07	0.00E+00	3.93E-07	3.93E-07
136	71-43-2	Benzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.13E-14	1.13E-14	5.65E-16	0.00E+00	5.65E-16	0.00E+00
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
138	74-83-9	Bromomethane (Methyl bromide)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.04E-13	1.04E-13	5.21E-15	0.00E+00	5.21E-15	5.21E-15
139	74-87-3	Chloromethane (Methyl chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
140	74-97-5	Bromochloromethane	1.69E-13	vapor	1.000	1.000	0.000	1.69E-13	0.00E+00	1.69E-13	1.02E-11	1.04E-11	5.20E-13	0.00E+00	5.20E-13	5.20E-13
141	74-99-7	Methylacetylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	8.64E-15	8.64E-15	4.32E-16	0.00E+00	4.32E-16	0.00E+00
142	75-00-3	Chloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
143	75-01-4	Vinyl chloride (1-Chloroethene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
144	75-05-8	Acetonitrile	4.29E-07	vapor	1.000	1.000	0.000	4.29E-07	0.00E+00	4.29E-07	1.60E-07	5.89E-07	2.95E-08	0.00E+00	2.95E-08	2.95E-08
145	75-07-0	Acetaldehyde	1.65E-06	vapor	1.000	1.000	0.000	1.65E-06	0.00E+00	1.65E-06	7.09E-07	2.36E-06	1.18E-07	0.00E+00	1.18E-07	1.18E-07
146	75-09-2	Dichloromethane (Methylene chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.04E-13	1.04E-13	5.21E-15	0.00E+00	5.21E-15	5.21E-15
147	75-12-7	Formamide	2.16E-03	vapor	1.000	1.000	0.000	2.16E-03	0.00E+00	2.16E-03	3.02E-08	2.16E-03	1.08E-04	0.00E+00	1.08E-04	1.08E-04
148	75-15-0	Carbon disulfide	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.44E-15	1.44E-15	7.20E-17	0.00E+00	7.20E-17	0.00E+00
149	75-21-8	Ethylene oxide (Oxirane)	1.39E-10	vapor	1.000	1.000	0.000	1.39E-10	0.00E+00	1.39E-10	4.46E-10	5.85E-10	2.93E-11	0.00E+00	2.93E-11	2.93E-11
150	75-27-4	Bromodichloromethane	1.22E-12	vapor	1.000	1.000	0.000	1.22E-12	0.00E+00	1.22E-12	3.94E-11	4.06E-11	2.03E-12	0.00E+00	2.03E-12	2.03E-12
151	75-34-3	1,1-Dichloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.04E-13	1.04E-13	5.21E-15	0.00E+00	5.21E-15	5.21E-15
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
153	75-43-4	Dichlorofluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
154	75-45-6	Chlorodifluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
155	75-50-3	Trimethylamine	6.79E-09	vapor	1.000	1.000	0.000	6.79E-09	0.00E+00	6.79E-09	9.76E-09	1.66E-08	8.28E-10	0.00E+00	8.28E-10	8.28E-10
156	75-52-5	Nitromethane	1.65E-06	vapor	1.000	1.000	0.000	1.65E-06	0.00E+00	1.65E-06	7.09E-07	2.36E-06	1.18E-07	0.00E+00	1.18E-07	1.18E-07
157	75-55-8	2-Methylaziridine	4.30E-05	vapor	1.000	1.000	0.000	4.30E-05	0.00E+00	4.30E-05	4.21E-06	4.72E-05	2.36E-06	0.00E+00	2.36E-06	2.36E-06
158	75-61-6	Difluorodibromomethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
159	75-63-8	Trifluorobromomethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
160	75-65-0	2-Methyl-2-propanol	7.17E-06	vapor	1.000	1.000	0.000	7.17E-06	0.00E+00	7.17E-06	7.02E-07	7.87E-06	3.93E-07	0.00E+00	3.93E-07	3.93E-07
161	75-69-4	Trichlorofluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
162	75-71-8	Dichlorodifluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
163	76-03-9	Trichloroacetic acid	3.61E-04	vapor	1.000	1.000	0.000	3.61E-04	0.00E+00	3.61E-04	4.05E-06	3.61E-04	1.81E-05	0.00E+00	1.81E-05	1.81E-05
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
168	76-15-3	Chloropentafluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.30E-05	vapor	1.000	1.000	0.000	4.30E-05	0.00E+00	4.30E-05	4.21E-06	4.72E-05	2.36E-06	0.00E+00	2.36E-06	2.36E-06
170	78-87-5	1,2-Dichloropropane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.04E-13	1.04E-13	5.21E-15	0.00E+00	5.21E-15	5.21E-15
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.87E-06	vapor	1.000	1.000	0.000	2.87E-06	0.00E+00	2.87E-06	2.81E-07	3.16E-06	1.57E-07	0.00E+00	1.57E-07	1.57E-07
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	2.75E-07	vapor	1.000	1.000	0.000	2.75E-07	0.00E+00	2.75E-07	1.18E-07	3.93E-07	1.97E-08	0.00E+00	1.97E-08	1.97E-08
173	79-00-5	1,1,2-Trichloroethane	1.69E-13	vapor	1.000	1.000	0.000	1.69E-13	0.00E+00	1.69E-13	1.02E-11	1.04E-11	5.20E-13	0.00E+00	5.20E-13	5.20E-13
174	79-01-6	Trichloroethylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.63E-15	1.63E-15	8.15E-17	0.00E+00	8.15E-17	0.00E+00
175	79-09-4	Propionic acid	1.76E-03	vapor	1.000	1.000	0.000	1.76E-03	0.00E+00	1.76E-03	8.06E-06	1.77E-03	8.84E-05	0.00E+00	8.84E-05	8.84E-05
176	79-10-7	2-Propenoic acid	2.35E-03	vapor	1.000	1.000	0.000	2.35E-03	0.00E+00	2.35E-03	1.08E-06	2.36E-03	1.18E-04	0.00E+00	1.18E-04	1.18E-04
177	79-20-9	Methyl acetate	4.07E-08	vapor	1.000	1.000	0.000	4.07E-08	0.00E+00	4.07E-08	5.86E-08	9.93E-08	4.97E-09	0.00E+00	4.97E-09	4.97E-09
178	79-34-5	1,1,2,2-Tetrachloroethane	4.72E-14	vapor	1.000	1.000	0.000	4.72E-14	0.00E+00	4.72E-14	4.82E-13	5.29E-13	2.65E-14	0.00E+00	2.65E-14	2.65E-14
179	83-32-9	Acenaphthene	7.34E-12	vapor	1.000	1.000	0.000	7.34E-12	0.00E+00	7.34E-12	2.37E-10	2.44E-10	1.22E-11	0.00E+00	1.22E-11	1.22E-11
180	84-66-2	Diethyl phthalate	1.56E-03	vapor	1.000	1.000	0.000	1.56E-03	0.00E+00	1.56E-03	9.59E-06	1.57E-03	7.87E-05	0.00E+00	7.87E-05	7.87E-05
181	84-74-2	Dibutyl phthalate	6.92E-04	particle bound	0.994	0.994	0.006	6.88E-04	1.04E-08	6.88E-04	1.28E-05	7.00E-04	3.48E-05	1.17E-14	3.48E-05	3.48E-05
182	85-01-8	Phenanthrene	1.65E-06	particle bound	0.999	0.999	0.001	1.65E-06	4.13E-12	1.65E-06	7.09E-07	2.36E-06	1.18E-07	6.55E-18	1.18E-07	1.18E-07
183	85-68-7	Butylbenzyl phthalate	6.92E-04	particle bound	0.948	0.948	0.052	6.56E-04	8.99E-08	6.56E-04	1.26E-05	6.68E-04	3.17E-05	8.86E-14	3.17E-05	3.17E-05
184	86-73-7	Fluorene	4.07E-08	vapor	1.000	1.000	0.000	4.07E-08	0.00E+00	4.07E-08	5.86E-08	9.93E-08	4.97E-09	0.00E+00	4.97E-09	4.97E-09
185	87-68-3	Hexachlorobutadiene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.25E-15	1.25E-15	6.25E-17	0.00E+00	6.25E-17	0.00E+00
186	88-06-2	2,4,6-Trichlorophenol	1.30E-04	vapor	1.000	1.000	0.000	1.30E-04	0.00E+00	1.30E-04	4.46E-06	1.35E-04	6.73E-06	0.00E+00	6.73E-06	6.73E-06
187	88-72-2	2-Nitrotoluene	4.26E-06	vapor	1.000	1.000	0.000	4.26E-06	0.00E+00	4.26E-06	5.47E-07	4.81E-06	2.40E-07	0.00E+00	2.40E-07	2.40E-07
188	88-75-5	2-Nitrophenol	2.56E-05	vapor	1.000	1.000	0.000	2.56E-05	0.00E+00	2.56E-05	3.28E-06	2.89E-05	1.44E-06	0.00E+00	1.44E-06	1.44E-06
189	88-89-1	Picric acid	2.16E-03	#N/A	0.934	0.934	0.066	2.02E-03	3.57E-07	2.02E-03	3.69E-10	2.02E-03	9.44E-05	3.71E-13	9.44E-05	9.44E-05
190	91-20-3	Naphthalene	1.29E-11	vapor	1.000	1.000	0.000	1.29E-11	0.00E+00	1.29E-11	1.14E-10	1.27E-10	6.37E-12	0.00E+00	6.37E-12	6.37E-12
191	91-22-5	Quinoline	5.83E-04	vapor	1.000	1.000	0.000	5.83E-04	0.00E+00	5.83E-04	1.07E-05	5.93E-04	2.97E-05	0.00E+00	2.97E-05	2.97E-05
192	91-58-7	2-Chloronapthalene	1.50E-10	vapor	1.000	1.000	0.000	1.50E-10	0.00E+00	1.50E-10	1.53E-09	1.68E-09	8.39E-11	0.00E+00	8.39E-11	8.39E-11
193	92-52-4	1,1'-Biphenyl	9.97E-11	vapor	1.000	1.000	0.000	9.97E-11	0.00E+00	9.97E-11	1.02E-09	1.12E-09	5.59E-11	0.00E+00	5.59E-11	5.59E-11
194	92-93-3	4-Nitrobiphenyl	1.30E-04	particle bound	0.999	0.999	0.001	1.30E-04	3.26E-10	1.30E-04	4.46E-06	1.35E-04	6.72E-06	3.74E-16	6.72E-06	6.72E-06
195	95-13-6	Indene	7.33E-12	vapor	1.000	1.000	0.000	7.33E-12	0.00E+00	7.33E-12	2.38E-10	2.44E-10	1.22E-11	0.00E+00	1.22E-11	1.22E-11
196	95-47-6	o-Xylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	1.04E-13	1.04E-13	5.21E-15	0.00E+00	5.21E-15	5.21E-15
197	95-48-7	o-Cresol (2-Methylphenol)	9.71E-05	vapor	1.000	1.000	0.000	9.71E-05	0.00E+00	9.71E-05	1.76E-06	9.89E-05	4.94E-06	0.00E+00	4.94E-06	4.94E-06
198	95-49-8	2-Chlorotoluene	7.66E-15	vapor	1.000	1.000	0.000	7.66E-15	0.00E+00	7.66E-15	1.56E-12	1.57E-12	7.85E-14	0.00E+00	7.85E-14	7.85E-14
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	4.89E-13	vapor	1.000	1.000	0.000	4.89E-13	0.00E+00	4.89E-13	1.56E-11	1.63E-11	8.13E-13	0.00E+00	8.13E-13	8.13E-13
200	95-57-8	2-Chlorophenol	4.30E-05	vapor	1.000	1.000	0.000	4.30E-05	0.00E+00	4.30E-05	4.21E-06	4.72E-05	2.36E-06	0.00E+00	2.36E-06	2.36E-06
201	95-95-4	2,4,5-Trichlorophenol	5.83E-04	vapor	1.000	1.000	0.000	5.83E-04	0.00E+00	5.83E-04	1.07E-05	5.93E-04	2.97E-05	0.00E+00	2.97E-05	2.97E-05
202	96-22-0	3-Pentanone	1.36E-08	vapor	1.000	1.000	0.000	1.36E-08	0.00E+00	1.36E-08	1.95E-08	3.31E-08	1.66E-09	0.00E+00	1.66E-09	1.66E-09

General Primary Offgas DF

	SBS	WESP	Total
Vapor	1	1	1
Particle	20	20	400

General Secondary Offgas DF

	HEME	HEPA	S-Ac	Ag-Z	VOC Ox	SCR	Total
Vapor	1	1	1	1	20	1	20
Particle	90	200000	1	1	20	1	3.6E+08

CALCULATION SHEET

BY: F. Borrico
DATE: 01/09/06

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-ERP-00005
SHEET REV: 0
SHEET NO.: B-16

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Table B-11	HOP31 - Abated HLW Melter Offgas System				Fraction		HOP07	HOP07				HOP31	HOP31		Corrected
2			HMP08		Fv	vapor	Fraction	g/sec	g/sec	HOP07	HOP10	HOP11	g/sec	g/sec	HOP31	HOP31
3	CAS #	COPC	g/sec	Phase		adjusted	particle	vapor	particle	g/sec	g/sec	g/sec	vapor	particle	g/sec	g/sec
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	7.86E-15	vapor	1.000	1.000	0.000	7.86E-15	0.00E+00	7.86E-15	1.58E-12	1.57E-12	7.85E-14	0.00E+00	7.85E-14	7.85E-14
204	98-51-1	p-tert-Butyltoluene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
205	98-82-8	Cumene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	8.64E-15	8.64E-15	4.32E-16	0.00E+00	4.32E-16	0.00E+00
206	98-83-9	alpha-Methylstyrene	1.28E-15	vapor	1.000	1.000	0.000	1.28E-15	0.00E+00	1.28E-15	2.60E-13	2.62E-13	1.31E-14	0.00E+00	1.31E-14	1.31E-14
207	98-86-2	Acetophenone	2.45E-05	vapor	1.000	1.000	0.000	2.45E-05	0.00E+00	2.45E-05	2.61E-06	2.71E-05	1.38E-06	0.00E+00	1.38E-06	1.38E-06
208	98-95-3	Nitrobenzene	1.70E-05	vapor	1.000	1.000	0.000	1.70E-05	0.00E+00	1.70E-05	2.19E-06	1.92E-05	9.62E-07	0.00E+00	9.62E-07	9.62E-07
209										7.02E-01						
210																Corrected
211	Coplanar PCBs									HOP07	HOP10	HOP11			HOP31	HOP31
212										g/sec	g/sec	g/sec			g/sec	g/sec
213	31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
214	32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
215	32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
216	32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
217	35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
218	35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
219	38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
220	39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
221	52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
222	57465-28-8	3,3',4,4',5-Pentachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
223	65510-44-3	2',3,4,4',5-Pentachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
224	69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
225	70362-50-4	3,4,4',5-Tetrachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
226	74472-37-0	2,3,4,4',5-Pentachlorobiphenyl								1.50E-13	1.22E-12	1.37E-12			6.83E-14	6.83E-14
227																
228	1336-36-3	Polychlorinated biphenyls (PCBs)								2.08E-10	Correction for Coplanar PCBs					
229	1336-36-3	UnCorrected (for coplanar PCBs)								2.10E-10	0.99	as parent				
230											0.01	as coplanar sum				

Table B-12 PJV32 - Unabated HLW PJM/RFD

Row	CAS #	COPC	Feed Rate g/sec	In ACM	Group	Grouping	Phase	PJV32 rate g/sec	Performance Factor	Adjusted PF	Calc'd rate PJV32 g/sec	Corrected PJV32 g/sec
4	100-00-5	p-Nitrochlorobenzene	2.86E-02	No		10	vapor			1.98E-09	5.65E-11	5.65E-11
5	100-21-0	p-Phthalic acid	4.29E-02	Yes	1	1	vapor	1.43E-09	3.34E-08		1.43E-09	1.43E-09
6	100-41-4	Ethyl benzene	2.86E-03	No		20	vapor			5.60E-51	1.60E-53	0.00E+00
7	100-42-5	Styrene	2.86E-03	No		19	vapor			6.10E-46	1.74E-48	0.00E+00
8	10061-01-5	cis-1,3-Dichloropropene	2.86E-03	Yes	19	19	vapor	5.21E-48	1.82E-45		5.21E-48	0.00E+00
9	10061-02-6	trans-1,3-Dichloropropene	2.86E-03	No		17	vapor			3.76E-44	1.07E-46	0.00E+00
10	101-55-3	4-Bromophenylphenyl ether	4.29E-02	No		14	vapor			3.67E-27	1.57E-28	0.00E+00
11	101-84-8	Diphenyl ether	7.14E-03	Yes	16	16	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
12	106-35-4	3-Heptanone	2.86E-03	No		14	vapor			3.67E-27	1.05E-29	0.00E+00
13	106-42-3	p-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			6.10E-46	4.35E-48	0.00E+00
14	106-46-7	1,4-Dichlorobenzene	2.86E-03	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
15	106-88-7	1,2-Epoxybutane	7.14E-03	No		15	vapor			1.02E-40	7.30E-43	0.00E+00
16	106-93-4	Ethylene dibromide (Dibromethane)	2.86E-03	Yes	18	18	vapor	1.32E-43	4.61E-41		1.32E-43	0.00E+00
17	106-97-8	Butane	7.14E-03	Yes	26	26	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
18	106-99-0	1,3-Butadiene	2.86E-03	Yes	23	23	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
19	107-02-8	Acrolein	7.14E-03	No		14	vapor			3.67E-27	2.62E-29	0.00E+00
20	107-05-1	3-Chloropropene (Allyl chloride)	2.86E-03	No		20	vapor			5.60E-51	1.60E-53	0.00E+00
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	2.86E-03	No		17	vapor			3.76E-44	1.07E-46	0.00E+00
22	107-12-0	Propionitrile	7.14E-03	No		13	vapor			8.69E-12	6.21E-14	6.21E-14
23	107-13-1	Acrylonitrile	1.43E-02	No		14	vapor			3.67E-27	5.25E-29	0.00E+00
24	107-18-6	2-Propene-1-ol	4.29E-02	No		10	vapor			1.98E-09	8.48E-11	8.48E-11
25	107-31-3	Formic acid, methyl ester	4.29E-02	No		15	vapor			1.02E-40	4.38E-42	0.00E+00
26	107-66-4	Dibutylphosphate	4.29E-02	No		5	particle bound			0.00E+00	0.00E+00	0.00E+00
27	107-87-9	2-Pentanone	1.43E-02	No		14	vapor			3.67E-27	5.25E-29	0.00E+00
28	108-03-2	1-Nitropropane	4.29E-02	No		14	vapor			3.67E-27	1.57E-28	0.00E+00
29	108-05-4	Vinyl acetate	4.29E-02	No		16	vapor			2.04E-41	8.73E-43	0.00E+00
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	7.14E-03	No		14	vapor			3.67E-27	2.62E-29	0.00E+00
31	108-20-3	Bis(isopropyl)ether	7.14E-03	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
32	108-38-3	m-Xylene (Dimethyl benzene)	7.14E-03	No		19	vapor			6.10E-46	4.35E-48	0.00E+00
33	108-39-4	m-Cresol	7.14E-03	No		9	vapor			0.00E+00	0.00E+00	0.00E+00
34	108-87-2	Methylcyclohexane	7.14E-03	Yes	25	25	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
35	108-88-3	Toluene	2.86E-03	Yes	19	19	vapor	6.39E-51	2.23E-48		6.39E-51	0.00E+00
36	108-90-7	Chlorobenzene	2.86E-03	No		19	vapor			6.10E-46	1.74E-48	0.00E+00
37	108-93-0	Cyclohexanol	7.14E-03	No		10	vapor			1.98E-09	1.41E-11	1.41E-11
38	108-94-1	Cyclohexanone	7.14E-03	No		11	vapor			4.49E-24	3.20E-26	0.00E+00
39	108-95-2	Phenol	4.29E-02	Yes	8	8	vapor	4.65E-24	1.08E-22		4.65E-24	0.00E+00
40	109-66-0	n-Pentane	7.14E-03	No		26	vapor			0.00E+00	0.00E+00	0.00E+00
41	109-99-9	Tetrahydrofuran	2.86E-03	No		13	vapor			8.69E-12	2.48E-14	2.48E-14
42	110-12-3	5-Methyl-2-hexanone	2.86E-03	No		15	vapor			1.02E-40	2.92E-43	0.00E+00
43	110-43-0	2-Heptanone	2.86E-03	No		15	vapor			1.02E-40	2.92E-43	0.00E+00
44	110-54-3	n-Hexane	7.14E-03	Yes	27	27	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
45	110-62-3	n-Valeraldehyde	4.29E-02	No		15	vapor			1.02E-40	4.38E-42	0.00E+00
46	110-82-7	Cyclohexane	7.14E-03	Yes	24	24	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
47	110-83-8	Cyclohexene	2.86E-03	No		22	vapor			2.28E-54	6.52E-57	0.00E+00
48	110-86-1	Pyridine	1.43E-02	No		11	vapor			4.49E-24	6.41E-26	0.00E+00
49	111-65-9	n-Octane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
50	111-76-2	Ethylene glycol monobutyl ether	4.29E-02	No		9	vapor			0.00E+00	0.00E+00	0.00E+00
51	111-84-2	n-Nonane	7.14E-03	Yes	28	28	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.29E-02	No		30	particle bound			1.85E-08	7.93E-10	7.93E-10
53	117-84-0	n-Dioctyl phthalate	4.29E-02	No		32	particle bound			9.51E-10	4.08E-11	4.08E-11
54	120-12-7	Anthracene	4.29E-02	Yes	13	13	particle bound	7.45E-13	1.74E-11		7.45E-13	7.45E-13
55	120-82-1	1,2,4-Trichlorobenzene	7.14E-03	Yes	17	17	vapor	2.69E-46	3.76E-44		2.69E-46	0.00E+00
56	120-83-2	2,4-Dichlorophenol	4.29E-02	No		10	vapor			1.98E-09	8.48E-11	8.48E-11
57	121-44-8	Triethylamine	7.14E-03	No		15	vapor			1.02E-40	7.30E-43	0.00E+00
58	121-69-7	Dimethylaniline	7.14E-03	No		13	vapor			8.69E-12	6.21E-14	6.21E-14
59	122-39-4	N,N-Diphenylamine	1.43E-02	Yes	10	10	vapor	5.65E-11	3.95E-09		5.65E-11	5.65E-11
60	123-19-3	4-Heptanone	2.86E-03	No		13	vapor			8.69E-12	2.48E-14	2.48E-14
61	123-38-6	n-Propionaldehyde	1.43E-02	No		14	vapor			3.67E-27	5.25E-29	0.00E+00
62	123-51-3	3-Methyl-1-butanol	7.14E-03	No		12	vapor			4.60E-38	3.29E-40	0.00E+00
63	123-86-4	Acetic acid n-butyl ester	1.35E-04	No		16	vapor			2.04E-41	2.75E-45	0.00E+00
64	123-91-1	1,4-Dioxane	1.43E-03	No		10	vapor			1.98E-09	2.83E-12	2.83E-12
65	126-73-8	Tributyl phosphate	2.86E-02	Yes	7	7	particle bound	9.86E-10	3.38E-08		9.86E-10	9.86E-10
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	7.14E-03	No		16	vapor			2.04E-41	1.45E-43	0.00E+00
67	127-18-4	Perchloroethylene (tetrachloroethylene)	2.86E-03	Yes	21	21	vapor	1.25E-55	4.38E-53		1.25E-55	0.00E+00
68	127-19-5	N,N-Dimethylacetamide	7.14E-03	No		5	vapor			0.00E+00	0.00E+00	0.00E+00
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.43E-02	No		32	vapor			9.51E-10	1.36E-11	1.36E-11
70	129-00-0	Pyrene	4.29E-02	Yes	33	33	particle bound	2.45E-11	5.71E-10		2.45E-11	2.45E-11
71	1321-64-8	Pentachloronaphthalene	4.29E-02	Yes	14	14	particle bound	0.00E+00	0.00E+00		0.00E+00	0.00E+00
72	1321-65-9	Trichloronaphthalene	4.29E-02	No		15	particle bound			1.02E-40	4.38E-42	0.00E+00
73	132-64-9	Dibenzofuran	4.29E-02	Yes	15	15	particle bound	8.76E-42	2.04E-40		8.76E-42	0.00E+00
74	1335-87-1	Hexachloronaphthalene	4.29E-02	No		14	particle bound			3.67E-27	1.57E-28	0.00E+00
75	1335-88-2	Tetrachloronaphthalene	4.29E-02	No		15	particle bound			1.02E-40	4.38E-42	0.00E+00
76	1336-36-3	Polychlorinated biphenyls (PCBs)	1.74E-03	Yes	35	35	vapor	1.21E-15	6.95E-13		1.20E-15	1.20E-15
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	1.35E-04	No		14	vapor			3.67E-27	4.97E-31	0.00E+00
78	141-79-7	4-Methyl-3-penten-2-one	4.29E-02	No		13	vapor			8.69E-12	3.73E-13	3.73E-13
79	142-82-5	n-Heptane	7.14E-03	No		27	vapor			0.00E+00	0.00E+00	0.00E+00
80	144-62-7	Oxalic acid	2.14E+00	Yes	3	3	vapor	7.27E-27	3.39E-27		7.27E-27	0.00E+00
81	156-60-5	trans-1,2-Dichloroethylene	7.14E-03	No		20	vapor			5.60E-51	4.00E-53	0.00E+00
82	1634-04-4	Methyl tert-butyl ether	7.14E-03	No		16	vapor			2.04E-41	1.45E-43	0.00E+00
83	189-55-9	Dibenzo(a,i)pyrene	4.29E-02	No		5	particle			0.00E+00	0.00E+00	0.00E+00
84	189-64-0	Dibenzo(a,h)pyrene	4.29E-02	No		5	particle			0.00E+00	0.00E+00	0.00E+00
85	191-24-2	Benzo(g,h,i)perylene	4.29E-02	No		30	particle bound			1.85E-08	7.93E-10	7.93E-10
86	191-30-0	Benzo(a,l)pyrene	4.29E-02	No		5	particle			0.00E+00	0.00E+00	0.00E+00
87	192-65-4	Dibenzo(a,e)pyrene	4.29E-02	No		5	particle			0.00E+00	0.00E+00	0.00E+00
88	193-39-5	Indeno(1,2,3-cd)pyrene	4.29E-02	Yes	30	30	particle	5.98E-15	1.39E-13		5.98E-15	5.98E-15
89	206-44-0	Fluoranthene	4.29E-02	Yes	33	33	particle bound	0.00E+00	0.00E+00		0.00E+00	0.00E+00
90	208-96-8	Acenaphthylene	4.29E-02	Yes	14	14	vapor	3.15E-28	7.34E-27		3.15E-28	0.00E+00
91	2234-13-1	Octachloronaphthalene	1.35E-04	No		14	particle bound			3.67E-27	4.97E-31	0.00E+00
92	224-42-0	Dibenz(a,j)acridine	4.29E-02	No		4	particle bound			4.53E-23	1.94E-24	0.00E+00
93	226-36-8	Dibenz(a,h)acridine	4.29E-02	No		4	particle bound			4.53E-23	1.94E-24	0.00E+00
94	25551-13-7	Trimethyl benzene	7.14E-03	No		19	vapor			6.10E-46	4.35E-48	0.00E+00
95	26140-60-3	Terphenyls	4.29E-02	Yes	34	34	particle bound	0.00E+00	0.00E+00		0.00E+00	0.00E+00
96	27154-33-2	Trichlorofluoroethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
97	287-92-3	Cyclopentane	7.14E-03	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
98	3697-24-3	5-Methylchrysene	4.29E-02	Yes	32	32	particle bound	0.00E+00	0.00E+00		0.00E+00	0.00E+00
99	3825-26-1	Ammonium perfluorooctanoate	4.29E-02	No		14	vapor			3.67E-27	1.57E-28	0.00E+00
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	7.14E-03	Yes	11	11	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
101	50-00-0	Formaldehyde	7.14E-03	No		8	vapor			1.04E-22	7.42E-25	0.00E+00
102	50-32-8	Benzo(a)pyrene	2.72E-02	Yes	30	30	particle bound	1.00E-09	3.70E-08		1.00E-09	1.00E-09
103	53-70-3	Dibenzo(a,h)anthracene	2.72E-02	No		7	particle bound			3.38E-08	9.18E-10	9.18E-10
104	540-59-0	1,2-Dichloroethylene	7.14E-03	No		19	vapor			6.10E-46	4.35E-48	0.00E+00
105	540-84-1	2,2,4-Trimethylpentane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
106	541-73-1	1,3-Dichlorobenzene	2.86E-03	No		19	vapor			6.10E-46	1.74E-48	0.00E+00
107	56-23-5	Carbon tetrachloride	2.86E-03	Yes	22	22	vapor	6.52E-57	2.28E-54		6.52E-57	0.00E+00
108	563-80-4	3-Methyl-2-butanone	7.14E-03	No		14	vapor			3.67E-27	2.62E-29	0.00E+00
109	56-49-5	3-Methylcholanthrene	4.29E-02	No		26	particle bound			0.00E+00	0.00E+00	0.00E+00
110	57-14-7	1,1-Dimethylhydrazine	4.29E-02	Yes	12	12	vapor	1.97E-39	4.60E-38		1.97E-39	0.00E+00
111	58-90-2	2,3,4,6-Tetrachlorophenol	4.29E-02	Yes	11	11	vapor	1.53E-25	3.57E-24		1.53E-25	0.00E+00
112	591-78-6	2-Hexanone	7.14E-03	No		14	vapor			3.67E-27	2.62E-29	0.00E+00
113	59-50-7	4-Chloro-3-methylphenol	4.29E-02	No		32	vapor			9.51E-10	4.08E-11	4.08E-11
114	59-89-2	N-Nitrosomorpholine	4.29E-02	Yes	8	8	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
115	602-87-9	5-Nitroacenaphthene	4.29E-02	No		9	particle bound			0.00E+00	0.00E+00	0.00E+00
116	60-29-7	Ethyl ether	4.29E-02	No		17	vapor			3.76E-44	1.61E-45	0.00E+00
117	603-34-9	Triphenylamine	4.29E-02	Yes	32	32	vapor	8.15E-11	1.90E-09		8.15E-11	8.15E-11
118	60-34-4	Methylhydrazine	7.14E-03	No		10	vapor			1.98E-09	1.41E-11	1.41E-11
119	60-35-5	Acetamide	7.14E-03	Yes	5	5	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	4.29E-02	Yes	10	10	vapor	0.00E+00	0.00E+00	1.98E-09	8.48E-11	8.48E-11
121	624-83-9	Methyl isocyanate	7.14E-03	No		17	vapor			3.76E-44	2.69E-46	0.00E+00
122	627-13-4	Nitric acid, propyl ester	3.57E-03	No		17	vapor			3.76E-44	1.34E-46	0.00E+00
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	4.29E-02	Yes	9	9	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
124	630-20-6	1,1,1,2-Tetrachloroethane	7.14E-03	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
125	64-17-5	Ethyl alcohol	7.14E-03	No		10	vapor			1.98E-09	1.41E-11	1.41E-11
126	64-18-6	Formic acid	1.07E+01	No		7	vapor			3.38E-08	3.62E-07	3.62E-07
127	64-19-7	Acetic acid	1.55E+01	Yes	6	6	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
128	67-56-1	Methyl alcohol (Methanol)	7.14E-03	No		10	vapor			1.98E-09	1.41E-11	1.41E-11
129	67-63-0	2-Propyl alcohol (Isopropanol, Propan-2-01)	1.43E-03	No		11	vapor			4.49E-24	6.41E-27	0.00E+00
130	67-64-1	2-Propanone (Acetone)	1.43E-02	No		13	vapor			8.69E-12	1.24E-13	1.24E-13
131	67-66-3	Chloroform	2.86E-03	No		19	vapor			6.10E-46	1.74E-48	0.00E+00
132	67-72-1	Hexachloroethane	4.29E-02	No		19	vapor			6.10E-46	2.61E-47	0.00E+00
133	684-16-2	Hexafluoroacetone	7.14E-03	No		19	vapor			6.10E-46	4.35E-48	0.00E+00
134	71-23-8	n-Propyl alcohol	2.86E-03	No		11	vapor			4.49E-24	1.28E-26	0.00E+00
135	71-36-3	n-Butyl alcohol	7.14E-03	No		11	vapor			4.49E-24	3.20E-26	0.00E+00
136	71-43-2	Benzene	2.86E-03	Yes	19	19	vapor	6.34E-51	2.22E-48		6.34E-51	0.00E+00
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	2.86E-03	No		21	vapor			4.38E-53	1.25E-55	0.00E+00
138	74-83-9	Bromomethane (Methyl bromide)	2.86E-03	No		19	vapor			6.10E-46	1.74E-48	0.00E+00
139	74-87-3	Chloromethane (Methyl chloride)	2.86E-03	No		20	vapor			5.60E-51	1.60E-53	0.00E+00
140	74-97-5	Bromochloromethane	7.14E-03	No		17	vapor			3.76E-44	2.69E-46	0.00E+00
141	74-99-7	Methylacetylene	4.29E-02	No		20	vapor			5.60E-51	2.40E-52	0.00E+00
142	75-00-3	Chloroethane	2.86E-03	No		20	vapor			5.60E-51	1.60E-53	0.00E+00
143	75-01-4	Vinyl chloride (1-Chloroethene)	2.86E-03	No		22	vapor			2.28E-54	6.52E-57	0.00E+00
144	75-05-8	Acetonitrile	7.14E-03	Yes	13	13	vapor	1.57E-40	2.19E-38		1.57E-40	0.00E+00
145	75-07-0	Acetaldehyde	4.29E-02	No		13	vapor			8.69E-12	3.73E-13	3.73E-13
146	75-09-2	Dichloromethane (Methylene chloride)	2.86E-03	No		19	vapor			6.10E-46	1.74E-48	0.00E+00
147	75-12-7	Formamide	4.29E-02	Yes	4	4	vapor	1.94E-24	4.53E-23		1.94E-24	0.00E+00
148	75-15-0	Carbon disulfide	7.14E-03	No		20	vapor			5.60E-51	4.00E-53	0.00E+00
149	75-21-8	Ethylene oxide (Oxirane)	1.43E-03	No		15	vapor			1.02E-40	1.46E-43	0.00E+00
150	75-27-4	Bromodichloromethane	7.14E-03	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
151	75-34-3	1,1-Dichloroethane	2.86E-03	No		19	vapor			6.10E-46	1.74E-48	0.00E+00
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	7.14E-03	No		22	vapor			2.28E-54	1.63E-56	0.00E+00
153	75-43-4	Dichlorofluoromethane	2.86E-03	No		20	vapor			5.60E-51	1.60E-53	0.00E+00
154	75-45-6	Chlorodifluoromethane	2.86E-03	No		22	vapor			2.28E-54	6.52E-57	0.00E+00
155	75-50-3	Trimethylamine	7.14E-03	No		14	vapor			3.67E-27	2.62E-29	0.00E+00
156	75-52-5	Nitromethane	4.29E-02	No		13	vapor			8.69E-12	3.73E-13	3.73E-13
157	75-56-9	2-Methylaziridine	4.29E-02	No		11	vapor			4.49E-24	1.92E-25	0.00E+00
158	75-61-6	Difluorodibromomethane	7.14E-03	No		22	vapor			2.28E-54	1.63E-56	0.00E+00
159	75-63-8	Trifluorobromomethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
160	75-65-0	2-Methyl-2-propanol	7.14E-03	No		11	vapor			4.49E-24	3.20E-26	0.00E+00
161	75-69-4	Trichlorofluoromethane	7.14E-03	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
162	75-71-8	Dichlorodifluoromethane	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
163	76-03-9	Trichloroacetic acid	7.14E-03	No		5	vapor			0.00E+00	0.00E+00	0.00E+00
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	4.29E-02	No		24	vapor			0.00E+00	0.00E+00	0.00E+00
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	4.29E-02	No		23	vapor			0.00E+00	0.00E+00	0.00E+00
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	7.14E-03	No		25	vapor			0.00E+00	0.00E+00	0.00E+00
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	7.14E-03	No		28	vapor			0.00E+00	0.00E+00	0.00E+00
168	76-15-3	Chloropentafluoroethane	7.14E-03	Yes	29	29	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	4.29E-02	No		11	vapor			4.49E-24	1.92E-25	0.00E+00
170	78-87-5	1,2-Dichloropropane	2.86E-03	No		19	vapor			6.10E-46	1.74E-48	0.00E+00
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	2.86E-03	No		11	vapor			4.49E-24	1.28E-26	0.00E+00
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	7.14E-03	No		13	vapor			8.69E-12	6.21E-14	6.21E-14
173	79-00-5	1,1,2-Trichloroethane	7.14E-03	No		17	vapor			3.76E-44	2.69E-46	0.00E+00
174	79-01-6	Trichloroethylene	7.14E-03	Yes	20	20	vapor	7.47E-53	1.05E-50		7.47E-53	0.00E+00
175	79-09-4	Propionic acid	4.29E-02	No		8	vapor			1.04E-22	4.45E-24	0.00E+00
176	79-10-7	2-Propenoic acid	5.72E-02	No		8	vapor			1.04E-22	5.94E-24	0.00E+00
177	79-20-9	Methyl acetate	4.29E-02	No		14	vapor			3.67E-27	1.57E-28	0.00E+00
178	79-34-5	1,1,2,2-Tetrachloroethane	1.35E-05	No		16	vapor			2.04E-41	2.75E-46	0.00E+00
179	83-32-9	Acenaphthene	4.29E-02	Yes	15	15	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
180	84-66-2	Diethyl phthalate	4.29E-02	Yes	8	8	vapor	4.26E-24	9.94E-23		4.26E-24	0.00E+00
181	84-74-2	Dibutyl phthalate	4.29E-02	Yes	31	31	particle bound	4.43E-10	1.03E-08		4.43E-10	4.43E-10
182	85-01-8	Phenanthrene	4.29E-02	No		13	particle bound			8.69E-12	3.73E-13	3.73E-13
183	85-68-7	Butylbenzyl phthalate	4.29E-02	No		31	particle bound			1.03E-08	4.43E-10	4.43E-10
184	86-73-7	Fluorene	4.29E-02	No		14	vapor			3.67E-27	1.57E-28	0.00E+00
185	87-68-3	Hexachlorobutadiene	7.14E-03	Yes	20	20	vapor	5.34E-54	7.47E-52		5.34E-54	0.00E+00
186	88-06-2	2,4,6-Trichlorophenol	4.29E-02	No		10	vapor			1.98E-09	8.48E-11	8.48E-11
187	88-72-2	2-Nitrotoluene	7.14E-03	No		12	vapor			4.60E-38	3.29E-40	0.00E+00
188	88-75-5	2-Nitrophenol	4.29E-02	No		12	vapor			4.60E-38	1.97E-39	0.00E+00
189	88-89-1	Picric acid	4.29E-02	Yes	2	2	#N/A	0.00E+00	0.00E+00		0.00E+00	0.00E+00
190	91-20-3	Naphthalene	1.43E-03	Yes	16	16	vapor	2.14E-44	1.49E-41		2.14E-44	0.00E+00
191	91-22-5	Quinoline	4.29E-02	No		9	vapor			0.00E+00	0.00E+00	0.00E+00
192	91-58-7	2-Chloronapthalene	4.29E-02	No		16	vapor			2.04E-41	8.73E-43	0.00E+00
193	92-52-4	1,1'-Biphenyl	2.86E-02	No		16	vapor			2.04E-41	5.82E-43	0.00E+00
194	92-93-3	4-Nitrobiphenyl	4.29E-02	No		10	particle bound			1.98E-09	8.48E-11	8.48E-11
195	95-13-6	Indene	4.29E-02	No		18	vapor			0.00E+00	0.00E+00	0.00E+00
196	95-47-6	o-Xylene	2.86E-03	No		19	vapor			6.10E-46	1.74E-48	0.00E+00
197	95-48-7	o-Cresol (2-Methylphenol)	7.14E-03	No		9	vapor			0.00E+00	0.00E+00	0.00E+00
198	95-49-8	2-Chlorotoluene	4.29E-02	No		19	vapor			6.10E-46	2.61E-47	0.00E+00
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	2.86E-03	Yes	18	18	vapor	0.00E+00	0.00E+00		0.00E+00	0.00E+00
200	95-57-8	2-Chlorophenol	4.29E-02	No		11	vapor			4.49E-24	1.92E-25	0.00E+00
201	95-95-4	2,4,5-Trichlorophenol	4.29E-02	No		9	vapor			0.00E+00	0.00E+00	0.00E+00
202	96-22-0	3-Pentanone	1.43E-02	No		14	vapor			3.67E-27	5.25E-29	0.00E+00
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	4.29E-02	No		19	vapor			6.10E-46	2.61E-47	0.00E+00
204	98-51-1	p-tert-Butyltoluene	4.29E-02	No		21	vapor			4.38E-53	1.88E-54	0.00E+00
205	98-82-8	Cumene	4.29E-02	No		20	vapor			5.60E-51	2.40E-52	0.00E+00
206	98-83-9	alpha-Methylstyrene	7.14E-03	No		19	vapor			6.10E-46	4.35E-48	0.00E+00
207	98-86-2	Acetophenone	2.86E-02	Yes	11	11	vapor	2.82E-25	9.88E-24		2.82E-25	0.00E+00
208	98-95-3	Nitrobenzene	2.86E-02	No		12	vapor			4.60E-38	1.31E-39	0.00E+00
209											3.70E-07	

Adjusted Performance Factors

Group	PF
1	3.34E-08
2	0.00E+00
3	3.39E-27
4	4.53E-23
5	0.00E+00
6	0.00E+00
7	3.38E-08
8	1.04E-22
9	0.00E+00
10	1.98E-09
11	4.49E-24
12	4.60E-38
13	8.69E-12
14	3.67E-27
15	1.02E-40
16	2.04E-41
17	3.76E-44
18	0.00E+00
19	6.10E-46
20	5.60E-51
21	4.38E-53
22	2.28E-54
23	0.00E+00
24	0.00E+00
25	0.00E+00
26	0.00E+00
27	0.00E+00
28	0.00E+00
29	0.00E+00
30	1.85E-08
31	1.03E-08
32	9.51E-10
33	2.85E-10
34	0.00E+00
35	6.95E-13

Coplanar PCBs

CAS #	Name	PJV32 g/sec	Corrected PJV32 g/sec
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	8.62E-19	0.00E+00
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	8.62E-19	0.00E+00
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	8.62E-19	0.00E+00
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	8.62E-19	0.00E+00
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	8.62E-19	0.00E+00
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	8.62E-19	0.00E+00
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	8.62E-19	0.00E+00
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	8.62E-19	0.00E+00
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	8.62E-19	0.00E+00
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	8.62E-19	0.00E+00
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	8.62E-19	0.00E+00
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	8.62E-19	0.00E+00
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	8.62E-19	0.00E+00
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	8.62E-19	0.00E+00
1336-36-3	Polychlorinated biphenyls (PCBs)	1.20E-15	
1336-36-3	UnCorrected (for coplanar PCBs)	1.21E-15	

Correction for Coplanar PCBs
0.99 as parent
0.01 as coplanar sum

CALCULATION SHEET

	A	B	C	D	E	F	G	H	I	J	K
1	Table B-13	PJV34 - Abated HLW PJM/RFD				Fraction		PJV34	PJV34		Corrected
2			PJV32		Fv	vapor	Fraction	g/sec	g/sec	PJV34	PJV34
3	CAS #	COPC	g/sec	Phase		adjusted	particle	vapor	particle	g/sec	g/sec
4	100-00-5	p-Nitrochlorobenzene	5.65E-11	vapor	1.000	1.000	0.000	5.65E-11	0.00E+00	5.65E-11	5.65E-11
5	100-21-0	p-Phthalic acid	1.43E-09	vapor	1.000	1.000	0.000	1.43E-09	0.00E+00	1.43E-09	1.43E-09
6	100-41-4	Ethyl benzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7	100-42-5	Styrene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	10061-01-5	cis-1,3-Dichloropropene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	10061-02-6	trans-1,3-Dichloropropene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10	101-55-3	4-Bromophenylphenyl ether	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	101-84-8	Diphenyl ether	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12	106-35-4	3-Heptanone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
13	106-42-3	p-Xylene (Dimethyl benzene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
14	106-46-7	1,4-Dichlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
15	106-88-7	1,2-Epoxybutane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
16	106-93-4	Ethylene dibromide (Dibromethane)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
17	106-97-8	Butane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
18	106-99-0	1,3-Butadiene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
19	107-02-8	Acrolein	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
20	107-05-1	3-Chloropropene (Allyl chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
21	107-06-2	1,2-Dichloroethane (Ethylene chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
22	107-12-0	Propionitrile	6.21E-14	vapor	1.000	1.000	0.000	6.21E-14	0.00E+00	6.21E-14	6.21E-14
23	107-13-1	Acrylonitrile	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
24	107-18-6	2-Propene-1-ol	8.48E-11	vapor	1.000	1.000	0.000	8.48E-11	0.00E+00	8.48E-11	8.48E-11
25	107-31-3	Formic acid, methyl ester	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
26	107-66-4	Dibutylphosphate	0.00E+00	particle bound	0.995	0.995	0.005	0.00E+00	0.00E+00	0.00E+00	0.00E+00
27	107-87-9	2-Pentanone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
28	108-03-2	1-Nitropropane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
29	108-05-4	Vinyl acetate	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
30	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
31	108-20-3	Bis(isopropyl)ether	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32	108-38-3	m-Xylene (Dimethyl benzene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
33	108-39-4	m-Cresol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
34	108-87-2	Methylcyclohexane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
35	108-88-3	Toluene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
36	108-90-7	Chlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
37	108-93-0	Cyclohexanol	1.41E-11	vapor	1.000	1.000	0.000	1.41E-11	0.00E+00	1.41E-11	1.41E-11
38	108-94-1	Cyclohexanone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39	108-95-2	Phenol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	109-66-0	n-Pentane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	109-99-9	Tetrahydrofuran	2.48E-14	vapor	1.000	1.000	0.000	2.48E-14	0.00E+00	2.48E-14	2.48E-14
42	110-12-3	5-Methyl-2-hexanone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
43	110-43-0	2-Heptanone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
44	110-54-3	n-Hexane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
45	110-62-3	n-Valeraldehyde	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
46	110-82-7	Cyclohexane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
47	110-83-8	Cyclohexene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	110-86-1	Pyridine	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	111-65-9	n-Octane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	111-76-2	Ethylene glycol monobutyl ether	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51	111-84-2	n-Nonane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	7.93E-10	particle bound	0.130	0.130	0.870	1.03E-10	3.45E-15	1.03E-10	1.03E-10
53	117-84-0	n-Dioctyl phthalate	4.08E-11	particle bound	0.852	0.852	0.148	3.47E-11	3.02E-17	3.47E-11	3.47E-11
54	120-12-7	Anthracene	7.45E-13	particle bound	0.998	0.998	0.002	7.44E-13	7.45E-21	7.44E-13	7.44E-13
55	120-82-1	1,2,4-Trichlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56	120-83-2	2,4-Dichlorophenol	8.48E-11	vapor	1.000	1.000	0.000	8.48E-11	0.00E+00	8.48E-11	8.48E-11
57	121-44-8	Triethylamine	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58	121-69-7	Dimethylaniline	6.21E-14	vapor	1.000	1.000	0.000	6.21E-14	0.00E+00	6.21E-14	6.21E-14
59	122-39-4	N,N-Diphenylamine	5.65E-11	vapor	1.000	1.000	0.000	5.65E-11	0.00E+00	5.65E-11	5.65E-11
60	123-19-3	4-Heptanone	2.48E-14	vapor	1.000	1.000	0.000	2.48E-14	0.00E+00	2.48E-14	2.48E-14
61	123-38-6	n-Propionaldehyde	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62	123-51-3	3-Methyl-1-butanol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
63	123-86-4	Acetic acid n-butyl ester	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64	123-91-1	1,4-Dioxane	2.83E-12	vapor	1.000	1.000	0.000	2.83E-12	0.00E+00	2.83E-12	2.83E-12
65	126-73-8	Tributyl phosphate	9.66E-10	particle bound	0.996	0.996	0.004	9.62E-10	1.93E-17	9.62E-10	9.62E-10
66	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	127-18-4	Perchloroethylene (tetrachloroethylene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	127-19-5	N,N-Dimethylacetamide	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
69	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	1.36E-11	vapor	1.000	1.000	0.000	1.36E-11	0.00E+00	1.36E-11	1.36E-11
70	129-00-0	Pyrene	2.45E-11	particle bound	0.994	0.994	0.006	2.43E-11	7.34E-19	2.43E-11	2.43E-11
71	1321-64-8	Pentachloronaphthalene	0.00E+00	particle bound	0.971	0.971	0.029	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	1321-65-9	Trichloronaphthalene	0.00E+00	particle bound	0.999	0.999	0.001	0.00E+00	0.00E+00	0.00E+00	0.00E+00
73	132-64-9	Dibenzofuran	0.00E+00	particle bound	0.999	0.999	0.001	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74	1335-87-1	Hexachloronaphthalene	0.00E+00	particle bound	0.984	0.984	0.016	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75	1335-88-2	Tetrachloronaphthalene	0.00E+00	particle bound	0.991	0.991	0.009	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76	1336-36-3	Polychlorinated biphenyls (PCBs)	1.20E-15	vapor	1.000	1.000	0.000	1.20E-15	0.00E+00	1.20E-15	1.20E-15
77	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	141-79-7	4-Methyl-3-penten-2-one	3.73E-13	vapor	1.000	1.000	0.000	3.73E-13	0.00E+00	3.73E-13	3.73E-13
79	142-82-5	n-Heptane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
80	144-62-7	Oxalic acid	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	156-60-5	trans-1,2-Dichloroethylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
82	1634-04-4	Methyl tert-butyl ether	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83	189-55-9	Dibenzo[a,i]pyrene	0.00E+00	particle	0.000	0.000	1.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	189-64-0	Dibenzo[a,h]pyrene	0.00E+00	particle	0.000	0.000	1.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85	191-24-2	Benzo(g,h,i)perylene	7.93E-10	particle bound	0.065	0.065	0.935	5.15E-11	3.71E-15	5.15E-11	5.15E-11
86	191-30-0	Benzo[a,l]pyrene	0.00E+00	particle	0.000	0.000	1.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	192-65-4	Dibenzo[a,e]pyrene	0.00E+00	particle	0.000	0.000	1.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88	193-39-5	Indeno(1,2,3-cd)pyrene	5.96E-15	particle	0.000	0.000	1.000	0.00E+00	2.98E-20	2.98E-20	0.00E+00
89	206-44-0	Fluoranthene	0.00E+00	particle bound	0.992	0.992	0.008	0.00E+00	0.00E+00	0.00E+00	0.00E+00
90	208-96-8	Acenaphthylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91	2234-13-1	Octachloronaphthalene	0.00E+00	particle bound	0.629	0.629	0.371	0.00E+00	0.00E+00	0.00E+00	0.00E+00
92	224-42-0	Dibenz[a,j]acridine	0.00E+00	particle bound	0.241	0.241	0.759	0.00E+00	0.00E+00	0.00E+00	0.00E+00
93	226-36-8	Dibenz[a,h]acridine	0.00E+00	particle bound	0.285	0.285	0.715	0.00E+00	0.00E+00	0.00E+00	0.00E+00
94	25551-13-7	Trimethyl benzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95	26140-60-3	Terphenyls	0.00E+00	particle bound	0.872	0.872	0.128	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	27154-33-2	Trichlorofluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	287-92-3	Cyclopentane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	3697-24-3	5-Methylchrysene	0.00E+00	particle bound	0.823	0.823	0.177	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	3825-26-1	Ammonium perfluorooctanoate	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101	50-00-0	Formaldehyde	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102	50-32-8	Benzo(a)pyrene	1.00E-09	particle bound	0.290	0.290	0.710	2.91E-10	3.57E-15	2.91E-10	2.91E-10
103	53-70-3	Dibenzo(a,h)anthracene	9.18E-10	particle bound	0.054	0.054	0.946	4.96E-11	4.34E-15	4.96E-11	4.96E-11
104	540-59-0	1,2-Dichloroethylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
105	540-84-1	2,2,4-Trimethylpentane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106	541-73-1	1,3-Dichlorobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107	56-23-5	Carbon tetrachloride	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108	563-80-4	3-Methyl-2-butanone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109	56-49-5	3-Methylcholanthrene	0.00E+00	particle bound	0.364	0.364	0.636	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110	57-14-7	1,1-Dimethylhydrazine	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111	58-90-2	2,3,4,6-Tetrachlorophenol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
112	591-78-6	2-Hexanone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
113	59-50-7	4-Chloro-3-methylphenol	4.08E-11	vapor	1.000	1.000	0.000	4.08E-11	0.00E+00	4.08E-11	4.08E-11
114	59-89-2	N-Nitrosomorpholine	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
115	602-87-9	5-Nitroacenaphthene	0.00E+00	particle bound	0.997	0.997	0.003	0.00E+00	0.00E+00	0.00E+00	0.00E+00
116	60-29-7	Ethyl ether	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	603-34-9	Triphenylamine	8.15E-11	vapor	1.000	1.000	0.000	8.15E-11	0.00E+00	8.15E-11	8.15E-11
118	60-34-4	Methylhydrazine	1.41E-11	vapor	1.000	1.000	0.000	1.41E-11	0.00E+00	1.41E-11	1.41E-11
119	60-35-5	Acetamide	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	8.48E-11	vapor	1.000	1.000	0.000	8.48E-11	0.00E+00	8.48E-11	8.48E-11
121	624-83-9	Methyl isocyanate	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122	627-13-4	Nitric acid, propyl ester	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
124	630-20-6	1,1,1,2-Tetrachloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
125	64-17-5	Ethyl alcohol	1.41E-11	vapor	1.000	1.000	0.000	1.41E-11	0.00E+00	1.41E-11	1.41E-11
126	64-18-6	Formic acid	3.62E-07	vapor	1.000	1.000	0.000	3.62E-07	0.00E+00	3.62E-07	3.62E-07
127	64-19-7	Acetic acid	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
128	67-56-1	Methyl alcohol (Methanol)	1.41E-11	vapor	1.000	1.000	0.000	1.41E-11	0.00E+00	1.41E-11	1.41E-11
129	67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
130	67-64-1	2-Propanone (Acetone)	1.24E-13	vapor	1.000	1.000	0.000	1.24E-13	0.00E+00	1.24E-13	1.24E-13
131	67-66-3	Chloroform	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
132	67-72-1	Hexachloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
133	684-16-2	Hexafluoroacetone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
134	71-23-8	n-Propyl alcohol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
135	71-36-3	n-Butyl alcohol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
136	71-43-2	Benzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
137	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
138	74-83-9	Bromomethane (Methyl bromide)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
139	74-87-3	Chloromethane (Methyl chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
140	74-97-5	Bromochloromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
141	74-99-7	Methylacetylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
142	75-00-3	Chloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
143	75-01-4	Vinyl chloride (1-Chloroethene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
144	75-05-8	Acetonitrile	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
145	75-07-0	Acetaldehyde	3.73E-13	vapor	1.000	1.000	0.000	3.73E-13	0.00E+00	3.73E-13	3.73E-13
146	75-09-2	Dichloromethane (Methylene chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
147	75-12-7	Formamide	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
148	75-15-0	Carbon disulfide	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
149	75-21-8	Ethylene oxide (Oxirane)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
150	75-27-4	Bromodichloromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
151	75-34-3	1,1-Dichloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
152	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
153	75-43-4	Dichlorofluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
154	75-45-6	Chlorodifluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
155	75-50-3	Trimethylamine	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
156	75-52-5	Nitromethane	3.73E-13	vapor	1.000	1.000	0.000	3.73E-13	0.00E+00	3.73E-13	3.73E-13
157	75-55-8	2-Methylaziridine	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
158	75-61-6	Difluorodibromomethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
159	75-63-8	Trifluorobromomethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
160	75-65-0	2-Methyl-2-propanol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
161	75-69-4	Trichlorofluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
162	75-71-8	Dichlorodifluoromethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
163	76-03-9	Trichloroacetic acid	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
164	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
165	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
166	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
167	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
168	76-15-3	Chloropentafluoroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
169	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
170	78-87-5	1,2-Dichloropropane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
171	78-92-2	1-Methylpropyl alcohol (2-Butanol)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
172	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	6.21E-14	vapor	1.000	1.000	0.000	6.21E-14	0.00E+00	6.21E-14	6.21E-14
173	79-00-5	1,1,2-Trichloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
174	79-01-6	Trichloroethylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
175	79-09-4	Propionic acid	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
176	79-10-7	2-Propenoic acid	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
177	79-20-9	Methyl acetate	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00
178	79-34-5	1,1,2,2-Tetrachloroethane	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00

M	N	O	P
Coplanar PCBs		PJV34	Corrected PJV34
		g/sec	g/sec
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	8.62E-19	0.00E+00
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (TCB)	8.62E-19	0.00E+00
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	8.62E-19	0.00E+00
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	8.62E-19	0.00E+00
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl	8.62E-19	0.00E+00
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl	8.62E-19	0.00E+00
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 157)	8.62E-19	0.00E+00
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	8.62E-19	0.00E+00
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	8.62E-19	0.00E+00
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	8.62E-19	0.00E+00
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	8.62E-19	0.00E+00
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	8.62E-19	0.00E+00
70362-50-4	3,4,4',5-Tetrachlorobiphenyl	8.62E-19	0.00E+00
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	8.62E-19	0.00E+00
1336-36-3	Polychlorinated biphenyls (PCBs)	1.20E-15	
1336-36-3	UnCorrected (for coplanar PCBs)	1.21E-15	

Correction for Coplanar PCBs
0.99 as parent
0.01 as coplanar sum

General DFs

	HEPA 1	HEPA 2	Total
Vapor	1	1	1
Particle	2000	100	200,000

CALCULATION SHEET

BY: E. Berrios
DATE: 01/09/06

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00005
SHEET REV. C
SHEET NO. B-19

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Table B-13	PJV34 - Abated HLW PJWRFD				Fraction		PJV34	PJV34		Corrected								
2			PJV32		Fv	vapor	Fraction	g/sec	g/sec	PJV34	PJV34								
3	CAS #	COPC	g/sec	Phase		adjusted	particle	vapor	particle	g/sec	g/sec					Corrected			
179	83-32-9	Acenaphthene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
180	84-66-2	Diethyl phthalate	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
181	84-74-2	Dibutyl phthalate	4.43E-10	particle bound	0.994	0.994	0.006	4.41E-10	1.33E-17	4.41E-10	4.41E-10								
182	85-01-8	Phenanthrene	3.73E-13	particle bound	0.999	0.999	0.001	3.72E-13	1.86E-21	3.72E-13	3.72E-13								
183	85-68-7	Butylbenzyl phthalate	4.43E-10	particle bound	0.948	0.948	0.052	4.20E-10	1.15E-16	4.20E-10	4.20E-10								
184	86-73-7	Fluorene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
185	87-68-3	Hexachlorobutadiene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
186	88-06-2	2,4,6-Trichlorophenol	8.48E-11	vapor	1.000	1.000	0.000	8.48E-11	0.00E+00	8.48E-11	8.48E-11								
187	88-72-2	2-Nitrotoluene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
188	88-75-5	2-Nitrophenol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
189	88-89-1	Picric acid	0.00E+00	#N/A	0.934	0.934	0.066	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
190	91-20-3	Naphthalene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
191	91-22-5	Quinoline	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
192	91-58-7	2-Chloronaphthalene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
193	92-52-4	1,1'-Biphenyl	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
194	92-93-3	4-Nitrobiphenyl	8.48E-11	particle bound	0.999	0.999	0.001	8.47E-11	4.24E-19	8.47E-11	8.47E-11								
195	95-13-6	Indene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
196	95-47-6	o-Xylene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
197	95-48-7	o-Cresol (2-Methylphenol)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
198	95-49-8	2-Chlorotoluene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
199	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
200	95-57-8	2-Chlorophenol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
201	95-95-4	2,4,5-Trichlorophenol	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
202	96-22-0	3-Pentanone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
203	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
204	98-51-1	p-tert-Butyltoluene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
205	98-82-8	Cumene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
206	98-83-9	alpha-Methylstyrene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
207	98-86-2	Acetophenone	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
208	98-95-3	Nitrobenzene	0.00E+00	vapor	1.000	1.000	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00								
209										3.67E-07									

Appendix C

Calculation: Integrated Emissions Baseline Report Non-modeled Inorganic and Radionuclide Constituents Air Emission Rates Estimation

24590-WTP-M4C-FRP-00003, Rev D

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R10661300

Calculation Cover Sheet

ISSUED BY
RPP-WTP PDC

Sheet i

RIVER PROTECTION PROJECT-WASTE TREATMENT PLANT		JOB NO.: 24590	
CALC NO. 24590-WTP-M4C-FRP-00003	GROUP Process Eng.		FACILITY Central
SUBJECT Integrated Emissions Baseline Report Non-Modeled Inorganic and Radionuclide Constituents Air Emission Rates Estimation			
CALCULATION STATUS DESIGNATION	☒ PRELIMINARY ☐ SUPERSEDED BY:	☐ COMMITTED	☐ CONFIRMED ☐ CANCELLED
SOFTWARE APPLICATIONS ☒ N/A			
QAS: ☐ YES ☐ NO	PROGRAM NAME:		VERSION/RELEASE NO.:

RECORD OF REVISIONS

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	ORIGINATOR	CHECKED	APPROVED/ ACCEPTED	DATE
A	Initial Issue	69	69	E. Berríos	J. Cook/C. Nguyen	O. Block	03/13/03
B	Revision to incorporate new emissions profile	76	D-16	E. Berríos	J. Cook/C. Leung	O. Block	12/12/03
C	Revision to support 2005 Rad NOC Permit Update	86	D-16	E. Berríos	D. Blumenkranz	S. Saunders	01/12/05
D	Revision to incorporate new air emissions profile	91	D-16	E. Berríos EB	D. Blumenkranz DB	S. Saunders SSA	01/05/06

Notes/Comments

Calculations were performed on a Compaq Personal Computer using the software Microsoft Excel® 2000.

This calculation does not affect any structures, systems, components, or services of the WTP.

This revision of the calculation is a complete rewrite, therefore no revision bars are used.

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1 Objective

The objective of this calculation is to estimate the Waste Treatment Plant (WTP) emission rates of inorganic and radionuclide constituents that are not modeled in the Steady-State Flowsheet Model (SSFM) with the results of compounds that are modeled in the SSFM. The results from this calculation will be reported in the next revision of the *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-03-008).

2 Inputs

- Emission estimates for the non-modeled compounds are based on the results from their representative compounds as determined in 24590-WTP-RPT-PO-03-008 Section 5.2. Rhodium (Rh) is a newly tracked constituent therefore is being deleted from this calculation. A summary of the non-modeled compounds and their representative constituents is presented below. This information is based on Table 5 of 24590-WTP-RPT-PO-03-008 (next revision of this document will reflect the deletion of Rh as a non-modeled constituent).

Representative Compounds for Inorganics and Radionuclides

Compound	Representative Compound	Compound	Representative Compound
Be	Zr+4	134Cs	137Cs
CN	PO4-3	137mBa	137Cs
Co	60Co	226Ra	Zr+4
Mo	Bi+3	227Ac	Zr+4
Sb	125Sb	228Ra	Zr+4
Se	F-	229Th	232Th
Sn	126Sn	231Pa	Zr+4
Ta	Zr+4	232U	233U
Tl	F-	59Ni	63Ni
U	234U	79Se	F-
V	Bi+3	90Y	90Sr
W	Zr+4	93Zr	Zr+4
Y	90Sr	93mNb	Zr+4
106Ru	F-	242Cm	243Cm
113mCd	Cd+2	-	-

- Feed concentration for nonradioactive Tin (Sn) is the same as the feed concentration for its radioactive counterpart, ^{126}Sn. Conversion factor for Ci to kg for radioactive Sn is: 29 Ci Sn/kg Sn (see Attachment A from http://www.ead.anl.gov/pub/doc/Tbl2RadProp.pdf). Feed concentration for 126Sn is 4.03E-06 Ci/mol Na for LAW and 1.82E-04 Ci/mol Na for HLW (24590-WTP-M4C-FRP-00001, Section 8). Conversion factor from Bq to Ci is 3.7E+10 Bq/Ci (Perry's, 1984, Table 1-4).
- Non-modeled constituents feed concentrations are specified in the *Updated Emissions Run Feed Vector* (24590-WTP-M4C-FRP-00001, Rev. 0A, Section 8), which can be found in Appendix D of 24590-WTP-RPT-PO-03-008. A summary of these feed concentrations is presented below.

Non-Modeled Compounds Feed Concentrations

Analyte	LAW	HLW
	mol/mol Na	mol/mol Na
Be	1.56E-05	2.60E-04
CN	1.66E-05	7.10E-05
Co	1.28E-05	8.18E-05
Mo	6.45E-05	6.86E-05
Sb	1.27E-05	2.06E-05
Se	3.36E-05	5.48E-05
Ta	1.13E-06	8.92E-04
Tl	9.13E-06	2.41E-05
U	5.23E-05	1.09E-02
V	2.02E-05	8.16E-05
W	9.80E-06	1.72E-04
Y	2.19E-05	1.98E-04
	Bq/mol Na	Bq/mol Na
106Ru	1.17E+05	7.02E+05
113mCd	1.81E+05	5.31E+06
134Cs	1.96E+06	1.69E+06
137mBa	6.52E+09	4.80E+09
226Ra	3.48E-01	7.07E+00
227Ac	2.71E+01	2.77E+04
228Ra	4.13E+02	2.03E+04
229Th	1.36E+01	7.58E+03
231Pa	2.85E+02	2.33E+03
232U	3.60E+01	3.10E+04
59Ni	9.55E+04	4.13E+05
79Se	4.60E+03	7.18E+04
90Y	3.74E+08	7.57E+10
93Zr	2.66E+05	2.86E+06
93mNb	1.64E+05	1.55E+06
242Cm	1.05E+04	3.40E+05

- Streams analyzed in this calculation are FRP01, FRP14, PJV04, LFP04, PVP01, HFP03, LCP01, LFP01, LMP06, LVP01, HMP06, HOP10, PJV32, PJV34, PVP12, PJV11, LVP18, HOP31, HLP09 (for glass former stream Zr+4 amount), and HFP01 (for glass former stream Zr+4 amount). Attachment C shows the stream reports for these streams. For stream LVP01, which is the LAW Vessel Vents, the total mass flow through this stream is the summation of streams LFP06, RLD34, RLD33, and RLD32.
- Feed stream to Pretreatment is based on a minimum sodium molarity of less than 5 (i.e., <5 mol Na /l) as with this condition, the feed is treated through the feed evaporator as specified in Section 6 of the *Basis of Design* (24590-WTP-DB-ENG-01-001). The molarity used for air emissions purposes is 4 M Na.
- Molecular weights (Perry's, 1984)

Analyte	MW g/mol	Analyte	MW g/mol
Be	9.0	113mCd	113
CN	26.0	134Cs	134
Co	58.9	137mBa	137
F	19.0	226Ra	226
Mo	95.9	227Ac	227
Sb	121.7	228Ra	228
Se	78.9	229Th	229
Sn	118.7	231Pa	231
Ta	180.9	232U	232
Tl	204.3	59Ni	59
U	238.0	79Se	79
V	50.9	90Y	90
W	183.8	93Zr	93
Y	88.9	93mNb	93
106Ru	106	242Cm	242

- The DFs used for each non-modeled constituent for the Pretreatment PVV system, the Pretreatment PJV system, LAW LMP, LOP, and LVP systems, and the HLW HMP, HOP, and PJV systems are used to calculate the final stack air emission rates. All DFs are the particulate DFs for each system as all these constituents are expected to be particles in the offgas systems. The DFs are presented below. When only one DF is given for a particular unit operation, it means that all constituents have the same DF.
  - Pretreatment Vessel Vent (PVV) (24590-WTP-RPT-PO-03-008)
    - Caustic scrubber: 3.5
    - HEME: 200
    - HEPA: 200,000
    - Thermal Oxidizer: 1
    - Carbon Bed: 1
  - Pretreatment Pulse-jet system (PJV) (24590-WTP-RPT-PO-03-008)
    - Demister: 5
    - HEPA: 200,000
  - LAW melter and primary offgas system (LMP/LOP) (CCN 128548)

Analyte	LAW Melter DF	LAW SBS DF	LAW WESP DF
Be	200	40	11
CN	40	6.5	20
Co	200	3.2	20
Mo	80	8.7	480
Sb	80	3.7	12
Se	1.7	8.4	100
Sn	200	40	11
Ta	250	73	50
Tl	6	73	100
U	200	40	11
V	80	5	860
W	250	73	50

Analyte	LAW Melter DF	LAW SBS DF	LAW WESP DF
Y	100	40	11
106Ru	3.9	3.6	4
113mCd	10	1.6	80
134Cs	2	2.4	30
137mBa	2	2.4	30
226Ra	6	73	50
227Ac	1,370	73	50
228Ra	6	73	50
229Th	250	73	50
231Pa	1,370	73	50
232U	200	40	11
59Ni	89	5.9	20
79Se	1.7	8	100
90Y	100	40	11
93Zr	300	17	10
93mNb	1,000	73	50
242Cm	200	40	11

- LAW secondary offgas system (LVP) (24590-WTP-RPT-PO-03-008)
  - HEPA: 200,000
  - Sulfur impregnated carbon bed: 1
  - SCO: 1
  - SCR: 1
  - Caustic scrubber: 1
- HLW melter and primary offgas system (HMP/HOP) (CCN 128548)

Analyte	HLW Melter DF	HLW SBS DF	HLW WESP DF	HLW HEME DF
Be	130	40	11	90
CN	40	18.1	20	90
Co	130	3.2	20	100
Mo	64.6	8.7	200	490
Sb	100	3.7	12	90
Se	2.1	5.9	200	490
Sn	130	40	11	90
Ta	130	427	20	470
Tl	130	427	20	470
U	130	40	11	90
V	130	4.6	370	500
W	130	427	20	470
Y	100	40	11	90
106Ru	3.9	3.6	20	90
113mCd	10	1.6	80	110
134Cs	26.6	2.4	30	100

Analyte	HLW Melter DF	HLW SBS DF	HLW WESP DF	HLW HEME DF
137mBa	26.6	2.4	30	100
226Ra	130	427	20	470
227Ac	130	427	20	470
228Ra	130	427	20	470
229Th	130	427	20	470
231Pa	130	427	20	470
232U	130	40	11	90
59Ni	76.2	5.9	20	90
79Se	2.1	5.9	200	490
90Y	100	40	11	90
93Zr	81	30	10	90
93mNb	130	427	20	470
242Cm	130	40	11	90

- HLW secondary offgas system (HOP) (24590-WTP-RPT-PO-03-008)
  - HEPA: 200,000
  - Sulfur impregnated carbon bed: 1
  - Silver mordenite: 1
  - SCO: 1
  - SCR: 1
- A tolerance of 1.00E-15 is applied to all the values calculated at any point in this calculation (i.e. 1.00E-15 g/sec for inorganic constituents and 1.00E-15 Ci/d or Ci/yr for radionuclide constituents). If any value calculated is below this tolerance it is considered to be zero. This tolerance point was agreed upon by E&NS and Process Engineering. It is considered adequate as mass rates and rad rates below this range are difficult to measure and/or detect.

3 Background

The *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-03-008) estimated air emissions from the Hanford Tank Waste Treatment and Immobilization Plant (WTP) by using the SSFM. Not all reported emissions constituents were calculated by using the SSFM as inclusion of all the constituents would increase the complexity of the model. Instead, constituents were separated into groups and representatives from each group were selected and actually tracked in the SSFM. This calculation generates the estimated air emissions for the constituents not tracked in the SSFM.

4 Applicable Codes and Standards

NA

5 Methodology

The following methodology was used to estimate the emissions for the constituents not modeled in the SSFM.

- HLW and LAW feed concentrations in mol/mol Na (for inorganics) and Bq/mol Na (for radionuclides) for the non-represented compounds in the supernate and solids were obtained from Section 8 of the *Updated Emissions Run Feed Vector* (24590-WTP-M4C-FRP-00001, Rev. 0A) which can be found in Appendix D of 24590-WTP-RPT-PO-03-008. These are presented in Section 2, 3rd bullet.
- LAW and HLW feed streams conditions to Pretreatment (Streams # FRP01 and FRP14) were obtained from the model run request titled *2005 Air Emissions Profile* (24590-WTP-MRQ-PO-05-0049). These are presented in Attachment C. As LAW feed is also introduced through the HLW feed stream (supernatant part of the stream), the total LAW feed rate was calculated by adding the FRP01 feed rate with the FRP14 feed rate. HLW solids feed rate is based on the amount of solids in the feed stream FRP14. As the volumetric flowrate given in the FRP14 stream report only represents the supernate (i.e. LAW feed), the HLW solids feed rate needs to be estimated the following way:
  - The wt% solids in the stream was calculated by dividing the total solids mass rate by the total stream mass rate.
  - This wt% value was applied to the stream density to obtain an estimated corrected density for the stream. For example, if the reported stream density was 1.24 g/cm^3 and the wt% solids in the stream was 10%, then the corrected stream density would be:
    1.24 g/cm^3 / (1 - 0.10) = 1.38 g/cm^3
  - The solids density is then calculated using the following formula:
    $$\rho_{stream} = \rho_{liquids} \times wt\%_{liquids} + \rho_{solids} \times wt\%_{solids}$$
    Solving for solids density gives,
    $$\rho_{solids} = \frac{\rho_{stream} - \rho_{liquids} \times wt\%_{liquids}}{wt\%_{solids}}$$
    Therefore, for the example above, it would be:
    $$\rho_{solids} = \frac{1.38\frac{g}{cm^3} - 1.24\frac{g}{cm^3} \times (1-0.10)}{0.10} = 2.64\frac{g}{cm^3}$$

  As HLW and LAW feeds are mixed together in Pretreatment, when the performance factor of representative constituents is calculated, the total feed rate for the constituent (HLW + LAW feed rates) was used.
- Non-modeled constituents feed rates were calculated based on stream volumetric flowrate (in liters/hr), their feed concentration (in mol/mol Na or Bq/mol Na), and feed sodium molarity. Feed rates in the supernate and solids phase were added together to obtain the total feed rate to the plant (streams # FRP01 and FRP14).
- Feed rates were converted to lb/day for inorganics and Ci/day for radionuclides (streams # FRP01 and FRP14).
- Per Section 5.4 of 24590-WTP-RPT-PO-03-008, the emission rates for compounds not estimated using the SSFM are based on the emission rate of a representative analyzed compound that is chemically or physically similar. This is achieved by using a performance factor (PF) of the representative compound calculated by the following equation:

  $$\text{PF} = \frac{\text{mass/rad rate at waste feed [representative compound]}}{\text{mass/rad rate at point of interest [representative compound]}}$$

  The "mass/rad rate at the point of interest" refers to the mass/rad rate of a representative compound at various points in the process train, such as at the plant stack or the unabated emission to each offgas treatment unit. The "mass/rad rate at waste feed" refers to the mass/rad rate of each representative compound in the SSFM analyzed waste feed. The mass/rad rate for the waste feed in the above equation is the sum of HLW (stream FRP14) and LAW (stream FRP01) feed rates for the compound. Since the non-modeled constituents are

assumed to behave identically as their modeled representative constituent, the calculated PF is assumed to be the same for the non-modeled constituents. For example, the Be emission rate at any point analyzed in the WTP flowsheet would be estimated by the following equation:

$$Mass_{Be@POI} = Mass_{Be_{Feed(LAW+HLW)}} \div \frac{Mass_{Zr\,Feed(LAW+HLW)}}{Mass_{Zr\,@POI}} = \frac{Mass_{Be_{Feed}(LAW+HLW)}}{PF_{Zr@POI}}$$

Where POI = point of interest (i.e. melter feed, stack, etc)

- Once the PF was calculated, it was applied to the feed rate for the non-modeled constituent in order to obtain the mass flowrate of the constituent at that stream. This process was applied to the following streams:
  - PJV04 - PT PJV unabated stream
  - LFP04 - LAW melter feed
  - PVP01 - PT VV unabated stream
  - HFP03 - HLW melter feed
  - LMP06 - unabated LAW melter offgas
  - LVP01 - unabated LAW vessel vents (LFP06 + RLD34 + RLD33 + RLD32)
  - HMP06 - unabated HLW melter offgas
  - HOP10 - unabated HLW vessel vents

  All these streams represent the unabated offgas streams for the WTP.
- For the LAW melter feed stream (LFP04) a correction factor to any constituents represented with Zr+4 had to be applied. This was necessary as Zr+4 is added as a glass former in the LAW glass former feed stream (LFP01). This amount is higher than the actual Zr+4 in the stream thus if a correction factor is not applied, the emission rates for the non-represented constituents would be over estimated. This correction factor was calculated by dividing the Zr+4 mass rate in the LAW CRV outlet (LCP01) by the summation of the Zr+4 mass rate in the LAW CRV outlet (LCP01) plus the Zr+4 mass rate in the GFC addition (LFP01):
  Zr+4 correction factor = (LCP01)/(LCP01 + LFP01)
  This correction factor was then multiplied by the Zr+4 mass rate at the evaluated stream to obtain the feed related Zr+4 portion. Constituents affected by this correction factor are Be, Ta, W, 226Ra, 227Ac, 228Ra, 231Pa, 93Zr, 93mNb. For example, if the stream conditions for Zr+4 were the following:
  LCP01: 10 lb/day
  LFP01: 100 lb/day
  LFP04: LCP01 + LFP01 = 10 lb/day + 100 lb/day = 110 lb/day
  The correction factor, as specified above, for Zr+4 would then be:
  (10 lb/day) / (10 lb/day + 100 lb/day) = 0.091
  The Be mass rate at this point would then be calculated as stated in bullet #8 above. If, for example, this number was 1 lb/day, then the Be rate would be corrected to:
  1 lb/day * 0.091 = 0.091 lb/day
- The same Zr+4 correction applies to the HLW streams. The affected streams are the HLW MFPV feed stream (HLP09) and the HLW glass former addition stream (HFP01). The Zr+4 correction factor for HLW is:
  Zr+4 correction factor = (HLP09)/(HLP09 + HFP01)
- The air emission rates for the abated streams (PVP12, PJV34, PJV11, LVP18, and HOP31) was calculated by taking the unabated air emission rate and dividing it by the overall system DF for the constituent. For example, if a constituent on the unabated stream PVP01 had a mass rate of 10 g/sec, then the stack emission rate (at stream PVP12) would be:
  PT VV System DFs (from Section 2):
  Caustic Scrubber: 3.5
  HEME: 200
  HEPA: 200,000
  Thermal Oxidizer: 1

Carbon bed: 1
Overall DF: 3.5 x 200 x 200,000 x 1 x 1 = 1.40E+08
Stack rate: 10 g/sec ÷ 1.40E+08 = 7.14E-08 g/sec

- In the HLW and LAW facilities, there is generation of offgas in the melter (HMP06 and LMP06 respectively), which is eventually mixed with the vessel vents in the primary offgas system. Thus, for the vitrification plants, the estimation of inorganic and radionuclide constituents generation from the melter was calculated by applying the melter DFs to the streams HFP03 and LFP04. Once these were calculated the corresponding primary offgas system DFs were applied (SBS and WESP for both LAW and HLW) to obtain the treated offgas amount after the primary offgas system. After this point, the vessel vent values were added (LVP01 and HOP10) to obtain the offgas amount at the exit of the primary offgas system. From then on, the specific DFs were applied to this rate for all unit operations found from the mixing point to the stack to obtain the final stack emission rate.

6 Assumptions

Assumptions Not Requiring Verification

- Representative constituents are chemically or physically similar to the non-modeled constituents. Therefore, the mass or radioactivity rate of the two remains proportionally constant throughout the WTP flowsheet.
- This calculation is a preliminary calculation and will remain as such, as it is only used to estimate air emission rates for permitting purposes. Supporting permitting calculations are used as input to this calculation and they will also remain in the preliminary status, as confirmation is not required. This calculation will need to be revised when:
    - The *Updated Emissions Run Feed Vector* (24590-WTP-M4C-FRP-00001) calculation is updated, and/or:
    - When a new emissions profile is generated to evaluate changes in the WTP flowsheet caused by Research and Technology tests data, vendor information, or design evolution.

7 Calculations

Calculations were performed using the Microsoft Excel® 2000 spreadsheet on a Compaq PC workstation. For illustration purposes, the calculation for one inorganic (Be) and one radionuclide (^{106}Ru) is shown below. No other constituent calculations are shown, as the calculation process is the same. Calculations are shown for most of the analyzed streams. Attachment D shows the calculation for the rest of the constituents.

The general calculation setup is as follows. Fifteen spreadsheets were created, each used to calculate the emission rates from a specific stream and one that calculates the initial feed rate for all the non-modeled constituents. The 'Initial Feed' spreadsheet (Table D-1) uses the feed concentration inputs as a starting point (mol/mol Na or Bq/mol Na), and converts them to a flowrate in mol/h or Bq/h (column F for LAW, column N for HLW) based on the total feed volumetric flowrates for streams FRP01 and FRP14. Then the amount of non-radioactive Sn is calculated using the conversion factors provided in Section 2 (bullet #2) to convert the amount of 126Sn, in Bq/mol Na, to units of mol/mol Na to represent non-radioactive Sn (Cells A35 through F43). This quantity is used in the appropriate cells as the corresponding mol rate, in mol/mol Na, for non-radioactive Sn (column C for LAW, column I for HLW). Subsequent spreadsheets sum the flowrates for streams FRP01 and FRP14 from this spreadsheet's columns F and N and convert it to units of lb/d or Ci/d.

The first stream emission rate calculation is stream PJV04 and can be found in the spreadsheet titled 'UnFRP01-PJV04' (Table D-2). This spreadsheet uses a vertical lookup function to input the appropriate representative

constituent stream feed rate, in lb/d or Ci/d, from the stream reports that correspond to streams FRP01 and FRP14 (Tables C-1 and C-2), and sums the contribution of each stream to compute a total feed rate in lb/d or Ci/d (column G). This quantity is then used as an input in subsequent unabated stream-specific spreadsheets, and corresponds to $Mass_{Rfeed}$ where "R" is the representative constituent.

Spreadsheet 'UnFRP01-PJV04' (Table D-2) and subsequent spreadsheets that calculate unabated streams emissions (Tables D-3 through D-10 except D-5 and D-8) use a vertical lookup function to input the appropriate representative constituent feed rate, in lb/d or Ci/d, from the stream reports (Tables C-3 through C-19) that correspond to the stream of interest (column I), and divides this quantity into the total feed rate (column G) to compute the appropriate PF (column J). This PF (in column J) is then divided into the feed rate (initial flowrate) (column D) of the constituent of interest to compute the constituent mass rate for the stream of interest, converted to units of g/sec, or left in units of Ci/d. This value is then compared to the tolerance value, which states that if the value is less than 1.00E-15, then the value is changed to zero. This condition is applied in the last column of every spreadsheet. At this point, for the radionuclide constituents, the units are changed to Ci/yr by multiplying the calculated value in Ci/d by 365 days per year.

Spreadsheets 'UnFRP01-LMP06' (Table D-5) and 'UnFRP01-HMP06' (Table D-8) air emissions are calculated by obtaining the LFP04 and HFP03 mass/rad rate and dividing the values by the melter DF. The LFP04 and HFP03 values are imported into column B of the 'UnFRP01-LMP06' and 'UnFRP01-HMP06' spreadsheets. The DFs specified in Section 2 are found in column C. Column D calculates the air emission rates for the melter by dividing the value in column B by the applicable DF. Finally the tolerance rule is applied to the calculated value and the result is shown in column E.

Spreadsheets 'UnFRP01-LFP04' (Table D-4) and 'UnFRP01-HFP03' (Table D-7) include the correction factor for Zr+4 added as a glass former. These spreadsheets use a vertical lookup function to input the Zr+4 mass rate as a glass former (LAW stream LFP01, HLW stream HFP01), the CRV feed for LAW (stream LCP01), and the HLW MFPV feed (stream HLP09) from the stream reports (Tables C-4, C-6, C-10, and C-11). The ratio of waste feed to melter feed for Zr+4 is then calculated (cell O21) and used as the Zr+4 correction factor. This correction factor is multiplied by the lookup values corresponding to Zr+4 (column I) to adjust the representative constituent feed rate as needed to account for GFC additions.

For spreadsheets 'AbFRP01-PVP12', 'AbFRP01-PJV11', 'AbFRP01-LVP18', 'AbFRP01-HOP31', and 'AbFRP01-PJV34', the air emission rates were calculated by importing the unabated air emission rate for the corresponding system and then applying the corresponding DF to the unabated emission rate. These rates were imported into column B. The spreadsheet inputs are as follows:

- AbFRP01-PVP12: uses as input results from UnFRP01-PVP01 column L.
- AbFRP01-PJV11: uses as input results from UnFRP01-PJV04 column L.
- AbFRP01-LVP18: uses as input results from UnFRP01-LMP06 column E.
- AbFRP01-HOP31: uses as input results from UnFRP01-HMP06 column E.
- AbFRP01-PJV34: uses as input results from UnFRP01-PJV32 column L.

For spreadsheet 'AbFRP01-PVP12', the DFs from Section 2 were obtained and multiplied together to obtain an overall DF (cell K11). This overall DF was divided into the value of column B to arrive at the final stack air emission (column C). The same tolerance rule was applied to these values. The results are shown in column D. Calculations for spreadsheet 'AbFRP01-PJV11' were calculated identically as for 'AbFRP01-PVP12'.

For spreadsheet 'AbFRP01-LVP18', the calculations are identical except there are additional steps. Once the mass rate at LMP06 was imported to column B, the primary offgas system DF (SBS [column C] and WESP [column D])

were applied to arrive at the LOP08 (column E) mass rate. LOP08 is the exiting stream from the LAW primary offgas before the vessel vents are added (LVP01). Column F imports the values from column L of UnFRP01-LVP01. Columns E and F are then added together to arrive at the combined stream LVP03 (column G). The stack emission rate is then calculated by applying the remaining overall offgas system DF (cell P11). The final mass/rad rate is shown in column H. Column I applies the same tolerance rule as mentioned before and provides the final answer. The calculation for stream AbFRP01-HOP31 follows this same process.

Below are the more detailed calculations.

Feed Rates

1. Calculate total feed rate in liters/hr for streams FRP01 and FRP14

Feed Streams conditions (refer to Table D-1):
LAW Feed (FRP01)

- Na molarity: 4 mol/l (cell P4 imported from Table C-1)
- Volumetric Flowrate: 0.55 ft^3/min x 60 min/hr = 33 ft^3/hr (cell P5 imported from Table C-1)

Vol. flowrate in l/hr:
33 ft^3/hr * 28.317 l/ft^3 = 935 l/hr (cell R5)

HLW Feed (FRP14)
This stream includes supernate and solids. Supernate is part of the LAW feed and solids are the HLW feed. Feed rates and density provided in the stream report does not take into account the solids phase therefore it needs need to be adjusted.

- Na molarity: 4 mol/l (cell P7 imported from Table C-2)
- Supernate volumetric flowrate: 0.963 ft^3/min * 60 min/hr = 57.8 ft^3/hr (cell P6 imported from Table C-2)

Supernate volumetric flowrate in l/hr:
57.8 ft^3/hr * 28.317 l/ft^3 = 1,637 l/hr (cell R6)
The solids volumetric flowrate is calculated the following way:
HLW wt % solids = Solids mass rate (lb/d) ÷ Total stream mass rate (lb/d)
Solids mass rate = 5.05E+03 lb/d (cell E28 from Table C-2)
Total mass rate = 1.14E+05 lb/d (cell B14 from Table C-2)
wt % solids = 5.05E+03 lb/d ÷ 1.14E+05 lb/d x 100% = 4.6% (cell P8)
The stream density is then adjusted by 4.6% to account for the solids.
Stream density = 1.25 g/cm^3 (cell B11 from Table C-2)
Adjusted stream density = 1.25 g/cm^3 ÷ (1 - 0.046) = 1.31 g/cm^3 (cell P10)
The total stream density is defined as:

$$\rho_{stream} = \rho_{liquids} \times wt\%_{liquids} + \rho_{solids} \times wt\%_{solids}$$

Solving for solids density gives:

$$\rho_{solids} = \frac{\rho_{stream} - \rho_{liquids} \times wt\%_{liquids}}{wt\%_{solids}}$$

Substituting the values into the above equation gives:

$$\rho_{solids} = \frac{1.31\frac{g}{cm^3} - 1.25\frac{g}{cm^3} \times (1 - 0.046)}{0.046} = 2.6\frac{g}{cm^3} \text{ (cell P11)}$$

The solids volumetric flowrate is then the mass rate divided by the solids density.

Solids volumetric flowrate = (5.05E+03 lb/d) x (1,000 g / 2.2 lb) ÷ (2.6 g/cm^3) x (1 ft^3/28,317 cm^3) x (1 d / 24 hr)
Solids volumetric flowrate = 1.3 ft^3/hr (cell P13)
Converting to liters/hour:
1.3 ft^3/hr x 28.317 liters/ft^3 = 37 liters/hr (cell R13)

2. Example calculation: total feed rate of non-represented inorganic constituent, Be.

Feed concentrations in Table D-1 (columns C and I) are those specified in Section 2, bullet #3.
Be WTP feed rate (FRP01 + FRP14 - refer to Table D-1):
FRP01
Feed Concentration: 1.56E-05 mol/mol Na (cell C4)
1.56E-05 mol/mol Na (cell C4)* 4 mol Na/l (cell P4) = 6.24E-05 mol/l (cell E4)
6.24E-05 mol/l (cell E4) * 935 l/hr (cell R5) = 5.84E-02 mol/hr (cell F4)

FRP14
Solids portion
Feed concentration: 2.60E-04 mol/mol Na (cell I4)
2.60E-04 mol/mol Na (cell I4)* 4 mol Na/l (cell P7) = 1.04E-03 mol/l (cell J4)
1.04E-03 mol/l (cell J4) * 37 l/hr (cell R13) = 3.88E-02 mol/hr (cell K4)
Supernate portion
Feed concentration: 1.56E-05 mol/mol Na (cell C4)
1.56E-05 mol/mol Na (cell C4) x 4 mol/l (cell P7) = 6.24E-05 mol/l (cell L4)
6.24E-05 mol/l (cell L4) x 1,637 l/hr (cell R6) = 1.02E-01 mol/hr (cell M4)
Total FRP14 feed rate: 3.88E-02 mol/hr (cell K4) + 1.02E-01 mol/hr (cell M4) = 1.41E-01 mol/hr (cell N4)

Be total feed concentration (FRP01 + FRP14 - refer to Table D-2):
MW Be: 9 g/mole (cell B4)
(5.84E-02 + 1.41E-01) mol/hr (cell C4) * 9 g/mole (cell B4) * 1kg/1000g * 2.2 lb/kg * 24 hr/d = 9.47E-02 lb/d (cell D4)

3. Example calculation: total feed rate of non-represented radionuclide constituent, ^{106}Ru

^{106}Ru feed rate (FRP01 + FRP14 - refer to Table D-1):
FRP01
Feed Concentration: 1.17E+05 Bq/mol Na (cell C18)
1.17E+05 Bq/mol Na (cell C18)* 4 mol Na/l (cell P4) = 4.68E+05 Bq/l (cell E18)
4.68E+05 Bq/l (cell E18) * 935 l/hr (cell R5) = 4.38E+08 Bq/hr (cell F18)

FRP14
Solids portion
Feed concentration: 7.02E+05 Bq/mol Na (cell I18)
7.02E+05 Bq/mol Na (cell I18)* 4 mol Na/l (cell P7) = 2.81E+06 Bq/l (cell J18)
2.81E+06 Bq/l (cell J18) * 37 l/hr (cell R13)= 1.05E+08 Bq/hr (cell K18)
Liquids portion
Feed concentration: 1.17E+05 Bq/mol Na (cell C18)
1.17E+05 Bq/mol Na (cell C18) x 4 mol/l (cell P7) = 4.68E+05 Bq/l (cell L18)
4.68E+05 Bq/l (cell L18) x 1,637 l/hr (cell R6) = 7.66E+08 Bq/hr (cell M18)
Total FRP14 feed rate: 1.05E+08 Bq/hr (cell K18) + 7.66E+08 Bq/hr (cell M18) = 8.71E+08 Bq/hr (cell N18)

Total ^{106}Ru feed concentration (FRP01 + FRP14 - refer to Table D-2):
(4.38E+08 + 8.71E+08) Bq/hr (cell C18) * 1 Ci/3.7E+10 Bq * 24 hr/d = 8.49E-01 Ci/d (cell D18)

4. Calculate the concentration of tin (Sn) in the LAW and HLW feeds

Non-radioactive tin (Sn) feed concentration is equivalent to the radioactive tin feed concentration.
126Sn feed (refer to Table D-1 for all cell references shown below):
4.08E+04 Bq/mol Na LAW Feed (cell B36) * 1 Ci / 3.7E+10 Bq = 1.10E-06 Ci/mol Na (cell E36)
6.72E+06 Bq/mol Na HLW Feed (cell B37) * 1 Ci / 3.7E+10 Bq = 1.82E-04 Ci/mol Na (cell E37)
Conversion factor for tin: 29 Ci Sn/kg Sn (cell B38)
LAW: 1.10E-06 Ci/mol Na (cell E36) * 1 kg Sn / 29 Ci Sn (cell B38) = 3.80E-08 kg/mol Na (cell B39)
HLW: 1.82E-04 Ci/mol Na (cell E37) * 1 kg Sn / 29 Ci Sn (cell B38) = 6.26E-06 kg/mol Na (cell B40)
Sn MW = 118.7 g/mol (cell B41)
LAW feed: 3.80E-08 kg/mol Na (cell B39) * 1000g/kg * 1 mol/118.7 g (cell B41) = 3.20E-07 mol/mol Na (cell B42)
HLW feed: 6.26E-06 kg/mol Na (cell B40) * 1000g/kg * 1 mol/118.7 g (cell B41) = 5.28E-05 mol/mol Na (cell B43)

Stream # PJV04 Calculation

PF, as defined in Section 5, is calculated in Column J.
Be (refer to Table D-2)
Feed rate (FRP01 + FRP14): 5.84E-02 mol/hr (Table D-1 cell F4) + 1.41E-01 mol/hr (Table D-1 cell N4) = 1.99E-01 mol/hr (cell C4 from Table D-2)
1.99E-01 mol/hr (cell C4) * 9 g/mol (cell B4) * 24 hr/d * 2.2 lb / 1000 g = 9.47E-02 lb/d (cell D4 from Table D-2)
Representative compound: Zr+4
Zr+4 feed rate from FRP01 + FRP14 (from Tables C-1 and C-2): 1.25E+02 lb/d (cell G4 from Table D-2)
Zr+4 mass flowrate (total) in PJV04 (from Table C-3): 4.49E-04 lb/d (cell I4 from Table D-2)
PF = 1.25E+02 lb/d (cell G4) / 4.49E-04 lb/d (cell I4) = 2.78E+05 (cell J4 from Table D-2)
Be mass flowrate in PJV04 = 9.47E-02 lb/d (cell D4) / 2.78E+05 (cell J4) = 3.41E-07 lb/d
Converting to g/sec: 4.03E-07 lb/d * 1d / 24hr * 1hr / 3600 sec * 1000g / 2.2 lb = 1.79E-09 g/sec (cell K4 from Table D-2). Since this value is greater than 1.00E-15, no changes in the mass rate are required (cell L4).

106Ru (refer to Table D-2)
Feed rate (FRP01 + FRP14): 4.38E+08 Bq/hr (Table D-1 cell F18) + 8.71E+08 Bq/hr (Table D-1 cell N18) = 1.31E+09 Bq/hr (Table D-2 cell C18)
1.31E+09 Bq/hr (cell C18) * 1 Ci / 3.7E+10 Bq * 24 hr/d = 0.849 Ci/d (cell D18 from Table D-2)
Representative compound: F-
F- feed rate from FRP01 + FRP14 (from Tables C-1 and Table C-2): 1.35E+02 lb/d (cell G18 from Table D-2)
F- mass flowrate in PJV04 (from Table C-3): 3.75E-04 lb/d (cell I18 from Table D-2)
PF = 1.35E+02 (cell G19) /3.75E-04 (cell I19)= 3.60E+05 (cell J18 from Table D-2)
106Ru mass flowrate in PJV04 = 0.849 Ci/d (cell D18) / 3.60E+05 (cell J18)= 2.36E-06 Ci/d (cell K18 from Table D-2). Since this value is greater than 1.00E-15, no changes in the rad rate are required. This value is then converted to Ci/year by multiplying by 365 days/year.
2.36E-06 Ci/d (cell K18) x 365 days/year = 8.61E-04 Ci/yr (cell L18)

Stream # PVP01 Calculation

Be (refer to Table D-3)
Feed rate (FRP01 + FRP14): 5.84E-02 mol/hr (Table D-1 cell F4) + 1.41E-01 mol/hr (Table D-1 cell N4) = 1.99E-01 mol/hr (cell C4)
1.99E-01 mol/hr (cell C4) * 9 g/mol (cell B4) * 24 hr/d * 2.2 lb / 1000 g = 9.47E-02 lb/d (cell D4 from Table D-3)
Representative compound: Zr+4
Zr+4 feed rate from FRP01 + FRP14 (from Tables C-1 and C-2): 1.25E+02 lb/d (cell G4 from Table D-3)
Zr+4 mass flowrate (total) in PVP01 (from Table C-20): 6.18E-04 lb/d (cell I4 from Table D-3)
PF = 1.25E+02 lb/d (cell G4) / 6.18E-04 lb/d (cell I4) = 2.02E+05 (cell J4 from Table D-3)
Be mass flowrate in PVP01 = 9.47E-02 lb/d / 2.02E+05 = 4.69E-07 lb/d
Converting to g/sec: 4.69E-07 lb/d * 1d / 24hr * 1hr / 3600 sec * 1000g / 2.2 lb = 2.47E-09 g/sec (cell K4 from Table D-3). Since this value is greater than 1.00E-15, no changes in the mass rate are required (cell L4).

106Ru (refer to Table D-3)
Feed rate (FRP01 + FRP14): 4.38E+08 Bq/hr (Table D-1 cell F18) + 8.71E+08 Bq/hr (Table D-1 cell N18) = 1.31E+09 Bq/hr (Table D-2 cell C18)
1.31E+09 Bq/hr (cell C18) * 1 Ci / 3.7E+10 Bq * 24 hr/d = 0.849 Ci/d (cell D18 from Table D-3)
Representative compound: F-
F- feed rate from FRP01 + FRP14 (from Tables C-1 and C-2): 1.35E+02 lb/d (cell G18 from Table D-3)
F- mass flowrate (total) in PVP01 (from Table C-20): 5.62E-04 lb/d (cell I19 from Table D-3)
PF = 1.35E+02 lb/d (cell G18) / 5.62E-04 lb/d (cell I18) = 2.40E+05 (cell J19 from Table D-3)
106Ru mass flowrate in PVP01 = 0.849 Ci/d (cell D18)/ 2.40E+05 (cell J18) = 3.54E-06 Ci/d (cell K18 from Table D-3). Since this value is greater than 1.00E-15, no changes in the rad rate are required. This value is then converted to Ci/year by multiplying by 365 days/year.
3.81E-06 Ci/d (cell K18) x 365 days/year = 1.29E-03 Ci/yr (cell L18)

The rest of the calculations are shown in Attachment D.

Calculation of Correction Factor for Constituents Represented by Zr+4

LAW Melter (see Table D-4)

Zr+4 added with the glass formers (LFP01): 2.49E+03 lb/day (cell O19)
Zr+4 at the outlet of the LAW CRV (LCP01): 9.09 lb/day (cell O20)
Correction factor for Zr+4: (9.09) / (9.09 + 2.49E+03) = 3.64E-03 (cell O21)

This correction factor was applied to all constituents represented as Zr+4 in stream LFP04.

HLW Melter (see Table D-7)

Zr+4 added with the glass formers (HFP01): 2.12E+01 lb/day (cell O19)
Zr+4 at the inlet of the MFPV (HLP09): 1.25E+02 lb/day (cell O20)
Correction factor for Zr+4: (125) / (21.2 + 125) = 0.855 (cell O21)

This correction factor was applied to all constituents represented as Zr+4 in stream HFP03.

LMP06 Calculation

To calculate the emission rates for the LAW melter (Table D-5), first the rates calculated for stream LFP04 were imported to column B of the 'UnFRP01-LMP06' spreadsheet. The appropriate LAW melter DFs specified in Section 2 were imported to column C. The emission rate for LMP06 is simply the division of the mass/rad rate in LFP04 by the melter DF. For Be:

LFP04 mass rate: 3.63E-05 g/sec (cell B5)
Be melter DF: 200 (cell C5)
LMP06 mass rate: 3.63E-05 g/sec (cell B5) ÷ 200 (cell C5) = 1.81E-07 g/sec (cell D5)
Since this value is greater than 1.00E-15, no changes in the mass rate are required (cell E5).

For 106Ru:
LFP04 rate: 2.02E+02 Ci/yr (cell B19)
Melter DF: 3.9 (cell C19)
LMP06 mass rate: 2.02E+02 Ci/yr (cell B19) ÷ 3.9 (cell C19) = 5.18E+01 Ci/yr (cell D19)
Since this value is greater than 1.00E-15, no changes in the rad rate are required (cell E19).

The emission rates for stream HMP06 (Table D-8) were calculated identically as stated above for LMP06.

PVP12 Calculation

PVP12 is the Pretreatment stack stream. To calculate the emission rates for this stream, the values from stream PVP01 were imported into column B of the 'AbFRP01-PVP12' spreadsheet (Table D-11). The stack emission rate is simply the division of the PVP01 mass rate by the overall vessel vent system DF. The DFs, obtained from Section 2, equate to the following overall DF:

PVV overall DF: 3.5 x 200 x 200,000 x 1 x 1 = 1.40E+08 (cell K11)

Therefore, for Be:
PVP01 mass rate: 2.47E-09 g/sec (cell B5)
PVP12 mass rate: 2.47E-09 g/sec (cell B5) ÷ 1.40E+08 (cell K11) = 1.76E-17 g/sec (cell C5)
Since this value is less than 1.00E-15, it is changed to zero (cell D5).

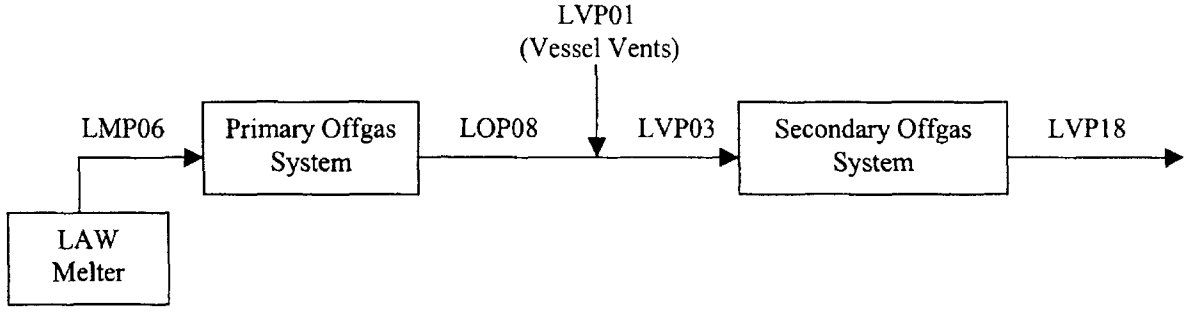
For 106Ru:
PVP01 rate: 1.29E-03 Ci/yr (cell B19)
PVP12 rate: 1.29E-03 Ci/yr (cell B19) ÷ 1.40E+08 (cell K11) = 9.22E-12 Ci/yr (cell C19)
Since this value is greater than 1.00E-15, no changes in the rad rate are required (cell D19).

This same calculation process was used for streams PJV11 (Table D-12) and PJV34 (Table D-15).

LVP18 Calculation (Table D-13)

To calculate the emission rates for this stream, first, the melter emissions (from LMP06) were divided by the SBS and WESP DFs specified for the LAW primary offgas system in Section 2. At this point, the stream is LOP08. Also at this point is where the vessel vents join the offgas system. The rates for the vessel vents were calculated in spreadsheet "UnFRP01-LVP01'. These two streams were added together to arrive at the composition of stream

LVP03. From this point on, the remaining offgas DF is applied to the rate values of stream LVP03 to obtain the final LVP18 air emission rate. The sketch below depicts the process just described:

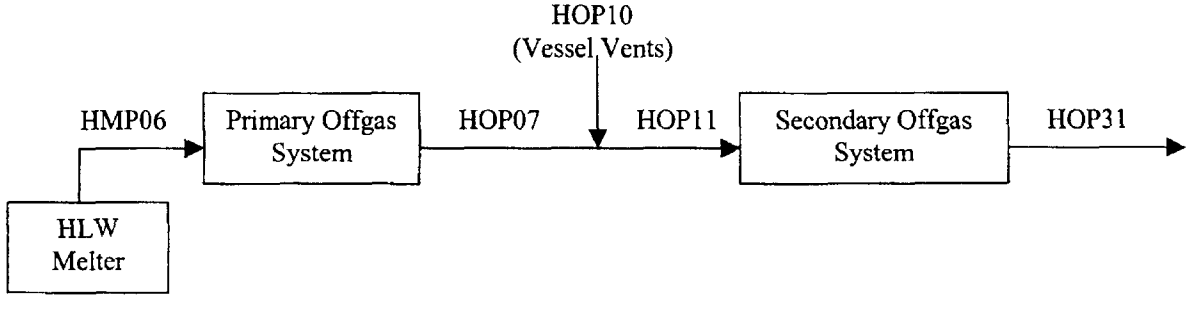


For Be:
LMP06 mass rate: 1.81E-07 g/sec (cell B5)
SBS DF: 40 (cell C5)
WESP DF: 11 (cell D5)
LOP08 rate: 1.81E-07 g/sec (cell B5) ÷ 40 (cell C5) ÷ 11 (cell D5) = 4.12E-10 g/sec (cell E5)
LVP01 rate: 3.80E-08 g/sec (cell F5)
LVP03 rate: 4.12E-10 g/sec (cell E5) + 3.80E-08 g/sec (cell F5) = 3.84E-08 g/sec (cell G5)

The remaining overall offgas system DF is:
200,000 x 1 x 1 x 1 x 1 = 200,000 (cell P11)
LVP18 rate: 3.84E-08 g/sec (cell G5) ÷ 200,000 (cell P11) = 1.92E-13 g/sec (cell H5)
Since this value is greater than 1.00E-15, no changes in the mass rate are required (cell I5).

For 106Ru:
LMP06 rate: 5.18E+01 Ci/yr (cell B19)
SBS DF: 3.6 (cell C19)
WESP DF: 4 (cell D19)
LOP08 rate: 5.18E+01 Ci/yr (cell B19) ÷ 3.6 (cell C19) ÷ 4 (cell D19) = 3.59 Ci/yr (cell E19)
LVP01 rate: 6.37E-06 Ci/yr (cell F19)
LVP03 rate: 3.59 Ci/yr (cell E19) + 6.37E-06 Ci/yr (cell F19) = 3.59 Ci/yr (cell G19)
LVP18 rate: 3.59 Ci/yr (cell G19) ÷ 200,000 (cell P11) = 1.80E-05 Ci/yr (cell H19)
Since this value is greater than 1.00E-15, no changes in the rad rate are required (cell I19).

This same calculation process was used for stream HOP31 that follows the process flow shown below:



All calculations for stream HOP31 are shown on Table D-14.

8 Results and Conclusions

A summary of the results per constituent is presented below. Emissions rates from the non-represented inorganic and radionuclide compounds in the SSFM have been estimated in this calculation. These rates will be reported in the next revision of the *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-03-008). This calculation will be updated each time a new official emissions profile is generated.

Summary of Calculation Results

	FRP01 + FRP14	PJV04	PVP01	LFP04	LMP06	LVP01	HFP03	HMP06	HOP10	PJV32	PVP12	PJV11	LVP18	HOP31	PJV34
Inorganics	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec	g/sec
Be	4.98E-04	1.79E-09	2.47E-09	3.63E-05	1.81E-07	3.80E-08	4.98E-04	3.83E-06	1.16E-10	1.93E-12	0.00E+00	1.79E-15	1.92E-13	0.00E+00	0.00E+00
CN	1.31E-03	3.06E-09	8.60E-09	9.09E-04	2.27E-05	5.07E-09	5.25E-04	1.31E-05	1.05E-10	8.26E-12	0.00E+00	3.06E-15	8.99E-13	2.02E-15	0.00E+00
Co	2.35E-03	8.40E-09	1.01E-08	5.89E-05	2.95E-07	3.37E-10	2.33E-03	1.79E-05	4.66E-10	2.04E-11	0.00E+00	8.40E-15	2.47E-14	1.40E-14	0.00E+00
Mo	1.80E-02	6.32E-08	4.77E-08	9.77E-04	1.22E-05	5.60E-09	1.73E-02	2.67E-04	3.46E-09	1.88E-10	0.00E+00	6.32E-14	4.26E-14	1.60E-15	0.00E+00
Sb	4.52E-03	1.58E-08	1.19E-08	2.39E-04	2.99E-06	1.37E-09	4.33E-03	4.33E-05	8.66E-10	2.73E-11	0.00E+00	1.58E-14	3.43E-13	5.42E-14	0.00E+00
Se	7.76E-03	2.15E-08	3.23E-08	5.05E-03	2.97E-03	3.03E-08	4.20E-03	2.00E-03	8.49E-10	5.19E-10	0.00E+00	2.15E-14	1.78E-11	1.73E-14	2.59E-15
Sn	3.69E-04	1.20E-09	1.05E-09	5.80E-05	2.90E-07	3.31E-10	3.13E-04	2.41E-06	6.26E-11	1.64E-12	0.00E+00	1.20E-15	4.95E-15	0.00E+00	0.00E+00
Ta	7.28E-03	2.62E-08	3.60E-08	5.30E-04	2.12E-06	5.56E-07	7.27E-03	5.59E-05	1.70E-09	2.82E-11	0.00E+00	2.62E-14	2.78E-12	0.00E+00	0.00E+00
Tl	5.54E-03	1.54E-08	2.31E-08	3.61E-03	6.01E-04	2.16E-08	3.00E-03	2.31E-05	6.06E-10	3.70E-10	0.00E+00	1.54E-14	5.20E-13	0.00E+00	1.85E-15
U	1.43E-01	4.90E-07	6.51E-07	1.35E-02	6.73E-05	7.69E-08	1.31E-01	1.01E-03	2.63E-08	1.15E-09	4.65E-15	4.90E-13	1.15E-12	1.29E-13	5.74E-15
V	3.11E-03	1.09E-08	8.27E-09	1.69E-04	2.12E-06	9.71E-10	2.99E-03	2.30E-05	5.99E-10	3.26E-11	0.00E+00	1.09E-14	7.32E-15	0.00E+00	0.00E+00
W	6.46E-03	2.32E-08	3.20E-08	4.70E-04	1.88E-06	4.93E-07	6.45E-03	4.96E-05	1.51E-09	2.50E-11	0.00E+00	2.32E-14	2.47E-12	0.00E+00	0.00E+00
Y	1.29E-03	4.48E-09	3.40E-09	7.55E-05	7.55E-07	4.32E-10	1.22E-03	1.22E-05	2.45E-10	7.70E-12	0.00E+00	4.48E-15	1.07E-14	1.56E-15	0.00E+00
Radionuclides	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr	Ci/yr
106Ru	3.10E+02	8.61E-04	1.29E-03	2.02E+02	5.18E+01	6.37E-06	1.68E+02	4.31E+01	3.39E-05	2.07E-05	9.22E-12	8.61E-10	1.80E-05	3.32E-08	1.04E-10
113mCd	6.29E+02	2.41E-03	1.86E-03	5.27E+01	5.27E+00	1.59E-06	6.54E+02	6.54E+01	1.31E-04	4.15E-05	1.33E-11	2.41E-09	2.06E-07	2.32E-08	2.08E-10
134Cs	4.83E+03	1.07E-02	1.31E-02	3.90E-01	1.95E-01	1.44E-08	5.00E+03	1.88E+02	1.00E-03	1.05E-04	9.35E-11	1.07E-08	1.35E-08	1.31E-07	5.27E-10
137mBa	1.61E+07	3.57E+01	4.34E+01	1.29E+03	6.47E+02	4.78E-05	1.66E+07	6.24E+05	3.33E+00	3.50E-01	3.10E-07	3.57E-05	4.49E-05	4.34E-04	1.75E-06
226Ra	1.10E-03	3.95E-09	5.43E-09	7.99E-05	1.33E-05	4.41E-10	1.10E-03	8.43E-06	2.57E-10	4.25E-12	0.00E+00	3.95E-15	2.04E-14	0.00E+00	0.00E+00
227Ac	1.05E+00	3.76E-06	5.17E-06	7.61E-02	5.56E-05	4.20E-07	1.04E+00	8.03E-03	2.44E-07	4.05E-09	3.70E-14	3.76E-12	2.18E-12	1.26E-14	2.02E-14
228Ra	1.72E+00	6.20E-06	8.53E-06	1.26E-01	2.09E-02	6.92E-07	1.72E+00	1.32E-02	4.03E-07	6.67E-09	6.09E-14	6.20E-12	3.21E-11	2.08E-14	3.34E-14
229Th	3.01E-01	1.08E-06	1.28E-06	6.85E-03	2.74E-05	3.67E-08	3.00E-01	2.30E-03	6.00E-08	2.60E-09	9.17E-15	1.08E-12	2.21E-13	3.51E-15	1.30E-14
231Pa	7.77E-01	2.79E-06	3.84E-06	5.65E-02	4.13E-05	3.12E-07	7.76E-01	5.97E-03	1.82E-07	3.00E-09	2.74E-14	2.79E-12	1.62E-12	9.36E-15	1.50E-14
232U	1.18E+00	4.27E-06	5.00E-06	9.09E-03	4.54E-05	2.73E-10	1.19E+00	9.16E-03	2.38E-07	1.04E-08	3.57E-14	4.27E-12	5.18E-13	1.17E-12	5.20E-14
59Ni	2.47E+02	5.18E-04	1.02E-03	1.77E+02	1.99E+00	5.34E-06	7.16E+01	9.39E-01	1.43E-05	5.07E-07	7.31E-12	5.18E-10	8.44E-08	4.43E-10	2.54E-12
79Se	1.37E+01	3.82E-05	5.72E-05	8.96E+00	5.27E+00	2.83E-07	7.45E+00	3.55E+00	1.50E-06	9.19E-07	4.09E-13	3.82E-11	3.29E-08	3.07E-11	4.60E-12
90Y	3.59E+06	1.25E+01	9.48E+00	2.11E+05	2.11E+03	6.34E-03	3.41E+06	3.41E+04	6.83E-01	2.15E-02	6.77E-08	1.25E-05	2.40E-05	4.35E-06	1.07E-07
93Zr	7.49E+02	2.69E-03	3.71E-03	5.45E+01	1.82E-01	3.01E-04	7.48E+02	9.24E+00	1.75E-04	2.90E-06	2.65E-11	2.69E-09	6.85E-09	1.72E-09	1.45E-11
93mNb	4.54E+02	1.63E-03	2.25E-03	3.31E+01	3.31E-02	1.82E-04	4.54E+02	3.49E+00	1.06E-04	1.76E-06	1.61E-11	1.63E-09	9.57E-10	9.47E-12	8.79E-12
242Cm	3.76E+01	1.36E-04	1.58E-04	6.54E-02	3.27E-04	1.96E-09	3.80E+01	2.93E-01	7.61E-06	3.32E-07	1.13E-12	1.36E-10	3.72E-12	3.74E-11	1.66E-12

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Gillespie, R and others, 1986, *Chemistry*, Allyn and Bacon, Inc, Boston, inside cover page (Attachment B)

Perry, R and others, 1984, *Perry's Chemical Engineers' Handbook*, Sixth Edition, McGraw Hill Book Company

10 Attachments

Attachment A – Summary Radioactive Properties for Selected Radionuclides (4 pages)

Attachment B – Periodic Table of the Elements (2 pages)

Attachment C - Steady State Flowsheet Model Stream Reports (49 pages)

Attachment D - Calculations (16 pages)

Attachment A - Summary Radioactive Properties for Selected Radionuclides

CALC. NO. 24590-WTP-M4C-FRP-00003, Rev D

ATTACHMENT A
PAGE - A-2

TABLE 2. Summary Radioactive Properties for Selected Radionuclides

Isotope	Half-Life	Specific Activity *(Ci/g)*	Decay Mode	Radiation Energy *(MeV)*		
				Alpha *(α)*	Beta *(β)*	Gamma *(γ)*
Americium-241	430 yr	3.5	α	5.5	0.052	0.033
Americium-242m	150 yr	9.8	IT	0.025	0.044	0.051
Americium-242	*16 hr*	*820,000*	*β, EC*	-	*0.18*	*0.018*
Americium-243	7,400 yr	0.20	α	5.3	0.022	0.055
Neptunium-239	*2.4 days*	*230,000*	*β*	-	*0.26*	*0.17*
Berkelium-247	1,400 yr	1.1	α	5.6	0.061	0.11
Californium-249	350 yr	4.1	α	5.8	0.043	0.33
Californium-251	900 yr	1.6	α	5.8	0.020	0.13
Cadmium-109	1.3 yr	2,600	EC	-	0.083	0.026
Cadmium-113[n]	9.3×10^{15} yr	3.4×10^{-13}	β	-	0.093	-
Cadmium-113m	14 yr	240	β	-	0.019	-
Carbon-14[n]	5.700 yr	4.5	β	-	0.049	-
Cesium-134	2.1 yr	1,300	β	-	0.16	1.6
Cesium-135	2.3 million yr	0.0012	β	-	0.067	-
Cesium-137	30 yr	88	β	-	0.19	-
Barium-137m (95%)	*2.6 min*	*540 million*	*IT*	-	*0.065*	*0.60*
Chlorine-36	300,000 yr	0.033	β, EC	-	0.027	<0.001
Cobalt-57	270 days	8,600	EC	-	0.019	0.13
Cobalt-60	5.3 yr	1,100	β	-	0.097	2.5
Curium-242	160 days	3,400	α	6.1	0.010	0.0018
Curium-243	29 yr	52	α	5.8	0.14	0.13
Curium-244	18 yr	82	α	5.8	0.086	00017
Curium-245	8,500 yr	0.17	α	5.4	0.065	0.096
Curium-246	4,700 yr	0.31	α	5.4	0.0080	0.0015
Curium-247	16 million yr	0.000094	α	4.9	0.021	0.32
Curium-248	340,000 yr	0.0043	α	4.7	0.0060	0.0012
Curium-250	6,900 yr	0.21	α, β	1.3	0.0016	-
Plutonium-246 (25%)	*11 days*	*49,000*	*β*	-	*0.13*	*0.14*
Berkelium-250 (14%)	*3.2 hr*	*3.9 million*	*β*	-	*0.29*	*0.89*
Americium-246 (25%)	*39 min*	*20 million*	*β*	-	*0.66*	*0.70*
Europium-150	34 yr	70	EC	-	0.044	1.5
Europium-152	13 yr	180	β, EC	-	0.14	1.2
Europium-154	8.8 yr	270	β	-	0.29	1.2
Europium-155	5.0 yr	470	β	-	0.063	0.061
Iodine-129	16 million yr	0.00018	β	-	0.064	0.025
Iodine-131	8.0 days	130,000	β	-	0.19	0.38
Krypton-81	210,000 yr	0.021	EC	-	0.0051	0.012
Krypton-85	11 yr	400	β	-	0.25	0.0022
Neptunium-235	1.1 yr	1,400	EC	<0.001	0.010	0.0071
Neptunium-236	120,000 yr	0.013	β	-	0.21	0.14
Plutonium-236 (9%)	*2.9 yr*	*540*	*α*	*5.8*	*0.013*	*0.0021*

Isotope	Half-Life	Specific Activity *(Ci/g)*	Decay Mode	Radiation Energy *(MeV)*		
				Alpha *(α)*	Beta *(β)*	Gamma *(γ)*
Neptunium-237	2.1 million yr	0.00071	α	4.8	0.070	0.035
Protactinium-233	*27 days*	*21,000*	*β*	-	*0.20*	*0.20*
Nickel-59	75,000 yr	0.082	EC	-	0.0046	0.0024
Nickel-63	96 yr	60	β	-	0.17	-
Plutonium-238	88 yr	17	α	5.5	0.011	0.0018
Plutonium-239	24,000 yr	0.063	α	5.1	0.0067	<0.001
Plutonium-240	6,500 yr	0.23	α	5.2	0.011	0.0017
Plutonium-241	14 yr	100	β	<0.001	0.0052	<0.001
Plutonium-242	380,000 yr	0.0040	α	4.9	0.0087	0.0014
Potassium-40[n]	1.3 billion yr	0.0000071	β, EC	-	0.52	0.16
Protactinium-231[n]	33,000 yr	0.048	α	5.0	0.065	0.048
Actinium-227[n]	*22 yr*	*73*	*α, β*	*0.068*	*0.016*	*<0.001*
Thorium-227[n] (99%)	*19 days*	*31,000*	*α*	*5.9*	*0.053*	*0.11*
Francium-223[n] (1%)	*22 min*	*39 million*	*β*	-	*0.40*	*0.059*
Radium-223[n]	*11 days*	*52,000*	*α*	*5.7*	*0.076*	*0.13*
Radon-219[n]	*4.0 sec*	*13 billion*	*α*	*6.8*	*0.0063*	*0.056*
Polonium-215[n]	*0.0018 sec*	*30 trillion*	*α*	*7.4*	*<0.001*	*<0.001*
Lead-211[n]	*36 min*	*25 million*	*β*	-	*0.46*	*0.051*
Bismuth-211[n]	*2.1 min*	*420 million*	*α, β*	*6.6*	*0.010*	*0.047*
Thallium-207[n]	*4.8 min*	*190 million*	*β*	-	*0.49*	*0.0022*
Radium-226[n]	1600 yr	1.0	α	4.8	0.0036	0.0067
Radon-222[n]	*3.8 days*	*160,000*	*α*	*5.5*	*<0.001*	*<0.001*
Polonium-218[n]	*3.1 min*	*290 million*	*α*	*6.0*	*<0.001*	*<0.001*
Lead-214[n]	*27 min*	*33 million*	*β*	-	*0.29*	*0.25*
Bismuth-214[n]	*20 min*	*45 million*	*β*	-	*0.66*	*1.5*
Polonium-214[n]	*0.00016 sec*	*330 trillion*	*α*	*7.7*	*<0.001*	*<0.001*
Lead-210[n]	*22 yr*	*77*	*β*	-	*0.038*	*0.0048*
Bismuth-210[n]	*5.0 days*	*130,000*	*β*	-	*0.39*	-
Polonium-210[n]	*140 days*	*4,500*	*α*	*5.3*	*<0.001*	*<0.001*
Radium-228[n]	5.8 yr	280	β	-	0.017	<0.001
Actinium-228[n]	*6.1 hr*	*2.3 million*	*β*	-	*0.48*	*0.97*
Thorium-228[n]	*1.9 yr*	*830*	*α*	*5.4*	*0.021*	*0.0033*
Radium-224[n]	*3.7 days*	*160,000*	*α*	*5.7*	*0.0022*	*0.010*
Radon-220[n]	*56 sec*	*930 million*	*α*	*6.3*	*<0.001*	*<0.001*
Polonium-216[n]	*0.15 sec*	*350 billion*	*α*	*6.8*	*<0.001*	*<0.001*
Lead-212[n]	*11 hr*	*1.4 million*	*β*	-	*0.18*	*0.15*
Bismuth-212[n]	*61 min*	*15 million*	*α, β*	*2.2*	*0.47*	*0.19*
Polonium-212[n] (64%)	*0.00000031 sec*	*180,000 trillion*	*α*	*8.8*	-	-
Thallium-208[n] (36%)	*3.1 min*	*300 million*	*β*	-	*0.60*	*3.4*
Samarium-146	100,000,000 yr	0.000024	α	2.5	-	-
Samarium-151	90 yr	27	β	-	0.020	<0.001
Selenium-79	650,000 yr	0.070	β	-	0.056	-
Strontium-90	29 yr	140	β	-	0.20	-
Yttrium-90	*64 hr*	*550,000*	*β*	-	*0.94*	*<0.001*

Isotope	Half-Life	Specific Activity (Ci/g)	Decay Mode	Radiation Energy (MeV)		
				Alpha (α)	Beta (β)	Gamma (γ)
Technetium-97	2.6 million	0.0014	EC	-	0.0056	0.011
Technetium-98	4.2 million	0.00088	β	-	0.16	1.4
Technetium-99	210,000	0.017	β	-	0.10	-
Thorium-229	14 billion yr	0.00000011	α	4.0	0.012	0.0013
Radium-225	*15 days*	*40,000*	*β*	-	*0.11*	*0.014*
Actinium-225	*10 days*	*59,000*	*α*	*5.8*	*0.022*	*0.018*
Francium-221	*4.8 min*	*180 million*	*α*	*6.3*	*0.010*	*0.031*
Astatine-217	*0.032 sec*	*1.6 trillion*	*α*	*7.1*	*<0.001*	*<0.001*
Bismuth-213	*46 min*	*20 million*	*α, β*	*0.13*	*0.44*	*0.13*
Polonium-213 (98%)	*0.0000042 sec*	*13,000 trillion*	*α*	*8.4*	-	-
Thallium-209 (2%)	*2.2 min*	*410 million*	*β*	-	*0.69*	*2.0*
Lead-209	*3.3 hr*	*4.7 million*	*β*	-	*0.20*	-
Thorium-230[n]	77,000 yr	0.020	α	4.7	0.015	0.0016
Thorium-232[n]	7,300 yr	0.22	α	4.9	0.12	0.096
Tin-121m	55 yr	54	β, IT	-	0.035	0.0049
Tin-121 (78%)	*27 hr*	*970,000*	*β*	-	*0.11*	-
Tin-126	250,000 yr	0.029	β	-	0.17	0.057
Antimony-126	*12 days*	*85,000*	*β*	-	*0.28*	*2.8*
Tritium (H-3)[n]	12 yr	9,800	β	-	0.0057	-
Uranium-232	72 hr	22	α	5.3	0.017	0.0022
Uranium-233	160,000 yr	0.0098	α	4.8	0.0061	0.0013
Uranium-234[n]	240,000 yr	0.0063	α	4.8	0.013	0.0017
Uranium-235[n]	700 million yr	0.0000022	α	4.4	0.049	0.16
Thorium-231[n]	*26 hr*	*540,000*	*β*	-	*0.17*	*0.026*
Uranium-236	23 million yr	0.000065	α	4.5	0.011	0.0016
Uranium-238[n]	4.5 billion yr	0.00000034	α	4.2	0.010	0.0014
Thorium-234[n]	*24 days*	*23,000*	*β*	-	*0.060*	*0.0093*
Protactinium-234m[n]	*1.2 min*	*690 million*	*β*	-	*0.82*	*0.012*
Zirconium-93	1.5 million yr	0.0025	β	-	0.020	-
Niobium-93m	*14 yr*	*290*	*IT*	-	*0.028*	*0.0019*

This table summarizes key radioactive properties of selected radionuclides and their associated decay products (for which information is presented in italics). Values are given to two significant figures. See the radionuclide-specific fact sheets for further information. EC = electron capture, IT = isomeric transition, Ci = curie, g = gram, and MeV = million electron volts. A dash indicates that the entry is not applicable, and an "n" indicates that the isotope exists naturally in the environment. (See the companion fact sheet on *Radioactive Properties, Internal Distribution, and Risk Coefficients* for an explanation of terms and interpretation of radiation energies.)

Attachment B – Periodic Table of the Elements

1 ← Atomic number H 1.008 ← Atomic mass

Period	Group* I/1	II/2	3	4	5	6	7	8	9	10	11	12	III/13	IV/14	V/15	VI/16	VII/17	VIII/18
			Transition Elements															
1	1 H 1.008																	2 He 4.003
2	3 Li 6.941	4 Be 9.012											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
3	11 Na 22.99	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95
4	19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.90	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.70	29 Cu 63.55	30 Zn 65.38	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
5	37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (98)	44 Ru 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
6	55 Cs 132.9	56 Ba 137.3	57 La 138.9	72 Hf 178.5	73 Ta 180.9	74 W 183.9	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po (209)	85 At (210)	86 Rn (222)
7	87 Fr (223)	88 Ra (226.0)	89 Ac (227)	104	105	106	107											

Lanthanides

6	58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm (145)	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0	71 Lu 175.0

Actinides

7	90 Th 232.0	91 Pa (231)	92 U 238.0	93 Np (244)	94 Pu (242)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (260)

*The main groups are numbered I to VIII following accepted practice, but the distinction between A and B groups has not been made because of the confusion that has been created by the differences between European and American practice in this respect. Recently, the American Chemical Society and the International Union of Pure and Applied Chemistry recommended a revised system in which the groups are numbered consecutively from 1 to 18 as shown here. Because it may be some time before this revised numbering system becomes widely accepted we have not adopted it in the main body of the text.

CALC # 24590-WTP-MYC-FRP-00003, Rev 0
ATTACHMENT B
PAGE B-2

Attachment C - Steady State Flowsheet Model Stream Reports

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-2

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
1	**Table C-1 FRP01 Stream Report**									
3	**Stream Number:**		**FRP01**							
4	**Stream Name:**		**Waste feed from DOE to LAW Feed Receipt**							
5	**Configuration:**		**MRQ-05-0049.acmf**							
6	**Run Date / Time:**		**12/14/2005 - 1:42:25 PM**							
7	**Run Data File:**		**H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv**							
8										
9	**Stream Properties**									
10	**Variable**	**Value**	**Units**							
11	Density	1.26E+00	g/cm^3	(does not include solid phase)						
12	Enthalpy	-1.54E+07	BTU/hr							
13	Mass Flow	2.60E+03	Lb/hr							
14		6.23E+04	Lb/day							
15	Volumetric Flow	4.12E+00	GPM	(does not include solid phase)						
16		5.50E-01	ft^3/min	(does not include solid phase)						
17	Molar Flow	1.28E+02	Lbmol/hr							
18	Molecular Weight	1.99E+01	Lb/Lbmol							
19	Pressure	1.00E+03	mbar							
20	Temperature	2.50E+01	C							
21	Na Molarity	4.00E+00	mol/L							
22	pH	1.44E+01	pH							
23	Total TRU	4.24E-04	Ci/L							
24	Total Activity	2.26E+00	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	6.19E+01	1.03E+01	6.09E+04	0.00E+00	0.00E+00	0.00E+00	6.09E+04	2.77E+01	3.20E+02
29	Ag^{+}	3.17E-05	2.85E-05	1.69E-01	0.00E+00	0.00E+00	0.00E+00	1.69E-01	7.69E-05	8.89E-04
30	Al^{+3}	3.84E-01	8.64E-02	5.12E+02	0.00E+00	0.00E+00	0.00E+00	5.12E+02	2.33E-01	2.70E+00
31	As^{+3}	1.40E-04	8.73E-05	5.18E-01	0.00E+00	0.00E+00	0.00E+00	5.18E-01	2.35E-04	2.72E-03
32	B^{+3}	2.32E-03	2.09E-04	1.24E+00	0.00E+00	0.00E+00	0.00E+00	1.24E+00	5.64E-04	6.52E-03
33	Ba^{+2}	2.91E-05	3.34E-05	1.98E-01	0.00E+00	0.00E+00	0.00E+00	1.98E-01	8.99E-05	1.04E-03
34	Bi^{+3}	3.43E-05	5.99E-05	3.55E-01	0.00E+00	0.00E+00	0.00E+00	3.55E-01	1.61E-04	1.87E-03
35	Ca^{+2}	1.98E-03	6.61E-04	3.92E+00	0.00E+00	0.00E+00	0.00E+00	3.92E+00	1.78E-03	2.06E-02
36	Cd^{+2}	5.41E-05	5.07E-05	3.01E-01	0.00E+00	0.00E+00	0.00E+00	3.01E-01	1.37E-04	1.58E-03
37	Ce^{+3}	6.69E-05	7.83E-05	4.64E-01	0.00E+00	0.00E+00	0.00E+00	4.64E-01	2.11E-04	2.44E-03
38	Cl^{-}	6.17E-02	1.82E-02	1.08E+02	0.00E+00	0.00E+00	0.00E+00	1.08E+02	4.92E-02	5.69E-01
39	CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	CO_3^{-2}	3.07E-01	1.54E-01	9.10E+02	0.00E+00	0.00E+00	0.00E+00	9.10E+02	4.14E-01	4.79E+00
42	Cr^{+3}	9.19E-03	3.99E-03	2.36E+01	0.00E+00	0.00E+00	0.00E+00	2.36E+01	1.07E-02	1.24E-01
43	Cu^{+2}	5.35E-05	2.84E-05	1.68E-01	0.00E+00	0.00E+00	0.00E+00	1.68E-01	7.65E-05	8.85E-04
44	F^{-}	2.47E-02	3.91E-03	2.32E+01	0.00E+00	0.00E+00	0.00E+00	2.32E+01	1.05E-02	1.22E-01
45	Fe^{+3}	1.39E-03	6.48E-04	3.84E+00	0.00E+00	0.00E+00	0.00E+00	3.84E+00	1.75E-03	2.02E-02
46	H_2O	5.24E+01	7.88E+00	4.68E+04	0.00E+00	0.00E+00	0.00E+00	4.68E+04	2.13E+01	2.46E+02
47	H_2O(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	5.60E-05	9.38E-05	5.56E-01	0.00E+00	0.00E+00	0.00E+00	5.56E-01	2.53E-04	2.93E-03
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^{+}	1.31E-01	4.28E-02	2.54E+02	0.00E+00	0.00E+00	0.00E+00	2.54E+02	1.15E-01	1.34E+00
56	La^{+3}	1.48E-05	1.72E-05	1.02E-01	0.00E+00	0.00E+00	0.00E+00	1.02E-01	4.64E-05	5.37E-04
57	Li^{+}	4.20E-04	2.43E-05	1.44E-01	0.00E+00	0.00E+00	0.00E+00	1.44E-01	6.55E-05	7.59E-04
58	Mg^{+2}	4.42E-04	8.96E-05	5.31E-01	0.00E+00	0.00E+00	0.00E+00	5.31E-01	2.41E-04	2.79E-03
59	Mn^{+3}	4.79E-04	2.20E-04	1.30E+00	0.00E+00	0.00E+00	0.00E+00	1.30E+00	5.92E-04	6.85E-03
60	MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62	Na^{+}	4.00E+00	7.67E-01	4.55E+03	0.00E+00	0.00E+00	0.00E+00	4.55E+03	2.07E+00	2.39E+01
63	NH3	2.82E-03	4.01E-04	2.38E+00	0.00E+00	0.00E+00	0.00E+00	2.38E+00	1.08E-03	1.25E-02
64	NH4+	0.00E+00	4.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	Ni^{+2}	7.32E-04	3.59E-04	2.13E+00	0.00E+00	0.00E+00	0.00E+00	2.13E+00	9.66E-04	1.12E-02
66	NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	NO_2^{-}	8.34E-01	3.20E-01	1.90E+03	0.00E+00	0.00E+00	0.00E+00	1.90E+03	8.63E-01	9.99E+00
69	NO_3^{-}	1.13E+00	5.83E-01	3.46E+03	0.00E+00	0.00E+00	0.00E+00	3.46E+03	1.57E+00	1.82E+01
70	O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71	O^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	OH^{-}	2.53E+00	3.59E-01	2.13E+03	0.00E+00	0.00E+00	0.00E+00	2.13E+03	9.68E-01	1.12E+01
73	OH(b)$^{-}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-3

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	1.96E-04	3.39E-04	2.01E+00	0.00E+00	0.00E+00	0.00E+00	2.01E+00	9.15E-04	1.06E-02
75	Pd^{+2}	1.52E-05	1.35E-05	8.00E-02	0.00E+00	0.00E+00	0.00E+00	8.00E-02	3.64E-05	4.21E-04
76	PO_4^{-3}	1.57E-02	1.24E-02	7.37E+01	0.00E+00	0.00E+00	0.00E+00	7.37E+01	3.35E-02	3.88E-01
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	1.47E-05	1.26E-05	7.48E-02	0.00E+00	0.00E+00	0.00E+00	7.48E-02	3.40E-05	3.94E-04
79	Ru^{+3}	2.18E-05	1.84E-05	1.09E-01	0.00E+00	0.00E+00	0.00E+00	1.09E-01	4.96E-05	5.74E-04
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	2.96E-03	1.48E-03	8.80E+00	0.00E+00	0.00E+00	0.00E+00	8.80E+00	4.00E-03	4.63E-02
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	3.74E-02	3.00E-02	1.78E+02	0.00E+00	0.00E+00	0.00E+00	1.78E+02	8.09E-02	9.36E-01
85	Sr^{+2}	6.95E-06	5.08E-06	3.01E-02	0.00E+00	0.00E+00	0.00E+00	3.01E-02	1.37E-05	1.59E-04
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	2.44E-05	9.75E-06	5.78E-02	0.00E+00	0.00E+00	0.00E+00	5.78E-02	2.63E-05	3.04E-04
88	Zn^{+2}	9.13E-05	4.98E-05	2.95E-01	0.00E+00	0.00E+00	0.00E+00	2.95E-01	1.34E-04	1.55E-03
89	Zr^{+4}	6.74E-05	5.13E-05	3.04E-01	0.00E+00	0.00E+00	0.00E+00	3.04E-01	1.38E-04	1.60E-03
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	1.58E-02	1.16E-02	6.88E+01	0.00E+00	0.00E+00	0.00E+00	6.88E+01	3.13E-02	3.62E-01
94	$C_2O_4^{-2}$	1.58E-02	1.16E-02	6.88E+01	0.00E+00	0.00E+00	0.00E+00	6.88E+01	3.13E-02	3.62E-01
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	2.26E+00	5.08E+04	2.65E+01	0.00E+00	0.00E+00	0.00E+00	2.26E+00	5.08E+04	2.65E+01
106	^{241}Am	2.98E-04	6.69E+00	4.30E-03	0.00E+00	0.00E+00	0.00E+00	2.98E-04	6.69E+00	4.30E-03
107	^{243}Am	1.95E-07	4.37E-03	4.83E-05	0.00E+00	0.00E+00	0.00E+00	1.95E-07	4.37E-03	4.83E-05
108	^{14}C	6.09E-06	1.37E-01	6.75E-05	0.00E+00	0.00E+00	0.00E+00	6.09E-06	1.37E-01	6.75E-05
109	^{60}Co	4.00E-05	8.97E-01	1.75E-06	0.00E+00	0.00E+00	0.00E+00	4.00E-05	8.97E-01	1.75E-06
110	^{243}Cm	3.22E-08	7.22E-04	3.15E-08	0.00E+00	0.00E+00	0.00E+00	3.22E-08	7.22E-04	3.15E-08
111	^{244}Cm	7.61E-07	1.71E-02	4.65E-07	0.00E+00	0.00E+00	0.00E+00	7.61E-07	1.71E-02	4.65E-07
112	^{137}Cs	2.17E+00	4.87E+04	1.24E+00	0.00E+00	0.00E+00	0.00E+00	2.17E+00	4.87E+04	1.24E+00
113	^{152}Eu	2.24E-06	5.03E-02	6.38E-07	0.00E+00	0.00E+00	0.00E+00	2.24E-06	5.03E-02	6.38E-07
114	^{154}Eu	4.65E-04	1.04E+01	8.51E-05	0.00E+00	0.00E+00	0.00E+00	4.65E-04	1.04E+01	8.51E-05
115	^{155}Eu	1.34E-04	3.02E+00	1.37E-05	0.00E+00	0.00E+00	0.00E+00	1.34E-04	3.02E+00	1.37E-05
116	^{3}H	5.19E-05	1.17E+00	2.67E-07	0.00E+00	0.00E+00	0.00E+00	5.19E-05	1.17E+00	2.67E-07
117	^{129}I	1.86E-07	4.17E-03	5.21E-02	0.00E+00	0.00E+00	0.00E+00	1.86E-07	4.17E-03	5.21E-02
118	^{63}Ni	7.20E-04	1.62E+01	6.27E-04	0.00E+00	0.00E+00	0.00E+00	7.20E-04	1.62E+01	6.27E-04
119	^{237}Np	2.36E-07	5.30E-03	1.66E-02	0.00E+00	0.00E+00	0.00E+00	2.36E-07	5.30E-03	1.66E-02
120	^{238}Pu	1.33E-06	2.99E-02	3.85E-06	0.00E+00	0.00E+00	0.00E+00	1.33E-06	2.99E-02	3.85E-06
121	^{239}Pu	1.84E-05	4.14E-01	1.47E-02	0.00E+00	0.00E+00	0.00E+00	1.84E-05	4.14E-01	1.47E-02
122	^{240}Pu	4.78E-06	1.07E-01	1.04E-03	0.00E+00	0.00E+00	0.00E+00	4.78E-06	1.07E-01	1.04E-03
123	^{241}Pu	1.00E-04	2.25E+00	4.82E-05	0.00E+00	0.00E+00	0.00E+00	1.00E-04	2.25E+00	4.82E-05
124	^{242}Pu	5.06E-10	1.14E-05	6.36E-06	0.00E+00	0.00E+00	0.00E+00	5.06E-10	1.14E-05	6.36E-06
125	^{125}Sb	2.77E-04	6.22E+00	1.32E-05	0.00E+00	0.00E+00	0.00E+00	2.77E-04	6.22E+00	1.32E-05
126	^{151}Sm	3.89E-03	8.74E+01	7.32E-03	0.00E+00	0.00E+00	0.00E+00	3.89E-03	8.74E+01	7.32E-03
127	^{126}Sn	4.41E-06	9.90E-02	1.92E-02	0.00E+00	0.00E+00	0.00E+00	4.41E-06	9.90E-02	1.92E-02
128	^{90}Sr	8.64E-02	1.94E+03	3.10E-02	0.00E+00	0.00E+00	0.00E+00	8.64E-02	1.94E+03	3.10E-02
129	^{99}Tc	7.67E-04	1.72E+01	2.24E+00	0.00E+00	0.00E+00	0.00E+00	7.67E-04	1.72E+01	2.24E+00
130	^{232}Th	7.17E-09	1.61E-04	3.22E+00	0.00E+00	0.00E+00	0.00E+00	7.17E-09	1.61E-04	3.22E+00
131	^{233}U	2.39E-07	5.36E-03	1.23E-03	0.00E+00	0.00E+00	0.00E+00	2.39E-07	5.36E-03	1.23E-03
132	^{234}U	1.70E-07	3.81E-03	1.35E-03	0.00E+00	0.00E+00	0.00E+00	1.70E-07	3.81E-03	1.35E-03
133	^{235}U	6.68E-09	1.50E-04	1.53E-01	0.00E+00	0.00E+00	0.00E+00	6.68E-09	1.50E-04	1.53E-01
134	^{236}U	1.14E-08	2.57E-04	8.76E-03	0.00E+00	0.00E+00	0.00E+00	1.14E-08	2.57E-04	8.76E-03
135	^{238}U	1.32E-07	2.97E-03	1.95E+01	0.00E+00	0.00E+00	0.00E+00	1.32E-07	2.97E-03	1.95E+01
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

	A	B	C	D	E	F	G	H	I	J
1	**Table C-2 FRP14 Stream Report**									
3	**Stream Number:**		**FRP14**							
4	**Stream Name:**		**Waste feed from DOE to HLW Feed Receipt**							
5	**Configuration:**		**MRQ-05-0049.acmf**							
6	**Run Date / Time:**		**12/14/2005 - 1:42:25 PM**							
7	**Run Data File:**		**H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv**							
8										
9	**Stream Properties**									
10	**Variable**	**Value**	**Units**							
11	Density	1.25E+00	g/cm^3	(does not include solid phase)						
12	Enthalpy	-2.66E+07	BTU/hr							
13	Mass Flow	4.76E+03	Lb/hr							
14		1.14E+05	Lb/day							
15	Volumetric Flow	7.21E+00	GPM	(does not include solid phase)						
16		9.63E-01	ft^3/min	(does not include solid phase)						
17	Molar Flow	2.22E+02	Lbmol/hr							
18	Molecular Weight	1.99E+01	Lb/Lbmol							
19	Pressure	1.00E+03	mbar							
20	Temperature	4.90E+01	C							
21	Na Molarity	4.00E+00	mol/L							
22	pH	1.44E+01	pH							
23	Total TRU	2.90E-02	Ci/L							
24	Total Activity	5.16E+00	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	6.14E+01	1.02E+01	1.06E+05	5.05E+03	0.00E+00	0.00E+00	1.11E+05	5.04E+01	5.83E+02
29	Ag^+	3.17E-05	2.85E-05	2.96E-01	3.50E+00	0.00E+00	0.00E+00	3.80E+00	1.73E-03	2.00E-02
30	Al^{+3}	3.84E-01	8.64E-02	8.97E+02	4.93E+02	0.00E+00	0.00E+00	1.39E+03	6.32E-01	7.31E+00
31	As^{+3}	1.40E-04	8.73E-05	9.06E-01	2.20E-01	0.00E+00	0.00E+00	1.13E+00	5.12E-04	5.92E-03
32	B^{+3}	2.32E-03	2.09E-04	2.17E+00	3.00E+00	0.00E+00	0.00E+00	5.17E+00	2.35E-03	2.72E-02
33	Ba^{+2}	2.91E-05	3.34E-05	3.46E-01	3.20E+00	0.00E+00	0.00E+00	3.55E+00	1.61E-03	1.87E-02
34	Bi^{+3}	3.43E-05	5.99E-05	6.21E-01	1.67E+01	0.00E+00	0.00E+00	1.73E+01	7.85E-03	9.09E-02
35	Ca^{+2}	1.98E-03	6.61E-04	6.86E+00	1.92E+01	0.00E+00	0.00E+00	2.60E+01	1.18E-02	1.37E-01
36	Cd^{+2}	5.41E-05	5.07E-05	5.27E-01	1.17E+01	0.00E+00	0.00E+00	1.23E+01	5.58E-03	6.45E-02
37	Ce^{+3}	6.69E-05	7.83E-05	8.12E-01	4.01E+00	0.00E+00	0.00E+00	4.82E+00	2.19E-03	2.53E-02
38	Cl^-	6.17E-02	1.82E-02	1.89E+02	3.93E+00	0.00E+00	0.00E+00	1.93E+02	8.79E-02	1.02E+00
39	CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	CO_3^{-2}	3.07E-01	1.54E-01	1.59E+03	4.40E+02	0.00E+00	0.00E+00	2.03E+03	9.24E-01	1.07E+01
42	Cr^{+3}	9.19E-03	3.99E-03	4.14E+01	9.96E+00	0.00E+00	0.00E+00	5.13E+01	2.33E-02	2.70E-01
43	Cu^{+2}	5.35E-05	2.84E-05	2.95E-01	1.36E+00	0.00E+00	0.00E+00	1.66E+00	7.53E-04	8.72E-03
44	F^-	2.47E-02	3.91E-03	4.06E+01	7.13E+01	0.00E+00	0.00E+00	1.12E+02	5.08E-02	5.88E-01
45	Fe^{+3}	1.39E-03	6.48E-04	6.72E+00	5.09E+02	0.00E+00	0.00E+00	5.15E+02	2.34E-01	2.71E+00
46	H_2O	5.20E+01	7.81E+00	8.11E+04	0.00E+00	0.00E+00	0.00E+00	8.11E+04	3.68E+01	4.26E+02
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	5.60E-05	9.38E-05	9.74E-01	1.99E+00	0.00E+00	0.00E+00	2.97E+00	1.35E-03	1.56E-02
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^+	1.31E-01	4.28E-02	4.44E+02	1.01E+01	0.00E+00	0.00E+00	4.54E+02	2.07E-01	2.39E+00
56	La^{+3}	1.48E-05	1.72E-05	1.79E-01	5.94E+00	0.00E+00	0.00E+00	6.12E+00	2.78E-03	3.22E-02
57	Li^+	4.20E-04	2.43E-05	2.52E-01	4.18E-01	0.00E+00	0.00E+00	6.71E-01	3.05E-04	3.53E-03
58	Mg^{+2}	4.42E-04	8.96E-05	9.29E-01	3.93E+00	0.00E+00	0.00E+00	4.86E+00	2.21E-03	2.56E-02
59	Mn^{+3}	4.79E-04	2.20E-04	2.28E+00	4.67E+01	0.00E+00	0.00E+00	4.90E+01	2.23E-02	2.58E-01
60	MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62	Na^+	4.00E+00	7.67E-01	7.96E+03	7.92E+02	0.00E+00	0.00E+00	8.76E+03	3.98E+00	4.61E+01
63	NH3	2.82E-03	4.01E-04	4.16E+00	0.00E+00	0.00E+00	0.00E+00	4.16E+00	1.89E-03	2.19E-02
64	NH4+	0.00E+00	4.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	Ni^{+2}	7.32E-04	3.59E-04	3.72E+00	2.09E+01	0.00E+00	0.00E+00	2.46E+01	1.12E-02	1.29E-01
66	NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	NO_2^-	8.34E-01	3.20E-01	3.32E+03	1.99E+02	0.00E+00	0.00E+00	3.52E+03	1.60E+00	1.85E+01

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-5

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	1.13E+00	5.83E-01	6.05E+03	1.53E+02	0.00E+00	0.00E+00	6.21E+03	2.82E+00	3.27E+01
70	O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71	O^{--}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	OH^-	2.53E+00	3.59E-01	3.73E+03	1.82E+03	0.00E+00	0.00E+00	5.54E+03	2.52E+00	2.92E+01
73	$OH(b)^-$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74	Pb^{+2}	1.96E-04	3.39E-04	3.52E+00	2.74E+01	0.00E+00	0.00E+00	3.09E+01	1.40E-02	1.62E-01
75	Pd^{+2}	1.52E-05	1.35E-05	1.40E-01	1.13E+00	0.00E+00	0.00E+00	1.27E+00	5.78E-04	6.69E-03
76	PO_4^{-3}	1.57E-02	1.24E-02	1.29E+02	1.21E+02	0.00E+00	0.00E+00	2.50E+02	1.14E-01	1.32E+00
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	1.47E-05	1.26E-05	1.31E-01	3.58E-01	0.00E+00	0.00E+00	4.88E-01	2.22E-04	2.57E-03
79	Ru^{+3}	2.18E-05	1.84E-05	1.91E-01	2.50E+00	0.00E+00	0.00E+00	2.70E+00	1.23E-03	1.42E-02
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	2.96E-03	1.48E-03	1.54E+01	8.20E+01	0.00E+00	0.00E+00	9.75E+01	4.43E-02	5.13E-01
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	3.74E-02	3.00E-02	3.11E+02	4.50E+01	0.00E+00	0.00E+00	3.56E+02	1.62E-01	1.88E+00
85	Sr^{+2}	6.95E-06	5.08E-06	5.28E-02	1.80E+00	0.00E+00	0.00E+00	1.85E+00	8.41E-04	9.74E-03
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	2.44E-05	9.75E-06	1.01E-01	7.23E-01	0.00E+00	0.00E+00	8.24E-01	3.74E-04	4.33E-03
88	Zn^{+2}	9.13E-05	4.98E-05	5.17E-01	1.81E+00	0.00E+00	0.00E+00	2.33E+00	1.06E-03	1.23E-02
89	Zr^{+4}	6.74E-05	5.13E-05	5.32E-01	1.24E+02	0.00E+00	0.00E+00	1.25E+02	5.66E-02	6.55E-01
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	1.58E-02	1.16E-02	1.20E+02	5.95E+01	0.00E+00	0.00E+00	1.80E+02	8.18E-02	9.47E-01
94	$C_2O_4^{-2}$	1.58E-02	1.16E-02	1.20E+02	5.95E+01	0.00E+00	0.00E+00	1.80E+02	8.18E-02	9.47E-01
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	2.26E+00	8.88E+04	4.64E+01	2.90E+00	1.14E+05	8.52E+02	5.16E+00	2.03E+05	8.98E+02
106	^{241}Am	2.98E-04	1.17E+01	7.53E-03	2.15E-02	8.46E+02	5.44E-01	2.18E-02	8.58E+02	5.52E-01
107	^{243}Am	1.95E-07	7.65E-03	8.45E-05	1.74E-06	6.84E-02	7.55E-04	1.94E-06	7.60E-02	8.40E-04
108	^{14}C	6.09E-06	2.39E-01	1.18E-04	1.55E-06	6.08E-02	3.00E-05	7.64E-06	3.00E-01	1.48E-04
109	^{60}Co	4.00E-05	1.57E+00	3.06E-06	2.39E-03	9.39E+01	1.83E-04	2.43E-03	9.54E+01	1.86E-04
110	^{243}Cm	3.22E-08	1.26E-03	5.51E-08	3.02E-05	1.19E+00	5.18E-05	3.03E-05	1.19E+00	5.19E-05
111	^{244}Cm	7.61E-07	2.99E-02	8.14E-07	6.87E-04	2.70E+01	7.36E-04	6.88E-04	2.70E+01	7.36E-04
112	^{137}Cs	2.17E+00	8.52E+04	2.16E+00	3.58E-01	1.41E+04	3.58E-01	2.53E+00	9.92E+04	2.52E+00
113	^{152}Eu	2.24E-06	8.81E-02	1.12E-06	1.15E-04	4.51E+00	5.73E-05	1.17E-04	4.60E+00	5.84E-05
114	^{154}Eu	4.65E-04	1.83E+01	1.49E-04	1.24E-02	4.89E+02	3.99E-03	1.29E-02	5.07E+02	4.14E-03
115	^{155}Eu	1.34E-04	5.28E+00	2.40E-05	1.84E-03	7.24E+01	3.29E-04	1.98E-03	7.77E+01	3.53E-04
116	^{3}H	5.19E-05	2.04E+00	4.68E-07	1.55E-05	6.08E-01	1.40E-07	6.74E-05	2.65E+00	6.08E-07
117	^{129}I	1.86E-07	7.30E-03	9.11E-02	6.95E-08	2.73E-03	3.41E-02	2.55E-07	1.00E-02	1.25E-01
118	^{63}Ni	7.20E-04	2.83E+01	1.10E-03	4.14E-04	1.63E+01	6.32E-04	1.13E-03	4.46E+01	1.73E-03
119	^{237}Np	2.36E-07	9.27E-03	2.90E-02	1.77E-05	6.95E-01	2.18E+00	1.79E-05	7.05E-01	2.20E+00
120	^{238}Pu	1.33E-06	5.24E-02	6.74E-06	8.39E-05	3.30E+00	4.24E-04	8.53E-05	3.35E+00	4.31E-04
121	^{239}Pu	1.84E-05	7.24E-01	2.57E-02	7.43E-04	2.92E+01	1.04E+00	7.62E-04	2.99E+01	1.06E+00
122	^{240}Pu	4.78E-06	1.88E-01	1.82E-03	1.96E-04	7.71E+00	7.48E-02	2.01E-04	7.89E+00	7.67E-02
123	^{241}Pu	1.00E-04	3.94E+00	8.43E-05	5.27E-03	2.07E+02	4.43E-03	5.37E-03	2.11E+02	4.51E-03
124	^{242}Pu	5.06E-10	1.99E-05	1.11E-05	1.83E-08	7.18E-04	4.02E-04	1.88E-08	7.38E-04	4.13E-04
125	^{125}Sb	2.77E-04	1.09E+01	2.31E-05	7.67E-03	3.01E+02	6.40E-04	7.95E-03	3.12E+02	6.63E-04
126	^{151}Sm	3.89E-03	1.53E+02	1.28E-02	9.31E-02	3.66E+03	3.06E-01	9.70E-02	3.81E+03	3.19E-01
127	^{126}Sn	4.41E-06	1.73E-01	3.36E-02	3.60E-05	1.41E+00	2.74E-01	4.04E-05	1.59E+00	3.08E-01
128	^{90}Sr	8.64E-02	3.40E+03	5.42E-02	2.39E+00	9.39E+04	1.50E+00	2.48E+00	9.73E+04	1.55E+00
129	^{99}Tc	7.67E-04	3.01E+01	3.92E+00	3.60E-03	1.41E+02	1.84E+01	4.37E-03	1.71E+02	2.23E+01
130	^{232}Th	7.17E-09	2.82E-04	5.64E+00	5.86E-07	2.30E-02	4.61E+02	5.93E-07	2.33E-02	4.66E+02
131	^{233}U	2.39E-07	9.39E-03	2.15E-03	4.79E-05	1.88E+00	4.31E-01	4.82E-05	1.89E+00	4.33E-01
132	^{234}U	1.70E-07	6.66E-03	2.37E-03	2.49E-06	9.79E-02	3.48E-02	2.66E-06	1.05E-01	3.71E-02
133	^{235}U	6.68E-09	2.62E-04	2.68E-01	5.99E-08	2.35E-03	2.40E+00	6.66E-08	2.61E-03	2.67E+00
134	^{236}U	1.14E-08	4.50E-04	1.53E-02	8.23E-08	3.23E-03	1.10E-01	9.37E-08	3.68E-03	1.26E-01
135	^{238}U	1.32E-07	5.20E-03	3.41E+01	1.41E-06	5.54E-02	3.63E+02	1.54E-06	6.06E-02	3.98E+02
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-6

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
1	**Table C-3 PJV04 Stream Report**									
3	**Stream Number:**		PJV04							
4	**Stream Name:**		Vapor feed to demister							
5	**Configuration:**		MRQ-05-0049.acmf							
6	**Run Date / Time:**		12/14/2005 - 1:42:25 PM							
7	**Run Data File:**		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	**Stream Properties**									
10	**Variable**	**Value**	**Units**							
11	Density	1.15E-03	g/cm^3	(does not include solid phase)						
12	Enthalpy	-8.69E+06	BTU/hr							
13	Mass Flow	1.71E+05	Lb/hr							
14		4.10E+06	Lb/day							
15	Volumetric Flow	2.96E+05	GPM	(does not include solid phase)						
16		3.96E+04	ft^3/min	(does not include solid phase)						
17	Molar Flow	5.95E+03	Lbmol/hr							
18	Molecular Weight	2.87E+01	Lb/Lbmol							
19	Pressure	9.93E+02	mbar							
20	Temperature	2.50E+01	C							
21	Na Molarity	0.00E+00	mol/L							
22	pH	4.16E+00	pH							
23	Total TRU	2.55E-12	Ci/L							
24	Total Activity	4.31E-10	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	5.86E-09	9.45E-10	4.03E-01	1.86E-02	4.01E-02	4.10E+06	4.10E+06	1.86E+03	2.16E+04
29	Ag^+	1.65E-15	1.67E-15	7.13E-07	1.30E-05	0.00E+00	0.00E+00	1.37E-05	6.21E-09	7.19E-08
30	Al^{+3}	2.25E-11	5.06E-12	2.16E-03	1.79E-03	0.00E+00	0.00E+00	3.95E-03	1.80E-06	2.08E-05
31	As^{+3}	8.18E-15	5.11E-15	2.18E-06	9.12E-07	0.00E+00	0.00E+00	3.09E-06	1.41E-09	1.63E-08
32	B^{+3}	1.36E-13	1.22E-14	5.23E-06	8.60E-05	0.00E+00	0.00E+00	9.12E-05	4.14E-08	4.80E-07
33	Ba^{+2}	1.71E-15	1.95E-15	8.34E-07	1.15E-05	0.00E+00	0.00E+00	1.24E-05	5.63E-09	6.51E-08
34	Bi^{+3}	2.01E-15	3.51E-15	1.50E-06	6.05E-05	0.00E+00	0.00E+00	6.20E-05	2.82E-08	3.26E-07
35	Ca^{+2}	1.42E-13	4.76E-14	2.03E-05	7.75E-05	0.00E+00	0.00E+00	9.78E-05	4.45E-08	5.15E-07
36	Cd^{+2}	3.17E-15	2.97E-15	1.27E-06	4.69E-05	0.00E+00	0.00E+00	4.82E-05	2.19E-08	2.53E-07
37	Ce^{+3}	6.75E-14	7.90E-14	3.37E-05	1.44E-05	0.00E+00	0.00E+00	4.81E-05	2.19E-08	2.53E-07
38	Cl^-	3.79E-12	1.12E-12	4.79E-04	1.40E-05	0.00E+00	0.00E+00	4.92E-04	2.24E-07	2.59E-06
39	CO	1.10E-111	2.57E-112	1.10E-103	0.00E+00	0.00E+00	0.00E+00	1.10E-103	4.99E-107	5.78E-106
40	CO_2	1.36E-16	4.99E-17	2.13E-08	0.00E+00	4.20E-16	6.58E-08	8.71E-08	3.96E-11	4.58E-10
41	CO_3^{-2}	1.80E-11	9.01E-12	3.84E-03	1.57E-03	0.00E+00	0.00E+00	5.42E-03	2.46E-06	2.85E-05
42	Cr^{+3}	5.43E-13	2.36E-13	1.01E-04	3.65E-05	0.00E+00	0.00E+00	1.37E-04	6.23E-08	7.21E-07
43	Cu^{+2}	3.13E-15	1.66E-15	7.10E-07	4.89E-06	0.00E+00	0.00E+00	5.60E-06	2.55E-09	2.95E-08
44	F^-	1.78E-12	2.83E-13	1.21E-04	2.54E-04	0.00E+00	0.00E+00	3.75E-04	1.71E-07	1.97E-06
45	Fe^{+3}	9.72E-14	4.53E-14	1.93E-05	1.84E-03	0.00E+00	0.00E+00	1.86E-03	8.45E-07	9.78E-06
46	H_2O	5.28E-09	7.93E-10	3.39E-01	0.00E+00	5.63E-04	3.61E+04	3.61E+04	1.64E+01	1.90E+02
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^+	3.79E-12	3.19E-14	1.36E-05	0.00E+00	0.00E+00	0.00E+00	1.36E-05	6.19E-09	7.17E-08
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	1.87E-15	9.51E-16	4.06E-07	9.36E-22	0.00E+00	0.00E+00	4.06E-07	1.84E-10	2.14E-09
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	3.28E-15	5.49E-15	2.35E-06	2.90E-05	0.00E+00	0.00E+00	3.14E-05	1.43E-08	1.65E-07
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^+	7.79E-12	2.54E-12	1.08E-03	3.59E-05	0.00E+00	0.00E+00	1.12E-03	5.09E-07	5.89E-06
56	La^{+3}	8.70E-16	1.01E-15	4.30E-07	2.17E-05	0.00E+00	0.00E+00	2.21E-05	1.00E-08	1.16E-07
57	Li^+	1.18E-13	6.81E-15	2.91E-06	5.37E-06	0.00E+00	0.00E+00	8.28E-06	3.76E-09	4.36E-08
58	Mg^{+2}	2.59E-14	5.24E-15	2.24E-06	1.60E-05	0.00E+00	0.00E+00	1.82E-05	8.28E-09	9.58E-08
59	Mn^{+3}	2.80E-14	1.29E-14	5.49E-06	1.69E-04	0.00E+00	0.00E+00	1.75E-04	7.93E-08	9.18E-07
60	MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	5.53E-14	1.29E-14	5.51E-06	0.00E+00	3.12E-02	3.12E+06	3.12E+06	1.42E+03	1.64E+04
62	Na^+	2.45E-10	4.71E-11	2.01E-02	2.83E-03	0.00E+00	0.00E+00	2.29E-02	1.04E-05	1.21E-04
63	NH3	1.67E-13	2.38E-14	1.01E-05	0.00E+00	0.00E+00	0.00E+00	1.01E-05	4.61E-09	5.34E-08
64	NH4+	1.25E-14	2.38E-14	8.01E-07	4.12E-23	0.00E+00	0.00E+00	8.01E-07	3.64E-10	4.21E-09
65	Ni^{+2}	4.50E-14	2.20E-14	9.41E-06	7.54E-05	0.00E+00	0.00E+00	8.48E-05	3.86E-08	4.46E-07
66	NO	6.65E-37	1.67E-37	7.11E-29	0.00E+00	0.00E+00	0.00E+00	7.11E-29	3.23E-32	3.74E-31
67	NO_2	9.76E-50	3.75E-50	1.60E-41	0.00E+00	0.00E+00	0.00E+00	1.60E-41	7.27E-45	8.42E-44
68	NO_2^-	4.88E-11	1.87E-11	8.00E-03	7.09E-04	0.00E+00	0.00E+00	8.71E-03	3.96E-06	4.58E-05

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	8.58E-11	4.44E-11	1.90E-02	5.47E-04	0.00E+00	0.00E+00	1.95E-02	8.87E-06	1.03E-04
70	O_2	1.78E-14	4.76E-15	2.03E-06	0.00E+00	8.30E-03	9.46E+05	9.46E+05	4.30E+02	4.98E+03
71	O^-	0.00E+00	0.00E+00	0.00E+00	2.62E-04	0.00E+00	0.00E+00	2.62E-04	1.19E-07	1.38E-06
72	OH^-	1.43E-10	2.03E-11	8.68E-03	6.48E-03	0.00E+00	0.00E+00	1.52E-02	6.89E-06	7.97E-05
73	$OH(b)^-$	2.16E-19	3.07E-20	1.31E-11	6.92E-25	0.00E+00	0.00E+00	1.31E-11	5.96E-15	6.90E-14
74	Pb^{+2}	1.15E-14	1.99E-14	8.49E-06	9.90E-05	0.00E+00	0.00E+00	1.07E-04	4.88E-08	5.65E-07
75	Pd^{+2}	8.90E-16	7.90E-16	3.37E-07	4.06E-06	0.00E+00	0.00E+00	4.40E-06	2.00E-09	2.31E-08
76	PO_4^{-3}	9.18E-13	7.28E-13	3.11E-04	4.47E-04	0.00E+00	0.00E+00	7.57E-04	3.44E-07	3.98E-06
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	8.60E-16	7.39E-16	3.16E-07	1.32E-06	0.00E+00	0.00E+00	1.63E-06	7.41E-10	8.58E-09
79	Ru^{+3}	1.28E-15	1.08E-15	4.61E-07	1.23E-05	0.00E+00	0.00E+00	1.27E-05	5.78E-09	6.69E-08
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.67E-22	0.00E+00	0.00E+00	3.67E-22	1.67E-25	1.93E-24
81	SiO2	1.73E-13	8.69E-14	3.71E-05	4.46E-04	0.00E+00	0.00E+00	4.83E-04	2.19E-07	2.54E-06
82	SiO_4^{-4}	9.10E-26	7.00E-26	2.99E-17	7.91E-12	0.00E+00	0.00E+00	7.91E-12	3.59E-15	4.16E-14
83	SO_2	1.40E-52	7.48E-53	3.19E-44	0.00E+00	0.00E+00	0.00E+00	3.19E-44	1.45E-47	1.68E-46
84	SO_4^{-2}	2.19E-12	1.76E-12	7.50E-04	1.61E-04	0.00E+00	0.00E+00	9.11E-04	4.14E-07	4.79E-06
85	Sr^{+2}	4.57E-16	3.34E-16	1.43E-07	6.44E-06	0.00E+00	0.00E+00	6.59E-06	2.99E-09	3.47E-08
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	1.43E-15	5.71E-16	2.44E-07	2.73E-06	0.00E+00	0.00E+00	2.98E-06	1.35E-09	1.57E-08
88	Zn^{+2}	5.35E-15	2.92E-15	1.25E-06	2.00E-05	0.00E+00	0.00E+00	2.13E-05	9.68E-09	1.12E-07
89	Zr^{+4}	3.94E-15	3.00E-15	1.28E-06	4.48E-04	0.00E+00	0.00E+00	4.49E-04	2.04E-07	2.36E-06
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	9.07E-13	6.66E-13	2.84E-04	2.24E-03	0.00E+00	0.00E+00	2.52E-03	1.15E-06	1.33E-05
94	$C_2O_4^{-2}$	9.07E-13	6.66E-13	2.84E-04	2.24E-03	0.00E+00	0.00E+00	2.52E-03	1.15E-06	1.33E-05
95	Formate	4.02E-25	1.51E-25	6.44E-17	3.08E-13	0.00E+00	0.00E+00	3.08E-13	1.40E-16	1.62E-15
96	Acetate	3.11E-25	1.53E-25	6.55E-17	3.13E-13	0.00E+00	0.00E+00	3.13E-13	1.42E-16	1.65E-15
97	Glycolate	2.07E-24	1.30E-24	5.54E-16	1.54E-13	0.00E+00	0.00E+00	1.54E-13	7.02E-17	8.13E-16
98	IDA	1.06E-24	1.18E-24	5.03E-16	3.93E-13	0.00E+00	0.00E+00	3.93E-13	1.79E-16	2.07E-15
99	Citrate	9.69E-26	1.55E-25	6.64E-17	3.37E-13	0.00E+00	0.00E+00	3.37E-13	1.53E-16	1.77E-15
100	HEDTA	4.54E-25	1.05E-24	4.50E-16	2.76E-13	0.00E+00	0.00E+00	2.77E-13	1.26E-16	1.46E-15
101	EDTA	5.46E-26	1.33E-25	5.68E-17	2.97E-13	0.00E+00	0.00E+00	2.97E-13	1.35E-16	1.56E-15
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	1.66E-10	2.69E-01	1.13E-04	2.65E-10	4.28E-01	3.12E-03	4.31E-10	6.96E-01	3.23E-03
106	^{241}Am	1.75E-14	2.82E-05	1.81E-08	1.90E-12	3.08E-03	1.98E-06	1.92E-12	3.10E-03	2.00E-06
107	^{243}Am	1.14E-17	1.84E-08	2.04E-10	1.54E-16	2.49E-07	2.75E-09	1.65E-16	2.67E-07	2.95E-09
108	^{14}C	3.57E-16	5.76E-07	2.85E-10	1.34E-16	2.17E-07	1.07E-10	4.91E-16	7.93E-07	3.92E-10
109	^{60}Co	2.34E-15	3.78E-06	7.37E-12	2.10E-13	3.40E-04	6.62E-10	2.13E-13	3.44E-04	6.69E-10
110	^{243}Cm	1.88E-18	3.04E-09	1.33E-13	2.66E-15	4.30E-06	1.88E-10	2.66E-15	4.30E-06	1.88E-10
111	^{244}Cm	4.46E-17	7.20E-08	1.96E-12	6.05E-14	9.77E-05	2.66E-09	6.05E-14	9.78E-05	2.66E-09
112	^{137}Cs	1.60E-10	2.59E-01	6.58E-06	4.31E-11	6.96E-02	1.77E-06	2.03E-10	3.29E-01	8.34E-06
113	^{152}Eu	1.31E-16	2.12E-07	2.69E-12	1.01E-14	1.64E-05	2.07E-10	1.03E-14	1.66E-05	2.10E-10
114	^{154}Eu	2.72E-14	4.40E-05	3.59E-10	1.10E-12	1.77E-03	1.45E-08	1.12E-12	1.82E-03	1.48E-08
115	^{155}Eu	7.87E-15	1.27E-05	5.77E-11	1.62E-13	2.62E-04	1.19E-09	1.70E-13	2.75E-04	1.25E-09
116	^{3}H	2.18E-15	3.53E-06	8.10E-13	3.48E-15	5.63E-06	1.29E-12	5.67E-15	9.16E-06	2.10E-12
117	^{129}I	1.09E-17	1.76E-08	2.19E-07	7.02E-18	1.13E-08	1.42E-07	1.79E-17	2.89E-08	3.61E-07
118	^{63}Ni	4.22E-14	6.81E-05	2.64E-09	3.65E-14	5.90E-05	2.29E-09	7.87E-14	1.27E-04	4.93E-09
119	^{237}Np	1.38E-17	2.23E-08	6.99E-08	1.56E-15	2.52E-06	7.87E-06	1.57E-15	2.54E-06	7.94E-06
120	^{238}Pu	7.81E-17	1.26E-07	1.62E-11	7.39E-15	1.19E-05	1.54E-09	7.47E-15	1.21E-05	1.55E-09
121	^{239}Pu	1.08E-15	1.75E-06	6.20E-08	6.55E-14	1.06E-04	3.76E-06	6.66E-14	1.08E-04	3.82E-06
122	^{240}Pu	2.80E-16	4.52E-07	4.39E-09	1.73E-14	2.79E-05	2.71E-07	1.76E-14	2.84E-05	2.76E-07
123	^{241}Pu	5.87E-15	9.49E-06	2.03E-10	4.64E-13	7.49E-04	1.60E-08	4.70E-13	7.59E-04	1.62E-08
124	^{242}Pu	2.96E-20	4.79E-11	2.68E-11	1.59E-18	2.57E-09	1.44E-09	1.62E-18	2.62E-09	1.47E-09
125	^{125}Sb	1.62E-14	2.62E-05	5.58E-11	6.73E-13	1.09E-03	2.31E-09	6.89E-13	1.11E-03	2.37E-09
126	^{151}Sm	2.28E-13	3.69E-04	3.09E-08	8.14E-12	1.32E-02	1.10E-06	8.37E-12	1.35E-02	1.13E-06
127	^{126}Sn	2.58E-16	4.17E-07	8.10E-08	3.15E-15	5.09E-06	9.88E-07	3.41E-15	5.51E-06	1.07E-06
128	^{90}Sr	5.57E-12	9.00E-03	1.44E-07	2.08E-10	3.36E-01	5.37E-06	2.14E-10	3.45E-01	5.51E-06
129	^{99}Tc	4.49E-14	7.26E-05	9.44E-06	4.83E-13	7.81E-04	1.02E-04	5.28E-13	8.54E-04	1.11E-04
130	^{232}Th	4.20E-19	6.78E-10	1.36E-05	5.15E-17	8.33E-08	1.67E-03	5.20E-17	8.40E-08	1.68E-03
131	^{233}U	1.40E-17	2.26E-08	5.17E-09	4.22E-15	6.82E-06	1.56E-06	4.23E-15	6.84E-06	1.56E-06
132	^{234}U	9.93E-18	1.61E-08	5.70E-09	2.19E-16	3.54E-07	1.26E-07	2.29E-16	3.71E-07	1.32E-07
133	^{235}U	3.91E-19	6.32E-10	6.45E-07	5.27E-18	8.52E-09	8.69E-06	5.66E-18	9.15E-09	9.34E-06
134	^{236}U	6.70E-19	1.08E-09	3.69E-08	7.24E-18	1.17E-08	3.99E-07	7.91E-18	1.28E-08	4.36E-07
135	^{238}U	7.76E-18	1.25E-08	8.22E-05	1.24E-16	2.01E-07	1.32E-03	1.32E-16	2.13E-07	1.40E-03
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-4 HFP01 Stream Report

Stream Number:		HFP01
Stream Name:		HLW blended glass formers
Configuration:		MRQ-05-0049.acmf
Run Date / Time:		12/14/2005 - 1:42:25 PM
Run Data File:		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

Variable	Value	Units	
Density	9.97E-01	g/cm^3	(does not include solid phase)
Enthalpy	-1.44E+05	BTU/hr	
Mass Flow	4.43E+02	Lb/hr	
	1.06E+04	Lb/day	
Volumetric Flow	4.23E-02	GPM	(does not include solid phase)
	5.65E-03	ft^3/min	(does not include solid phase)
Molar Flow	1.17E+00	Lbmol/hr	
Molecular Weight	1.80E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	2.50E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	7.00E+00	pH	
Total TRU	0.00E+00	Ci/L	
Total Activity	3.73E-09	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	5.54E+01	8.32E+00	5.07E+02	1.01E+04	0.00E+00	0.00E+00	1.06E+04	4.84E+00	5.60E+01
Ag^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	1.02E+02	0.00E+00	0.00E+00	1.02E+02	4.62E-02	5.34E-01
As^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B^{+3}	0.00E+00	0.00E+00	0.00E+00	3.24E+02	0.00E+00	0.00E+00	3.24E+02	1.47E-01	1.70E+00
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	4.74E-01	0.00E+00	0.00E+00	4.74E-01	2.15E-04	2.49E-03
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	8.18E-03	0.00E+00	0.00E+00	8.18E-03	3.72E-06	4.30E-05
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cl^-	1.83E-02	5.42E-03	3.30E-01	0.00E+00	0.00E+00	0.00E+00	3.30E-01	1.50E-04	1.74E-03
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	6.55E+02	0.00E+00	0.00E+00	6.55E+02	2.98E-01	3.44E+00
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	6.67E+01	0.00E+00	0.00E+00	6.67E+01	3.03E-02	3.51E-01
H_2O	5.53E+01	8.32E+00	5.07E+02	0.00E+00	0.00E+00	0.00E+00	5.07E+02	2.30E-01	2.67E+00
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	1.38E+02	0.00E+00	0.00E+00	1.38E+02	6.27E-02	7.26E-01
H^+	1.00E-07	8.41E-10	5.12E-08	0.00E+00	0.00E+00	0.00E+00	5.12E-08	2.33E-11	2.70E-10
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	0.00E+00	0.00E+00	0.00E+00	1.04E+00	0.00E+00	0.00E+00	1.04E+00	4.73E-04	5.47E-03
La^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Li^+	0.00E+00	0.00E+00	0.00E+00	1.39E+02	0.00E+00	0.00E+00	1.39E+02	6.32E-02	7.32E-01
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	8.76E-01	0.00E+00	0.00E+00	8.76E-01	3.98E-04	4.61E-03
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	8.53E-02	0.00E+00	0.00E+00	8.53E-02	3.88E-05	4.49E-04
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na^+	0.00E+00	0.00E+00	0.00E+00	7.53E+01	0.00E+00	0.00E+00	7.53E+01	3.42E-02	3.96E-01
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NH4+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70	O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71	O^-	0.00E+00	0.00E+00	0.00E+00	9.09E+02	0.00E+00	0.00E+00	9.09E+02	4.13E-01	4.78E+00
72	OH^-	1.00E-07	1.42E-08	8.64E-07	1.36E+03	0.00E+00	0.00E+00	1.36E+03	6.19E-01	7.17E+00
73	$OH(b)^-$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74	Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	1.73E-03	0.00E+00	0.00E+00	1.73E-03	7.88E-07	9.12E-06
75	Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76	PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	3.36E-01	0.00E+00	0.00E+00	3.36E-01	1.53E-04	1.77E-03
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79	Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	0.00E+00	0.00E+00	0.00E+00	6.19E+03	0.00E+00	0.00E+00	6.19E+03	2.81E+00	3.25E+01
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	8.88E-01	0.00E+00	0.00E+00	8.88E-01	4.04E-04	4.67E-03
85	Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	2.33E+00	0.00E+00	0.00E+00	2.33E+00	1.06E-03	1.23E-02
88	Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	1.50E+02	0.00E+00	0.00E+00	1.50E+02	6.82E-02	7.90E-01
89	Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	2.12E+01	0.00E+00	0.00E+00	2.12E+01	9.83E-03	1.12E-01
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
94	$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	0.00E+00	0.00E+00	0.00E+00	3.73E-09	8.60E-07	1.72E-02	3.73E-09	8.60E-07	1.72E-02
106	^{241}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107	^{243}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109	^{60}Co	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110	^{243}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111	^{244}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
112	^{137}Cs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
113	^{152}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
114	^{154}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
115	^{155}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
116	^{3}H	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
118	^{63}Ni	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
119	^{237}Np	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120	^{238}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121	^{239}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122	^{240}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123	^{241}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
124	^{242}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
125	^{125}Sb	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
126	^{151}Sm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
127	^{126}Sn	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
128	^{90}Sr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129	^{99}Tc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
130	^{232}Th	0.00E+00	0.00E+00	0.00E+00	3.73E-09	8.60E-07	1.72E-02	3.73E-09	8.60E-07	1.72E-02
131	^{233}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
132	^{234}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
133	^{235}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
134	^{236}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
135	^{238}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-5 HFP03 Stream Report

Stream Number:	HFP03
Stream Name:	Blended HLW melter feed to HLW melter
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

Variable	Value	Units	
Density	1.06E+00	g/cm^3	(does not include solid phase)
Enthalpy	-5.24E+06	BTU/hr	
Mass Flow	1.51E+03	Lb/hr	
	3.62E+04	Lb/day	
Volumetric Flow	1.54E+00	GPM	(does not include solid phase)
	2.05E-01	ft^3/min	(does not include solid phase)
Molar Flow	4.29E+01	Lbmol/hr	
Molecular Weight	1.89E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	3.00E+01	C	
Na Molarity	9.21E-01	mol/L	
pH	6.99E+00	pH	
Total TRU	1.36E-01	Ci/L	
Total Activity	3.03E+01	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	5.58E+01	8.81E+00	1.95E+04	1.52E+04	0.00E+00	0.00E+00	3.47E+04	1.58E+01	1.83E+02
Ag^+	5.81E-06	5.23E-06	1.16E-02	3.62E+00	0.00E+00	0.00E+00	3.63E+00	1.65E-03	1.91E-02
Al^{+3}	7.03E-02	1.58E-02	3.50E+01	6.01E+02	0.00E+00	0.00E+00	6.36E+02	2.89E-01	3.34E+00
As^{+3}	2.56E-05	1.60E-05	3.54E-02	2.33E-01	0.00E+00	0.00E+00	2.68E-01	1.22E-04	1.41E-03
B^{+3}	3.93E-02	3.55E-03	7.85E+00	3.31E+02	0.00E+00	0.00E+00	3.38E+02	1.54E-01	1.78E+00
Ba^{+2}	5.34E-06	6.12E-06	1.35E-02	3.23E+00	0.00E+00	0.00E+00	3.24E+00	1.47E-03	1.71E-02
Bi^{+3}	6.28E-06	1.09E-05	2.42E-02	1.69E+01	0.00E+00	0.00E+00	1.70E+01	7.71E-03	8.92E-02
Ca^{+2}	3.70E-04	1.24E-04	2.73E-01	1.97E+01	0.00E+00	0.00E+00	2.00E+01	9.09E-03	1.05E-01
Cd^{+2}	9.88E-06	9.27E-06	2.05E-02	1.31E+01	0.00E+00	0.00E+00	1.31E+01	5.94E-03	6.88E-02
Ce^{+3}	2.37E-04	2.77E-04	6.13E-01	4.02E+00	0.00E+00	0.00E+00	4.64E+00	2.11E-03	2.44E-02
Cl^-	1.22E-02	3.60E-03	7.95E+00	3.92E+00	0.00E+00	0.00E+00	1.19E+01	5.40E-03	6.25E-02
CO	6.36E-101	1.49E-101	3.29E-98	0.00E+00	0.00E+00	0.00E+00	3.29E-98	1.49E-101	1.73E-100
CO_2	4.90E-06	1.80E-06	3.98E-03	0.00E+00	0.00E+00	0.00E+00	3.98E-03	1.81E-06	2.09E-05
CO_3^{-2}	5.62E-02	2.82E-02	6.23E+01	1.09E+03	0.00E+00	0.00E+00	1.16E+03	5.26E-01	6.09E+00
Cr^{+3}	1.69E-03	7.35E-04	1.63E+00	1.01E+01	0.00E+00	0.00E+00	1.17E+01	5.32E-03	6.16E-02
Cu^{+2}	9.81E-06	5.20E-06	1.15E-02	1.37E+00	0.00E+00	0.00E+00	1.38E+00	6.28E-04	7.27E-03
F^-	5.51E-03	8.74E-04	1.93E+00	7.13E+01	0.00E+00	0.00E+00	7.32E+01	3.33E-02	3.85E-01
Fe^{+3}	3.11E-04	1.45E-04	3.20E-01	5.80E+02	0.00E+00	0.00E+00	5.80E+02	2.64E-01	3.05E+00
H_2O	5.35E+01	8.05E+00	1.78E+04	0.00E+00	0.00E+00	0.00E+00	1.78E+04	8.09E+00	9.36E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	1.38E+02	0.00E+00	0.00E+00	1.38E+02	6.27E-02	7.26E-01
H^+	1.01E-07	8.53E-10	1.89E-06	0.00E+00	0.00E+00	0.00E+00	1.89E-06	8.57E-10	9.92E-09
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	7.10E-24	3.61E-24	7.99E-21	0.00E+00	0.00E+00	0.00E+00	7.99E-21	3.63E-24	4.21E-23
H2CO3	7.66E-23	3.96E-23	8.77E-20	0.00E+00	0.00E+00	0.00E+00	8.77E-20	3.99E-23	4.61E-22
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	1.03E-05	1.72E-05	3.80E-02	7.45E+00	0.00E+00	0.00E+00	7.49E+00	3.41E-03	3.94E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	2.92E-02	9.53E-03	2.11E+01	1.11E+01	0.00E+00	0.00E+00	3.22E+01	1.46E-02	1.69E-01
La^{+3}	2.72E-06	3.16E-06	6.98E-03	6.06E+00	0.00E+00	0.00E+00	6.06E+00	2.76E-03	3.19E-02
Li^+	2.12E-04	1.23E-05	2.71E-02	1.40E+02	0.00E+00	0.00E+00	1.40E+02	6.38E-02	7.38E-01
Mg^{+2}	8.09E-05	1.64E-05	3.63E-02	4.88E+00	0.00E+00	0.00E+00	4.92E+00	2.24E-03	2.59E-02
Mn^{+3}	8.78E-05	4.03E-05	8.90E-02	4.74E+01	0.00E+00	0.00E+00	4.75E+01	2.16E-02	2.50E-01
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	2.28E-03	5.33E-04	1.18E+00	0.00E+00	0.00E+00	0.00E+00	1.18E+00	5.36E-04	6.20E-03
Na^+	9.21E-01	1.77E-01	3.91E+02	8.68E+02	0.00E+00	0.00E+00	1.26E+03	5.72E-01	6.62E+00
NH3	3.72E-03	5.28E-04	1.17E+00	0.00E+00	0.00E+00	0.00E+00	1.17E+00	5.31E-04	6.14E-03
NH4+	3.69E-20	5.28E-04	1.23E-17	0.00E+00	0.00E+00	0.00E+00	1.23E-17	5.58E-21	6.46E-20
Ni^{+2}	1.41E-04	6.92E-05	1.53E-01	2.11E+01	0.00E+00	0.00E+00	2.12E+01	9.65E-03	1.12E-01
NO	4.00E-26	1.00E-26	2.22E-23	0.00E+00	0.00E+00	0.00E+00	2.22E-23	1.01E-26	1.17E-25
NO_2	5.65E-39	2.17E-39	4.80E-36	0.00E+00	0.00E+00	0.00E+00	4.80E-36	2.18E-39	2.52E-38
NO_2^-	1.53E-01	5.86E-02	1.30E+02	1.99E+02	0.00E+00	0.00E+00	3.28E+02	1.49E-01	1.73E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-11

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	8.33E-01	4.31E-01	9.54E+02	1.53E+02	0.00E+00	0.00E+00	1.11E+03	5.03E-01	5.82E+00
70	O_2	7.36E-04	1.96E-04	4.34E-01	0.00E+00	0.00E+00	0.00E+00	4.34E-01	1.97E-04	2.29E-03
71	O^-	0.00E+00	0.00E+00	0.00E+00	9.53E+02	0.00E+00	0.00E+00	9.53E+02	4.33E-01	5.01E+00
72	OH^-	9.86E-08	1.40E-08	3.10E-05	3.14E+03	0.00E+00	0.00E+00	3.14E+03	1.43E+00	1.65E+01
73	$OH(b)^-$	1.56E-01	2.21E-02	4.88E+01	1.98E-19	0.00E+00	0.00E+00	4.88E+01	2.22E-02	2.57E-01
74	Pb^{+2}	3.59E-05	6.20E-05	1.37E-01	2.77E+01	0.00E+00	0.00E+00	2.78E+01	1.27E-02	1.46E-01
75	Pd^{+2}	2.78E-06	2.46E-06	5.45E-03	1.14E+00	0.00E+00	0.00E+00	1.14E+00	5.19E-04	6.01E-03
76	PO_4^{-3}	2.87E-03	2.28E-03	5.04E+00	1.25E+02	0.00E+00	0.00E+00	1.30E+02	5.90E-02	6.83E-01
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	2.68E-06	2.30E-06	5.10E-03	3.68E-01	0.00E+00	0.00E+00	3.73E-01	1.69E-04	1.96E-03
79	Ru^{+3}	3.99E-06	3.36E-06	7.44E-03	3.37E+00	0.00E+00	0.00E+00	3.38E+00	1.54E-03	1.78E-02
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	8.52E-17	0.00E+00	0.00E+00	8.52E-17	3.87E-20	4.48E-19
81	SiO2	5.43E-04	2.72E-04	6.02E-01	6.30E+03	0.00E+00	0.00E+00	6.30E+03	2.86E+00	3.31E+01
82	SiO_4^{-4}	4.15E-16	3.19E-16	7.05E-13	2.08E-06	0.00E+00	0.00E+00	2.08E-06	9.45E-10	1.09E-08
83	SO_2	6.08E-42	3.25E-42	7.19E-39	0.00E+00	0.00E+00	0.00E+00	7.19E-39	3.27E-42	3.78E-41
84	SO_4^{-2}	6.86E-03	5.50E-03	1.22E+01	4.59E+01	0.00E+00	0.00E+00	5.80E+01	2.64E-02	3.05E-01
85	Sr^{+2}	1.45E-06	1.06E-06	2.34E-03	1.80E+00	0.00E+00	0.00E+00	1.81E+00	8.21E-04	9.51E-03
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	3.59E-36	0.00E+00	0.00E+00	3.59E-36	1.63E-39	1.89E-38
87	Ti^{+4}	4.48E-06	1.79E-06	3.95E-03	3.05E+00	0.00E+00	0.00E+00	3.06E+00	1.39E-03	1.61E-02
88	Zn^{+2}	1.67E-05	9.13E-06	2.02E-02	1.53E+02	0.00E+00	0.00E+00	1.53E+02	6.97E-02	8.07E-01
89	Zr^{+4}	1.23E-05	9.40E-06	2.08E-02	1.46E+02	0.00E+00	0.00E+00	1.46E+02	6.63E-02	7.67E-01
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	3.62E-03	2.66E-03	5.87E+00	5.21E+02	0.00E+00	0.00E+00	5.27E+02	2.40E-01	2.77E+00
94	$C_2O_4^{-2}$	3.62E-03	2.66E-03	5.87E+00	5.21E+02	0.00E+00	0.00E+00	5.27E+02	2.40E-01	2.77E+00
95	Formate	2.57E-15	9.66E-16	2.14E-12	1.01E-07	0.00E+00	0.00E+00	1.01E-07	4.58E-11	5.30E-10
96	Acetate	1.99E-15	9.82E-16	2.17E-12	1.02E-07	0.00E+00	0.00E+00	1.02E-07	4.66E-11	5.39E-10
97	Glycolate	1.33E-14	8.31E-15	1.84E-11	5.03E-08	0.00E+00	0.00E+00	5.03E-08	2.29E-11	2.65E-10
98	IDA	6.21E-15	6.90E-15	1.53E-11	1.28E-07	0.00E+00	0.00E+00	1.29E-07	5.84E-11	6.76E-10
99	Citrate	5.68E-16	9.11E-16	2.01E-12	1.10E-07	0.00E+00	0.00E+00	1.10E-07	5.02E-11	5.81E-10
100	HEDTA	2.66E-15	6.18E-15	1.37E-11	9.04E-08	0.00E+00	0.00E+00	9.04E-08	4.11E-11	4.76E-10
101	EDTA	3.20E-16	7.80E-16	1.72E-12	9.72E-08	0.00E+00	0.00E+00	9.72E-08	4.42E-11	5.11E-10
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	1.60E+01	1.34E+05	5.13E+00	1.43E+01	1.19E+05	8.72E+02	3.03E+01	2.53E+05	8.77E+02
106	^{241}Am	5.44E-05	4.56E-01	2.93E-04	1.03E-01	8.61E+02	5.54E-01	1.03E-01	8.61E+02	5.54E-01
107	^{243}Am	3.56E-08	2.98E-04	3.29E-06	8.31E-06	6.96E-02	7.69E-04	8.35E-06	6.99E-02	7.72E-04
108	^{14}C	1.12E-06	9.35E-03	4.62E-06	7.26E-06	6.08E-02	3.00E-05	8.38E-06	7.01E-02	3.46E-05
109	^{60}Co	7.33E-06	6.14E-02	1.20E-07	1.14E-02	9.51E+01	1.85E-04	1.14E-02	9.52E+01	1.85E-04
110	^{243}Cm	5.90E-09	4.94E-05	2.15E-09	1.44E-04	1.20E+00	5.25E-05	1.44E-04	1.20E+00	5.25E-05
111	^{244}Cm	1.40E-07	1.17E-03	3.18E-08	3.27E-03	2.74E+01	7.45E-04	3.27E-03	2.74E+01	7.45E-04
112	^{137}Cs	1.60E+01	1.34E+05	3.40E+00	2.29E+00	1.92E+04	4.87E-01	1.83E+01	1.53E+05	3.89E+00
113	^{152}Eu	4.09E-07	3.43E-03	4.35E-08	5.47E-04	4.58E+00	5.81E-05	5.47E-04	4.58E+00	5.81E-05
114	^{154}Eu	8.49E-05	7.10E-01	5.80E-06	5.92E-02	4.96E+02	4.05E-03	5.93E-02	4.97E+02	4.05E-03
115	^{155}Eu	2.45E-05	2.05E-01	9.33E-07	8.77E-03	7.34E+01	3.33E-04	8.80E-03	7.37E+01	3.34E-04
116	^{3}H	2.40E-05	2.01E-01	4.60E-08	1.80E-04	1.51E+00	3.45E-07	2.04E-04	1.71E+00	3.91E-07
117	^{129}I	3.42E-08	2.87E-04	3.58E-03	3.58E-07	3.00E-03	3.74E-02	3.93E-07	3.29E-03	4.10E-02
118	^{63}Ni	1.31E-04	1.10E+00	4.27E-05	1.97E-03	1.65E+01	6.39E-04	2.10E-03	1.76E+01	6.82E-04
119	^{237}Np	4.33E-08	3.62E-04	1.13E-03	8.41E-05	7.04E-01	2.20E+00	8.42E-05	7.05E-01	2.20E+00
120	^{238}Pu	2.44E-07	2.04E-03	2.62E-07	3.99E-04	3.34E+00	4.30E-04	4.00E-04	3.35E+00	4.31E-04
121	^{239}Pu	3.37E-06	2.82E-02	1.00E-03	3.54E-03	2.96E+01	1.05E+00	3.54E-03	2.96E+01	1.05E+00
122	^{240}Pu	8.73E-07	7.31E-03	7.10E-05	9.33E-04	7.81E+00	7.59E-02	9.34E-04	7.82E+00	7.60E-02
123	^{241}Pu	1.83E-05	1.53E-01	3.28E-06	2.51E-02	2.10E+02	4.49E-03	2.51E-02	2.10E+02	4.49E-03
124	^{242}Pu	9.24E-11	7.74E-07	4.33E-07	8.60E-08	7.20E-04	4.03E-04	8.61E-08	7.21E-04	4.03E-04
125	^{125}Sb	5.07E-05	4.24E-01	9.02E-07	3.63E-02	3.04E+02	6.46E-04	3.64E-02	3.05E+02	6.47E-04
126	^{151}Sm	7.11E-04	5.95E+00	4.99E-04	4.40E-01	3.68E+03	3.09E-01	4.41E-01	3.69E+03	3.09E-01
127	^{126}Sn	8.06E-07	6.75E-03	1.31E-03	1.70E-04	1.43E+00	2.77E-01	1.71E-04	1.43E+00	2.78E-01
128	^{90}Sr	1.76E-02	1.47E+02	2.35E-03	1.13E+01	9.42E+04	1.50E+00	1.13E+01	9.44E+04	1.51E+00
129	^{99}Tc	1.41E-04	1.18E+00	1.53E-01	2.54E-02	2.12E+02	2.76E+01	2.55E-02	2.14E+02	2.78E+01
130	^{232}Th	1.31E-09	1.10E-05	2.20E-01	2.78E-06	2.33E-02	4.67E+02	2.79E-06	2.33E-02	4.67E+02
131	^{233}U	4.38E-08	3.67E-04	8.39E-05	2.28E-04	1.91E+00	4.37E-01	2.28E-04	1.91E+00	4.37E-01
132	^{234}U	3.11E-08	2.60E-04	9.24E-05	1.18E-05	9.92E-02	3.52E-02	1.19E-05	9.95E-02	3.53E-02
133	^{235}U	1.23E-09	1.03E-05	1.05E-02	2.85E-07	2.38E-03	2.43E+00	2.86E-07	2.39E-03	2.44E+00
134	^{236}U	2.10E-09	1.76E-05	5.99E-04	3.91E-07	3.28E-03	1.12E-01	3.93E-07	3.29E-03	1.12E-01
135	^{238}U	2.43E-08	2.03E-04	1.33E+00	6.70E-06	5.61E-02	3.68E+02	6.73E-06	5.63E-02	3.70E+02
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-6 HLP09 Stream Report

Stream Number:	HLP09
Stream Name:	Blended HLW feed to HLW Vitrification
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

Variable	Value	Units	
Density	1.06E+00	g/cm^3	(does not include solid phase)
Enthalpy	-4.75E+06	BTU/hr	
Mass Flow	1.02E+03	Lb/hr	
	2.44E+04	Lb/day	
Volumetric Flow	1.40E+00	GPM	(does not include solid phase)
	1.88E-01	ft^3/min	(does not include solid phase)
Molar Flow	3.91E+01	Lbmol/hr	
Molecular Weight	1.90E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	4.50E+01	C	
Na Molarity	1.01E+00	mol/L	
pH	1.26E+01	pH	
Total TRU	1.49E-01	Ci/L	
Total Activity	3.31E+01	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	5.56E+01	8.82E+00	1.78E+04	5.15E+03	0.00E+00	0.00E+00	2.30E+04	1.05E+01	1.21E+02
Ag^{+}	6.35E-06	5.72E-06	1.16E-02	3.62E+00	0.00E+00	0.00E+00	3.63E+00	1.65E-03	1.91E-02
Al^{+3}	7.68E-02	1.73E-02	3.50E+01	4.99E+02	0.00E+00	0.00E+00	5.34E+02	2.43E-01	2.81E+00
As^{+3}	2.80E-05	1.75E-05	3.54E-02	2.33E-01	0.00E+00	0.00E+00	2.68E-01	1.22E-04	1.41E-03
B^{+3}	4.65E-04	4.19E-05	8.48E-02	1.43E+01	0.00E+00	0.00E+00	1.44E+01	6.53E-03	7.56E-02
Ba^{+2}	5.84E-06	6.69E-06	1.35E-02	3.23E+00	0.00E+00	0.00E+00	3.24E+00	1.47E-03	1.71E-02
Bi^{+3}	6.86E-06	1.20E-05	2.42E-02	1.69E+01	0.00E+00	0.00E+00	1.70E+01	7.71E-03	8.92E-02
Ca^{+2}	4.04E-04	1.35E-04	2.73E-01	1.93E+01	0.00E+00	0.00E+00	1.95E+01	8.88E-03	1.03E-01
Cd^{+2}	1.08E-05	1.01E-05	2.05E-02	1.30E+01	0.00E+00	0.00E+00	1.31E+01	5.94E-03	6.87E-02
Ce^{+3}	2.59E-04	3.03E-04	6.13E-01	4.02E+00	0.00E+00	0.00E+00	4.64E+00	2.11E-03	2.44E-02
Cl^{-}	1.27E-02	3.77E-03	7.62E+00	3.92E+00	0.00E+00	0.00E+00	1.15E+01	5.25E-03	6.07E-02
CO	6.95E-101	1.62E-101	3.29E-98	0.00E+00	0.00E+00	0.00E+00	3.29E-98	1.49E-101	1.73E-100
CO_2	5.36E-06	1.97E-06	3.98E-03	0.00E+00	0.00E+00	0.00E+00	3.98E-03	1.81E-06	2.09E-05
CO_3^{-2}	6.15E-02	3.08E-02	6.23E+01	4.40E+02	0.00E+00	0.00E+00	5.02E+02	2.28E-01	2.64E+00
Cr^{+3}	1.85E-03	8.04E-04	1.63E+00	1.01E+01	0.00E+00	0.00E+00	1.17E+01	5.32E-03	6.16E-02
Cu^{+2}	1.07E-05	5.69E-06	1.15E-02	1.37E+00	0.00E+00	0.00E+00	1.38E+00	6.28E-04	7.27E-03
F^{-}	6.03E-03	9.56E-04	1.93E+00	7.13E+01	0.00E+00	0.00E+00	7.32E+01	3.33E-02	3.85E-01
Fe^{+3}	3.40E-04	1.58E-04	3.20E-01	5.13E+02	0.00E+00	0.00E+00	5.13E+02	2.33E-01	2.70E+00
H_2O	5.33E+01	8.01E+00	1.62E+04	0.00E+00	0.00E+00	0.00E+00	1.62E+04	7.37E+00	8.53E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	2.35E-13	1.98E-15	4.00E-12	0.00E+00	0.00E+00	0.00E+00	4.00E-12	1.82E-15	2.11E-14
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	7.76E-24	3.95E-24	7.99E-21	0.00E+00	0.00E+00	0.00E+00	7.99E-21	3.63E-24	4.21E-23
H2CO3	8.37E-23	4.33E-23	8.77E-20	0.00E+00	0.00E+00	0.00E+00	8.77E-20	3.99E-23	4.61E-22
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	1.12E-05	1.88E-05	3.80E-02	7.45E+00	0.00E+00	0.00E+00	7.49E+00	3.41E-03	3.94E-02
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	3.19E-02	1.04E-02	2.11E+01	1.01E+01	0.00E+00	0.00E+00	3.11E+01	1.42E-02	1.64E-01
La^{+3}	2.98E-06	3.45E-06	6.98E-03	6.06E+00	0.00E+00	0.00E+00	6.06E+00	2.76E-03	3.19E-02
Li^{+}	2.31E-04	1.34E-05	2.71E-02	1.12E+00	0.00E+00	0.00E+00	1.15E+00	5.23E-04	6.05E-03
Mg^{+2}	8.85E-05	1.79E-05	3.63E-02	4.01E+00	0.00E+00	0.00E+00	4.04E+00	1.84E-03	2.13E-02
Mn^{+3}	9.60E-05	4.40E-05	8.90E-02	4.73E+01	0.00E+00	0.00E+00	4.74E+01	2.15E-02	2.49E-01
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	2.49E-03	5.83E-04	1.18E+00	0.00E+00	0.00E+00	0.00E+00	1.18E+00	5.36E-04	6.20E-03
Na^{+}	1.01E+00	1.93E-01	3.91E+02	7.92E+02	0.00E+00	0.00E+00	1.18E+03	5.38E-01	6.22E+00
NH3	4.06E-03	5.77E-04	1.17E+00	0.00E+00	0.00E+00	0.00E+00	1.17E+00	5.31E-04	6.14E-03
NH4+	4.03E-20	5.77E-04	1.23E-17	0.00E+00	0.00E+00	0.00E+00	1.23E-17	5.58E-21	6.46E-20
Ni^{+2}	1.54E-04	7.56E-05	1.53E-01	2.11E+01	0.00E+00	0.00E+00	2.12E+01	9.65E-03	1.12E-01
NO	4.38E-26	1.10E-26	2.22E-23	0.00E+00	0.00E+00	0.00E+00	2.22E-23	1.01E-26	1.17E-25
NO_2	6.18E-39	2.37E-39	4.80E-36	0.00E+00	0.00E+00	0.00E+00	4.80E-36	2.18E-39	2.52E-38
NO_2^{-}	1.67E-01	6.40E-02	1.30E+02	1.99E+02	0.00E+00	0.00E+00	3.28E+02	1.49E-01	1.73E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-13

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	9.11E-01	4.71E-01	9.54E+02	1.53E+02	0.00E+00	0.00E+00	1.11E+03	5.03E-01	5.82E+00
70	O_2	8.04E-04	2.15E-04	4.34E-01	0.00E+00	0.00E+00	0.00E+00	4.34E-01	1.97E-04	2.29E-03
71	O^-	0.00E+00	0.00E+00	0.00E+00	4.41E+01	0.00E+00	0.00E+00	4.41E+01	2.00E-02	2.32E-01
72	OH^-	4.25E-02	6.04E-03	1.22E+01	1.81E+03	0.00E+00	0.00E+00	1.83E+03	8.30E-01	9.61E+00
73	$OH(b)^-$	8.37E-10	1.19E-10	2.40E-07	1.98E-19	0.00E+00	0.00E+00	2.40E-07	1.09E-10	1.26E-09
74	Pb^{+2}	3.92E-05	6.78E-05	1.37E-01	2.77E+01	0.00E+00	0.00E+00	2.78E+01	1.26E-02	1.46E-01
75	Pd^{+2}	3.03E-06	2.69E-06	5.45E-03	1.14E+00	0.00E+00	0.00E+00	1.14E+00	5.19E-04	6.01E-03
76	PO_4^{-3}	3.14E-03	2.49E-03	5.04E+00	1.24E+02	0.00E+00	0.00E+00	1.29E+02	5.88E-02	6.81E-01
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	2.93E-06	2.52E-06	5.10E-03	3.68E-01	0.00E+00	0.00E+00	3.73E-01	1.69E-04	1.96E-03
79	Ru^{+3}	4.36E-06	3.68E-06	7.44E-03	3.37E+00	0.00E+00	0.00E+00	3.38E+00	1.54E-03	1.78E-02
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	8.52E-17	0.00E+00	0.00E+00	8.52E-17	3.87E-20	4.48E-19
81	SiO2	5.93E-04	2.98E-04	6.02E-01	1.09E+02	0.00E+00	0.00E+00	1.10E+02	5.00E-02	5.78E-01
82	SiO_4^{-4}	4.54E-16	3.49E-16	7.05E-13	2.08E-06	0.00E+00	0.00E+00	2.08E-06	9.45E-10	1.09E-08
83	SO_2	6.65E-42	3.56E-42	7.19E-39	0.00E+00	0.00E+00	0.00E+00	7.19E-39	3.27E-42	3.78E-41
84	SO_4^{-2}	7.49E-03	6.01E-03	1.22E+01	4.50E+01	0.00E+00	0.00E+00	5.71E+01	2.60E-02	3.01E-01
85	Sr^{+2}	1.58E-06	1.16E-06	2.34E-03	1.80E+00	0.00E+00	0.00E+00	1.81E+00	8.21E-04	9.51E-03
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	3.59E-36	0.00E+00	0.00E+00	3.59E-36	1.63E-39	1.89E-38
87	Ti^{+4}	4.89E-06	1.95E-06	3.95E-03	7.24E-01	0.00E+00	0.00E+00	7.28E-01	3.31E-04	3.83E-03
88	Zn^{+2}	1.83E-05	9.99E-06	2.02E-02	3.35E+00	0.00E+00	0.00E+00	3.37E+00	1.53E-03	1.77E-02
89	Zr^{+4}	1.35E-05	1.03E-05	2.08E-02	1.25E+02	0.00E+00	0.00E+00	1.25E+02	5.67E-02	6.56E-01
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	3.95E-03	2.90E-03	5.87E+00	5.21E+02	0.00E+00	0.00E+00	5.27E+02	2.40E-01	2.77E+00
94	$C_2O_4^{-2}$	3.95E-03	2.90E-03	5.87E+00	5.21E+02	0.00E+00	0.00E+00	5.27E+02	2.40E-01	2.77E+00
95	Formate	2.81E-15	1.06E-15	2.14E-12	1.01E-07	0.00E+00	0.00E+00	1.01E-07	4.58E-11	5.30E-10
96	Acetate	2.18E-15	1.07E-15	2.17E-12	1.02E-07	0.00E+00	0.00E+00	1.02E-07	4.66E-11	5.39E-10
97	Glycolate	1.45E-14	9.08E-15	1.84E-11	5.03E-08	0.00E+00	0.00E+00	5.03E-08	2.29E-11	2.65E-10
98	IDA	6.79E-15	7.55E-15	1.53E-11	1.28E-07	0.00E+00	0.00E+00	1.29E-07	5.84E-11	6.76E-10
99	Citrate	6.21E-16	9.96E-16	2.01E-12	1.10E-07	0.00E+00	0.00E+00	1.10E-07	5.02E-11	5.81E-10
100	HEDTA	2.91E-15	6.75E-15	1.37E-11	9.04E-08	0.00E+00	0.00E+00	9.04E-08	4.11E-11	4.76E-10
101	EDTA	3.49E-16	8.52E-16	1.72E-12	9.72E-08	0.00E+00	0.00E+00	9.72E-08	4.42E-11	5.11E-10
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	1.75E+01	1.34E+05	5.13E+00	1.56E+01	1.19E+05	8.72E+02	3.31E+01	2.53E+05	8.77E+02
106	^{241}Am	5.95E-05	4.56E-01	2.93E-04	1.12E-01	8.61E+02	5.54E-01	1.12E-01	8.61E+02	5.54E-01
107	^{243}Am	3.89E-08	2.98E-04	3.29E-06	9.08E-06	6.96E-02	7.69E-04	9.12E-06	6.99E-02	7.72E-04
108	^{14}C	1.22E-06	9.35E-03	4.62E-06	7.94E-06	6.08E-02	3.00E-05	9.16E-06	7.01E-02	3.46E-05
109	^{60}Co	8.01E-06	6.14E-02	1.20E-07	1.24E-02	9.51E+01	1.85E-04	1.24E-02	9.52E+01	1.85E-04
110	^{243}Cm	6.44E-09	4.94E-05	2.15E-09	1.57E-04	1.20E+00	5.25E-05	1.57E-04	1.20E+00	5.25E-05
111	^{244}Cm	1.53E-07	1.17E-03	3.18E-08	3.57E-03	2.74E+01	7.45E-04	3.57E-03	2.74E+01	7.45E-04
112	^{137}Cs	1.75E+01	1.34E+05	3.40E+00	2.50E+00	1.92E+04	4.87E-01	2.00E+01	1.53E+05	3.89E+00
113	^{152}Eu	4.48E-07	3.43E-03	4.35E-08	5.98E-04	4.58E+00	5.81E-05	5.98E-04	4.58E+00	5.81E-05
114	^{154}Eu	9.28E-05	7.10E-01	5.80E-06	6.48E-02	4.96E+02	4.05E-03	6.48E-02	4.97E+02	4.05E-03
115	^{155}Eu	2.68E-05	2.05E-01	9.33E-07	9.59E-03	7.34E+01	3.33E-04	9.62E-03	7.37E+01	3.34E-04
116	^{3}H	2.62E-05	2.01E-01	4.60E-08	1.97E-04	1.51E+00	3.45E-07	2.23E-04	1.71E+00	3.91E-07
117	^{129}I	3.74E-08	2.87E-04	3.58E-03	3.92E-07	3.00E-03	3.74E-02	4.29E-07	3.29E-03	4.10E-02
118	^{63}Ni	1.44E-04	1.10E+00	4.27E-05	2.15E-03	1.65E+01	6.39E-04	2.30E-03	1.76E+01	6.82E-04
119	^{237}Np	4.73E-08	3.62E-04	1.13E-03	9.20E-05	7.04E-01	2.20E+00	9.20E-05	7.05E-01	2.20E+00
120	^{238}Pu	2.66E-07	2.04E-03	2.62E-07	4.37E-04	3.34E+00	4.30E-04	4.37E-04	3.35E+00	4.31E-04
121	^{239}Pu	3.68E-06	2.82E-02	1.00E-03	3.87E-03	2.96E+01	1.05E+00	3.87E-03	2.96E+01	1.05E+00
122	^{240}Pu	9.54E-07	7.31E-03	7.10E-05	1.02E-03	7.81E+00	7.59E-02	1.02E-03	7.82E+00	7.60E-02
123	^{241}Pu	2.00E-05	1.53E-01	3.28E-06	2.74E-02	2.10E+02	4.49E-03	2.74E-02	2.10E+02	4.49E-03
124	^{242}Pu	1.01E-10	7.74E-07	4.33E-07	9.40E-08	7.20E-04	4.03E-04	9.41E-08	7.21E-04	4.03E-04
125	^{125}Sb	5.54E-05	4.24E-01	9.02E-07	3.97E-02	3.04E+02	6.46E-04	3.98E-02	3.05E+02	6.47E-04
126	^{151}Sm	7.77E-04	5.95E+00	4.99E-04	4.81E-01	3.68E+03	3.09E-01	4.82E-01	3.69E+03	3.09E-01
127	^{126}Sn	8.81E-07	6.75E-03	1.31E-03	1.86E-04	1.43E+00	2.77E-01	1.87E-04	1.43E+00	2.78E-01
128	^{90}Sr	1.92E-02	1.47E+02	2.35E-03	1.23E+01	9.42E+04	1.50E+00	1.23E+01	9.44E+04	1.51E+00
129	^{99}Tc	1.54E-04	1.18E+00	1.53E-01	2.77E-02	2.12E+02	2.76E+01	2.79E-02	2.14E+02	2.78E+01
130	^{232}Th	1.44E-09	1.10E-05	2.20E-01	3.04E-06	2.33E-02	4.67E+02	3.04E-06	2.33E-02	4.67E+02
131	^{233}U	4.79E-08	3.67E-04	8.39E-05	2.49E-04	1.91E+00	4.37E-01	2.49E-04	1.91E+00	4.37E-01
132	^{234}U	3.40E-08	2.60E-04	9.24E-05	1.30E-05	9.92E-02	3.52E-02	1.30E-05	9.95E-02	3.53E-02
133	^{235}U	1.34E-09	1.03E-05	1.05E-02	3.11E-07	2.38E-03	2.43E+00	3.13E-07	2.39E-03	2.44E+00
134	^{236}U	2.29E-09	1.76E-05	5.99E-04	4.28E-07	3.28E-03	1.12E-01	4.30E-07	3.29E-03	1.12E-01
135	^{238}U	2.65E-08	2.03E-04	1.33E+00	7.33E-06	5.61E-02	3.68E+02	7.35E-06	5.63E-02	3.70E+02
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

	A	B	C	D	E	F	G	H	I	J
1	**Table C-7 HMP06 Stream Report**									
3	**Stream Number:**		**HMP06**							
4	**Stream Name:**		**Melter offgas (primary)**							
5	**Configuration:**		**MRQ-05-0049.acmf**							
6	**Run Date / Time:**		**12/14/2005 - 1:42:25 PM**							
7	**Run Data File:**		**H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv**							
8										
9	**Stream Properties**									
10	**Variable**	**Value**	**Units**							
11	Density	4.13E-04	g/cm^3	(does not include solid phase)						
12	Enthalpy	-4.44E+06	BTU/hr							
13	Mass Flow	2.21E+03	Lb/hr							
14		5.31E+04	Lb/day							
15	Volumetric Flow	1.06E+04	GPM	(does not include solid phase)						
16		1.42E+03	ft^3/min	(does not include solid phase)						
17	Molar Flow	9.24E+01	Lbmol/hr							
18	Molecular Weight	2.36E+01	Lb/Lbmol							
19	Pressure	9.76E+02	mbar							
20	Temperature	4.00E+02	C							
21	Na Molarity	0.00E+00	mol/L							
22	pH	0.00E+00	pH							
23	Total TRU	3.25E-07	Ci/L							
24	Total Activity	1.07E-04	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	0.00E+00	0.00E+00	0.00E+00	1.33E+02	1.74E-02	5.25E+04	5.26E+04	2.39E+01	2.77E+02
29	Ag^+	0.00E+00	0.00E+00	0.00E+00	1.21E-01	0.00E+00	0.00E+00	1.21E-01	5.50E-05	6.37E-04
30	Al^{+3}	0.00E+00	0.00E+00	0.00E+00	6.36E+00	0.00E+00	0.00E+00	6.36E+00	2.89E-03	3.34E-02
31	As^{+3}	0.00E+00	0.00E+00	0.00E+00	1.28E-02	0.00E+00	0.00E+00	1.28E-02	5.80E-06	6.72E-05
32	B^{+3}	0.00E+00	0.00E+00	0.00E+00	1.13E+01	0.00E+00	0.00E+00	1.13E+01	5.13E-03	5.93E-02
33	Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	3.24E-02	0.00E+00	0.00E+00	3.24E-02	1.47E-05	1.71E-04
34	Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	2.92E-01	0.00E+00	0.00E+00	2.92E-01	1.33E-04	1.54E-03
35	Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	2.67E-01	0.00E+00	0.00E+00	2.67E-01	1.21E-04	1.40E-03
36	Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.31E+00	0.00E+00	0.00E+00	1.31E+00	5.94E-04	6.88E-03
37	Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	2.32E-02	0.00E+00	0.00E+00	2.32E-02	1.05E-05	1.22E-04
38	Cl^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39	CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-06	5.65E+00	5.65E+00	2.57E-03	2.97E-02
40	CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04	8.88E+02	8.88E+02	4.03E-01	4.67E+00
41	CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42	Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	1.17E-01	0.00E+00	0.00E+00	1.17E-01	5.32E-05	6.16E-04
43	Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	8.13E-03	0.00E+00	0.00E+00	8.13E-03	3.69E-06	4.27E-05
44	F^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
45	Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	4.83E+00	0.00E+00	0.00E+00	4.83E+00	2.20E-03	2.54E-02
46	H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.70E-03	1.99E+04	1.99E+04	9.07E+00	1.05E+02
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-06	6.43E+00	6.43E+00	2.92E-03	3.38E-02
50	HCO3-	0.00E+00	0.00E+00	0.00E+00	7.99E-21	0.00E+00	0.00E+00	7.99E-21	3.63E-24	4.21E-23
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.57E-06	1.93E+01	1.93E+01	8.76E-03	1.01E-01
53	Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	7.49E+00	0.00E+00	0.00E+00	7.49E+00	3.41E-03	3.94E-02
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^+	0.00E+00	0.00E+00	0.00E+00	1.61E+00	0.00E+00	0.00E+00	1.61E+00	7.31E-04	8.47E-03
56	La^{+3}	0.00E+00	0.00E+00	0.00E+00	1.21E-01	0.00E+00	0.00E+00	1.21E-01	5.51E-05	6.38E-04
57	Li^+	0.00E+00	0.00E+00	0.00E+00	1.40E+00	0.00E+00	0.00E+00	1.40E+00	6.38E-04	7.38E-03
58	Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	7.81E-02	0.00E+00	0.00E+00	7.81E-02	3.55E-05	4.11E-04
59	Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	6.33E-01	0.00E+00	0.00E+00	6.33E-01	2.88E-04	3.33E-03
60	MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.45E-03	2.30E+04	2.30E+04	1.05E+01	1.21E+02
62	Na^+	0.00E+00	0.00E+00	0.00E+00	1.26E+01	0.00E+00	0.00E+00	1.26E+01	5.72E-03	6.62E-02
63	NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-06	2.51E+00	2.51E+00	1.14E-03	1.32E-02
64	NH4+	0.00E+00	0.00E+00	0.00E+00	1.23E-17	0.00E+00	0.00E+00	1.23E-17	5.58E-21	6.46E-20
65	Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	2.39E-01	0.00E+00	0.00E+00	2.39E-01	1.08E-04	1.26E-03
66	NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-04	3.96E+02	3.96E+02	1.80E-01	2.08E+00
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.70E-06	5.68E+01	5.68E+01	2.58E-02	2.99E-01
68	NO_2^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-15

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70	O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-03	8.14E+03	8.14E+03	3.70E+00	4.28E+01
71	O^-	0.00E+00	0.00E+00	0.00E+00	4.98E+01	0.00E+00	0.00E+00	4.98E+01	2.27E-02	2.62E-01
72	OH^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
73	$OH(b)^-$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74	Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	3.48E-01	0.00E+00	0.00E+00	3.48E-01	1.58E-04	1.83E-03
75	Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	5.71E-03	0.00E+00	0.00E+00	5.71E-03	2.60E-06	3.01E-05
76	PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	3.24E+00	0.00E+00	0.00E+00	3.24E+00	1.47E-03	1.71E-02
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	1.01E-02	0.00E+00	0.00E+00	1.01E-02	4.58E-06	5.30E-05
79	Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	8.66E-01	0.00E+00	0.00E+00	8.66E-01	3.94E-04	4.56E-03
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	0.00E+00	0.00E+00	0.00E+00	2.74E+01	0.00E+00	0.00E+00	2.74E+01	1.24E-02	1.44E-01
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	9.04E-09	0.00E+00	0.00E+00	9.04E-09	4.11E-12	4.76E-11
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-06	1.43E+01	1.43E+01	6.52E-03	7.54E-02
84	SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85	Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	1.81E-02	0.00E+00	0.00E+00	1.81E-02	8.21E-06	9.51E-05
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	1.65E-03	0.00E+00	0.00E+00	1.65E-03	7.51E-07	8.69E-06
88	Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	1.53E+00	0.00E+00	0.00E+00	1.53E+00	6.97E-04	8.07E-03
89	Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	7.68E-01	0.00E+00	0.00E+00	7.68E-01	3.49E-04	4.04E-03
90										
91	**Components**	***Aqueous Comp***			***Solid Comp***	***Gaseous***		***Total Comp***		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	0.00E+00	0.00E+00	0.00E+00	4.79E+02	0.00E+00	0.00E+00	4.79E+02	2.18E-01	2.52E+00
94	$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	4.79E+02	0.00E+00	0.00E+00	4.79E+02	2.18E-01	2.52E+00
95	Formate	0.00E+00	0.00E+00	0.00E+00	9.17E-08	0.00E+00	0.00E+00	9.17E-08	4.17E-11	4.82E-10
96	Acetate	0.00E+00	0.00E+00	0.00E+00	9.32E-08	0.00E+00	0.00E+00	9.32E-08	4.23E-11	4.90E-10
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	4.58E-08	0.00E+00	0.00E+00	4.58E-08	2.08E-11	2.41E-10
98	IDA	0.00E+00	0.00E+00	0.00E+00	1.17E-07	0.00E+00	0.00E+00	1.17E-07	5.31E-11	6.15E-10
99	Citrate	0.00E+00	0.00E+00	0.00E+00	1.00E-07	0.00E+00	0.00E+00	1.00E-07	4.56E-11	5.28E-10
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	8.22E-08	0.00E+00	0.00E+00	8.22E-08	3.74E-11	4.33E-10
101	EDTA	0.00E+00	0.00E+00	0.00E+00	8.84E-08	0.00E+00	0.00E+00	8.84E-08	4.02E-11	4.65E-10
102										
103	**Rad. Comp**	***Aqueous Rad. Comp***			***Solids Rad. Comp (1)***			***Total Rad. Comp (1)***		
104	**Unit**	***Ci/L***	***Ci/day***	**Lb/day**	***Ci/L***	***Ci/day***	**Lb/day**	***Ci/L***	***Ci/day***	**Lb/day**
105	**Total**	0.00E+00	0.00E+00	0.00E+00	1.07E-04	6.18E+03	2.12E+01	1.07E-04	6.18E+03	2.12E+01
106	^{241}Am	0.00E+00	0.00E+00	0.00E+00	2.57E-07	1.48E+01	9.55E-03	2.57E-07	1.48E+01	9.55E-03
107	^{243}Am	0.00E+00	0.00E+00	0.00E+00	2.09E-11	1.20E-03	1.33E-05	2.09E-11	1.20E-03	1.33E-05
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	1.22E-09	7.01E-02	3.46E-05	1.22E-09	7.01E-02	3.46E-05
109	^{60}Co	0.00E+00	0.00E+00	0.00E+00	2.29E-08	1.32E+00	2.58E-06	2.29E-08	1.32E+00	2.58E-06
110	^{243}Cm	0.00E+00	0.00E+00	0.00E+00	2.90E-10	1.67E-02	7.29E-07	2.90E-10	1.67E-02	7.29E-07
111	^{244}Cm	0.00E+00	0.00E+00	0.00E+00	6.58E-09	3.80E-01	1.04E-05	6.58E-09	3.80E-01	1.04E-05
112	^{137}Cs	0.00E+00	0.00E+00	0.00E+00	8.84E-05	5.10E+03	1.30E-01	8.84E-05	5.10E+03	1.30E-01
113	^{152}Eu	0.00E+00	0.00E+00	0.00E+00	1.10E-09	6.36E-02	8.07E-07	1.10E-09	6.36E-02	8.07E-07
114	^{154}Eu	0.00E+00	0.00E+00	0.00E+00	1.20E-07	6.90E+00	5.63E-05	1.20E-07	6.90E+00	5.63E-05
115	^{155}Eu	0.00E+00	0.00E+00	0.00E+00	1.77E-08	1.02E+00	4.64E-06	1.77E-08	1.02E+00	4.64E-06
116	^{3}H	0.00E+00	0.00E+00	0.00E+00	2.96E-08	1.71E+00	3.91E-07	2.96E-08	1.71E+00	3.91E-07
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	5.18E-11	2.99E-03	3.73E-02	5.18E-11	2.99E-03	3.73E-02
118	^{63}Ni	0.00E+00	0.00E+00	0.00E+00	3.42E-09	1.98E-01	7.66E-06	3.42E-09	1.98E-01	7.66E-06
119	^{237}Np	0.00E+00	0.00E+00	0.00E+00	1.70E-10	9.79E-03	3.06E-02	1.70E-10	9.79E-03	3.06E-02
120	^{238}Pu	0.00E+00	0.00E+00	0.00E+00	8.05E-10	4.65E-02	5.98E-06	8.05E-10	4.65E-02	5.98E-06
121	^{239}Pu	0.00E+00	0.00E+00	0.00E+00	7.13E-09	4.12E-01	1.46E-02	7.13E-09	4.12E-01	1.46E-02
122	^{240}Pu	0.00E+00	0.00E+00	0.00E+00	1.88E-09	1.09E-01	1.06E-03	1.88E-09	1.09E-01	1.06E-03
123	^{241}Pu	0.00E+00	0.00E+00	0.00E+00	5.05E-08	2.92E+00	6.24E-05	5.05E-08	2.92E+00	6.24E-05
124	^{242}Pu	0.00E+00	0.00E+00	0.00E+00	1.73E-13	1.00E-05	5.60E-06	1.73E-13	1.00E-05	5.60E-06
125	^{125}Sb	0.00E+00	0.00E+00	0.00E+00	5.28E-08	3.05E+00	6.47E-06	5.28E-08	3.05E+00	6.47E-06
126	^{151}Sm	0.00E+00	0.00E+00	0.00E+00	4.92E-07	2.84E+01	2.38E-03	4.92E-07	2.84E+01	2.38E-03
127	^{126}Sn	0.00E+00	0.00E+00	0.00E+00	2.07E-10	1.19E-02	2.32E-03	2.07E-10	1.19E-02	2.32E-03
128	^{90}Sr	0.00E+00	0.00E+00	0.00E+00	1.64E-05	9.44E+02	1.51E-02	1.64E-05	9.44E+02	1.51E-02
129	^{99}Tc	0.00E+00	0.00E+00	0.00E+00	1.23E-06	7.12E+01	9.26E+00	1.23E-06	7.12E+01	9.26E+00
130	^{232}Th	0.00E+00	0.00E+00	0.00E+00	5.61E-12	3.24E-04	6.49E+00	5.61E-12	3.24E-04	6.49E+00
131	^{233}U	0.00E+00	0.00E+00	0.00E+00	4.59E-10	2.65E-02	6.06E-03	4.59E-10	2.65E-02	6.06E-03
132	^{234}U	0.00E+00	0.00E+00	0.00E+00	2.39E-11	1.38E-03	4.91E-04	2.39E-11	1.38E-03	4.91E-04
133	^{235}U	0.00E+00	0.00E+00	0.00E+00	5.76E-13	3.32E-05	3.39E-02	5.76E-13	3.32E-05	3.39E-02
134	^{236}U	0.00E+00	0.00E+00	0.00E+00	7.93E-13	4.57E-05	1.56E-03	7.93E-13	4.57E-05	1.56E-03
135	^{238}U	0.00E+00	0.00E+00	0.00E+00	1.36E-11	7.82E-04	5.13E+00	1.36E-11	7.82E-04	5.13E+00
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-8 HOP10 Stream Report

3	**Stream Number:**	HOP10
4	**Stream Name:**	HLW vessel ventilation header offgas
5	**Configuration:**	MRQ-05-0049.acmf
6	**Run Date / Time:**	12/14/2005 - 1:42:25 PM
7	**Run Data File:**	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

	Variable	Value	Units	
11	Density	1.15E-03	g/cm^3	(does not include solid phase)
12	Enthalpy	-1.25E+05	BTU/hr	
13	Mass Flow	1.15E+03	Lb/hr	
14		2.76E+04	Lb/day	
15	Volumetric Flow	2.00E+03	GPM	(does not include solid phase)
16		2.67E+02	ft^3/min	(does not include solid phase)
17	Molar Flow	4.03E+01	Lbmol/hr	
18	Molecular Weight	2.85E+01	Lb/Lbmol	
19	Pressure	1.00E+03	mbar	
20	Temperature	2.55E+01	C	
21	Na Molarity	0.00E+00	mol/L	
22	pH	5.25E+00	pH	
23	Total TRU	2.10E-11	Ci/L	
24	Total Activity	4.66E-09	Ci/L	

	Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
27	Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
28	**Total**	4.95E-07	7.58E-08	2.18E-01	3.02E-03	4.03E-02	2.76E+04	2.76E+04	1.25E+01	1.45E+02
29	Ag^{+}	8.93E-16	8.04E-16	2.31E-09	7.25E-07	0.00E+00	0.00E+00	7.27E-07	3.31E-10	3.83E-09
30	Al^{+3}	1.08E-11	2.43E-12	7.00E-06	1.20E-04	0.00E+00	0.00E+00	1.27E-04	5.78E-08	6.69E-07
31	As^{+3}	3.94E-15	2.46E-15	7.08E-09	4.67E-08	0.00E+00	0.00E+00	5.37E-08	2.44E-11	2.83E-10
32	B^{+3}	6.05E-12	5.46E-13	1.57E-06	6.62E-05	0.00E+00	0.00E+00	6.78E-05	3.08E-08	3.57E-07
33	Ba^{+2}	8.21E-16	9.41E-16	2.71E-09	6.46E-07	0.00E+00	0.00E+00	6.49E-07	2.95E-10	3.41E-09
34	Bi^{+3}	9.65E-16	1.68E-15	4.84E-09	3.39E-06	0.00E+00	0.00E+00	3.40E-06	1.54E-09	1.79E-08
35	Ca^{+2}	5.88E-14	1.97E-14	5.66E-08	3.95E-06	0.00E+00	0.00E+00	4.00E-06	1.82E-09	2.11E-08
36	Cd^{+2}	1.52E-15	1.43E-15	4.10E-09	2.62E-06	0.00E+00	0.00E+00	2.63E-06	1.19E-09	1.38E-08
37	Ce^{+3}	6.97E-11	8.15E-11	2.35E-04	8.05E-07	0.00E+00	0.00E+00	2.35E-04	1.07E-07	1.24E-06
38	Cl^{-}	3.29E-11	9.73E-12	2.80E-05	7.84E-07	0.00E+00	0.00E+00	2.88E-05	1.31E-08	1.51E-07
39	CO	9.78E-111	2.29E-111	6.57E-105	0.00E+00	0.00E+00	0.00E+00	6.57E-105	2.99E-108	3.46E-107
40	CO_2	7.54E-16	2.77E-16	7.96E-10	0.00E+00	1.18E-32	1.24E-26	7.96E-10	3.62E-13	4.19E-12
41	CO_3^{-2}	8.65E-12	4.33E-12	1.25E-05	2.19E-04	0.00E+00	0.00E+00	2.31E-04	1.05E-07	1.22E-06
42	Cr^{+3}	5.22E-12	2.27E-12	6.52E-06	2.02E-06	0.00E+00	0.00E+00	8.54E-06	3.88E-09	4.49E-08
43	Cu^{+2}	1.51E-15	8.00E-16	2.30E-09	2.74E-07	0.00E+00	0.00E+00	2.76E-07	1.26E-10	1.45E-09
44	F^{-}	1.16E-12	1.84E-13	5.30E-07	1.43E-05	0.00E+00	0.00E+00	1.48E-05	6.72E-09	7.78E-08
45	Fe^{+3}	1.73E-11	8.07E-12	2.32E-05	1.16E-04	0.00E+00	0.00E+00	1.39E-04	6.33E-08	7.32E-07
46	H_2O	4.85E-07	7.29E-08	2.10E-01	0.00E+00	1.21E-03	5.22E+02	5.22E+02	2.37E-01	2.74E+00
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^{+}	2.73E-12	2.29E-14	6.60E-08	0.00E+00	0.00E+00	0.00E+00	6.60E-08	3.00E-11	3.47E-10
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	6.88E-15	3.50E-15	1.01E-08	0.00E+00	0.00E+00	0.00E+00	1.01E-08	4.58E-12	5.30E-11
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	1.58E-15	2.65E-15	7.61E-09	1.55E-06	0.00E+00	0.00E+00	1.55E-06	7.06E-10	8.17E-09
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^{+}	4.51E-12	1.47E-12	4.23E-06	2.22E-06	0.00E+00	0.00E+00	6.45E-06	2.93E-09	3.40E-08
56	La^{+3}	4.19E-16	4.85E-16	1.40E-09	1.21E-06	0.00E+00	0.00E+00	1.21E-06	5.52E-10	6.39E-09
57	Li^{+}	7.45E-14	4.31E-15	1.24E-08	2.81E-05	0.00E+00	0.00E+00	2.81E-05	1.28E-08	1.48E-07
58	Mg^{+2}	1.24E-14	2.53E-15	7.26E-09	9.77E-07	0.00E+00	0.00E+00	9.85E-07	4.48E-10	5.18E-09
59	Mn^{+3}	1.35E-14	6.19E-15	1.78E-08	9.48E-06	0.00E+00	0.00E+00	9.50E-06	4.32E-09	5.00E-08
60	MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	3.51E-13	8.20E-14	2.36E-07	0.00E+00	3.09E-02	2.07E+04	2.07E+04	9.43E+00	1.09E+02
62	Na^{+}	4.70E-09	9.02E-10	2.59E-03	1.74E-04	0.00E+00	0.00E+00	2.77E-03	1.26E-06	1.46E-05
63	NH3	5.72E-13	8.13E-14	2.34E-07	0.00E+00	0.00E+00	0.00E+00	2.34E-07	1.06E-10	1.23E-09
64	NH4+	4.59E-14	8.13E-14	1.99E-08	0.00E+00	0.00E+00	0.00E+00	1.99E-08	9.03E-12	1.04E-10
65	Ni^{+2}	2.36E-12	1.16E-12	3.33E-06	4.22E-06	0.00E+00	0.00E+00	7.55E-06	3.43E-09	3.97E-08
66	NO	6.16E-36	1.54E-36	4.44E-30	0.00E+00	0.00E+00	0.00E+00	4.44E-30	2.02E-33	2.33E-32
67	NO_2	8.69E-49	3.34E-49	9.59E-43	0.00E+00	0.00E+00	0.00E+00	9.59E-43	4.36E-46	5.05E-45
68	NO_2^{-}	2.35E-11	9.01E-12	2.59E-05	3.97E-05	0.00E+00	0.00E+00	6.56E-05	2.98E-08	3.45E-07

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	3.14E-09	1.62E-09	4.67E-03	3.06E-05	0.00E+00	0.00E+00	4.70E-03	2.14E-06	2.47E-05
70	O_2	1.13E-13	3.02E-14	8.69E-08	0.00E+00	8.20E-03	6.30E+03	6.30E+03	2.86E+00	3.31E+01
71	O^-	0.00E+00	0.00E+00	0.00E+00	1.91E-04	0.00E+00	0.00E+00	1.91E-04	8.68E-08	1.00E-06
72	OH^-	1.80E-09	2.55E-10	7.33E-04	6.28E-04	0.00E+00	0.00E+00	1.36E-03	6.19E-07	7.16E-06
73	$OH(b)^-$	2.39E-11	3.40E-12	9.77E-06	3.96E-26	0.00E+00	0.00E+00	9.77E-06	4.44E-09	5.14E-08
74	Pb^{+2}	5.52E-15	9.54E-15	2.74E-08	5.54E-06	0.00E+00	0.00E+00	5.57E-06	2.53E-09	2.93E-08
75	Pd^{+2}	4.27E-16	3.79E-16	1.09E-09	2.27E-07	0.00E+00	0.00E+00	2.29E-07	1.04E-10	1.20E-09
76	PO_4^{-3}	4.42E-13	3.50E-13	1.01E-06	2.50E-05	0.00E+00	0.00E+00	2.60E-05	1.18E-08	1.37E-07
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	4.13E-16	3.54E-16	1.02E-09	7.36E-08	0.00E+00	0.00E+00	7.46E-08	3.39E-11	3.93E-10
79	Ru^{+3}	6.13E-16	5.17E-16	1.49E-09	6.83E-07	0.00E+00	0.00E+00	6.84E-07	3.11E-10	3.60E-09
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.70E-23	0.00E+00	0.00E+00	1.70E-23	7.75E-27	8.97E-26
81	SiO2	8.35E-14	4.19E-14	1.20E-07	1.26E-03	0.00E+00	0.00E+00	1.26E-03	5.72E-07	6.63E-06
82	SiO_4^{-4}	6.38E-26	4.90E-26	1.41E-19	4.37E-13	0.00E+00	0.00E+00	4.37E-13	1.99E-16	2.30E-15
83	SO_2	9.36E-52	5.00E-52	1.44E-45	0.00E+00	0.00E+00	0.00E+00	1.44E-45	6.54E-49	7.57E-48
84	SO_4^{-2}	1.05E-12	8.45E-13	2.43E-06	9.18E-06	0.00E+00	0.00E+00	1.16E-05	5.28E-09	6.11E-08
85	Sr^{+2}	2.77E-16	2.02E-16	5.82E-10	3.61E-07	0.00E+00	0.00E+00	3.62E-07	1.64E-10	1.90E-09
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	6.88E-16	2.75E-16	7.91E-10	6.11E-07	0.00E+00	0.00E+00	6.11E-07	2.78E-10	3.22E-09
88	Zn^{+2}	2.57E-15	1.40E-15	4.04E-09	3.07E-05	0.00E+00	0.00E+00	3.07E-05	1.40E-08	1.62E-07
89	Zr^{+4}	1.90E-15	1.45E-15	4.16E-09	2.92E-05	0.00E+00	0.00E+00	2.92E-05	1.33E-08	1.54E-07
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	5.56E-13	4.08E-13	1.17E-06	1.09E-04	0.00E+00	0.00E+00	1.10E-04	5.01E-08	5.80E-07
94	$C_2O_4^{-2}$	5.56E-13	4.08E-13	1.17E-06	1.09E-04	0.00E+00	0.00E+00	1.10E-04	5.01E-08	5.80E-07
95	Formate	3.96E-25	1.49E-25	4.27E-19	2.02E-14	0.00E+00	0.00E+00	2.02E-14	9.17E-18	1.06E-16
96	Acetate	3.07E-25	1.51E-25	4.34E-19	2.05E-14	0.00E+00	0.00E+00	2.05E-14	9.32E-18	1.08E-16
97	Glycolate	2.04E-24	1.28E-24	3.68E-18	1.01E-14	0.00E+00	0.00E+00	1.01E-14	4.58E-18	5.30E-17
98	IDA	9.56E-25	1.06E-24	3.05E-18	2.57E-14	0.00E+00	0.00E+00	2.57E-14	1.17E-17	1.35E-16
99	Citrate	8.73E-26	1.40E-25	4.03E-19	2.21E-14	0.00E+00	0.00E+00	2.21E-14	1.00E-17	1.16E-16
100	HEDTA	4.09E-25	9.50E-25	2.73E-18	1.81E-14	0.00E+00	0.00E+00	1.81E-14	8.22E-18	9.52E-17
101	EDTA	4.92E-26	1.20E-25	3.45E-19	1.94E-14	0.00E+00	0.00E+00	1.94E-14	8.84E-18	1.02E-16
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	2.46E-09	2.68E-02	1.03E-06	2.20E-09	2.39E-02	1.75E-04	4.66E-09	5.07E-02	1.76E-04
106	^{241}Am	8.37E-15	9.11E-08	5.86E-11	1.58E-11	1.72E-04	1.11E-07	1.58E-11	1.72E-04	1.11E-07
107	^{243}Am	5.47E-18	5.95E-11	6.58E-13	1.28E-15	1.39E-08	1.54E-10	1.28E-15	1.40E-08	1.54E-10
108	^{14}C	1.72E-16	1.87E-09	9.23E-13	1.12E-15	1.22E-08	6.00E-12	1.29E-15	1.40E-08	6.92E-12
109	^{60}Co	1.13E-15	1.23E-08	2.39E-14	1.75E-12	1.90E-05	3.71E-11	1.75E-12	1.90E-05	3.71E-11
110	^{243}Cm	9.07E-19	9.87E-12	4.31E-16	2.21E-14	2.41E-07	1.05E-11	2.21E-14	2.41E-07	1.05E-11
111	^{244}Cm	2.15E-17	2.34E-10	6.37E-15	5.03E-13	5.47E-06	1.49E-10	5.03E-13	5.48E-06	1.49E-10
112	^{137}Cs	2.46E-09	2.68E-02	6.80E-07	3.57E-10	3.89E-03	9.87E-08	2.82E-09	3.07E-02	7.78E-07
113	^{152}Eu	6.30E-17	6.86E-10	8.70E-15	8.41E-14	9.16E-07	1.16E-11	8.42E-14	9.17E-07	1.16E-11
114	^{154}Eu	1.31E-14	1.42E-07	1.16E-12	9.12E-12	9.92E-05	8.10E-10	9.13E-12	9.94E-05	8.11E-10
115	^{155}Eu	3.77E-15	4.11E-08	1.87E-13	1.35E-12	1.47E-05	6.67E-11	1.35E-12	1.47E-05	6.69E-11
116	^{3}H	3.68E-15	4.01E-08	9.20E-15	2.84E-14	3.10E-07	7.11E-14	3.21E-14	3.50E-07	8.03E-14
117	^{129}I	5.27E-18	5.73E-11	7.16E-10	5.54E-17	6.03E-10	7.52E-09	6.06E-17	6.60E-10	8.24E-09
118	^{63}Ni	2.02E-14	2.20E-07	8.54E-12	3.03E-13	3.30E-06	1.28E-10	3.23E-13	3.52E-06	1.37E-10
119	^{237}Np	6.65E-18	7.24E-11	2.27E-10	1.29E-14	1.41E-07	4.41E-07	1.30E-14	1.41E-07	4.41E-07
120	^{238}Pu	3.75E-17	4.08E-10	5.25E-14	6.15E-14	6.69E-07	8.61E-11	6.15E-14	6.70E-07	8.62E-11
121	^{239}Pu	5.18E-16	5.64E-09	2.00E-10	5.44E-13	5.93E-06	2.11E-07	5.45E-13	5.93E-06	2.11E-07
122	^{240}Pu	1.34E-16	1.46E-09	1.42E-11	1.44E-13	1.56E-06	1.52E-08	1.44E-13	1.57E-06	1.52E-08
123	^{241}Pu	2.82E-15	3.07E-08	6.57E-13	3.86E-12	4.20E-05	8.99E-10	3.86E-12	4.20E-05	8.99E-10
124	^{242}Pu	1.42E-20	1.55E-13	8.66E-14	1.32E-17	1.44E-10	8.06E-11	1.32E-17	1.44E-10	8.07E-11
125	^{125}Sb	7.80E-15	8.49E-08	1.80E-13	5.59E-12	6.09E-05	1.29E-10	5.60E-12	6.10E-05	1.30E-10
126	^{151}Sm	1.09E-13	1.19E-06	9.97E-11	6.77E-11	7.37E-04	6.17E-08	6.78E-11	7.38E-04	6.18E-08
127	^{126}Sn	1.24E-16	1.35E-09	2.62E-10	2.62E-14	2.85E-07	5.54E-08	2.63E-14	2.87E-07	5.56E-08
128	^{90}Sr	3.25E-12	3.54E-05	5.65E-10	1.73E-09	1.88E-02	3.01E-07	1.73E-09	1.89E-02	3.01E-07
129	^{99}Tc	2.16E-14	2.35E-07	3.06E-08	3.97E-12	4.32E-05	5.62E-06	3.99E-12	4.34E-05	5.65E-06
130	^{232}Th	2.02E-19	2.20E-12	4.41E-08	4.28E-16	4.66E-09	9.35E-05	4.29E-16	4.67E-09	9.35E-05
131	^{233}U	6.74E-18	7.34E-11	1.68E-11	3.51E-14	3.82E-07	8.74E-08	3.51E-14	3.82E-07	8.74E-08
132	^{234}U	4.78E-18	5.21E-11	1.85E-11	1.82E-15	1.99E-08	7.05E-09	1.83E-15	1.99E-08	7.07E-09
133	^{235}U	1.88E-19	2.05E-12	2.09E-09	4.38E-17	4.77E-10	4.87E-07	4.40E-17	4.79E-10	4.89E-07
134	^{236}U	3.23E-19	3.51E-12	1.20E-10	6.02E-17	6.56E-10	2.24E-08	6.05E-17	6.59E-10	2.25E-08
135	^{238}U	3.73E-18	4.07E-11	2.67E-07	1.03E-15	1.12E-08	7.37E-05	1.04E-15	1.13E-08	7.40E-05
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-18

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
1	**Table C-9 HOP31 Stream Report**									
3	**Stream Number:**		HOP31							
4	**Stream Name:**		Stack extraction fan discharge to stack							
5	**Configuration:**		MRQ-05-0049.acmf							
6	**Run Date / Time:**		12/14/2005 - 1:42:25 PM							
7	**Run Data File:**		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	**Stream Properties**									
10	**Variable**	**Value**	**Units**							
11	Density	7.88E-04	g/cm^3	(does not include solid phase)						
12	Enthalpy	-3.70E+06	BTU/hr							
13	Mass Flow	1.19E+04	Lb/hr							
14		2.85E+05	Lb/day							
15	Volumetric Flow	3.01E+04	GPM	(does not include solid phase)						
16		4.02E+03	ft^3/min	(does not include solid phase)						
17	Molar Flow	4.26E+02	Lbmol/hr							
18	Molecular Weight	2.79E+01	Lb/Lbmol							
19	Pressure	9.86E+02	mbar							
20	Temperature	1.46E+02	C							
21	Na Molarity	0.00E+00	mol/L							
22	pH	-3.18E+00	pH							
23	Total TRU	1.45E-17	Ci/L							
24	Total Activity	5.58E-09	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	6.89E-14	1.83E-14	5.57E-07	2.99E+00	2.83E-02	2.85E+05	2.85E+05	1.29E+02	1.50E+03
29	Ag^{+}	2.97E-24	2.67E-24	1.16E-16	6.73E-11	0.00E+00	0.00E+00	6.73E-11	3.06E-14	3.54E-13
30	Al^{+3}	3.99E-20	8.98E-21	3.89E-13	8.09E-10	0.00E+00	0.00E+00	8.10E-10	3.68E-13	4.26E-12
31	As^{+3}	1.45E-23	9.09E-24	3.93E-16	7.39E-12	0.00E+00	0.00E+00	7.39E-12	3.36E-15	3.89E-14
32	B^{+3}	2.23E-20	2.01E-21	8.72E-14	1.90E-09	0.00E+00	0.00E+00	1.90E-09	8.65E-13	1.00E-11
33	Ba^{+2}	3.03E-24	3.47E-24	1.50E-16	6.29E-12	0.00E+00	0.00E+00	6.29E-12	2.86E-15	3.31E-14
34	Bi^{+3}	3.21E-24	5.59E-24	2.42E-16	1.88E-10	0.00E+00	0.00E+00	1.88E-10	8.53E-14	9.87E-13
35	Ca^{+2}	2.17E-22	7.27E-23	3.14E-15	6.76E-11	0.00E+00	0.00E+00	6.76E-11	3.07E-14	3.55E-13
36	Cd^{+2}	4.59E-24	4.31E-24	1.86E-16	4.64E-10	0.00E+00	0.00E+00	4.64E-10	2.11E-13	2.44E-12
37	Ce^{+3}	4.93E-20	5.77E-20	2.50E-12	8.33E-14	0.00E+00	0.00E+00	2.58E-12	1.17E-15	1.36E-14
38	Cl^{-}	1.09E-19	3.23E-20	1.40E-12	3.92E-14	0.00E+00	0.00E+00	1.44E-12	6.54E-16	7.56E-15
39	CO	6.50E-112	1.52E-112	6.57E-105	0.00E+00	2.79E-08	2.82E-01	2.82E-01	1.28E-04	1.49E-03
40	CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.63E-05	8.95E+02	8.95E+02	4.07E-01	4.71E+00
41	CO_3^{-2}	5.87E-21	2.94E-21	1.27E-13	2.23E-12	0.00E+00	0.00E+00	2.36E-12	1.07E-15	1.24E-14
42	Cr^{+3}	1.93E-20	8.37E-21	3.62E-13	1.47E-10	0.00E+00	0.00E+00	1.48E-10	6.71E-14	7.76E-13
43	Cu^{+2}	5.02E-24	2.66E-24	1.15E-16	4.68E-12	0.00E+00	0.00E+00	4.68E-12	2.13E-15	2.46E-14
44	F^{-}	4.29E-21	6.80E-22	2.94E-14	7.92E-13	0.00E+00	0.00E+00	8.21E-13	3.73E-16	4.32E-15
45	Fe^{+3}	6.40E-20	2.98E-20	1.29E-12	6.17E-10	0.00E+00	0.00E+00	6.18E-10	2.81E-13	3.25E-12
46	H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E-03	1.75E+04	1.75E+04	7.96E+00	9.21E+01
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^{+}	1.93E-21	1.62E-23	7.02E-16	0.00E+00	0.00E+00	0.00E+00	7.02E-16	3.19E-19	3.69E-18
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.75E-10	4.94E-03	4.94E-03	2.25E-06	2.60E-05
50	HCO3-	5.53E-22	2.82E-22	1.22E-14	4.03E-29	0.00E+00	0.00E+00	1.22E-14	5.54E-18	6.41E-17
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.85E-10	4.23E-03	4.23E-03	1.92E-06	2.22E-05
53	Hg^{+2}	1.05E-19	1.76E-19	7.61E-12	2.03E-03	0.00E+00	0.00E+00	2.03E-03	9.20E-07	1.07E-05
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^{+}	1.36E-20	4.45E-21	1.92E-13	7.17E-10	0.00E+00	0.00E+00	7.17E-10	3.26E-13	3.77E-12
56	La^{+3}	3.03E-25	3.51E-25	1.52E-17	1.09E-13	0.00E+00	0.00E+00	1.09E-13	4.94E-17	5.72E-16
57	Li^{+}	2.47E-22	1.43E-23	6.20E-16	8.36E-10	0.00E+00	0.00E+00	8.36E-10	3.80E-13	4.40E-12
58	Mg^{+2}	4.60E-23	9.32E-24	4.03E-16	2.17E-11	0.00E+00	0.00E+00	2.17E-11	9.88E-15	1.14E-13
59	Mn^{+3}	4.99E-23	2.29E-23	9.89E-16	1.18E-10	0.00E+00	0.00E+00	1.18E-10	5.35E-14	6.19E-13
60	MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	2.33E-14	5.45E-15	2.36E-07	0.00E+00	2.01E-02	2.03E+05	2.03E+05	9.24E+01	1.07E+03
62	Na^{+}	1.56E-17	3.00E-18	1.30E-10	8.08E-09	0.00E+00	0.00E+00	8.20E-09	3.73E-12	4.32E-11
63	NH3	3.80E-14	5.40E-15	2.34E-07	0.00E+00	2.83E-07	1.74E+00	1.74E+00	7.91E-04	9.15E-03
64	NH4+	1.52E-20	5.40E-15	9.93E-14	1.54E-23	0.00E+00	0.00E+00	9.93E-14	4.51E-17	5.22E-16
65	Ni^{+2}	8.72E-21	4.27E-21	1.85E-13	1.13E-10	0.00E+00	0.00E+00	1.13E-10	5.13E-14	5.93E-13
66	NO	4.09E-37	1.03E-37	4.44E-30	0.00E+00	1.83E-06	1.98E+01	1.98E+01	9.00E-03	1.04E-01
67	NO_2	5.77E-50	2.22E-50	9.59E-43	0.00E+00	1.71E-07	2.84E+00	2.84E+00	1.29E-03	1.49E-02
68	NO_2^{-}	8.66E-20	3.33E-20	1.44E-12	2.21E-12	0.00E+00	0.00E+00	3.65E-12	1.66E-15	1.92E-14
69	NO_3^{-}	1.16E-17	6.00E-18	2.60E-10	1.70E-12	0.00E+00	0.00E+00	2.61E-10	1.19E-13	1.37E-12
70	O_2	7.52E-15	2.01E-15	8.69E-08	0.00E+00	5.43E-03	6.28E+04	6.28E+04	2.85E+01	3.30E+02
71	O^{-}	0.00E+00	0.00E+00	0.00E+00	1.79E+00	0.00E+00	0.00E+00	1.79E+00	8.15E-04	9.43E-03
72	OH^{-}	6.83E-18	9.42E-19	4.07E-11	3.49E-11	0.00E+00	0.00E+00	7.56E-11	3.44E-14	3.98E-13
73	$OH(b)^{-}$	8.84E-20	1.25E-20	5.43E-13	2.20E-33	0.00E+00	0.00E+00	5.43E-13	2.47E-16	2.85E-15

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-19

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	1.83E-23	3.17E-23	1.37E-15	2.10E-10	0.00E+00	0.00E+00	2.10E-10	9.56E-14	1.11E-12
75	Pd^{+2}	3.02E-25	2.68E-25	1.16E-17	6.89E-15	0.00E+00	0.00E+00	6.90E-15	3.14E-18	3.63E-17
76	PO_4^{-3}	1.63E-21	1.29E-21	5.60E-14	4.97E-10	0.00E+00	0.00E+00	4.97E-10	2.26E-13	2.61E-12
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	2.74E-25	2.36E-25	1.02E-17	3.19E-14	0.00E+00	0.00E+00	3.19E-14	1.45E-17	1.68E-16
79	Ru^{+3}	2.26E-24	1.91E-24	8.27E-17	6.68E-10	0.00E+00	0.00E+00	6.68E-10	3.04E-13	3.52E-12
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.20E+00	0.00E+00	0.00E+00	1.20E+00	5.43E-04	6.29E-03
81	SiO2	3.08E-22	1.55E-22	6.69E-15	4.68E-09	0.00E+00	0.00E+00	4.68E-09	2.13E-12	2.46E-11
82	SiO_4^{-4}	2.36E-34	1.81E-34	7.84E-27	1.55E-18	0.00E+00	0.00E+00	1.55E-18	7.03E-22	8.14E-21
83	SO_2	6.22E-53	3.32E-53	1.44E-45	0.00E+00	5.16E-07	1.19E+01	1.19E+01	5.43E-03	6.28E-02
84	SO_4^{-2}	3.89E-21	3.12E-21	1.35E-13	5.10E-13	0.00E+00	0.00E+00	6.45E-13	2.93E-16	3.39E-15
85	Sr^{+2}	1.02E-24	7.47E-25	3.23E-17	2.30E-12	0.00E+00	0.00E+00	2.30E-12	1.05E-15	1.21E-14
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	4.58E-25	1.83E-25	7.91E-18	6.27E-15	0.00E+00	0.00E+00	6.28E-15	2.85E-18	3.30E-17
88	Zn^{+2}	9.51E-24	5.19E-24	2.24E-16	3.89E-10	0.00E+00	0.00E+00	3.89E-10	1.77E-13	2.05E-12
89	Zr^{+4}	7.01E-24	5.34E-24	2.31E-16	1.44E-10	0.00E+00	0.00E+00	1.44E-10	6.54E-14	7.57E-13
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	2.05E-17	1.51E-17	6.53E-10	6.66E-04	0.00E+00	0.00E+00	6.66E-04	3.03E-07	3.50E-06
94	$C_2O_4^{-2}$	2.05E-17	1.51E-17	6.53E-10	6.65E-04	0.00E+00	0.00E+00	6.65E-04	3.02E-07	3.50E-06
95	Formate	1.31E-27	4.94E-28	2.14E-20	4.58E-09	0.00E+00	0.00E+00	4.58E-09	2.08E-12	2.41E-11
96	Acetate	1.02E-27	5.02E-28	2.17E-20	4.66E-09	0.00E+00	0.00E+00	4.66E-09	2.12E-12	2.45E-11
97	Glycolate	6.78E-27	4.25E-27	1.84E-19	2.29E-09	0.00E+00	0.00E+00	2.29E-09	1.04E-12	1.20E-11
98	IDA	6.35E-26	7.06E-26	3.05E-18	1.17E-07	0.00E+00	0.00E+00	1.17E-07	5.31E-11	6.15E-10
99	Citrate	2.90E-28	4.65E-28	2.01E-20	5.02E-09	0.00E+00	0.00E+00	5.02E-09	2.28E-12	2.64E-11
100	HEDTA	1.36E-27	3.16E-27	1.37E-19	4.11E-09	0.00E+00	0.00E+00	4.11E-09	1.87E-12	2.16E-11
101	EDTA	1.63E-28	3.98E-28	1.72E-20	4.42E-09	0.00E+00	0.00E+00	4.42E-09	2.01E-12	2.32E-11
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	2.20E-16	3.60E-08	1.70E-12	5.58E-09	9.15E-01	6.87E-05	5.58E-09	9.15E-01	6.87E-05
106	^{241}Am	3.09E-23	5.06E-15	3.26E-18	1.15E-17	1.88E-09	1.21E-12	1.15E-17	1.88E-09	1.21E-12
107	^{243}Am	2.02E-26	3.31E-18	3.65E-20	9.33E-22	1.53E-13	1.69E-15	9.33E-22	1.53E-13	1.69E-15
108	^{14}C	1.14E-17	1.87E-09	9.23E-13	4.28E-10	7.01E-02	3.46E-05	4.28E-10	7.01E-02	3.46E-05
109	^{60}Co	3.75E-24	6.14E-16	1.20E-21	6.31E-18	1.03E-09	2.01E-15	6.31E-18	1.03E-09	2.01E-15
110	^{243}Cm	3.35E-27	5.48E-19	2.39E-23	1.30E-20	2.12E-12	9.26E-17	1.30E-20	2.12E-12	9.26E-17
111	^{244}Cm	7.92E-26	1.30E-17	3.54E-22	2.95E-19	4.83E-11	1.32E-15	2.95E-19	4.83E-11	1.32E-15
112	^{137}Cs	8.17E-18	1.34E-09	3.40E-14	2.16E-14	3.54E-06	8.99E-11	2.16E-14	3.54E-06	9.00E-11
113	^{152}Eu	2.33E-25	3.81E-17	4.83E-22	4.93E-20	8.08E-12	1.03E-16	4.93E-20	8.08E-12	1.03E-16
114	^{154}Eu	4.82E-23	7.89E-15	6.44E-20	5.35E-18	8.76E-10	7.15E-15	5.35E-18	8.76E-10	7.15E-15
115	^{155}Eu	1.39E-23	2.28E-15	1.04E-20	7.93E-19	1.30E-10	5.90E-16	7.93E-19	1.30E-10	5.90E-16
116	^{3}H	2.00E-16	3.28E-08	7.52E-15	5.16E-09	8.45E-01	1.94E-07	5.16E-09	8.45E-01	1.94E-07
117	^{129}I	3.50E-22	5.73E-14	7.16E-13	1.66E-14	2.72E-06	3.39E-05	1.66E-14	2.72E-06	3.39E-05
118	^{63}Ni	7.47E-23	1.22E-14	4.75E-19	5.69E-19	9.32E-11	3.62E-15	5.69E-19	9.32E-11	3.62E-15
119	^{237}Np	2.46E-26	4.02E-18	1.26E-17	7.59E-21	1.24E-12	3.89E-12	7.59E-21	1.24E-12	3.89E-12
120	^{238}Pu	1.38E-25	2.27E-17	2.92E-21	3.60E-20	5.90E-12	7.60E-16	3.60E-20	5.90E-12	7.60E-16
121	^{239}Pu	1.91E-24	3.13E-16	1.11E-17	3.19E-19	5.23E-11	1.86E-12	3.19E-19	5.23E-11	1.86E-12
122	^{240}Pu	4.96E-25	8.12E-17	7.89E-19	8.43E-20	1.38E-11	1.34E-13	8.43E-20	1.38E-11	1.34E-13
123	^{241}Pu	1.04E-23	1.70E-15	3.65E-20	2.26E-18	3.70E-10	7.93E-15	2.26E-18	3.70E-10	7.93E-15
124	^{242}Pu	5.25E-29	8.60E-21	4.81E-21	7.76E-24	1.27E-15	7.12E-16	7.76E-24	1.27E-15	7.12E-16
125	^{125}Sb	2.88E-23	4.72E-15	1.00E-20	2.33E-17	3.82E-09	8.11E-15	2.33E-17	3.82E-09	8.11E-15
126	^{151}Sm	7.73E-23	1.27E-14	1.06E-18	2.64E-19	4.32E-11	3.62E-15	2.64E-19	4.32E-11	3.62E-15
127	^{126}Sn	4.58E-25	7.50E-17	1.46E-17	9.30E-21	1.52E-12	2.96E-13	9.30E-21	1.52E-12	2.96E-13
128	^{90}Sr	1.20E-20	1.97E-12	3.14E-17	7.34E-16	1.20E-07	1.92E-12	7.34E-16	1.20E-07	1.92E-12
129	^{99}Tc	7.99E-23	1.31E-14	1.70E-15	3.10E-16	5.07E-08	6.59E-09	3.10E-16	5.07E-08	6.59E-09
130	^{232}Th	1.43E-28	2.34E-20	4.69E-16	2.77E-24	4.53E-16	9.08E-12	2.77E-24	4.53E-16	9.08E-12
131	^{233}U	2.49E-26	4.08E-18	9.32E-19	2.06E-20	3.37E-12	7.70E-13	2.06E-20	3.37E-12	7.70E-13
132	^{234}U	1.77E-26	2.89E-18	1.03E-18	1.07E-21	1.76E-13	6.23E-14	1.07E-21	1.76E-13	6.23E-14
133	^{235}U	6.96E-28	1.14E-19	1.16E-16	2.58E-23	4.22E-15	4.31E-12	2.58E-23	4.22E-15	4.31E-12
134	^{236}U	1.19E-27	1.95E-19	6.65E-18	3.55E-23	5.81E-15	1.98E-13	3.55E-23	5.81E-15	1.98E-13
135	^{238}U	1.38E-26	2.26E-18	1.48E-14	6.07E-22	9.94E-14	6.52E-10	6.07E-22	9.94E-14	6.52E-10
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-20

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
1	**Table C-10 LCP01 Stream Report**									
3	Stream Number:		LCP01							
4	Stream Name:		LAW concentrate							
5	Configuration:		MRQ-05-0049.acmf							
6	Run Date / Time:		12/14/2005 - 1:42:25 PM							
7	Run Data File:		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	Stream Properties									
10	Variable	Value	Units							
11	Density	1.44E+00	g/cm^3	(does not include solid phase)						
12	Enthalpy	-2.25E+07	BTU/hr							
13	Mass Flow	4.29E+03	Lb/hr							
14		1.03E+05	Lb/day							
15	Volumetric Flow	5.85E+00	GPM	(does not include solid phase)						
16		7.82E-01	ft^3/min	(does not include solid phase)						
17	Molar Flow	1.92E+02	Lbmol/hr							
18	Molecular Weight	2.19E+01	Lb/Lbmol							
19	Pressure	1.00E+03	mbar							
20	Temperature	5.34E+01	C							
21	Na Molarity	7.95E+00	mol/L							
22	pH	1.46E+01	pH							
23	Total TRU	8.08E-04	Ci/L							
24	Total Activity	1.96E-01	Ci/L							
25										
26	Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
27	Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
28	Total	6.54E+01	1.19E+01	1.01E+05	7.57E+02	0.00E+00	0.00E+00	1.01E+05	4.61E+01	5.33E+02
29	Ag^{+}	5.93E-05	5.34E-05	4.50E-01	1.57E-02	0.00E+00	0.00E+00	4.66E-01	2.12E-04	2.45E-03
30	Al^{+3}	7.19E-01	1.62E-01	1.36E+03	3.63E+01	0.00E+00	0.00E+00	1.40E+03	6.36E-01	7.37E+00
31	As^{+3}	2.62E-04	1.64E-04	1.38E+00	2.72E-01	0.00E+00	0.00E+00	1.65E+00	7.50E-04	8.68E-03
32	B^{+3}	4.34E-03	3.92E-04	3.30E+00	1.12E+02	0.00E+00	0.00E+00	1.16E+02	5.26E-02	6.09E-01
33	Ba^{+2}	5.45E-05	6.25E-05	5.27E-01	5.68E-03	0.00E+00	0.00E+00	5.32E-01	2.42E-04	2.80E-03
34	Bi^{+3}	6.44E-05	1.12E-04	9.46E-01	1.38E-02	0.00E+00	0.00E+00	9.60E-01	4.36E-04	5.05E-03
35	Ca^{+2}	8.12E-03	2.71E-03	2.29E+01	3.05E+01	0.00E+00	0.00E+00	5.34E+01	2.43E-02	2.81E-01
36	Cd^{+2}	1.01E-04	9.52E-05	8.02E-01	1.06E-01	0.00E+00	0.00E+00	9.08E-01	4.13E-04	4.78E-03
37	Ce^{+3}	2.42E-03	2.83E-03	2.39E+01	1.20E-01	0.00E+00	0.00E+00	2.40E+01	1.09E-02	1.26E-01
38	Cl^{-}	1.35E-01	4.00E-02	3.37E+02	4.48E-04	0.00E+00	0.00E+00	3.37E+02	1.53E-01	1.77E+00
39	CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	CO_3^{-2}	5.79E-01	2.90E-01	2.44E+03	5.03E-02	0.00E+00	0.00E+00	2.44E+03	1.11E+00	1.28E+01
42	Cr^{+3}	1.74E-02	7.55E-03	6.36E+01	1.69E+00	0.00E+00	0.00E+00	6.53E+01	2.97E-02	3.44E-01
43	Cu^{+2}	1.00E-04	5.32E-05	4.48E-01	2.38E-03	0.00E+00	0.00E+00	4.50E-01	2.05E-04	2.37E-03
44	F^{-}	6.59E-02	1.04E-02	8.80E+01	8.16E-03	0.00E+00	0.00E+00	8.80E+01	4.00E-02	4.63E-01
45	Fe^{+3}	3.17E-03	1.48E-03	1.25E+01	2.28E+01	0.00E+00	0.00E+00	3.52E+01	1.60E-02	1.85E-01
46	H_2O	4.67E+01	7.02E+00	5.91E+04	0.00E+00	0.00E+00	0.00E+00	5.91E+04	2.69E+01	3.11E+02
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^{+}	2.26E-15	1.90E-17	1.60E-13	0.00E+00	0.00E+00	0.00E+00	1.60E-13	7.27E-17	8.41E-16
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	3.24E-24	1.65E-24	1.39E-20	3.26E-15	0.00E+00	0.00E+00	3.26E-15	1.48E-18	1.71E-17
51	H2CO3	2.05E-23	1.06E-23	8.93E-20	0.00E+00	0.00E+00	0.00E+00	8.93E-20	4.06E-23	4.70E-22
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	1.05E-04	1.76E-04	1.48E+00	3.99E+00	0.00E+00	0.00E+00	5.47E+00	2.48E-03	2.88E-02
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^{+}	2.58E-01	8.43E-02	7.10E+02	1.15E-03	0.00E+00	0.00E+00	7.10E+02	3.23E-01	3.73E+00
56	La^{+3}	2.78E-05	3.22E-05	2.72E-01	6.24E-03	0.00E+00	0.00E+00	2.78E-01	1.26E-04	1.46E-03
57	Li^{+}	1.18E-02	8.84E-04	5.76E+00	4.17E+00	0.00E+00	0.00E+00	9.93E+00	4.51E-03	5.22E-02
58	Mg^{+2}	8.27E-04	1.68E-04	1.41E+00	5.74E+00	0.00E+00	0.00E+00	7.15E+00	3.25E-03	3.76E-02
59	Mn^{+3}	8.97E-04	4.11E-04	3.46E+00	2.25E-01	0.00E+00	0.00E+00	3.69E+00	1.68E-03	1.94E-02
60	MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	1.78E-23	4.16E-24	3.50E-20	0.00E+00	0.00E+00	0.00E+00	3.50E-20	1.59E-23	1.84E-22
62	Na^{+}	7.95E+00	1.53E+00	1.28E+04	9.07E-02	0.00E+00	0.00E+00	1.28E+04	5.84E+00	6.76E+01
63	NH3	9.36E-04	1.33E-04	1.12E+00	0.00E+00	0.00E+00	0.00E+00	1.12E+00	5.09E-04	5.90E-03
64	NH4+	1.35E-22	1.33E-04	1.71E-19	1.44E-16	0.00E+00	0.00E+00	1.44E-16	6.55E-20	7.58E-19
65	Ni^{+2}	1.45E-03	7.11E-04	5.99E+00	2.00E-01	0.00E+00	0.00E+00	6.19E+00	2.81E-03	3.25E-02
66	NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	NO_2^{-}	1.56E+00	6.00E-01	5.06E+03	2.27E-02	0.00E+00	0.00E+00	5.06E+03	2.30E+00	2.66E+01
69	NO_3^{-}	2.86E+00	1.48E+00	1.24E+04	1.75E-02	0.00E+00	0.00E+00	1.24E+04	5.66E+00	6.55E+01
70	O_2	9.42E-26	2.52E-26	2.12E-22	0.00E+00	0.00E+00	0.00E+00	2.12E-22	9.63E-26	1.12E-24
71	O^{-}	0.00E+00	0.00E+00	0.00E+00	3.27E+02	0.00E+00	0.00E+00	3.27E+02	1.49E-01	1.72E+00
72	OH^{-}	4.43E+00	6.29E-01	5.30E+03	2.07E-01	0.00E+00	0.00E+00	5.30E+03	2.41E+00	2.79E+01
73	$OH(b)^{-}$	7.82E-09	1.11E-09	9.35E-06	0.00E+00	0.00E+00	0.00E+00	9.35E-06	4.25E-09	4.92E-08

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-21

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	3.68E-04	6.37E-04	5.36E+00	6.90E-02	0.00E+00	0.00E+00	5.43E+00	2.47E-03	2.86E-02
75	Pd^{+2}	2.85E-05	2.53E-05	2.13E-01	1.20E-03	0.00E+00	0.00E+00	2.14E-01	9.75E-05	1.13E-03
76	PO_4^{-3}	2.94E-02	2.33E-02	1.96E+02	5.46E+00	0.00E+00	0.00E+00	2.02E+02	9.16E-02	1.06E+00
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	2.76E-05	2.37E-05	1.99E-01	3.87E-03	0.00E+00	0.00E+00	2.03E-01	9.24E-05	1.07E-03
79	Ru^{+3}	4.10E-05	3.46E-05	2.91E-01	9.17E-02	0.00E+00	0.00E+00	3.83E-01	1.74E-04	2.01E-03
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.04E-15	0.00E+00	0.00E+00	1.04E-15	4.73E-19	5.48E-18
81	SiO2	5.55E-03	2.78E-03	2.34E+01	1.70E+02	0.00E+00	0.00E+00	1.93E+02	8.77E-02	1.02E+00
82	SiO_4^{-4}	4.24E-15	3.26E-15	2.74E-11	0.00E+00	0.00E+00	0.00E+00	2.74E-11	1.25E-14	1.44E-13
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	7.01E-02	5.62E-02	4.74E+02	5.15E-03	0.00E+00	0.00E+00	4.74E+02	2.15E-01	2.49E+00
85	Sr^{+2}	1.49E-05	1.09E-05	9.19E-02	6.79E-04	0.00E+00	0.00E+00	9.26E-02	4.21E-05	4.87E-04
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	4.57E-05	1.83E-05	1.54E-01	5.22E-01	0.00E+00	0.00E+00	6.76E-01	3.07E-04	3.56E-03
88	Zn^{+2}	1.71E-04	9.33E-05	7.86E-01	2.69E+01	0.00E+00	0.00E+00	2.77E+01	1.26E-02	1.46E-01
89	Zr^{+4}	1.26E-04	9.61E-05	8.09E-01	8.28E+00	0.00E+00	0.00E+00	9.09E+00	4.13E-03	4.78E-02
90										
91	Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
92	Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
93	Total	2.65E-02	1.95E-02	1.64E+02	9.04E+02	0.00E+00	0.00E+00	1.07E+03	4.85E-01	5.62E+00
94	$C_2O_4^{-2}$	2.65E-02	1.95E-02	1.64E+02	9.04E+02	0.00E+00	0.00E+00	1.07E+03	4.85E-01	5.62E+00
95	Formate	1.67E-14	6.26E-15	5.27E-11	0.00E+00	0.00E+00	0.00E+00	5.27E-11	2.40E-14	2.77E-13
96	Acetate	1.29E-14	6.36E-15	5.36E-11	0.00E+00	0.00E+00	0.00E+00	5.36E-11	2.44E-14	2.82E-13
97	Glycolate	8.59E-14	5.38E-14	4.53E-10	0.00E+00	0.00E+00	0.00E+00	4.53E-10	2.06E-13	2.38E-12
98	IDA	4.56E-14	5.06E-14	4.26E-10	0.00E+00	0.00E+00	0.00E+00	4.26E-10	1.94E-13	2.24E-12
99	Citrate	4.16E-15	6.68E-15	5.62E-11	0.00E+00	0.00E+00	0.00E+00	5.62E-11	2.56E-14	2.96E-13
100	HEDTA	1.95E-14	4.53E-14	3.82E-10	0.00E+00	0.00E+00	0.00E+00	3.82E-10	1.73E-13	2.01E-12
101	EDTA	2.34E-15	5.72E-15	4.81E-11	0.00E+00	0.00E+00	0.00E+00	4.81E-11	2.19E-14	2.53E-13
102										
103	Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
104	Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
105	Total	1.94E-01	6.19E+03	6.73E+01	2.29E-03	7.31E+01	3.34E+00	1.96E-01	6.26E+03	7.06E+01
106	^{241}Am	5.59E-04	1.78E+01	1.15E-02	1.02E-05	3.25E-01	2.09E-04	5.69E-04	1.81E+01	1.17E-02
107	^{243}Am	3.65E-07	1.16E-02	1.29E-04	4.87E-09	1.55E-04	1.71E-06	3.70E-07	1.18E-02	1.30E-04
108	^{14}C	1.14E-05	3.64E-01	1.80E-04	2.18E-10	6.96E-06	3.43E-09	1.14E-05	3.64E-01	1.80E-04
109	^{60}Co	7.49E-05	2.39E+00	4.65E-06	7.13E-07	2.27E-02	4.43E-08	7.56E-05	2.41E+00	4.70E-06
110	^{243}Cm	6.02E-08	1.92E-03	8.38E-08	4.64E-09	1.48E-04	6.45E-09	6.49E-08	2.07E-03	9.02E-08
111	^{244}Cm	1.43E-06	4.55E-02	1.24E-06	1.06E-07	3.37E-03	9.19E-08	1.53E-06	4.88E-02	1.33E-06
112	^{137}Cs	1.21E-04	3.85E+00	9.78E-05	2.53E-04	8.08E+00	2.05E-04	3.74E-04	1.19E+01	3.03E-04
113	^{152}Eu	4.21E-06	1.34E-01	1.70E-06	3.76E-08	1.20E-03	1.52E-08	4.24E-06	1.35E-01	1.72E-06
114	^{154}Eu	8.72E-04	2.78E+01	2.27E-04	6.16E-06	1.96E-01	1.60E-06	8.78E-04	2.80E+01	2.28E-04
115	^{155}Eu	2.52E-04	8.04E+00	3.65E-05	1.53E-06	4.88E-02	2.21E-07	2.54E-04	8.09E+00	3.67E-05
116	^{3}H	8.29E-06	2.64E-01	6.07E-08	3.99E-08	1.27E-01	2.92E-08	1.23E-05	3.92E-01	8.99E-08
117	^{129}I	3.47E-07	1.11E-02	1.38E-01	6.19E-08	1.97E-03	2.46E-02	4.09E-07	1.30E-02	1.63E-01
118	^{63}Ni	1.35E-03	4.31E+01	1.67E-03	1.52E-05	4.85E-01	1.88E-05	1.37E-03	4.35E+01	1.69E-03
119	^{237}Np	4.42E-07	1.41E-02	4.41E-02	4.75E-09	1.52E-04	4.74E-04	4.47E-07	1.42E-02	4.46E-02
120	^{238}Pu	2.50E-06	7.98E-02	1.03E-05	2.46E-08	7.85E-04	1.01E-07	2.53E-06	8.06E-02	1.04E-05
121	^{239}Pu	3.46E-05	1.10E+00	3.92E-02	2.80E-07	8.94E-03	3.18E-04	3.49E-05	1.11E+00	3.95E-02
122	^{240}Pu	8.97E-06	2.86E-01	2.78E-03	7.32E-08	2.33E-03	2.27E-05	9.04E-06	2.88E-01	2.80E-03
123	^{241}Pu	1.88E-04	6.00E+00	1.28E-04	1.70E-06	5.42E-02	1.16E-06	1.90E-04	6.05E+00	1.30E-04
124	^{242}Pu	9.49E-10	3.03E-05	1.69E-05	7.36E-12	2.35E-07	1.31E-07	9.57E-10	3.05E-05	1.71E-05
125	^{125}Sb	5.20E-04	1.66E+01	3.52E-05	7.54E-06	2.40E-01	5.11E-07	5.28E-04	1.68E+01	3.57E-05
126	^{151}Sm	7.31E-03	2.33E+02	1.95E-02	1.86E-05	5.92E-01	4.96E-05	7.32E-03	2.34E+02	1.96E-02
127	^{126}Sn	8.27E-06	2.64E-01	5.12E-02	4.66E-08	1.49E-03	2.88E-04	8.32E-06	2.65E-01	5.15E-02
128	^{90}Sr	1.81E-01	5.78E+03	9.22E-02	1.27E-03	4.05E+01	6.46E-04	1.83E-01	5.82E+03	9.29E-02
129	^{99}Tc	1.44E-03	4.58E+01	5.96E+00	7.02E-04	2.24E+01	2.91E+00	2.14E-03	6.82E+01	8.87E+00
130	^{232}Th	1.34E-08	4.28E-04	8.58E+00	1.51E-10	4.80E-06	9.61E-02	1.36E-08	4.33E-04	8.67E+00
131	^{233}U	4.48E-07	1.43E-02	3.27E-03	9.12E-09	2.91E-04	6.65E-05	4.57E-07	1.46E-02	3.33E-03
132	^{234}U	3.18E-07	1.01E-02	3.60E-03	1.95E-09	6.21E-05	2.21E-05	3.20E-07	1.02E-02	3.62E-03
133	^{235}U	1.25E-08	3.99E-04	4.07E-01	7.12E-11	2.27E-06	2.32E-03	1.26E-08	4.01E-04	4.10E-01
134	^{236}U	2.14E-08	6.84E-04	2.33E-02	1.19E-10	3.80E-06	1.30E-04	2.16E-08	6.87E-04	2.34E-02
135	^{238}U	2.48E-07	7.91E-03	5.19E+01	1.45E-09	4.61E-05	3.02E-01	2.50E-07	7.96E-03	5.22E+01
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-11 LFP01 Stream Report

Stream Number:	LFP01
Stream Name:	LAW blended glass formers
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

Variable	Value	Units	
Density	9.97E-01	g/cm^3	(does not include solid phase)
Enthalpy	-9.70E+05	BTU/hr	
Mass Flow	4.88E+03	Lb/hr	
	1.17E+05	Lb/day	
Volumetric Flow	2.85E-01	GPM	(does not include solid phase)
	3.80E-02	ft^3/min	(does not include solid phase)
Molar Flow	7.89E+00	Lbmol/hr	
Molecular Weight	1.80E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	2.50E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	7.00E+00	pH	
Total TRU	0.00E+00	Ci/L	
Total Activity	6.45E-08	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	5.54E+01	8.32E+00	3.41E+03	1.14E+05	0.00E+00	0.00E+00	1.17E+05	5.32E+01	6.16E+02
Ag^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	2.23E+03	0.00E+00	0.00E+00	2.23E+03	1.01E+00	1.17E+01
As^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B^{+3}	0.00E+00	0.00E+00	0.00E+00	3.28E+03	0.00E+00	0.00E+00	3.28E+03	1.49E+00	1.72E+01
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	3.17E+03	0.00E+00	0.00E+00	3.17E+03	1.44E+00	1.67E+01
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.46E-01	0.00E+00	0.00E+00	1.46E-01	6.63E-05	7.67E-04
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cl^{-}	0.00E+00	0.00E+00	0.00E+00	7.96E-01	0.00E+00	0.00E+00	7.96E-01	3.62E-04	4.19E-03
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	3.87E+03	0.00E+00	0.00E+00	3.87E+03	1.76E+00	2.03E+01
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	5.35E+00	0.00E+00	0.00E+00	5.35E+00	2.43E-03	2.82E-02
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	4.52E+03	0.00E+00	0.00E+00	4.52E+03	2.06E+00	2.38E+01
H_2O	5.54E+01	8.32E+00	3.41E+03	0.00E+00	0.00E+00	0.00E+00	3.41E+03	1.55E+00	1.79E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	1.00E-07	8.41E-10	3.45E-07	0.00E+00	0.00E+00	0.00E+00	3.45E-07	1.57E-10	1.81E-09
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	0.00E+00	0.00E+00	0.00E+00	1.00E+01	0.00E+00	0.00E+00	1.00E+01	4.56E-03	5.28E-02
La^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Li^{+}	0.00E+00	0.00E+00	0.00E+00	8.88E+02	0.00E+00	0.00E+00	8.88E+02	4.04E-01	4.67E+00
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	1.17E+03	0.00E+00	0.00E+00	1.17E+03	5.34E-01	6.18E+00
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	1.28E+01	0.00E+00	0.00E+00	1.28E+01	5.84E-03	6.75E-02
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na^{+}	0.00E+00	0.00E+00	0.00E+00	3.79E+00	0.00E+00	0.00E+00	3.79E+00	1.72E-03	1.99E-02
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NH4+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	1.16E+01	0.00E+00	0.00E+00	1.16E+01	5.29E-03	6.12E-02
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O^{--}	0.00E+00	0.00E+00	0.00E+00	1.54E+04	0.00E+00	0.00E+00	1.54E+04	7.01E+00	8.11E+01
OH^{-}	1.00E-07	1.42E-08	5.82E-06	1.55E+04	0.00E+00	0.00E+00	1.55E+04	7.03E+00	8.14E+01
$OH(b)^{-}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-23

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	3.09E-02	0.00E+00	0.00E+00	3.09E-02	1.41E-05	1.63E-04
75	Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76	PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	2.31E+01	0.00E+00	0.00E+00	2.31E+01	1.05E-02	1.22E-01
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79	Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	0.00E+00	0.00E+00	0.00E+00	5.09E+04	0.00E+00	0.00E+00	5.09E+04	2.31E+01	2.68E+02
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	1.33E+01	0.00E+00	0.00E+00	1.33E+01	6.03E-03	6.98E-02
85	Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	6.60E+03	0.00E+00	0.00E+00	6.60E+03	3.00E+00	3.47E+01
87	Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	9.67E+02	0.00E+00	0.00E+00	9.67E+02	4.39E-01	5.09E+00
88	Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	2.68E+03	0.00E+00	0.00E+00	2.68E+03	1.22E+00	1.41E+01
89	Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	2.49E+03	0.00E+00	0.00E+00	2.49E+03	1.13E+00	1.31E+01
90										
91	Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
92	Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
93	Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
94	$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
104	Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
105	Total	0.00E+00	0.00E+00	0.00E+00	6.45E-08	1.00E-04	2.00E+00	6.45E-08	1.00E-04	2.00E+00
106	^{241}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107	^{243}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109	^{60}Co	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110	^{243}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111	^{244}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
112	^{137}Cs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
113	^{152}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
114	^{154}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
115	^{155}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
116	^{3}H	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
118	^{63}Ni	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
119	^{237}Np	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120	^{238}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121	^{239}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122	^{240}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123	^{241}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
124	^{242}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
125	^{125}Sb	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
126	^{151}Sm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
127	^{126}Sn	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
128	^{90}Sr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129	^{99}Tc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
130	^{232}Th	0.00E+00	0.00E+00	0.00E+00	6.45E-08	1.00E-04	2.00E+00	6.45E-08	1.00E-04	2.00E+00
131	^{233}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
132	^{234}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
133	^{235}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
134	^{236}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
135	^{238}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-24

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
1	**Table C-12 LFP04 Stream Report**									
3	**Stream Number:**		LFP04							
4	**Stream Name:**		Blended LAW melter feed to melter							
5	**Configuration:**		MRQ-05-0049.acmf							
6	**Run Date / Time:**		12/14/2005 - 1:42:25 PM							
7	**Run Data File:**		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	**Stream Properties**									
10	**Variable**	**Value**	**Units**							
11	Density	1.21E+00	g/cm^3	(does not include solid phase)						
12	Enthalpy	-3.75E+07	BTU/hr							
13	Mass Flow	1.03E+04	Lb/hr							
14		2.46E+05	Lb/day							
15	Volumetric Flow	1.03E+01	GPM	(does not include solid phase)						
16		1.37E+00	ft^3/min	(does not include solid phase)						
17	Molar Flow	3.11E+02	Lbmol/hr							
18	Molecular Weight	2.00E+01	Lb/Lbmol							
19	Pressure	1.00E+03	mbar							
20	Temperature	3.00E+01	C							
21	Na Molarity	4.53E+00	mol/L							
22	pH	1.28E+01	pH							
23	Total TRU	4.60E-04	Ci/L							
24	Total Activity	1.12E-01	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	6.05E+01	1.01E+01	1.49E+05	9.57E+04	0.00E+00	0.00E+00	2.45E+05	1.11E+02	1.29E+03
29	Ag^+	3.38E-05	3.04E-05	4.50E-01	1.57E-02	0.00E+00	0.00E+00	4.66E-01	2.12E-04	2.45E-03
30	Al^{+3}	4.10E-01	9.22E-02	1.36E+03	2.27E+03	0.00E+00	0.00E+00	3.63E+03	1.65E+00	1.91E+01
31	As^{+3}	1.49E-04	9.31E-05	1.38E+00	2.72E-01	0.00E+00	0.00E+00	1.65E+00	7.50E-04	8.68E-03
32	B^{+3}	2.46E+00	2.22E-01	3.28E+03	1.12E+02	0.00E+00	0.00E+00	3.39E+03	1.54E+00	1.79E+01
33	Ba^{+2}	3.11E-05	3.56E-05	5.27E-01	5.68E-03	0.00E+00	0.00E+00	5.32E-01	2.42E-04	2.80E-03
34	Bi^{+3}	3.67E-05	6.39E-05	9.46E-01	1.38E-02	0.00E+00	0.00E+00	9.60E-01	4.36E-04	5.05E-03
35	Ca^{+2}	4.62E-03	1.55E-03	2.29E+01	3.20E+03	0.00E+00	0.00E+00	3.23E+03	1.47E+00	1.70E+01
36	Cd^{+2}	5.78E-05	5.42E-05	8.02E-01	2.52E-01	0.00E+00	0.00E+00	1.05E+00	4.79E-04	5.54E-03
37	Ce^{+3}	1.38E-03	1.61E-03	2.39E+01	1.20E-01	0.00E+00	0.00E+00	2.40E+01	1.09E-02	1.26E-01
38	Cl^-	7.69E-02	2.28E-02	3.37E+02	7.97E-01	0.00E+00	0.00E+00	3.37E+02	1.53E-01	1.77E+00
39	CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	CO_3^{-2}	3.29E-01	1.65E-01	2.44E+03	3.87E+03	0.00E+00	0.00E+00	6.31E+03	2.87E+00	3.32E+01
42	Cr^{+3}	9.91E-03	4.30E-03	6.36E+01	7.04E+00	0.00E+00	0.00E+00	7.07E+01	3.21E-02	3.72E-01
43	Cu^{+2}	5.71E-05	3.03E-05	4.48E-01	2.38E-03	0.00E+00	0.00E+00	4.50E-01	2.05E-04	2.37E-03
44	F^-	3.75E-02	5.95E-03	8.80E+01	8.16E-03	0.00E+00	0.00E+00	8.80E+01	4.00E-02	4.63E-01
45	Fe^{+3}	1.81E-03	8.42E-04	1.25E+01	4.54E+03	0.00E+00	0.00E+00	4.56E+03	2.07E+00	2.40E+01
46	H_2O	4.00E+01	6.01E+00	8.90E+04	0.00E+00	0.00E+00	0.00E+00	8.90E+04	4.04E+01	4.68E+02
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^+	1.50E-13	1.26E-15	1.86E-11	0.00E+00	0.00E+00	0.00E+00	1.86E-11	8.46E-15	9.79E-14
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	1.85E-24	9.40E-25	1.39E-20	3.26E-15	0.00E+00	0.00E+00	3.26E-15	1.48E-18	1.71E-17
51	H2CO3	1.17E-23	6.04E-24	8.93E-20	0.00E+00	0.00E+00	0.00E+00	8.93E-20	4.06E-23	4.70E-22
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	5.98E-05	1.00E-04	1.48E+00	3.99E+00	0.00E+00	0.00E+00	5.47E+00	2.48E-03	2.88E-02
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^+	1.47E-01	4.80E-02	7.10E+02	1.00E+01	0.00E+00	0.00E+00	7.20E+02	3.27E-01	3.79E+00
56	La^{+3}	1.58E-05	1.84E-05	2.72E-01	6.24E-03	0.00E+00	0.00E+00	2.78E-01	1.26E-04	1.46E-03
57	Li^+	6.73E-03	3.90E-04	5.76E+00	8.92E+02	0.00E+00	0.00E+00	8.98E+02	4.08E-01	4.72E+00
58	Mg^{+2}	4.71E-04	9.55E-05	1.41E+00	1.18E+03	0.00E+00	0.00E+00	1.18E+03	5.37E-01	6.22E+00
59	Mn^{+3}	5.11E-04	2.34E-04	3.46E+00	1.31E+01	0.00E+00	0.00E+00	1.65E+01	7.51E-03	8.69E-02
60	MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	1.01E-23	2.37E-24	3.50E-20	0.00E+00	0.00E+00	0.00E+00	3.50E-20	1.59E-23	1.84E-22
62	Na^+	4.53E+00	8.68E-01	1.28E+04	3.88E+00	0.00E+00	0.00E+00	1.28E+04	5.84E+00	6.76E+01
63	NH3	5.33E-04	7.58E-05	1.12E+00	0.00E+00	0.00E+00	0.00E+00	1.12E+00	5.09E-04	5.90E-03
64	NH4+	7.66E-23	7.58E-05	1.71E-19	1.44E-16	0.00E+00	0.00E+00	1.44E-16	6.55E-20	7.58E-19
65	Ni^{+2}	8.26E-04	4.05E-04	5.99E+00	1.18E+01	0.00E+00	0.00E+00	1.78E+01	8.10E-03	9.38E-02
66	NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	NO_2^-	8.90E-01	3.42E-01	5.06E+03	2.27E-02	0.00E+00	0.00E+00	5.06E+03	2.30E+00	2.66E+01
69	NO_3^-	1.63E+00	8.41E-01	1.24E+04	1.75E-02	0.00E+00	0.00E+00	1.24E+04	5.66E+00	6.55E+01
70	O_2	5.37E-26	1.43E-26	2.12E-22	0.00E+00	0.00E+00	0.00E+00	2.12E-22	9.63E-26	1.12E-24
71	O^-	0.00E+00	0.00E+00	0.00E+00	1.57E+04	0.00E+00	0.00E+00	1.57E+04	7.16E+00	8.28E+01
72	OH^-	6.69E-02	9.49E-03	1.40E+02	0.00E+00	0.00E+00	0.00E+00	1.40E+02	6.38E-02	7.39E-01
73	$OH(b)^-$	9.82E+00	1.39E+00	2.06E+04	0.00E+00	0.00E+00	0.00E+00	2.06E+04	9.38E+00	1.09E+02

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-25

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	2.10E-04	3.62E-04	5.36E+00	9.99E-02	0.00E+00	0.00E+00	5.46E+00	2.48E-03	2.87E-02
75	Pd^{+2}	1.62E-05	1.44E-05	2.13E-01	1.20E-03	0.00E+00	0.00E+00	2.14E-01	9.75E-05	1.13E-03
76	PO_4^{-3}	1.67E-02	1.33E-02	1.96E+02	2.86E+01	0.00E+00	0.00E+00	2.25E+02	1.02E-01	1.18E+00
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	1.57E-05	1.35E-05	1.99E-01	3.87E-03	0.00E+00	0.00E+00	2.03E-01	9.24E-05	1.07E-03
79	Ru^{+3}	2.33E-05	1.97E-05	2.91E-01	9.17E-02	0.00E+00	0.00E+00	3.83E-01	1.74E-04	2.01E-03
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.04E-15	0.00E+00	0.00E+00	1.04E-15	4.73E-19	5.48E-18
81	SiO2	3.16E-03	1.58E-03	2.34E+01	5.10E+04	0.00E+00	0.00E+00	5.11E+04	2.32E+01	2.69E+02
82	SiO_4^{-4}	2.41E-15	1.86E-15	2.74E-11	0.00E+00	0.00E+00	0.00E+00	2.74E-11	1.25E-14	1.44E-13
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	3.99E-02	3.20E-02	4.74E+02	1.33E+01	0.00E+00	0.00E+00	4.87E+02	2.21E-01	2.56E+00
85	Sr^{+2}	8.50E-06	6.21E-06	9.19E-02	6.79E-04	0.00E+00	0.00E+00	9.26E-02	4.21E-05	4.87E-04
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	6.60E+03	0.00E+00	0.00E+00	6.60E+03	3.00E+00	3.47E+01
87	Ti^{+4}	2.60E-05	1.04E-05	1.54E-01	9.67E+02	0.00E+00	0.00E+00	9.67E+02	4.40E-01	5.09E+00
88	Zn^{+2}	9.74E-05	5.31E-05	7.86E-01	2.70E+03	0.00E+00	0.00E+00	2.70E+03	1.23E+00	1.42E+01
89	Zr^{+4}	7.18E-05	5.47E-05	8.09E-01	2.50E+03	0.00E+00	0.00E+00	2.50E+03	1.14E+00	1.31E+01
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	1.51E-02	1.11E-02	1.64E+02	9.04E+02	0.00E+00	0.00E+00	1.07E+03	4.85E-01	5.62E+00
94	$C_2O_4^{-2}$	1.51E-02	1.11E-02	1.64E+02	9.04E+02	0.00E+00	0.00E+00	1.07E+03	4.85E-01	5.62E+00
95	Formate	9.49E-15	3.56E-15	5.27E-11	0.00E+00	0.00E+00	0.00E+00	5.27E-11	2.40E-14	2.77E-13
96	Acetate	7.35E-15	3.62E-15	5.36E-11	0.00E+00	0.00E+00	0.00E+00	5.36E-11	2.44E-14	2.82E-13
97	Glycolate	4.89E-14	3.06E-14	4.53E-10	0.00E+00	0.00E+00	0.00E+00	4.53E-10	2.06E-13	2.38E-12
98	IDA	2.59E-14	2.88E-14	4.26E-10	0.00E+00	0.00E+00	0.00E+00	4.26E-10	1.94E-13	2.24E-12
99	Citrate	2.37E-15	3.80E-15	5.62E-11	0.00E+00	0.00E+00	0.00E+00	5.62E-11	2.56E-14	2.96E-13
100	HEDTA	1.11E-14	2.58E-14	3.82E-10	0.00E+00	0.00E+00	0.00E+00	3.82E-10	1.73E-13	2.01E-12
101	EDTA	1.33E-15	3.25E-15	4.81E-11	0.00E+00	0.00E+00	0.00E+00	4.81E-11	2.19E-14	2.53E-13
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	1.10E-01	6.19E+03	6.73E+01	1.30E-03	7.31E+01	5.34E+00	1.12E-01	6.26E+03	7.26E+01
106	^{241}Am	3.18E-04	1.78E+01	1.15E-02	5.80E-06	3.25E-01	2.09E-04	3.24E-04	1.81E+01	1.17E-02
107	^{243}Am	2.08E-07	1.16E-02	1.29E-04	2.77E-09	1.55E-04	1.71E-06	2.11E-07	1.18E-02	1.30E-04
108	^{14}C	6.50E-06	3.64E-01	1.80E-04	1.24E-10	6.96E-06	3.43E-09	6.50E-06	3.64E-01	1.80E-04
109	^{60}Co	4.26E-05	2.39E+00	4.65E-06	4.06E-07	2.27E-02	4.43E-08	4.30E-05	2.41E+00	4.70E-06
110	^{243}Cm	3.43E-08	1.92E-03	8.38E-08	2.64E-09	1.48E-04	6.45E-09	3.69E-08	2.07E-03	9.02E-08
111	^{244}Cm	8.12E-07	4.55E-02	1.24E-06	6.02E-08	3.37E-03	9.19E-08	8.72E-07	4.88E-02	1.33E-06
112	^{137}Cs	6.88E-05	3.85E+00	9.78E-05	1.44E-04	8.08E+00	2.05E-04	2.13E-04	1.19E+01	3.03E-04
113	^{152}Eu	2.40E-06	1.34E-01	1.70E-06	2.14E-08	1.20E-03	1.52E-08	2.42E-06	1.35E-01	1.72E-06
114	^{154}Eu	4.96E-04	2.78E+01	2.27E-04	3.51E-06	1.96E-01	1.60E-06	5.00E-04	2.80E+01	2.28E-04
115	^{155}Eu	1.44E-04	8.04E+00	3.65E-05	8.71E-07	4.88E-02	2.21E-07	1.44E-04	8.09E+00	3.67E-05
116	^{3}H	4.72E-06	2.64E-01	6.07E-08	2.27E-06	1.27E-01	2.92E-08	6.99E-06	3.92E-01	8.99E-08
117	^{129}I	1.98E-07	1.11E-02	1.38E-01	3.52E-08	1.97E-03	2.46E-02	2.33E-07	1.30E-02	1.63E-01
118	^{63}Ni	7.69E-04	4.31E+01	1.67E-03	8.66E-06	4.85E-01	1.88E-05	7.78E-04	4.35E+01	1.69E-03
119	^{237}Np	2.52E-07	1.41E-02	4.41E-02	2.71E-09	1.52E-04	4.74E-04	2.54E-07	1.42E-02	4.46E-02
120	^{238}Pu	1.42E-06	7.98E-02	1.03E-05	1.40E-08	7.85E-04	1.01E-07	1.44E-06	8.06E-02	1.04E-05
121	^{239}Pu	1.97E-05	1.10E+00	3.92E-02	1.60E-07	8.94E-03	3.18E-04	1.99E-05	1.11E+00	3.95E-02
122	^{240}Pu	5.11E-06	2.86E-01	2.78E-03	4.17E-08	2.33E-03	2.27E-05	5.15E-06	2.88E-01	2.80E-03
123	^{241}Pu	1.07E-04	6.00E+00	1.28E-04	9.68E-07	5.42E-02	1.16E-06	1.08E-04	6.05E+00	1.30E-04
124	^{242}Pu	5.40E-10	3.03E-05	1.69E-05	4.19E-12	2.35E-07	1.31E-07	5.45E-10	3.05E-05	1.71E-05
125	^{125}Sb	2.96E-04	1.66E+01	3.52E-05	4.29E-06	2.40E-01	5.11E-07	3.00E-04	1.68E+01	3.57E-05
126	^{151}Sm	4.16E-03	2.33E+02	1.95E-02	1.06E-05	5.92E-01	4.96E-05	4.17E-03	2.34E+02	1.96E-02
127	^{126}Sn	4.71E-06	2.64E-01	5.12E-02	2.65E-08	1.49E-03	2.88E-04	4.74E-06	2.65E-01	5.15E-02
128	^{90}Sr	1.03E-01	5.78E+03	9.22E-02	7.23E-04	4.05E+01	6.46E-04	1.04E-01	5.82E+03	9.29E-02
129	^{99}Tc	8.18E-04	4.58E+01	5.96E+00	4.00E-04	2.24E+01	2.91E+00	1.22E-03	6.82E+01	8.87E+00
130	^{232}Th	7.65E-09	4.28E-04	8.58E+00	1.87E-09	1.05E-04	2.10E+00	9.52E-09	5.33E-04	1.07E+01
131	^{233}U	2.55E-07	1.43E-02	3.27E-03	5.19E-09	2.91E-04	6.65E-05	2.60E-07	1.46E-02	3.33E-03
132	^{234}U	1.81E-07	1.01E-02	3.60E-03	1.11E-09	6.21E-05	2.21E-05	1.82E-07	1.02E-02	3.62E-03
133	^{235}U	7.13E-09	3.99E-04	4.07E-01	4.06E-11	2.27E-06	2.32E-03	7.17E-09	4.01E-04	4.10E-01
134	^{236}U	1.22E-08	6.84E-04	2.33E-02	6.79E-11	3.80E-06	1.30E-04	1.23E-08	6.87E-04	2.34E-02
135	^{238}U	1.41E-07	7.91E-03	5.19E+01	8.23E-10	4.61E-05	3.02E-01	1.42E-07	7.96E-03	5.22E+01
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-13 LFP06 Stream Report

Stream Number:	LFP06
Stream Name:	LAW LFP Vents
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

Variable	Value	Units	
Density	1.14E-03	g/cm^3	(does not include solid phase)
Enthalpy	-6.17E+04	BTU/hr	
Mass Flow	4.88E+02	Lb/hr	
	1.17E+04	Lb/day	
Volumetric Flow	8.52E+02	GPM	(does not include solid phase)
	1.14E+02	ft^3/min	(does not include solid phase)
Molar Flow	1.71E+01	Lbmol/hr	
Molecular Weight	2.85E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	2.64E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	4.51E+00	pH	
Total TRU	1.68E-13	Ci/L	
Total Activity	4.04E-11	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	1.90E-08	3.24E-09	3.98E-03	1.79E-03	4.02E-02	1.17E+04	1.17E+04	5.32E+00	6.16E+01
Ag^{+}	1.22E-14	1.10E-14	1.35E-08	4.72E-10	0.00E+00	0.00E+00	1.40E-08	6.35E-12	7.35E-11
Al^{+3}	1.48E-10	3.34E-11	4.09E-05	4.57E-05	0.00E+00	0.00E+00	8.66E-05	3.94E-08	4.56E-07
As^{+3}	5.39E-14	3.37E-14	4.13E-08	8.15E-09	0.00E+00	0.00E+00	4.95E-08	2.25E-11	2.60E-10
B^{+3}	5.93E-10	5.35E-11	6.57E-05	3.37E-06	0.00E+00	0.00E+00	6.90E-05	3.14E-08	3.63E-07
Ba^{+2}	1.12E-14	1.29E-14	1.58E-08	1.70E-10	0.00E+00	0.00E+00	1.60E-08	7.26E-12	8.40E-11
Bi^{+3}	1.33E-14	2.31E-14	2.84E-08	4.13E-10	0.00E+00	0.00E+00	2.88E-08	1.31E-11	1.51E-10
Ca^{+2}	1.67E-12	5.59E-13	6.86E-07	6.44E-05	0.00E+00	0.00E+00	6.50E-05	2.96E-08	3.42E-07
Cd^{+2}	2.09E-14	1.96E-14	2.41E-08	6.10E-09	0.00E+00	0.00E+00	3.02E-08	1.37E-11	1.59E-10
Ce^{+3}	4.99E-13	5.84E-13	7.16E-07	3.61E-09	0.00E+00	0.00E+00	7.20E-07	3.27E-10	3.79E-09
Cl^{-}	2.78E-11	8.23E-12	1.01E-05	1.59E-08	0.00E+00	0.00E+00	1.01E-05	4.60E-09	5.32E-08
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.22E-33	1.90E-27	1.90E-27	8.65E-31	1.00E-29
CO_3^{-2}	1.19E-10	5.97E-11	7.32E-05	7.73E-05	0.00E+00	0.00E+00	1.51E-04	6.84E-08	7.92E-07
Cr^{+3}	3.58E-12	1.56E-12	1.91E-06	1.58E-07	0.00E+00	0.00E+00	2.07E-06	9.39E-10	1.09E-08
Cu^{+2}	2.07E-14	1.10E-14	1.34E-08	7.14E-11	0.00E+00	0.00E+00	1.35E-08	6.14E-12	7.11E-11
F^{-}	1.36E-11	2.15E-12	2.64E-06	2.45E-10	0.00E+00	0.00E+00	2.64E-06	1.20E-09	1.39E-08
Fe^{+3}	6.54E-13	3.05E-13	3.74E-07	9.11E-05	0.00E+00	0.00E+00	9.15E-05	4.16E-08	4.81E-07
H_2O	1.28E-08	1.93E-09	2.36E-03	0.00E+00	1.40E-03	2.58E+02	2.58E+02	1.17E-01	1.36E+00
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	5.16E-23	4.34E-25	5.32E-19	0.00E+00	0.00E+00	0.00E+00	5.32E-19	2.42E-22	2.80E-21
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	6.68E-34	3.40E-34	4.17E-28	9.78E-23	0.00E+00	0.00E+00	9.78E-23	4.45E-26	5.14E-25
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	2.16E-14	3.62E-14	4.44E-08	1.20E-07	0.00E+00	0.00E+00	1.64E-07	7.45E-11	8.63E-10
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	5.32E-11	1.74E-11	2.13E-05	2.01E-07	0.00E+00	0.00E+00	2.15E-05	9.77E-09	1.13E-07
La^{+3}	5.73E-15	6.64E-15	8.15E-09	1.87E-10	0.00E+00	0.00E+00	8.34E-09	3.79E-12	4.39E-11
Li^{+}	2.43E-12	1.41E-13	1.73E-07	1.79E-05	0.00E+00	0.00E+00	1.81E-05	8.21E-09	9.50E-08
Mg^{+2}	1.70E-13	3.46E-14	4.24E-08	2.37E-05	0.00E+00	0.00E+00	2.37E-05	1.08E-08	1.25E-07
Mn^{+3}	1.85E-13	8.47E-14	1.04E-07	2.63E-07	0.00E+00	0.00E+00	3.67E-07	1.67E-10	1.93E-09
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	3.66E-33	8.57E-34	1.05E-27	0.00E+00	3.06E-02	8.78E+03	8.78E+03	3.99E+00	4.62E+01
Na^{+}	1.64E-09	3.14E-10	3.85E-04	7.85E-08	0.00E+00	0.00E+00	3.85E-04	1.75E-07	2.03E-06
NH3	1.93E-13	2.74E-14	3.36E-08	0.00E+00	0.00E+00	0.00E+00	3.36E-08	1.53E-11	1.77E-10
NH4+	2.77E-32	2.74E-14	5.12E-27	4.32E-24	0.00E+00	0.00E+00	4.32E-24	1.96E-27	2.27E-26
Ni^{+2}	2.99E-13	1.46E-13	1.80E-07	2.39E-07	0.00E+00	0.00E+00	4.18E-07	1.90E-10	2.20E-09
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^{-}	3.22E-10	1.24E-10	1.52E-04	6.82E-10	0.00E+00	0.00E+00	1.52E-04	6.89E-08	7.98E-07

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-27

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	5.88E-10	3.04E-10	3.73E-04	5.25E-10	0.00E+00	0.00E+00	3.73E-04	1.70E-07	1.96E-06
70	O_2	1.94E-35	5.18E-36	6.36E-30	0.00E+00	8.14E-03	2.67E+03	2.67E+03	1.21E+00	1.40E+01
71	O^-	0.00E+00	0.00E+00	0.00E+00	3.18E-04	0.00E+00	0.00E+00	3.18E-04	1.45E-07	1.67E-06
72	OH^-	3.20E-10	4.55E-11	5.58E-05	2.07E-09	0.00E+00	0.00E+00	5.58E-05	2.54E-08	2.93E-07
73	$OH(b)^-$	2.37E-09	3.36E-10	4.13E-04	0.00E+00	0.00E+00	0.00E+00	4.13E-04	1.88E-07	2.17E-06
74	Pb^{+2}	7.58E-14	1.31E-13	1.61E-07	2.69E-09	0.00E+00	0.00E+00	1.64E-07	7.43E-11	8.60E-10
75	Pd^{+2}	5.87E-15	5.21E-15	6.40E-09	3.61E-11	0.00E+00	0.00E+00	6.43E-09	2.92E-12	3.38E-11
76	PO_4^{-3}	6.05E-12	4.79E-12	5.88E-06	6.26E-07	0.00E+00	0.00E+00	6.51E-06	2.96E-09	3.42E-08
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	5.68E-15	4.88E-15	5.98E-09	1.16E-10	0.00E+00	0.00E+00	6.10E-09	2.77E-12	3.21E-11
79	Ru^{+3}	8.44E-15	7.12E-15	8.73E-09	2.75E-09	0.00E+00	0.00E+00	1.15E-08	5.22E-12	6.04E-11
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.12E-23	0.00E+00	0.00E+00	3.12E-23	1.42E-26	1.64E-25
81	SiO2	1.14E-12	5.73E-13	7.03E-07	1.02E-03	0.00E+00	0.00E+00	1.02E-03	4.65E-07	5.38E-06
82	SiO_4^{-4}	8.73E-25	6.71E-25	8.23E-19	0.00E+00	0.00E+00	0.00E+00	8.23E-19	3.74E-22	4.33E-21
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	1.44E-11	1.16E-11	1.42E-05	2.66E-07	0.00E+00	0.00E+00	1.45E-05	6.58E-09	7.62E-08
85	Sr^{+2}	3.07E-15	2.25E-15	2.76E-09	2.04E-11	0.00E+00	0.00E+00	2.78E-09	1.26E-12	1.46E-11
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	9.42E-15	3.76E-15	4.62E-09	1.94E-05	0.00E+00	0.00E+00	1.94E-05	8.80E-09	1.02E-07
88	Zn^{+2}	3.52E-14	1.92E-14	2.36E-08	5.43E-05	0.00E+00	0.00E+00	5.44E-05	2.47E-08	2.86E-07
89	Zr^{+4}	2.60E-14	1.98E-14	2.43E-08	5.00E-05	0.00E+00	0.00E+00	5.00E-05	2.27E-08	2.63E-07
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	5.46E-12	4.01E-12	4.92E-06	2.71E-05	0.00E+00	0.00E+00	3.20E-05	1.46E-08	1.69E-07
94	$C_2O_4^{-2}$	5.46E-12	4.01E-12	4.92E-06	2.71E-05	0.00E+00	0.00E+00	3.20E-05	1.46E-08	1.69E-07
95	Formate	3.43E-24	1.29E-24	1.58E-18	0.00E+00	0.00E+00	0.00E+00	1.58E-18	7.19E-22	8.32E-21
96	Acetate	2.66E-24	1.31E-24	1.61E-18	0.00E+00	0.00E+00	0.00E+00	1.61E-18	7.31E-22	8.46E-21
97	Glycolate	1.77E-23	1.11E-23	1.36E-17	0.00E+00	0.00E+00	0.00E+00	1.36E-17	6.18E-21	7.15E-20
98	IDA	9.38E-24	1.04E-23	1.28E-17	0.00E+00	0.00E+00	0.00E+00	1.28E-17	5.81E-21	6.73E-20
99	Citrate	8.58E-25	1.38E-24	1.69E-18	0.00E+00	0.00E+00	0.00E+00	1.69E-18	7.67E-22	8.88E-21
100	HEDTA	4.02E-24	9.33E-24	1.14E-17	0.00E+00	0.00E+00	0.00E+00	1.14E-17	5.20E-21	6.02E-20
101	EDTA	4.83E-25	1.18E-24	1.44E-18	0.00E+00	0.00E+00	0.00E+00	1.44E-18	6.56E-22	7.60E-21
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	4.00E-11	1.86E-04	2.02E-06	4.72E-13	2.19E-06	1.40E-07	4.04E-11	1.88E-04	2.16E-06
106	^{241}Am	1.15E-13	5.35E-07	3.44E-10	2.10E-15	9.75E-09	6.27E-12	1.17E-13	5.44E-07	3.50E-10
107	^{243}Am	7.52E-17	3.49E-10	3.86E-12	1.00E-18	4.65E-12	5.14E-14	7.62E-17	3.54E-10	3.91E-12
108	^{14}C	2.35E-15	1.09E-08	5.39E-12	4.49E-20	2.09E-13	1.03E-16	2.35E-15	1.09E-08	5.39E-12
109	^{60}Co	1.54E-14	7.16E-08	1.40E-13	1.47E-16	6.82E-10	1.33E-15	1.56E-14	7.23E-08	1.41E-13
110	^{243}Cm	1.24E-17	5.76E-11	2.51E-15	9.56E-19	4.44E-12	1.94E-16	1.34E-17	6.21E-11	2.71E-15
111	^{244}Cm	2.94E-16	1.36E-09	3.72E-14	2.18E-17	1.01E-10	2.76E-15	3.15E-16	1.46E-09	3.99E-14
112	^{137}Cs	2.49E-14	1.16E-07	2.93E-12	5.22E-14	2.42E-07	6.15E-12	7.71E-14	3.58E-07	9.09E-12
113	^{152}Eu	8.66E-16	4.02E-09	5.10E-14	7.75E-18	3.60E-11	4.56E-16	8.74E-16	4.06E-09	5.15E-14
114	^{154}Eu	1.80E-13	8.34E-07	6.80E-12	1.27E-15	5.89E-09	4.81E-14	1.81E-13	8.40E-07	6.85E-12
115	^{155}Eu	5.19E-14	2.41E-07	1.09E-12	3.15E-16	1.46E-09	6.64E-15	5.22E-14	2.43E-07	1.10E-12
116	^{3}H	1.71E-15	7.93E-09	1.82E-15	8.22E-16	3.82E-09	8.76E-16	2.53E-15	1.18E-08	2.70E-15
117	^{129}I	7.15E-17	3.32E-10	4.15E-09	1.27E-17	5.92E-11	7.39E-10	8.43E-17	3.91E-10	4.89E-09
118	^{63}Ni	2.78E-13	1.29E-06	5.01E-11	3.13E-15	1.45E-08	5.65E-13	2.81E-13	1.31E-06	5.07E-11
119	^{237}Np	9.11E-17	4.23E-10	1.32E-09	9.79E-19	4.55E-12	1.42E-11	9.20E-17	4.27E-10	1.34E-09
120	^{238}Pu	5.15E-16	2.39E-09	3.08E-13	5.07E-18	2.35E-11	3.03E-15	5.20E-16	2.42E-09	3.11E-13
121	^{238}Pu	7.12E-15	3.31E-08	1.18E-09	5.77E-17	2.68E-10	9.53E-12	7.18E-15	3.34E-08	1.19E-09
122	^{240}Pu	1.85E-15	8.58E-09	8.33E-11	1.51E-17	7.00E-11	6.80E-13	1.86E-15	8.65E-09	8.40E-11
123	^{241}Pu	3.88E-14	1.80E-07	3.85E-12	3.50E-16	1.63E-09	3.48E-14	3.91E-14	1.82E-07	3.89E-12
124	^{242}Pu	1.95E-19	9.08E-13	5.08E-13	1.52E-21	7.04E-15	3.94E-15	1.97E-19	9.15E-13	5.12E-13
125	^{125}Sb	1.07E-13	4.97E-07	1.06E-12	1.55E-15	7.21E-09	1.53E-14	1.09E-13	5.05E-07	1.07E-12
126	^{151}Sm	1.50E-12	6.99E-06	5.85E-10	3.83E-15	1.78E-08	1.49E-12	1.51E-12	7.01E-06	5.87E-10
127	^{126}Sn	1.70E-15	7.91E-09	1.54E-09	9.60E-18	4.46E-11	8.65E-12	1.71E-15	7.96E-09	1.54E-09
128	^{90}Sr	3.73E-11	1.73E-04	2.77E-09	2.61E-13	1.21E-06	1.94E-11	3.76E-11	1.75E-04	2.79E-09
129	^{99}Tc	2.96E-13	1.37E-06	1.79E-07	1.45E-13	6.72E-07	8.74E-08	4.41E-13	2.05E-06	2.66E-07
130	^{232}Th	2.77E-18	1.28E-11	2.57E-07	4.62E-19	2.14E-12	4.30E-08	3.23E-18	1.50E-11	3.00E-07
131	^{233}U	9.22E-17	4.28E-10	9.80E-11	1.88E-18	8.72E-12	2.00E-12	9.41E-17	4.37E-10	1.00E-10
132	^{234}U	6.54E-17	3.04E-10	1.08E-10	4.01E-19	1.86E-12	6.62E-13	6.58E-17	3.06E-10	1.09E-10
133	^{235}U	2.58E-18	1.20E-11	1.22E-08	1.47E-20	6.81E-14	6.95E-11	2.59E-18	1.20E-11	1.23E-08
134	^{236}U	4.42E-18	2.05E-11	6.99E-10	2.46E-20	1.14E-13	3.89E-12	4.44E-18	2.06E-11	7.03E-10
135	^{238}U	5.11E-17	2.37E-10	1.56E-06	2.98E-19	1.38E-12	9.07E-09	5.14E-17	2.39E-10	1.57E-06
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-14 LMP06 Stream Report

3	**Stream Number:**	**LMP06**
4	**Stream Name:**	**Melter offgas (primary)**
5	**Configuration:**	**MRQ-05-0049.acmf**
6	**Run Date / Time:**	**12/14/2005 - 1:42:25 PM**
7	**Run Data File:**	**H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv**

Stream Properties

	Variable	Value	Units	
11	Density	4.01E-04	g/cm^3	(does not include solid phase)
12	Enthalpy	-2.53E+07	BTU/hr	
13	Mass Flow	8.97E+03	Lb/hr	
14		2.15E+05	Lb/day	
15	Volumetric Flow	4.43E+04	GPM	(does not include solid phase)
16		5.92E+03	ft^3/min	(does not include solid phase)
17	Molar Flow	3.90E+02	Lbmol/hr	
18	Molecular Weight	2.28E+01	Lb/Lbmol	
19	Pressure	9.83E+02	mbar	
20	Temperature	4.00E+02	C	
21	Na Molarity	0.00E+00	mol/L	
22	pH	0.00E+00	pH	
23	Total TRU	1.10E-09	Ci/L	
24	Total Activity	3.68E-07	Ci/L	

	Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
27	Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
28	Total	0.00E+00	0.00E+00	0.00E+00	1.01E+03	1.76E-02	2.13E+05	2.14E+05	9.72E+01	1.13E+03
29	Ag^{+}	0.00E+00	0.00E+00	0.00E+00	1.55E-02	0.00E+00	0.00E+00	1.55E-02	7.06E-06	8.17E-05
30	Al^{+3}	0.00E+00	0.00E+00	0.00E+00	3.63E+01	0.00E+00	0.00E+00	3.63E+01	1.65E-02	1.91E-01
31	As^{+3}	0.00E+00	0.00E+00	0.00E+00	2.75E-01	0.00E+00	0.00E+00	2.75E-01	1.25E-04	1.45E-03
32	B^{+3}	0.00E+00	0.00E+00	0.00E+00	1.13E+02	0.00E+00	0.00E+00	1.13E+02	5.14E-02	5.95E-01
33	Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	5.32E-03	0.00E+00	0.00E+00	5.32E-03	2.42E-06	2.80E-05
34	Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	1.20E-02	0.00E+00	0.00E+00	1.20E-02	5.45E-06	6.31E-05
35	Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	4.30E+01	0.00E+00	0.00E+00	4.30E+01	1.95E-02	2.26E-01
36	Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.05E-01	0.00E+00	0.00E+00	1.05E-01	4.79E-05	5.54E-04
37	Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	1.20E-01	0.00E+00	0.00E+00	1.20E-01	5.45E-05	6.31E-04
38	Cl^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39	CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.30E-06	9.39E+01	9.39E+01	4.27E-02	4.94E-01
40	CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.30E-04	1.48E+04	1.48E+04	6.71E+00	7.76E+01
41	CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42	Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	1.72E+00	0.00E+00	0.00E+00	1.72E+00	7.83E-04	9.07E-03
43	Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	2.25E-03	0.00E+00	0.00E+00	2.25E-03	1.02E-06	1.18E-05
44	F^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
45	Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	2.28E+01	0.00E+00	0.00E+00	2.28E+01	1.04E-02	1.20E-01
46	H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-02	1.05E+05	1.05E+05	4.78E+01	5.53E+02
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^{+}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.41E-06	1.83E+02	1.83E+02	8.30E-02	9.61E-01
50	HCO3-	0.00E+00	0.00E+00	0.00E+00	3.26E-15	0.00E+00	0.00E+00	3.26E-15	1.48E-18	1.71E-17
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.17E-06	2.32E+01	2.32E+01	1.05E-02	1.22E-01
53	Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	5.47E+00	0.00E+00	0.00E+00	5.47E+00	2.48E-03	2.88E-02
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^{+}	0.00E+00	0.00E+00	0.00E+00	3.60E+01	0.00E+00	0.00E+00	3.60E+01	1.64E-02	1.89E-01
56	La^{+3}	0.00E+00	0.00E+00	0.00E+00	5.56E-03	0.00E+00	0.00E+00	5.56E-03	2.53E-06	2.92E-05
57	Li^{+}	0.00E+00	0.00E+00	0.00E+00	8.98E+00	0.00E+00	0.00E+00	8.98E+00	4.08E-03	4.72E-02
58	Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	5.91E+00	0.00E+00	0.00E+00	5.91E+00	2.69E-03	3.11E-02
59	Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	2.20E-01	0.00E+00	0.00E+00	2.20E-01	1.00E-04	1.16E-03
60	MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.12E-03	6.15E+04	6.15E+04	2.80E+01	3.24E+02
62	Na^{+}	0.00E+00	0.00E+00	0.00E+00	1.28E+02	0.00E+00	0.00E+00	1.28E+02	5.84E-02	6.76E-01
63	NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06	1.12E+01	1.12E+01	5.09E-03	5.90E-02
64	NH4+	0.00E+00	0.00E+00	0.00E+00	1.44E-16	0.00E+00	0.00E+00	1.44E-16	6.55E-20	7.58E-19
65	Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	2.00E-01	0.00E+00	0.00E+00	2.00E-01	9.10E-05	1.05E-03
66	NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.07E-04	4.91E+03	4.91E+03	2.23E+00	2.58E+01
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.81E-05	6.87E+02	6.87E+02	3.12E-01	3.62E+00
68	NO_2^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-29

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70	O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-03	2.56E+04	2.56E+04	1.16E+01	1.35E+02
71	O^-	0.00E+00	0.00E+00	0.00E+00	3.92E+02	0.00E+00	0.00E+00	3.92E+02	1.78E-01	2.06E+00
72	OH^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
73	$OH(b)^-$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74	Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	6.66E-02	0.00E+00	0.00E+00	6.66E-02	3.03E-05	3.50E-04
75	Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.07E-03	0.00E+00	0.00E+00	1.07E-03	4.87E-07	5.64E-06
76	PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	5.62E+00	0.00E+00	0.00E+00	5.62E+00	2.55E-03	2.96E-02
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	3.84E-03	0.00E+00	0.00E+00	3.84E-03	1.74E-06	2.02E-05
79	Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	9.81E-02	0.00E+00	0.00E+00	9.81E-02	4.46E-05	5.16E-04
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	0.00E+00	0.00E+00	0.00E+00	1.70E+02	0.00E+00	0.00E+00	1.70E+02	7.74E-02	8.95E-01
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	9.15E-14	0.00E+00	0.00E+00	9.15E-14	4.16E-17	4.81E-16
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.20E-07	1.77E+01	1.77E+01	8.06E-03	9.33E-02
84	SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85	Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	9.26E-04	0.00E+00	0.00E+00	9.26E-04	4.21E-07	4.87E-06
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	5.23E-01	0.00E+00	0.00E+00	5.23E-01	2.38E-04	2.75E-03
88	Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	2.70E+01	0.00E+00	0.00E+00	2.70E+01	1.23E-02	1.42E-01
89	Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	8.32E+00	0.00E+00	0.00E+00	8.32E+00	3.78E-03	4.38E-02
90										
91	**Components**	***Aqueous Comp***			***Solid Comp***	***Gaseous***		***Total Comp***		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	0.00E+00	0.00E+00	0.00E+00	9.71E+02	0.00E+00	0.00E+00	9.71E+02	4.41E-01	5.11E+00
94	$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	9.71E+02	0.00E+00	0.00E+00	9.71E+02	4.41E-01	5.11E+00
95	Formate	0.00E+00	0.00E+00	0.00E+00	4.79E-11	0.00E+00	0.00E+00	4.79E-11	2.18E-14	2.52E-13
96	Acetate	0.00E+00	0.00E+00	0.00E+00	4.87E-11	0.00E+00	0.00E+00	4.87E-11	2.21E-14	2.56E-13
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	4.12E-10	0.00E+00	0.00E+00	4.12E-10	1.87E-13	2.17E-12
98	IDA	0.00E+00	0.00E+00	0.00E+00	3.88E-10	0.00E+00	0.00E+00	3.88E-10	1.76E-13	2.04E-12
99	Citrate	0.00E+00	0.00E+00	0.00E+00	5.11E-11	0.00E+00	0.00E+00	5.11E-11	2.32E-14	2.69E-13
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	3.47E-10	0.00E+00	0.00E+00	3.47E-10	1.58E-13	1.82E-12
101	EDTA	0.00E+00	0.00E+00	0.00E+00	4.38E-11	0.00E+00	0.00E+00	4.38E-11	1.99E-14	2.30E-13
102										
103	***Rad. Comp***	***Aqueous Rad. Comp***			***Solids Rad. Comp (1)***			***Total Rad. Comp (1)***		
104	**Unit**	***Ci/L***	***Ci/day***	**Lb/day**	***Ci/L***	***Ci/day***	**Lb/day**	***Ci/L***	***Ci/day***	**Lb/day**
105	**Total**	0.00E+00	0.00E+00	0.00E+00	3.68E-07	8.90E+01	3.41E+00	3.68E-07	8.90E+01	3.41E+00
106	^{241}Am	0.00E+00	0.00E+00	0.00E+00	9.39E-10	2.27E-01	1.46E-04	9.39E-10	2.27E-01	1.46E-04
107	^{243}Am	0.00E+00	0.00E+00	0.00E+00	6.11E-13	1.48E-04	1.63E-06	6.11E-13	1.48E-04	1.63E-06
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	1.51E-09	3.64E-01	1.80E-04	1.51E-09	3.64E-01	1.80E-04
109	^{60}Co	0.00E+00	0.00E+00	0.00E+00	4.99E-11	1.21E-02	2.35E-08	4.99E-11	1.21E-02	2.35E-08
110	^{243}Cm	0.00E+00	0.00E+00	0.00E+00	4.28E-14	1.03E-05	4.51E-10	4.28E-14	1.03E-05	4.51E-10
111	^{244}Cm	0.00E+00	0.00E+00	0.00E+00	1.01E-12	2.44E-04	6.65E-09	1.01E-12	2.44E-04	6.65E-09
112	^{137}Cs	0.00E+00	0.00E+00	0.00E+00	2.47E-08	5.96E+00	1.51E-04	2.47E-08	5.96E+00	1.51E-04
113	^{152}Eu	0.00E+00	0.00E+00	0.00E+00	2.80E-12	6.77E-04	8.58E-09	2.80E-12	6.77E-04	8.58E-09
114	^{154}Eu	0.00E+00	0.00E+00	0.00E+00	5.80E-10	1.40E-01	1.14E-06	5.80E-10	1.40E-01	1.14E-06
115	^{155}Eu	0.00E+00	0.00E+00	0.00E+00	1.67E-10	4.04E-02	1.84E-07	1.67E-10	4.04E-02	1.84E-07
116	^{3}H	0.00E+00	0.00E+00	0.00E+00	1.62E-09	3.92E-01	8.99E-08	1.62E-09	3.92E-01	8.99E-08
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	4.91E-11	1.19E-02	1.48E-01	4.91E-11	1.19E-02	1.48E-01
118	^{63}Ni	0.00E+00	0.00E+00	0.00E+00	2.03E-09	4.89E-01	1.90E-05	2.03E-09	4.89E-01	1.90E-05
119	^{237}Np	0.00E+00	0.00E+00	0.00E+00	2.95E-13	7.12E-05	2.23E-04	2.95E-13	7.12E-05	2.23E-04
120	^{238}Pu	0.00E+00	0.00E+00	0.00E+00	1.67E-12	4.03E-04	5.19E-08	1.67E-12	4.03E-04	5.19E-08
121	^{239}Pu	0.00E+00	0.00E+00	0.00E+00	2.30E-11	5.56E-03	1.98E-04	2.30E-11	5.56E-03	1.98E-04
122	^{240}Pu	0.00E+00	0.00E+00	0.00E+00	5.97E-12	1.44E-03	1.40E-05	5.97E-12	1.44E-03	1.40E-05
123	^{241}Pu	0.00E+00	0.00E+00	0.00E+00	1.25E-10	3.03E-02	6.48E-07	1.25E-10	3.03E-02	6.48E-07
124	^{242}Pu	0.00E+00	0.00E+00	0.00E+00	6.31E-16	1.52E-07	8.54E-08	6.31E-16	1.52E-07	8.54E-08
125	^{125}Sb	0.00E+00	0.00E+00	0.00E+00	8.71E-10	2.10E-01	4.47E-07	8.71E-10	2.10E-01	4.47E-07
126	^{151}Sm	0.00E+00	0.00E+00	0.00E+00	7.06E-10	1.70E-01	1.43E-05	7.06E-10	1.70E-01	1.43E-05
127	^{126}Sn	0.00E+00	0.00E+00	0.00E+00	5.49E-12	1.33E-03	2.57E-04	5.49E-12	1.33E-03	2.57E-04
128	^{90}Sr	0.00E+00	0.00E+00	0.00E+00	2.41E-07	5.82E+01	9.29E-04	2.41E-07	5.82E+01	9.29E-04
129	^{99}Tc	0.00E+00	0.00E+00	0.00E+00	9.41E-08	2.27E+01	2.96E+00	9.41E-08	2.27E+01	2.96E+00
130	^{232}Th	0.00E+00	0.00E+00	0.00E+00	8.83E-15	2.13E-06	4.27E-02	8.83E-15	2.13E-06	4.27E-02
131	^{233}U	0.00E+00	0.00E+00	0.00E+00	3.01E-13	7.28E-05	1.67E-05	3.01E-13	7.28E-05	1.67E-05
132	^{234}U	0.00E+00	0.00E+00	0.00E+00	2.11E-13	5.10E-05	1.81E-05	2.11E-13	5.10E-05	1.81E-05
133	^{235}U	0.00E+00	0.00E+00	0.00E+00	8.31E-15	2.01E-06	2.05E-03	8.31E-15	2.01E-06	2.05E-03
134	^{236}U	0.00E+00	0.00E+00	0.00E+00	1.42E-14	3.44E-06	1.17E-04	1.42E-14	3.44E-06	1.17E-04
135	^{238}U	0.00E+00	0.00E+00	0.00E+00	1.65E-13	3.98E-05	2.61E-01	1.65E-13	3.98E-05	2.61E-01
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-30

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

Table C-15 LVP01 Stream Report

Stream Number:	LVP01
Stream Name:	LAW vessel ventilation header offgas
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

Variable	Value	Units	
Density	1.01E-03	g/cm^3	(does not include solid phase)
Enthalpy	-1.05E+05	BTU/hr	
Mass Flow	1.93E+03	Lb/hr	
	4.63E+04	Lb/day	
Volumetric Flow	3.82E+03	GPM	(does not include solid phase)
	5.11E+02	ft^3/min	(does not include solid phase)
Molar Flow	6.73E+01	Lbmol/hr	
Molecular Weight	2.87E+01	Lb/Lbmol	
Pressure	8.92E+02	mbar	
Temperature	3.20E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	0.00E+00	pH	
Total TRU	0.00E+00	Ci/L	
Total Activity	0.00E+00	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.52E-02	4.63E+04	4.63E+04	2.10E+01	2.44E+02
Ag^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
As^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cl^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.55E-04	4.59E+02	4.59E+02	2.09E-01	2.42E+00
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
La^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Li^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-02	3.52E+04	3.52E+04	1.60E+01	1.85E+02
Na^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NH4+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.27E-03	1.07E+04	1.07E+04	4.85E+00	5.62E+01
O^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OH^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
$OH(b)^-$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-31

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75	Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76	PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79	Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85	Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88	Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
89	Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
94	$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106	^{241}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107	^{243}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109	^{60}Co	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110	^{243}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111	^{244}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
112	^{137}Cs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
113	^{152}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
114	^{154}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
115	^{155}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
116	^{3}H	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
118	^{63}Ni	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
119	^{237}Np	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120	^{238}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121	^{239}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122	^{240}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123	^{241}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
124	^{242}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
125	^{125}Sb	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
126	^{151}Sm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
127	^{126}Sn	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
128	^{90}Sr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129	^{99}Tc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
130	^{232}Th	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
131	^{233}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
132	^{234}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
133	^{235}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
134	^{236}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
135	^{238}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-16 LVP18 Stream Report

Stream Number:	LVP18
Stream Name:	Caustic scrubber offgas discharge to stack
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

Variable	Value	Units	
Density	1.02E-03	g/cm^3	(does not include solid phase)
Enthalpy	-1.40E+07	BTU/hr	
Mass Flow	1.83E+04	Lb/hr	
	4.40E+05	Lb/day	
Volumetric Flow	3.59E+04	GPM	(does not include solid phase)
	4.79E+03	ft^3/min	(does not include solid phase)
Molar Flow	6.70E+02	Lbmol/hr	
Molecular Weight	2.74E+01	Lb/Lbmol	
Pressure	1.02E+03	mbar	
Temperature	5.72E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	-2.41E+00	pH	
Total TRU	1.54E-17	Ci/L	
Total Activity	2.24E-09	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	1.68E-14	4.74E-15	1.27E-07	3.71E+00	3.73E-02	4.40E+05	4.40E+05	2.00E+02	2.31E+03
Ag^{+}	1.45E-21	1.31E-21	6.75E-14	8.62E-10	0.00E+00	0.00E+00	8.62E-10	3.92E-13	4.54E-12
Al^{+3}	1.76E-17	3.96E-18	2.05E-10	4.13E-07	0.00E+00	0.00E+00	4.13E-07	1.88E-10	2.17E-09
As^{+3}	6.40E-21	4.00E-21	2.07E-13	1.43E-08	0.00E+00	0.00E+00	1.43E-08	6.51E-12	7.53E-11
B^{+3}	7.05E-17	6.36E-18	3.28E-10	3.19E-06	0.00E+00	0.00E+00	3.19E-06	1.45E-09	1.68E-08
Ba^{+2}	1.33E-21	1.53E-21	7.90E-14	2.46E-11	0.00E+00	0.00E+00	2.47E-11	1.12E-14	1.30E-13
Bi^{+3}	1.58E-21	2.75E-21	1.42E-13	7.69E-10	0.00E+00	0.00E+00	7.69E-10	3.50E-13	4.05E-12
Ca^{+2}	2.34E-19	7.83E-20	4.04E-12	9.78E-07	0.00E+00	0.00E+00	9.78E-07	4.44E-10	5.14E-09
Cd^{+2}	2.48E-21	2.33E-21	1.20E-13	4.12E-09	0.00E+00	0.00E+00	4.12E-09	1.87E-12	2.17E-11
Ce^{+3}	5.93E-20	6.93E-20	3.58E-12	9.09E-11	0.00E+00	0.00E+00	9.45E-11	4.29E-14	4.97E-13
Cl^{-}	3.57E-18	1.06E-18	5.46E-11	7.97E-14	0.00E+00	0.00E+00	5.47E-11	2.48E-14	2.88E-13
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.89E-07	4.70E+00	4.70E+00	2.13E-03	2.47E-02
CO_2	5.77E-17	2.12E-17	1.09E-09	0.00E+00	7.85E-04	1.49E+04	1.49E+04	6.76E+00	7.83E+01
CO_3^{-2}	1.42E-17	7.12E-18	3.68E-10	3.87E-10	0.00E+00	0.00E+00	7.54E-10	3.43E-13	3.97E-12
Cr^{+3}	4.28E-19	1.85E-19	9.54E-12	1.95E-07	0.00E+00	0.00E+00	1.95E-07	8.86E-11	1.03E-09
Cu^{+2}	2.45E-21	1.30E-21	6.72E-14	1.29E-10	0.00E+00	0.00E+00	1.29E-10	5.88E-14	6.81E-13
F^{-}	1.70E-18	2.69E-19	1.39E-11	1.22E-15	0.00E+00	0.00E+00	1.39E-11	6.31E-15	7.30E-14
Fe^{+3}	7.76E-20	3.62E-20	1.87E-12	2.59E-07	0.00E+00	0.00E+00	2.59E-07	1.18E-10	1.36E-09
H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.37E-03	4.94E+04	4.94E+04	2.25E+01	2.60E+02
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	8.08E-30	6.80E-32	3.51E-24	0.00E+00	0.00E+00	0.00E+00	3.51E-24	1.60E-27	1.85E-26
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.44E-07	3.83E+00	3.83E+00	1.74E-03	2.02E-02
HCO3-	7.93E-41	4.04E-41	2.09E-33	3.16E-23	0.00E+00	0.00E+00	3.16E-23	1.44E-26	1.66E-25
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.22E-08	2.77E-01	2.77E-01	1.26E-04	1.46E-03
Hg^{+2}	5.14E-18	8.60E-18	4.44E-10	1.48E-02	0.00E+00	0.00E+00	1.48E-02	6.72E-06	7.77E-05
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	6.49E-18	2.12E-18	1.09E-10	1.76E-06	0.00E+00	0.00E+00	1.76E-06	8.02E-10	9.28E-09
La^{+3}	6.81E-22	7.89E-22	4.07E-14	9.94E-13	0.00E+00	0.00E+00	1.03E-12	4.70E-16	5.44E-15
Li^{+}	3.68E-19	2.13E-20	1.10E-12	5.34E-07	0.00E+00	0.00E+00	5.34E-07	2.43E-10	2.81E-09
Mg^{+2}	2.02E-20	4.10E-21	2.12E-13	8.21E-07	0.00E+00	0.00E+00	8.21E-07	3.73E-10	4.32E-09
Mn^{+3}	2.19E-20	1.01E-20	5.20E-13	3.67E-09	0.00E+00	0.00E+00	3.67E-09	1.67E-12	1.93E-11
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	8.70E-35	2.03E-35	1.05E-27	0.00E+00	2.35E-02	2.84E+05	2.84E+05	1.29E+02	1.49E+03
Na^{+}	1.95E-16	3.75E-17	1.94E-09	8.24E-06	0.00E+00	0.00E+00	8.24E-06	3.74E-09	4.33E-08
NH3	1.60E-14	2.28E-15	1.18E-07	0.00E+00	2.70E-06	1.98E+01	1.98E+01	8.99E-03	1.04E-01
NH4+	3.84E-18	2.28E-15	2.99E-11	1.44E-18	0.00E+00	0.00E+00	2.99E-11	1.36E-14	1.57E-13
Ni^{+2}	3.55E-20	1.74E-20	8.98E-13	1.25E-08	0.00E+00	0.00E+00	1.25E-08	5.69E-12	6.59E-11
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.73E-05	2.23E+02	2.23E+02	1.01E-01	1.17E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.58E-06	3.12E+01	3.12E+01	1.42E-02	1.64E-01
NO_2^{-}	3.82E-17	1.47E-17	7.58E-10	3.41E-15	0.00E+00	0.00E+00	7.58E-10	3.45E-13	3.99E-12
NO_3^{-}	6.99E-17	3.61E-17	1.87E-09	2.62E-15	0.00E+00	0.00E+00	1.87E-09	8.49E-13	9.82E-12
O_2	4.61E-37	1.23E-37	6.36E-30	0.00E+00	6.65E-03	9.17E+04	9.17E+04	4.17E+01	4.82E+02
O^{-}	0.00E+00	0.00E+00	0.00E+00	2.22E+00	0.00E+00	0.00E+00	2.22E+00	1.01E-03	1.17E-02
OH^{-}	3.88E-17	5.50E-18	2.84E-10	1.04E-14	0.00E+00	0.00E+00	2.84E-10	1.29E-13	1.49E-12
$OH(b)^{-}$	2.81E-16	3.99E-17	2.06E-09	0.00E+00	0.00E+00	0.00E+00	2.06E-09	9.38E-13	1.09E-11

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	9.01E-21	1.56E-20	8.04E-13	4.02E-09	0.00E+00	0.00E+00	4.02E-09	1.83E-12	2.12E-11
75	Pd^{+2}	6.97E-22	6.19E-22	3.20E-14	1.19E-12	0.00E+00	0.00E+00	1.22E-12	5.56E-16	6.44E-15
76	PO_4^{-3}	7.19E-19	5.70E-19	2.94E-11	8.26E-07	0.00E+00	0.00E+00	8.26E-07	3.76E-10	4.35E-09
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	6.74E-22	5.79E-22	2.99E-14	1.21E-11	0.00E+00	0.00E+00	1.21E-11	5.52E-15	6.39E-14
79	Ru^{+3}	1.00E-21	8.45E-22	4.37E-14	3.41E-08	0.00E+00	0.00E+00	3.41E-08	1.55E-11	1.79E-10
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.48E+00	0.00E+00	0.00E+00	1.48E+00	6.73E-04	7.79E-03
81	SiO2	1.36E-19	6.80E-20	3.51E-12	2.58E-06	0.00E+00	0.00E+00	2.58E-06	1.17E-09	1.36E-08
82	SiO_4^{-4}	1.04E-31	7.97E-32	4.12E-24	1.39E-21	0.00E+00	0.00E+00	1.39E-21	6.32E-25	7.31E-24
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-08	4.44E-01	4.44E-01	2.02E-04	2.34E-03
84	SO_4^{-2}	1.72E-18	1.38E-18	7.11E-11	1.33E-12	0.00E+00	0.00E+00	7.24E-11	3.29E-14	3.81E-13
85	Sr^{+2}	3.66E-22	2.67E-22	1.38E-14	1.05E-11	0.00E+00	0.00E+00	1.05E-11	4.79E-15	5.54E-14
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	1.12E-21	4.47E-22	2.31E-14	2.87E-10	0.00E+00	0.00E+00	2.87E-10	1.31E-13	1.51E-12
88	Zn^{+2}	4.18E-21	2.28E-21	1.18E-13	6.95E-07	0.00E+00	0.00E+00	6.95E-07	3.16E-10	3.65E-09
89	Zr^{+4}	3.09E-21	2.35E-21	1.21E-13	2.49E-07	0.00E+00	0.00E+00	2.49E-07	1.13E-10	1.31E-09
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	3.24E-20	2.38E-20	1.23E-12	6.07E-07	0.00E+00	0.00E+00	6.07E-07	2.76E-10	3.19E-09
94	$C_2O_4^{-2}$	3.24E-20	2.38E-20	1.23E-12	6.07E-07	0.00E+00	0.00E+00	6.07E-07	2.76E-10	3.19E-09
95	Formate	4.08E-27	1.53E-27	7.91E-20	2.40E-12	0.00E+00	0.00E+00	2.40E-12	1.09E-15	1.26E-14
96	Acetate	3.16E-27	1.56E-27	8.04E-20	2.44E-12	0.00E+00	0.00E+00	2.44E-12	1.11E-15	1.28E-14
97	Glycolate	2.10E-26	1.32E-26	6.80E-19	2.06E-11	0.00E+00	0.00E+00	2.06E-11	9.37E-15	1.08E-13
98	IDA	1.11E-26	1.24E-26	6.39E-19	1.94E-11	0.00E+00	0.00E+00	1.94E-11	8.81E-15	1.02E-13
99	Citrate	1.02E-27	1.63E-27	8.44E-20	2.56E-12	0.00E+00	0.00E+00	2.56E-12	1.16E-15	1.34E-14
100	HEDTA	9.54E-26	2.22E-25	1.14E-17	3.47E-10	0.00E+00	0.00E+00	3.47E-10	1.58E-13	1.82E-12
101	EDTA	1.15E-26	2.80E-26	1.44E-18	4.38E-11	0.00E+00	0.00E+00	4.38E-11	1.99E-14	2.30E-13
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	1.01E-16	1.98E-08	5.32E-11	2.24E-09	4.39E-01	1.30E-03	2.24E-09	4.39E-01	1.30E-03
106	^{241}Am	1.37E-20	2.67E-12	1.72E-15	1.32E-17	2.58E-09	1.66E-12	1.32E-17	2.58E-09	1.66E-12
107	^{243}Am	8.94E-24	1.75E-15	1.93E-17	8.58E-21	1.68E-12	1.85E-14	8.58E-21	1.68E-12	1.85E-14
108	^{14}C	5.58E-17	1.09E-08	5.39E-12	1.86E-09	3.64E-01	1.80E-04	1.86E-09	3.64E-01	1.80E-04
109	^{60}Co	1.83E-21	3.58E-13	6.98E-19	4.82E-18	9.41E-10	1.83E-15	4.82E-18	9.42E-10	1.84E-15
110	^{243}Cm	1.47E-24	2.88E-16	1.26E-20	6.01E-22	1.18E-13	5.13E-18	6.03E-22	1.18E-13	5.14E-18
111	^{244}Cm	3.49E-23	6.82E-15	1.86E-19	1.42E-20	2.77E-12	7.56E-17	1.42E-20	2.78E-12	7.58E-17
112	^{137}Cs	2.96E-21	5.78E-13	1.47E-17	2.12E-15	4.14E-07	1.05E-11	2.12E-15	4.14E-07	1.05E-11
113	^{152}Eu	1.03E-22	2.01E-14	2.55E-19	3.93E-20	7.69E-12	9.75E-17	3.94E-20	7.71E-12	9.78E-17
114	^{154}Eu	2.13E-20	4.17E-12	3.40E-17	8.14E-18	1.59E-09	1.30E-14	8.16E-18	1.59E-09	1.30E-14
115	^{155}Eu	6.17E-21	1.21E-12	5.47E-18	2.35E-18	4.60E-10	2.09E-15	2.36E-18	4.61E-10	2.09E-15
116	^{3}H	4.06E-17	7.93E-09	1.82E-15	3.82E-10	7.47E-02	1.71E-08	3.82E-10	7.47E-02	1.71E-08
117	^{129}I	1.55E-20	3.02E-12	3.77E-11	4.60E-13	8.99E-05	1.12E-03	4.60E-13	8.99E-05	1.12E-03
118	^{63}Ni	3.30E-20	6.46E-12	2.51E-16	1.56E-16	3.06E-08	1.19E-12	1.56E-16	3.06E-08	1.19E-12
119	^{237}Np	1.08E-23	2.11E-15	6.61E-15	4.14E-21	8.10E-13	2.53E-12	4.15E-21	8.12E-13	2.54E-12
120	^{238}Pu	6.12E-23	1.20E-14	1.54E-18	2.34E-20	4.58E-12	5.89E-16	2.35E-20	4.59E-12	5.91E-16
121	^{239}Pu	8.46E-22	1.65E-13	5.88E-15	3.23E-19	6.32E-11	2.24E-12	3.24E-19	6.33E-11	2.25E-12
122	^{240}Pu	2.19E-22	4.29E-14	4.16E-16	8.38E-20	1.64E-11	1.59E-13	8.40E-20	1.64E-11	1.59E-13
123	^{241}Pu	4.60E-21	9.00E-13	1.93E-17	1.76E-18	3.44E-10	7.36E-15	1.76E-18	3.45E-10	7.38E-15
124	^{242}Pu	2.32E-26	4.54E-18	2.54E-18	8.86E-24	1.73E-15	9.70E-16	8.89E-24	1.74E-15	9.73E-16
125	^{125}Sb	1.27E-20	2.49E-12	5.28E-18	1.21E-16	2.37E-08	5.03E-14	1.21E-16	2.37E-08	5.03E-14
126	^{151}Sm	1.79E-19	3.49E-11	2.93E-15	1.19E-18	2.34E-10	1.96E-14	1.37E-18	2.69E-10	2.25E-14
127	^{126}Sn	2.02E-22	3.96E-14	7.68E-15	7.71E-20	1.51E-11	2.93E-12	7.73E-20	1.51E-11	2.93E-12
128	^{90}Sr	4.44E-18	8.68E-10	1.39E-14	3.38E-15	6.61E-07	1.06E-11	3.39E-15	6.62E-07	1.06E-11
129	^{99}Tc	3.51E-20	6.87E-12	8.94E-13	8.81E-15	1.72E-06	2.24E-07	8.81E-15	1.72E-06	2.24E-07
130	^{232}Th	3.29E-25	6.42E-17	1.29E-12	1.50E-23	2.93E-15	5.87E-11	1.53E-23	3.00E-15	6.00E-11
131	^{233}U	1.10E-23	2.14E-15	4.90E-16	4.23E-21	8.27E-13	1.89E-13	4.24E-21	8.30E-13	1.90E-13
132	^{234}U	7.77E-24	1.52E-15	5.40E-16	2.96E-21	5.79E-13	2.06E-13	2.97E-21	5.81E-13	2.06E-13
133	^{235}U	3.06E-25	5.99E-17	6.11E-14	1.17E-22	2.28E-14	2.33E-11	1.17E-22	2.29E-14	2.33E-11
134	^{236}U	5.25E-25	1.03E-16	3.50E-15	2.00E-22	3.91E-14	1.33E-12	2.00E-22	3.92E-14	1.34E-12
135	^{238}U	6.07E-24	1.19E-15	7.79E-12	2.31E-21	4.52E-13	2.97E-09	2.32E-21	4.53E-13	2.97E-09
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-34

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
1	**Table C-17 PJV11 Stream Report**									
3	**Stream Number:**		PJV11							
4	**Stream Name:**		HEPA discharge							
5	**Configuration:**		MRQ-05-0049.acmf							
6	**Run Date / Time:**		12/14/2005 - 1:42:25 PM							
7	**Run Data File:**		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	Stream Properties									
10	**Variable**	**Value**	**Units**							
11	Density	1.07E-03	g/cm^3	(does not include solid phase)						
12	Enthalpy	-9.30E+06	BTU/hr							
13	Mass Flow	1.85E+05	Lb/hr							
14		4.44E+06	Lb/day							
15	Volumetric Flow	3.44E+05	GPM	(does not include solid phase)						
16		4.59E+04	ft^3/min	(does not include solid phase)						
17	Molar Flow	6.44E+03	Lbmol/hr							
18	Molecular Weight	2.87E+01	Lb/Lbmol							
19	Pressure	9.33E+02	mbar							
20	Temperature	2.64E+01	C							
21	Na Molarity	0.00E+00	mol/L							
22	pH	1.15E+01	pH							
23	Total TRU	2.20E-18	Ci/L							
24	Total Activity	5.70E-15	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	4.56E-09	6.84E-10	3.39E-01	2.90E-05	3.74E-02	4.44E+06	4.44E+06	2.02E+03	2.34E+04
29	Ag^{+}	1.60E-21	1.44E-21	7.13E-13	1.30E-11	0.00E+00	0.00E+00	1.37E-11	6.21E-15	7.19E-14
30	Al^{+3}	1.94E-17	4.36E-18	2.16E-09	1.79E-09	0.00E+00	0.00E+00	3.95E-09	1.80E-12	2.08E-11
31	As^{+3}	7.05E-21	4.41E-21	2.18E-12	9.12E-13	0.00E+00	0.00E+00	3.09E-12	1.41E-15	1.63E-14
32	B^{+3}	1.17E-19	1.06E-20	5.23E-12	8.60E-11	0.00E+00	0.00E+00	9.12E-11	4.14E-14	4.80E-13
33	Ba^{+2}	1.47E-21	1.69E-21	8.34E-13	1.15E-11	0.00E+00	0.00E+00	1.24E-11	5.63E-15	6.51E-14
34	Bi^{+3}	1.73E-21	3.03E-21	1.50E-12	6.05E-11	0.00E+00	0.00E+00	6.20E-11	2.82E-14	3.26E-13
35	Ca^{+2}	1.23E-19	4.11E-20	2.03E-11	7.75E-11	0.00E+00	0.00E+00	9.78E-11	4.45E-14	5.15E-13
36	Cd^{+2}	2.73E-21	2.56E-21	1.27E-12	4.69E-11	0.00E+00	0.00E+00	4.82E-11	2.19E-14	2.53E-13
37	Ce^{+3}	5.83E-20	6.81E-20	3.37E-11	1.44E-11	0.00E+00	0.00E+00	4.81E-11	2.19E-14	2.53E-13
38	Cl^{-}	3.27E-18	9.67E-19	4.79E-10	1.40E-11	0.00E+00	0.00E+00	4.92E-10	2.24E-13	2.59E-12
39	CO	9.50E-112	2.22E-112	1.10E-103	0.00E+00	0.00E+00	0.00E+00	1.10E-103	4.99E-107	5.78E-106
40	CO_2	1.17E-16	4.31E-17	2.13E-08	0.00E+00	3.62E-16	6.58E-08	8.71E-08	3.96E-11	4.58E-10
41	CO_3^{-2}	1.55E-17	7.77E-18	3.84E-09	1.57E-09	0.00E+00	0.00E+00	5.42E-09	2.46E-12	2.85E-11
42	Cr^{+3}	4.68E-19	2.03E-19	1.01E-10	3.65E-11	0.00E+00	0.00E+00	1.37E-10	6.23E-14	7.21E-13
43	Cu^{+2}	2.70E-21	1.43E-21	7.10E-13	4.89E-12	0.00E+00	0.00E+00	5.60E-12	2.55E-15	2.95E-14
44	F^{-}	1.54E-18	2.44E-19	1.21E-10	2.54E-10	0.00E+00	0.00E+00	3.75E-10	1.71E-13	1.97E-12
45	Fe^{+3}	8.38E-20	3.91E-20	1.93E-11	1.84E-09	0.00E+00	0.00E+00	1.86E-09	8.45E-13	9.78E-12
46	H_2O	4.55E-09	6.84E-10	3.39E-01	0.00E+00	5.26E-04	3.91E+04	3.91E+04	1.78E+01	2.06E+02
47	H_2O(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^{+}	3.27E-12	2.75E-14	1.36E-05	0.00E+00	0.00E+00	0.00E+00	1.36E-05	6.19E-09	7.17E-08
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	1.61E-21	8.20E-22	4.06E-13	9.36E-28	0.00E+00	0.00E+00	4.06E-13	1.84E-16	2.14E-15
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	2.83E-15	4.74E-15	2.35E-06	2.90E-05	0.00E+00	0.00E+00	3.14E-05	1.43E-08	1.65E-07
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^{+}	6.72E-18	2.19E-18	1.08E-09	3.59E-11	0.00E+00	0.00E+00	1.12E-09	5.09E-13	5.89E-12
56	La^{+3}	7.50E-22	8.70E-22	4.30E-13	2.17E-11	0.00E+00	0.00E+00	2.21E-11	1.00E-14	1.16E-13
57	Li^{+}	1.01E-19	5.88E-21	2.91E-12	5.37E-12	0.00E+00	0.00E+00	8.28E-12	3.76E-15	4.36E-14
58	Mg^{+2}	2.23E-20	4.52E-21	2.24E-12	1.60E-11	0.00E+00	0.00E+00	1.82E-11	8.28E-15	9.58E-14
59	Mn^{+3}	2.42E-20	1.11E-20	5.49E-12	1.69E-10	0.00E+00	0.00E+00	1.75E-10	7.93E-14	9.18E-13
60	MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	4.77E-14	1.11E-14	5.51E-06	0.00E+00	2.92E-02	3.37E+06	3.37E+06	1.53E+03	1.78E+04
62	Na^{+}	2.12E-16	4.06E-17	2.01E-08	2.83E-09	0.00E+00	0.00E+00	2.29E-08	1.04E-11	1.21E-10
63	NH3	1.44E-13	2.05E-14	1.01E-05	0.00E+00	0.00E+00	0.00E+00	1.01E-05	4.61E-09	5.34E-08
64	NH4+	1.07E-14	2.05E-14	8.01E-07	4.12E-23	0.00E+00	0.00E+00	8.01E-07	3.64E-10	4.21E-09
65	Ni^{+2}	3.88E-20	1.90E-20	9.41E-12	7.54E-11	0.00E+00	0.00E+00	8.48E-11	3.86E-14	4.46E-13
66	NO	5.74E-37	1.44E-37	7.11E-29	0.00E+00	0.00E+00	0.00E+00	7.11E-29	3.23E-32	3.74E-31
67	NO_2	8.42E-50	3.23E-50	1.60E-41	0.00E+00	0.00E+00	0.00E+00	1.60E-41	7.27E-45	8.42E-44
68	NO_2^{-}	4.21E-17	1.62E-17	8.00E-09	7.09E-10	0.00E+00	0.00E+00	8.71E-09	3.96E-12	4.58E-11

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-35

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	7.40E-17	3.83E-17	1.90E-08	5.47E-10	0.00E+00	0.00E+00	1.95E-08	8.87E-12	1.03E-10
70	O_2	1.54E-14	4.11E-15	2.03E-06	0.00E+00	7.75E-03	1.02E+06	1.02E+06	4.66E+02	5.39E+03
71	O^-	0.00E+00	0.00E+00	0.00E+00	2.62E-10	0.00E+00	0.00E+00	2.62E-10	1.19E-13	1.38E-12
72	OH^-	1.24E-16	1.75E-17	8.68E-09	6.48E-09	0.00E+00	0.00E+00	1.52E-08	6.89E-12	7.97E-11
73	$OH(b)^-$	1.87E-25	2.65E-26	1.31E-17	6.92E-31	0.00E+00	0.00E+00	1.31E-17	5.96E-21	6.90E-20
74	Pb^{+2}	9.92E-21	1.71E-20	8.49E-12	9.90E-11	0.00E+00	0.00E+00	1.07E-10	4.88E-14	5.65E-13
75	Pd^{+2}	7.68E-22	6.82E-22	3.37E-13	4.06E-12	0.00E+00	0.00E+00	4.40E-12	2.00E-15	2.31E-14
76	PO_4^{-3}	7.92E-19	6.28E-19	3.11E-10	4.47E-10	0.00E+00	0.00E+00	7.57E-10	3.44E-13	3.98E-12
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	7.42E-22	6.38E-22	3.16E-13	1.32E-12	0.00E+00	0.00E+00	1.63E-12	7.41E-16	8.58E-15
79	Ru^{+3}	1.10E-21	9.31E-22	4.61E-13	1.23E-11	0.00E+00	0.00E+00	1.27E-11	5.78E-15	6.69E-14
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.67E-28	0.00E+00	0.00E+00	3.67E-28	1.67E-31	1.93E-30
81	SiO2	1.50E-19	7.50E-20	3.71E-11	4.46E-10	0.00E+00	0.00E+00	4.83E-10	2.19E-13	2.54E-12
82	SiO_4^{-4}	7.85E-32	6.04E-32	2.99E-23	7.91E-18	0.00E+00	0.00E+00	7.91E-18	3.59E-21	4.16E-20
83	SO_2	1.21E-52	6.45E-53	3.19E-44	0.00E+00	0.00E+00	0.00E+00	3.19E-44	1.45E-47	1.68E-46
84	SO_4^{-2}	1.89E-18	1.52E-18	7.50E-10	1.61E-10	0.00E+00	0.00E+00	9.11E-10	4.14E-13	4.79E-12
85	Sr^{+2}	3.95E-22	2.89E-22	1.43E-13	6.44E-12	0.00E+00	0.00E+00	6.59E-12	2.99E-15	3.47E-14
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	1.23E-21	4.93E-22	2.44E-13	2.73E-12	0.00E+00	0.00E+00	2.98E-12	1.35E-15	1.57E-14
88	Zn^{+2}	4.61E-21	2.52E-21	1.25E-12	2.00E-11	0.00E+00	0.00E+00	2.13E-11	9.68E-15	1.12E-13
89	Zr^{+4}	3.40E-21	2.59E-21	1.28E-12	4.48E-10	0.00E+00	0.00E+00	4.49E-10	2.04E-13	2.36E-12
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	7.82E-19	5.75E-19	2.84E-10	2.24E-09	0.00E+00	0.00E+00	2.52E-09	1.15E-12	1.33E-11
94	$C_2O_4^{-2}$	7.82E-19	5.75E-19	2.84E-10	2.24E-09	0.00E+00	0.00E+00	2.52E-09	1.15E-12	1.33E-11
95	Formate	3.47E-31	1.30E-31	6.44E-23	3.08E-19	0.00E+00	0.00E+00	3.08E-19	1.40E-22	1.62E-21
96	Acetate	2.69E-31	1.32E-31	6.55E-23	3.13E-19	0.00E+00	0.00E+00	3.13E-19	1.42E-22	1.65E-21
97	Glycolate	1.79E-30	1.12E-30	5.54E-22	1.54E-19	0.00E+00	0.00E+00	1.54E-19	7.02E-23	8.13E-22
98	IDA	9.15E-31	1.02E-30	5.03E-22	3.93E-19	0.00E+00	0.00E+00	3.93E-19	1.79E-22	2.07E-21
99	Citrate	8.36E-32	1.34E-31	6.64E-23	3.37E-19	0.00E+00	0.00E+00	3.37E-19	1.53E-22	1.77E-21
100	HEDTA	3.92E-31	9.10E-31	4.50E-22	2.76E-19	0.00E+00	0.00E+00	2.77E-19	1.26E-22	1.46E-21
101	EDTA	4.71E-32	1.15E-31	5.68E-23	2.97E-19	0.00E+00	0.00E+00	2.97E-19	1.35E-22	1.56E-21
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	2.35E-15	4.39E-06	2.20E-07	3.35E-15	6.28E-06	1.45E-07	5.70E-15	1.07E-05	3.65E-07
106	^{241}Am	1.51E-20	2.82E-11	1.81E-14	1.64E-18	3.08E-09	1.98E-12	1.66E-18	3.10E-09	2.00E-12
107	^{243}Am	9.84E-24	1.84E-14	2.04E-16	1.33E-22	2.49E-13	2.75E-15	1.43E-22	2.67E-13	2.95E-15
108	^{14}C	3.08E-16	5.76E-07	2.85E-10	1.16E-16	2.17E-07	1.07E-10	4.24E-16	7.93E-07	3.92E-10
109	^{60}Co	2.02E-21	3.78E-12	7.37E-18	1.81E-19	3.40E-10	6.62E-16	1.83E-19	3.44E-10	6.69E-16
110	^{243}Cm	1.62E-24	3.04E-15	1.33E-19	2.30E-21	4.30E-12	1.88E-16	2.30E-21	4.30E-12	1.88E-16
111	^{244}Cm	3.84E-23	7.20E-14	1.96E-18	5.22E-20	9.77E-11	2.66E-15	5.22E-20	9.78E-11	2.66E-15
112	^{137}Cs	1.38E-16	2.59E-07	6.58E-12	3.72E-17	6.96E-08	1.77E-12	1.75E-16	3.29E-07	8.34E-12
113	^{152}Eu	1.13E-22	2.12E-13	2.69E-18	8.73E-21	1.64E-11	2.07E-16	8.84E-21	1.66E-11	2.10E-16
114	^{154}Eu	2.35E-20	4.40E-11	3.59E-16	9.46E-19	1.77E-09	1.45E-14	9.69E-19	1.82E-09	1.48E-14
115	^{155}Eu	6.79E-21	1.27E-11	5.77E-17	1.40E-19	2.62E-10	1.19E-15	1.47E-19	2.75E-10	1.25E-15
116	^{3}H	1.88E-15	3.53E-06	8.10E-13	3.00E-15	5.63E-06	1.29E-12	4.89E-15	9.16E-06	2.10E-12
117	^{129}I	9.38E-18	1.76E-08	2.19E-07	6.05E-18	1.13E-08	1.42E-07	1.54E-17	2.89E-08	3.61E-07
118	^{63}Ni	3.64E-20	6.81E-11	2.64E-15	3.15E-20	5.90E-11	2.29E-15	6.79E-20	1.27E-10	4.93E-15
119	^{237}Np	1.19E-23	2.23E-14	6.99E-14	1.34E-21	2.52E-12	7.87E-12	1.36E-21	2.54E-12	7.94E-12
120	^{238}Pu	6.74E-23	1.26E-13	1.62E-17	6.38E-21	1.19E-11	1.54E-15	6.44E-21	1.21E-11	1.55E-15
121	^{239}Pu	9.32E-22	1.75E-12	6.20E-14	5.65E-20	1.06E-10	3.76E-12	5.74E-20	1.08E-10	3.82E-12
122	^{240}Pu	2.41E-22	4.52E-13	4.39E-15	1.49E-20	2.79E-11	2.71E-13	1.51E-20	2.84E-11	2.76E-13
123	^{241}Pu	5.07E-21	9.49E-12	2.03E-16	4.00E-19	7.49E-10	1.60E-14	4.05E-19	7.59E-10	1.62E-14
124	^{242}Pu	2.56E-26	4.79E-17	2.68E-17	1.37E-24	2.57E-15	1.44E-15	1.40E-24	2.62E-15	1.47E-15
125	^{125}Sb	1.40E-20	2.62E-11	5.58E-17	5.80E-19	1.09E-09	2.31E-15	5.94E-19	1.11E-09	2.37E-15
126	^{151}Sm	1.97E-19	3.69E-10	3.09E-14	7.02E-18	1.32E-08	1.10E-12	7.22E-18	1.35E-08	1.13E-12
127	^{126}Sn	2.23E-22	4.17E-13	8.10E-14	2.72E-21	5.09E-12	9.88E-13	2.94E-21	5.51E-12	1.07E-12
128	^{90}Sr	4.81E-18	9.00E-09	1.44E-13	1.80E-16	3.36E-07	5.37E-12	1.84E-16	3.45E-07	5.51E-12
129	^{99}Tc	3.87E-20	7.26E-11	9.44E-12	4.17E-19	7.81E-10	1.02E-10	4.56E-19	8.54E-10	1.11E-10
130	^{232}Th	3.62E-25	6.78E-16	1.36E-11	4.45E-23	8.33E-14	1.67E-09	4.48E-23	8.40E-14	1.68E-09
131	^{233}U	1.21E-23	2.26E-14	5.17E-15	3.64E-21	6.82E-12	1.56E-12	3.65E-21	6.84E-12	1.56E-12
132	^{234}U	8.57E-24	1.61E-14	5.70E-15	1.89E-22	3.54E-13	1.26E-13	1.98E-22	3.71E-13	1.32E-13
133	^{235}U	3.38E-25	6.32E-16	6.45E-13	4.55E-24	8.52E-15	8.69E-12	4.88E-24	9.15E-15	9.34E-12
134	^{236}U	5.78E-25	1.08E-15	3.69E-14	6.25E-24	1.17E-14	3.99E-13	6.83E-24	1.28E-14	4.36E-13
135	^{238}U	6.69E-24	1.25E-14	8.22E-11	1.07E-22	2.01E-13	1.32E-09	1.14E-22	2.13E-13	1.40E-09
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-18 PJV32 Stream Report

Stream Number:	PJV32
Stream Name:	HLW pulse ventilation header offgas
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

Variable	Value	Units	
Density	1.03E-03	g/cm^3	(does not include solid phase)
Enthalpy	-7.39E+05	BTU/hr	
Mass Flow	2.11E+04	Lb/hr	
	5.06E+05	Lb/day	
Volumetric Flow	4.08E+04	GPM	(does not include solid phase)
	5.45E+03	ft^3/min	(does not include solid phase)
Molar Flow	7.34E+02	Lbmol/hr	
Molecular Weight	2.87E+01	Lb/Lbmol	
Pressure	8.91E+02	mbar	
Temperature	2.52E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	2.24E+00	pH	
Total TRU	5.30E-14	Ci/L	
Total Activity	1.76E-11	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	2.94E-09	4.43E-10	2.60E-02	6.92E-05	3.59E-02	5.06E+05	5.06E+05	2.30E+02	2.66E+03
Ag^{+}	2.76E-23	2.49E-23	1.46E-15	7.67E-08	0.00E+00	0.00E+00	7.67E-08	3.49E-11	4.04E-10
Al^{+3}	3.34E-19	7.52E-20	4.42E-12	4.00E-06	0.00E+00	0.00E+00	4.00E-06	1.82E-09	2.10E-08
As^{+3}	1.22E-22	7.61E-23	4.47E-15	8.05E-09	0.00E+00	0.00E+00	8.05E-09	3.66E-12	4.24E-11
B^{+3}	1.87E-19	1.69E-20	9.91E-13	7.10E-06	0.00E+00	0.00E+00	7.10E-06	3.23E-09	3.73E-08
Ba^{+2}	2.54E-23	2.91E-23	1.71E-15	2.04E-08	0.00E+00	0.00E+00	2.04E-08	9.28E-12	1.07E-10
Bi^{+3}	2.99E-23	5.21E-23	3.06E-15	1.85E-07	0.00E+00	0.00E+00	1.85E-07	8.41E-11	9.73E-10
Ca^{+2}	6.08E-15	2.03E-15	1.19E-07	4.83E-08	0.00E+00	0.00E+00	1.68E-07	7.63E-11	8.83E-10
Cd^{+2}	4.71E-23	4.42E-23	2.59E-15	8.30E-07	0.00E+00	0.00E+00	8.30E-07	3.77E-10	4.37E-09
Ce^{+3}	6.78E-14	7.93E-14	4.66E-06	1.46E-08	0.00E+00	0.00E+00	4.67E-06	2.12E-09	2.46E-08
Cl^{-}	8.32E-14	2.46E-14	1.45E-06	3.73E-15	0.00E+00	0.00E+00	1.45E-06	6.57E-10	7.60E-09
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	7.01E-18	2.58E-18	1.51E-10	0.00E+00	4.76E-15	1.03E-07	1.03E-07	4.67E-11	5.41E-10
CO_3^{-2}	4.07E-16	2.04E-16	1.20E-08	1.38E-10	0.00E+00	0.00E+00	1.21E-08	5.50E-12	6.37E-11
Cr^{+3}	4.83E-15	2.10E-15	1.23E-07	7.39E-08	0.00E+00	0.00E+00	1.97E-07	8.96E-11	1.04E-09
Cu^{+2}	4.67E-23	2.48E-23	1.45E-15	5.14E-09	0.00E+00	0.00E+00	5.14E-09	2.34E-12	2.70E-11
F^{-}	9.70E-13	1.54E-13	9.03E-06	6.78E-14	0.00E+00	0.00E+00	9.03E-06	4.11E-09	4.75E-08
Fe^{+3}	1.68E-14	7.84E-15	4.60E-07	3.04E-06	0.00E+00	0.00E+00	3.50E-06	1.59E-09	1.84E-08
H_2O	2.93E-09	4.40E-10	2.59E-02	0.00E+00	3.48E-04	3.07E+03	3.07E+03	1.40E+00	1.62E+01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	4.00E-15	3.37E-17	1.98E-09	0.00E+00	0.00E+00	0.00E+00	1.98E-09	8.99E-13	1.04E-11
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	2.12E-14	1.08E-14	6.33E-07	7.68E-29	0.00E+00	0.00E+00	6.33E-07	2.88E-10	3.33E-09
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	3.44E-06	0.00E+00	0.00E+00	3.44E-06	1.56E-09	1.81E-08
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	5.33E-14	1.74E-14	1.02E-06	2.45E-23	0.00E+00	0.00E+00	1.02E-06	4.64E-10	5.37E-09
La^{+3}	1.31E-23	1.51E-23	8.89E-16	7.63E-08	0.00E+00	0.00E+00	7.63E-08	3.47E-11	4.01E-10
Li^{+}	1.29E-13	7.47E-15	4.39E-07	4.49E-07	0.00E+00	0.00E+00	8.88E-07	4.04E-10	4.67E-09
Mg^{+2}	3.85E-22	7.81E-23	4.59E-15	4.91E-08	0.00E+00	0.00E+00	4.91E-08	2.23E-11	2.59E-10
Mn^{+3}	4.17E-22	1.91E-22	1.12E-14	3.98E-07	0.00E+00	0.00E+00	3.98E-07	1.81E-10	2.10E-09
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.81E-02	3.86E+05	3.86E+05	1.75E+02	2.03E+03
Na^{+}	5.15E-12	9.87E-13	5.80E-05	7.31E-12	0.00E+00	0.00E+00	5.80E-05	2.64E-08	3.05E-07
NH3	8.07E-16	1.15E-16	6.74E-09	0.00E+00	0.00E+00	0.00E+00	6.74E-09	3.06E-12	3.54E-11
NH4+	1.41E-13	1.15E-16	1.25E-06	0.00E+00	0.00E+00	0.00E+00	1.25E-06	5.68E-10	6.57E-09
Ni^{+2}	2.28E-15	1.12E-15	6.55E-08	1.50E-07	0.00E+00	0.00E+00	2.16E-07	9.82E-11	1.14E-09
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^{-}	7.25E-19	2.78E-19	1.64E-11	2.12E-11	0.00E+00	0.00E+00	3.75E-11	1.71E-14	1.97E-13

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-37

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	2.93E-12	1.52E-12	8.91E-05	1.63E-11	0.00E+00	0.00E+00	8.91E-05	4.05E-08	4.69E-07
70	O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.47E-03	1.17E+05	1.17E+05	5.33E+01	6.17E+02
71	O^-	0.00E+00	0.00E+00	0.00E+00	2.77E-05	0.00E+00	0.00E+00	2.77E-05	1.26E-08	1.46E-07
72	OH^-	1.75E-12	2.49E-13	1.46E-05	3.97E-10	0.00E+00	0.00E+00	1.46E-05	6.64E-09	7.68E-08
73	$OH(b)^-$	7.40E-19	1.05E-19	6.17E-12	3.76E-34	0.00E+00	0.00E+00	6.17E-12	2.80E-15	3.24E-14
74	Pb^{+2}	1.71E-22	2.95E-22	1.73E-14	2.20E-07	0.00E+00	0.00E+00	2.20E-07	1.00E-10	1.16E-09
75	Pd^{+2}	1.33E-23	1.18E-23	6.95E-16	3.59E-09	0.00E+00	0.00E+00	3.59E-09	1.63E-12	1.89E-11
76	PO_4^{-3}	1.37E-20	1.08E-20	6.36E-13	2.04E-06	0.00E+00	0.00E+00	2.04E-06	9.28E-10	1.07E-08
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	1.29E-23	1.11E-23	6.50E-16	6.35E-09	0.00E+00	0.00E+00	6.35E-09	2.89E-12	3.34E-11
79	Ru^{+3}	1.90E-23	1.60E-23	9.39E-16	5.47E-07	0.00E+00	0.00E+00	5.47E-07	2.49E-10	2.88E-09
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	1.08E-29	0.00E+00	0.00E+00	1.08E-29	4.89E-33	5.66E-32
81	SiO2	2.58E-21	1.29E-21	7.60E-14	1.72E-05	0.00E+00	0.00E+00	1.72E-05	7.83E-09	9.06E-08
82	SiO_4^{-4}	1.97E-33	1.52E-33	8.90E-26	1.32E-12	0.00E+00	0.00E+00	1.32E-12	5.98E-16	6.92E-15
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	3.26E-20	2.61E-20	1.53E-12	1.93E-13	0.00E+00	0.00E+00	1.73E-12	7.85E-16	9.09E-15
85	Sr^{+2}	1.68E-16	1.23E-16	7.20E-09	4.17E-09	0.00E+00	0.00E+00	1.14E-08	5.17E-12	5.98E-11
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	2.15E-23	8.58E-24	5.04E-16	1.04E-09	0.00E+00	0.00E+00	1.04E-09	4.73E-13	5.47E-12
88	Zn^{+2}	7.96E-23	4.34E-23	2.55E-15	9.66E-07	0.00E+00	0.00E+00	9.66E-07	4.39E-10	5.08E-09
89	Zr^{+4}	5.87E-23	4.47E-23	2.63E-15	4.83E-07	0.00E+00	0.00E+00	4.83E-07	2.20E-10	2.54E-09
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	1.72E-20	1.26E-20	7.42E-13	3.01E-04	0.00E+00	0.00E+00	3.01E-04	1.37E-07	1.59E-06
94	$C_2O_4^{-2}$	1.72E-20	1.26E-20	7.42E-13	3.01E-04	0.00E+00	0.00E+00	3.01E-04	1.37E-07	1.59E-06
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	1.89E-26	0.00E+00	0.00E+00	1.89E-26	8.59E-30	9.94E-29
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	5.15E-27	0.00E+00	0.00E+00	5.15E-27	2.34E-30	2.71E-29
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	6.87E-27	0.00E+00	0.00E+00	6.87E-27	3.12E-30	3.61E-29
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	1.69E-12	3.76E-04	6.00E-09	1.59E-11	3.53E-03	1.33E-05	1.76E-11	3.90E-03	1.33E-05
106	^{241}Am	2.59E-22	5.75E-14	3.70E-17	4.20E-14	9.34E-06	6.01E-09	4.20E-14	9.34E-06	6.01E-09
107	^{243}Am	1.69E-25	3.76E-17	4.15E-19	3.41E-18	7.58E-10	8.37E-12	3.41E-18	7.58E-10	8.37E-12
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109	^{60}Co	3.49E-23	7.76E-15	1.51E-20	3.75E-15	8.35E-07	1.63E-12	3.75E-15	8.35E-07	1.63E-12
110	^{243}Cm	2.80E-26	6.23E-18	2.72E-22	4.73E-17	1.05E-08	4.59E-13	4.73E-17	1.05E-08	4.59E-13
111	^{244}Cm	6.63E-25	1.48E-16	4.02E-21	1.07E-15	2.39E-07	6.51E-12	1.07E-15	2.39E-07	6.51E-12
112	^{137}Cs	7.61E-17	1.69E-08	4.30E-13	1.45E-11	3.23E-03	8.19E-08	1.45E-11	3.23E-03	8.19E-08
113	^{152}Eu	1.95E-24	4.33E-16	5.49E-21	1.80E-16	4.00E-08	5.08E-13	1.80E-16	4.00E-08	5.08E-13
114	^{154}Eu	4.03E-22	8.97E-14	7.32E-19	1.95E-14	4.34E-06	3.54E-11	1.95E-14	4.34E-06	3.54E-11
115	^{155}Eu	1.17E-22	2.59E-14	1.18E-19	2.89E-15	6.44E-07	2.92E-12	2.89E-15	6.44E-07	2.92E-12
116	^{3}H	2.11E-23	4.68E-15	1.07E-21	2.44E-15	5.43E-07	1.25E-13	2.44E-15	5.43E-07	1.25E-13
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	7.71E-19	1.72E-10	2.14E-09	7.71E-19	1.72E-10	2.14E-09
118	^{63}Ni	6.25E-22	1.39E-13	5.39E-18	5.60E-16	1.25E-07	4.83E-12	5.60E-16	1.25E-07	4.83E-12
119	^{237}Np	2.06E-25	4.57E-17	1.43E-16	2.77E-17	6.16E-09	1.93E-08	2.77E-17	6.16E-09	1.93E-08
120	^{238}Pu	1.16E-24	2.57E-16	3.31E-20	1.31E-16	2.92E-08	3.76E-12	1.31E-16	2.92E-08	3.76E-12
121	^{239}Pu	1.60E-23	3.56E-15	1.26E-16	1.16E-15	2.59E-07	9.20E-09	1.16E-15	2.59E-07	9.20E-09
122	^{240}Pu	4.15E-24	9.23E-16	8.96E-18	3.07E-16	6.83E-08	6.64E-10	3.07E-16	6.83E-08	6.64E-10
123	^{241}Pu	8.71E-23	1.94E-14	4.15E-19	8.25E-15	1.83E-06	3.93E-11	8.25E-15	1.83E-06	3.93E-11
124	^{242}Pu	4.39E-28	9.77E-20	5.47E-20	2.06E-21	4.59E-13	2.57E-13	2.06E-21	4.59E-13	2.57E-13
125	^{125}Sb	2.41E-22	5.36E-14	1.14E-19	8.65E-15	1.92E-06	4.09E-12	8.65E-15	1.92E-06	4.09E-12
126	^{151}Sm	3.41E-21	7.59E-13	6.35E-17	8.03E-14	1.79E-05	1.50E-09	8.03E-14	1.79E-05	1.50E-09
127	^{126}Sn	3.83E-24	8.52E-16	1.65E-16	3.38E-17	7.51E-09	1.46E-09	3.38E-17	7.51E-09	1.46E-09
128	^{90}Sr	1.69E-12	3.76E-04	6.00E-09	9.78E-13	2.18E-04	3.47E-09	2.67E-12	5.94E-04	9.47E-09
129	^{99}Tc	6.69E-22	1.49E-13	1.93E-14	2.02E-13	4.49E-05	5.84E-06	2.02E-13	4.49E-05	5.84E-06
130	^{232}Th	6.30E-27	1.40E-18	2.81E-14	9.09E-19	2.02E-10	4.05E-06	9.09E-19	2.02E-10	4.05E-06
131	^{233}U	2.08E-25	4.63E-17	1.06E-17	7.50E-17	1.67E-08	3.82E-09	7.50E-17	1.67E-08	3.82E-09
132	^{234}U	1.48E-25	3.29E-17	1.17E-17	3.91E-18	8.69E-10	3.08E-10	3.91E-18	8.69E-10	3.08E-10
133	^{235}U	5.82E-27	1.30E-18	1.32E-15	8.79E-20	1.96E-11	2.00E-08	8.79E-20	1.96E-11	2.00E-08
134	^{236}U	9.98E-27	2.22E-18	7.56E-17	1.21E-19	2.69E-11	9.16E-10	1.21E-19	2.69E-11	9.16E-10
135	^{238}U	1.15E-25	2.57E-17	1.68E-13	2.20E-18	4.89E-10	3.21E-06	2.20E-18	4.89E-10	3.21E-06
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

	A	B	C	D	E	F	G	H	I	J
1	**Table C-19 PJV34 Stream Report**									
3	**Stream Number:**		PJV34							
4	**Stream Name:**		Pulse vent HEPA discharge offgas							
5	**Configuration:**		MRQ-05-0049.acmf							
6	**Run Date / Time:**		12/14/2005 - 1:42:25 PM							
7	**Run Data File:**		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	**Stream Properties**									
10	**Variable**	**Value**	**Units**							
11	Density	9.73E-04	g/cm^3	(does not include solid phase)						
12	Enthalpy	-6.84E+05	BTU/hr							
13	Mass Flow	2.11E+04	Lb/hr							
14		5.06E+05	Lb/day							
15	Volumetric Flow	4.33E+04	GPM	(does not include solid phase)						
16		5.79E+03	ft^3/min	(does not include solid phase)						
17	Molar Flow	7.34E+02	Lbmol/hr							
18	Molecular Weight	2.87E+01	Lb/Lbmol							
19	Pressure	8.56E+02	mbar							
20	Temperature	3.10E+01	C							
21	Na Molarity	0.00E+00	mol/L							
22	pH	1.44E+01	pH							
23	Total TRU	2.50E-19	Ci/L							
24	Total Activity	2.39E-15	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	2.76E-09	4.15E-10	2.59E-02	3.44E-06	3.38E-02	5.06E+05	5.06E+05	2.30E+02	2.66E+03
29	Ag^{+}	1.30E-28	1.17E-28	7.31E-21	3.84E-13	0.00E+00	0.00E+00	3.84E-13	1.74E-16	2.02E-15
30	Al^{+3}	1.57E-24	3.54E-25	2.21E-17	2.00E-11	0.00E+00	0.00E+00	2.00E-11	9.09E-15	1.05E-13
31	As^{+3}	5.73E-28	3.59E-28	2.24E-20	4.03E-14	0.00E+00	0.00E+00	4.03E-14	1.83E-17	2.12E-16
32	B^{+3}	8.81E-25	7.95E-26	4.95E-18	3.55E-11	0.00E+00	0.00E+00	3.55E-11	1.61E-14	1.87E-13
33	Ba^{+2}	1.20E-28	1.37E-28	8.54E-21	1.02E-13	0.00E+00	0.00E+00	1.02E-13	4.64E-17	5.37E-16
34	Bi^{+3}	1.41E-28	2.45E-28	1.53E-20	9.25E-13	0.00E+00	0.00E+00	9.25E-13	4.20E-16	4.87E-15
35	Ca^{+2}	2.87E-20	9.58E-21	5.97E-13	2.42E-13	0.00E+00	0.00E+00	8.39E-13	3.81E-16	4.41E-15
36	Cd^{+2}	2.22E-28	2.08E-28	1.30E-20	4.15E-12	0.00E+00	0.00E+00	4.15E-12	1.89E-15	2.18E-14
37	Ce^{+3}	3.20E-19	3.74E-19	2.33E-11	7.29E-14	0.00E+00	0.00E+00	2.34E-11	1.06E-14	1.23E-13
38	Cl^{-}	3.92E-19	1.16E-19	7.23E-12	1.87E-20	0.00E+00	0.00E+00	7.23E-12	3.28E-15	3.80E-14
39	CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	CO_2	6.61E-18	2.43E-18	1.51E-10	0.00E+00	4.48E-15	1.03E-07	1.03E-07	4.67E-11	5.41E-10
41	CO_3^{-2}	1.92E-21	9.59E-22	5.98E-14	6.91E-16	0.00E+00	0.00E+00	6.05E-14	2.75E-17	3.18E-16
42	Cr^{+3}	2.28E-20	9.88E-21	6.16E-13	3.69E-13	0.00E+00	0.00E+00	9.85E-13	4.48E-16	5.18E-15
43	Cu^{+2}	2.20E-28	1.17E-28	7.27E-21	2.57E-14	0.00E+00	0.00E+00	2.57E-14	1.17E-17	1.35E-16
44	F^{-}	4.57E-18	7.24E-19	4.52E-11	3.39E-19	0.00E+00	0.00E+00	4.52E-11	2.05E-14	2.38E-13
45	Fe^{+3}	7.92E-20	3.69E-20	2.30E-12	1.52E-11	0.00E+00	0.00E+00	1.75E-11	7.96E-15	9.21E-14
46	H_2O	2.76E-09	4.15E-10	2.59E-02	0.00E+00	3.28E-04	3.07E+03	3.07E+03	1.40E+00	1.62E+01
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^{+}	3.77E-15	3.17E-17	1.98E-09	0.00E+00	0.00E+00	0.00E+00	1.98E-09	8.99E-13	1.04E-11
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	9.97E-20	5.08E-20	3.17E-12	3.84E-34	0.00E+00	0.00E+00	3.17E-12	1.44E-15	1.67E-14
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	3.44E-06	0.00E+00	0.00E+00	3.44E-06	1.56E-09	1.81E-08
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^{+}	2.51E-19	8.19E-20	5.10E-12	1.23E-28	0.00E+00	0.00E+00	5.10E-12	2.32E-15	2.69E-14
56	La^{+3}	6.15E-29	7.13E-29	4.45E-21	3.81E-13	0.00E+00	0.00E+00	3.81E-13	1.73E-16	2.01E-15
57	Li^{+}	6.08E-19	3.52E-20	2.19E-12	2.25E-12	0.00E+00	0.00E+00	4.44E-12	2.02E-15	2.34E-14
58	Mg^{+2}	1.81E-27	3.68E-28	2.29E-20	2.46E-13	0.00E+00	0.00E+00	2.46E-13	1.12E-16	1.29E-15
59	Mn^{+3}	1.97E-27	9.02E-28	5.62E-20	1.99E-12	0.00E+00	0.00E+00	1.99E-12	9.05E-16	1.05E-14
60	MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-02	3.86E+05	3.86E+05	1.75E+02	2.03E+03
62	Na^{+}	2.42E-17	4.65E-18	2.90E-10	3.65E-17	0.00E+00	0.00E+00	2.90E-10	1.32E-13	1.53E-12
63	NH3	7.60E-16	1.08E-16	6.74E-09	0.00E+00	0.00E+00	0.00E+00	6.74E-09	3.06E-12	3.54E-11
64	NH4+	6.65E-19	1.08E-16	6.24E-12	0.00E+00	0.00E+00	0.00E+00	6.24E-12	2.84E-15	3.28E-14
65	Ni^{+2}	1.07E-20	5.25E-21	3.28E-13	7.52E-13	0.00E+00	0.00E+00	1.08E-12	4.91E-16	5.68E-15
66	NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	NO_2^{-}	3.42E-24	1.31E-24	8.18E-17	1.06E-16	0.00E+00	0.00E+00	1.88E-16	8.53E-20	9.87E-19
69	NO_3^{-}	1.38E-17	7.14E-18	4.45E-10	8.16E-17	0.00E+00	0.00E+00	4.45E-10	2.02E-13	2.34E-12
70	O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.04E-03	1.17E+05	1.17E+05	5.33E+01	6.17E+02
71	O^{--}	0.00E+00	0.00E+00	0.00E+00	1.39E-10	0.00E+00	0.00E+00	1.39E-10	6.31E-14	7.30E-13
72	OH^{-}	8.25E-18	1.17E-18	7.30E-11	1.98E-15	0.00E+00	0.00E+00	7.30E-11	3.32E-14	3.84E-13
73	$OH(b)^{-}$	3.48E-24	4.95E-25	3.08E-17	1.88E-39	0.00E+00	0.00E+00	3.08E-17	1.40E-20	1.62E-19

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-39

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	8.05E-28	1.39E-27	8.87E-20	1.10E-12	0.00E+00	0.00E+00	1.10E-12	5.00E-16	5.79E-15
75	Pd^{+2}	6.27E-29	5.57E-29	3.47E-21	1.80E-14	0.00E+00	0.00E+00	1.80E-14	8.17E-18	9.45E-17
76	PO_4^{-3}	6.44E-26	5.10E-26	3.18E-18	1.02E-11	0.00E+00	0.00E+00	1.02E-11	4.64E-15	5.37E-14
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	6.07E-29	5.21E-29	3.25E-21	3.18E-14	0.00E+00	0.00E+00	3.18E-14	1.44E-17	1.67E-16
79	Ru^{+3}	8.93E-29	7.53E-29	4.70E-21	2.73E-12	0.00E+00	0.00E+00	2.73E-12	1.24E-15	1.44E-14
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	5.38E-35	0.00E+00	0.00E+00	5.38E-35	2.45E-38	2.83E-37
81	SiO2	1.22E-26	6.10E-27	3.80E-19	8.61E-11	0.00E+00	0.00E+00	8.61E-11	3.91E-14	4.53E-13
82	SiO_4^{-4}	9.29E-39	7.14E-39	4.45E-31	6.58E-18	0.00E+00	0.00E+00	6.58E-18	2.99E-21	3.46E-20
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	1.54E-25	1.23E-25	7.67E-18	9.63E-19	0.00E+00	0.00E+00	8.64E-18	3.93E-21	4.54E-20
85	Sr^{+2}	7.90E-22	5.78E-22	3.60E-14	2.08E-14	0.00E+00	0.00E+00	5.68E-14	2.58E-17	2.99E-16
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	1.01E-28	4.04E-29	2.52E-21	5.20E-15	0.00E+00	0.00E+00	5.20E-15	2.36E-18	2.73E-17
88	Zn^{+2}	3.75E-28	2.05E-28	1.28E-20	4.83E-12	0.00E+00	0.00E+00	4.83E-12	2.19E-15	2.54E-14
89	Zr^{+4}	2.77E-28	2.11E-28	1.31E-20	2.42E-12	0.00E+00	0.00E+00	2.42E-12	1.10E-15	1.27E-14
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	8.10E-26	5.95E-26	3.71E-18	1.51E-09	0.00E+00	0.00E+00	1.51E-09	6.85E-13	7.93E-12
94	$C_2O_4^{-2}$	8.10E-26	5.95E-26	3.71E-18	1.51E-09	0.00E+00	0.00E+00	1.51E-09	6.85E-13	7.93E-12
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	9.45E-32	0.00E+00	0.00E+00	9.45E-32	4.29E-35	4.97E-34
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	2.58E-32	0.00E+00	0.00E+00	2.58E-32	1.17E-35	1.36E-34
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	3.44E-32	0.00E+00	0.00E+00	3.44E-32	1.56E-35	1.81E-34
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	7.97E-18	1.88E-09	3.00E-14	2.38E-15	5.61E-07	2.21E-09	2.39E-15	5.63E-07	2.21E-09
106	^{241}Am	1.22E-27	2.88E-19	1.85E-22	1.98E-19	4.67E-11	3.00E-14	1.98E-19	4.67E-11	3.00E-14
107	^{243}Am	7.96E-31	1.88E-22	2.08E-24	1.61E-23	3.79E-15	4.18E-17	1.61E-23	3.79E-15	4.18E-17
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109	^{60}Co	1.64E-28	3.88E-20	7.56E-26	1.77E-20	4.17E-12	8.13E-18	1.77E-20	4.17E-12	8.13E-18
110	^{243}Cm	1.32E-31	3.12E-23	1.36E-27	2.23E-22	5.26E-14	2.29E-18	2.23E-22	5.26E-14	2.29E-18
111	^{244}Cm	3.13E-30	7.38E-22	2.01E-26	5.06E-21	1.20E-12	3.26E-17	5.06E-21	1.20E-12	3.26E-17
112	^{137}Cs	3.58E-22	8.46E-14	2.15E-18	6.84E-17	1.61E-08	4.10E-13	6.84E-17	1.61E-08	4.10E-13
113	^{152}Eu	9.17E-30	2.16E-21	2.75E-26	8.48E-22	2.00E-13	2.54E-18	8.48E-22	2.00E-13	2.54E-18
114	^{154}Eu	1.90E-27	4.49E-19	3.66E-24	9.19E-20	2.17E-11	1.77E-16	9.19E-20	2.17E-11	1.77E-16
115	^{155}Eu	5.50E-28	1.30E-19	5.89E-25	1.36E-20	3.22E-12	1.46E-17	1.36E-20	3.22E-12	1.46E-17
116	^{3}H	1.98E-23	4.68E-15	1.07E-21	2.30E-15	5.43E-07	1.25E-13	2.30E-15	5.43E-07	1.25E-13
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	7.27E-19	1.72E-10	2.14E-09	7.27E-19	1.72E-10	2.14E-09
118	^{63}Ni	2.94E-27	6.95E-19	2.70E-23	2.64E-21	6.23E-13	2.42E-17	2.64E-21	6.23E-13	2.42E-17
119	^{237}Np	9.69E-31	2.29E-22	7.15E-22	1.31E-22	3.08E-14	9.63E-14	1.31E-22	3.08E-14	9.63E-14
120	^{238}Pu	5.45E-30	1.29E-21	1.66E-25	6.19E-22	1.46E-13	1.88E-17	6.19E-22	1.46E-13	1.88E-17
121	^{239}Pu	7.54E-29	1.78E-20	8.32E-22	5.49E-21	1.29E-12	4.60E-14	5.49E-21	1.29E-12	4.60E-14
122	^{240}Pu	1.95E-29	4.61E-21	4.48E-23	1.45E-21	3.42E-13	3.32E-15	1.45E-21	3.42E-13	3.32E-15
123	^{241}Pu	4.10E-28	9.68E-20	2.07E-24	3.89E-20	9.17E-12	1.96E-16	3.89E-20	9.17E-12	1.96E-16
124	^{242}Pu	2.07E-33	4.88E-25	2.73E-25	9.72E-27	2.29E-18	1.28E-18	9.72E-27	2.29E-18	1.28E-18
125	^{125}Sb	1.14E-27	2.68E-19	5.69E-25	4.08E-20	9.62E-12	2.04E-17	4.08E-20	9.62E-12	2.04E-17
126	^{151}Sm	1.61E-26	3.79E-18	3.18E-22	3.78E-19	8.93E-11	7.48E-15	3.78E-19	8.93E-11	7.48E-15
127	^{126}Sn	1.81E-29	4.26E-21	8.27E-22	1.59E-22	3.75E-14	7.29E-15	1.59E-22	3.75E-14	7.29E-15
128	^{90}Sr	7.97E-18	1.88E-09	3.00E-14	4.61E-18	1.09E-09	1.74E-14	1.26E-17	2.97E-09	4.74E-14
129	^{99}Tc	3.15E-27	7.43E-19	9.67E-20	9.52E-19	2.25E-10	2.92E-11	9.52E-19	2.25E-10	2.92E-11
130	^{232}Th	2.97E-32	7.01E-24	1.40E-19	4.28E-24	1.01E-15	2.03E-11	4.28E-24	1.01E-15	2.03E-11
131	^{233}U	9.81E-31	2.32E-22	5.30E-23	3.53E-22	8.34E-14	1.91E-14	3.53E-22	8.34E-14	1.91E-14
132	^{234}U	6.97E-31	1.64E-22	5.84E-23	1.84E-23	4.34E-15	1.54E-15	1.84E-23	4.34E-15	1.54E-15
133	^{235}U	2.74E-32	6.48E-24	6.61E-21	4.14E-25	9.78E-17	9.98E-14	4.14E-25	9.78E-17	9.98E-14
134	^{236}U	4.70E-32	1.11E-23	3.78E-22	5.69E-25	1.34E-16	4.58E-15	5.69E-25	1.34E-16	4.58E-15
135	^{238}U	5.44E-31	1.28E-22	8.42E-19	1.04E-23	2.45E-15	1.60E-11	1.04E-23	2.45E-15	1.60E-11
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-40

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
1	**Table C-20 PVP01 Stream Report**									
3	**Stream Number:**		PVP01							
4	**Stream Name:**		Pretreatment vessel vents feed to caustic scrubber							
5	**Configuration:**		MRQ-05-0049.acmf							
6	**Run Date / Time:**		12/14/2005 - 1:42:25 PM							
7	**Run Data File:**		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	Stream Properties									
10	**Variable**	**Value**	**Units**							
11	Density	1.10E-03	g/cm^3	(does not include solid phase)						
12	Enthalpy	-4.75E+06	BTU/hr							
13	Mass Flow	3.28E+04	Lb/hr							
14		7.87E+05	Lb/day							
15	Volumetric Flow	5.95E+04	GPM	(does not include solid phase)						
16		7.96E+03	ft^3/min	(does not include solid phase)						
17	Molar Flow	1.15E+03	Lbmol/hr							
18	Molecular Weight	2.84E+01	Lb/Lbmol							
19	Pressure	9.68E+02	mbar							
20	Temperature	2.89E+01	C							
21	Na Molarity	0.00E+00	mol/L							
22	pH	5.55E+00	pH							
23	Total TRU	9.27E-12	Ci/L							
24	Total Activity	2.10E-09	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	1.69E-07	2.65E-08	2.27E+00	2.59E-02	3.86E-02	7.84E+05	7.84E+05	3.56E+02	4.13E+03
29	Ag^{+}	5.18E-14	4.66E-14	3.99E-06	1.64E-05	0.00E+00	0.00E+00	2.04E-05	9.25E-09	1.07E-07
30	Al^{+3}	4.93E-10	1.11E-10	9.52E-03	1.90E-03	0.00E+00	0.00E+00	1.14E-02	5.19E-06	6.01E-05
31	As^{+3}	2.09E-13	1.30E-13	1.12E-05	1.92E-06	0.00E+00	0.00E+00	1.31E-05	5.96E-09	6.89E-08
32	B^{+3}	3.68E-12	3.32E-13	2.85E-05	4.82E-04	0.00E+00	0.00E+00	5.10E-04	2.32E-07	2.68E-06
33	Ba^{+2}	4.91E-14	5.63E-14	4.83E-06	1.51E-05	0.00E+00	0.00E+00	1.99E-05	9.04E-09	1.05E-07
34	Bi^{+3}	3.00E-14	5.23E-14	4.49E-06	4.24E-05	0.00E+00	0.00E+00	4.68E-05	2.13E-08	2.46E-07
35	Ca^{+2}	7.54E-11	2.52E-11	2.16E-03	3.10E-03	0.00E+00	0.00E+00	5.26E-03	2.39E-06	2.77E-05
36	Cd^{+2}	4.86E-14	4.56E-14	3.91E-06	3.34E-05	0.00E+00	0.00E+00	3.73E-05	1.69E-08	1.96E-07
37	Ce^{+3}	1.89E-12	2.21E-12	1.89E-04	1.71E-05	0.00E+00	0.00E+00	2.07E-04	9.39E-08	1.09E-06
38	Cl^{-}	6.53E-11	1.93E-11	1.66E-03	1.08E-05	0.00E+00	0.00E+00	1.67E-03	7.57E-07	8.77E-06
39	CO	4.90E-35	1.15E-35	9.82E-28	0.00E+00	1.36E-71	2.73E-64	9.82E-28	4.46E-31	5.17E-30
40	CO_2	8.00E-15	2.94E-15	2.52E-07	0.00E+00	1.45E-12	4.56E-05	4.59E-05	2.08E-08	2.41E-07
41	CO_3^{-2}	4.60E-10	2.30E-10	1.97E-02	1.82E-03	0.00E+00	0.00E+00	2.16E-02	9.80E-06	1.13E-04
42	Cr^{+3}	8.09E-12	3.51E-12	3.01E-04	2.85E-05	0.00E+00	0.00E+00	3.29E-04	1.50E-07	1.73E-06
43	Cu^{+2}	8.75E-14	4.64E-14	3.98E-06	6.19E-06	0.00E+00	0.00E+00	1.02E-05	4.62E-09	5.35E-08
44	F^{-}	2.82E-11	4.47E-12	3.83E-04	1.79E-04	0.00E+00	0.00E+00	5.62E-04	2.56E-07	2.96E-06
45	Fe^{+3}	2.83E-12	1.32E-12	1.13E-04	2.47E-03	0.00E+00	0.00E+00	2.58E-03	1.17E-06	1.36E-05
46	H_2O	1.58E-07	2.38E-08	2.04E+00	0.00E+00	1.55E-03	2.00E+04	2.00E+04	9.08E+00	1.05E+02
47	H_2O(b)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^{+}	7.69E-11	6.47E-13	5.55E-05	0.00E+00	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.61E-35	2.25E-27	2.25E-27	1.02E-30	1.18E-29
50	HCO3-	4.08E-16	2.08E-16	1.78E-08	0.00E+00	0.00E+00	0.00E+00	1.78E-08	8.10E-12	9.38E-11
51	H2CO3	8.00E-28	4.14E-28	3.55E-20	0.00E+00	0.00E+00	0.00E+00	3.55E-20	1.61E-23	1.87E-22
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-35	1.62E-28	1.62E-28	7.35E-32	8.51E-31
53	Hg^{+2}	8.38E-14	1.40E-13	1.20E-05	4.34E-05	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-33	4.72E-26	4.72E-26	2.15E-29	2.48E-28
55	K^{+}	1.41E-10	4.60E-11	3.95E-03	2.99E-05	0.00E+00	0.00E+00	3.98E-03	1.81E-06	2.09E-05
56	La^{+3}	2.22E-14	2.57E-14	2.21E-06	2.51E-05	0.00E+00	0.00E+00	2.73E-05	1.24E-08	1.44E-07
57	Li^{+}	2.95E-12	1.71E-13	1.47E-05	1.12E-05	0.00E+00	0.00E+00	2.59E-05	1.18E-08	1.36E-07
58	Mg^{+2}	6.64E-12	1.35E-12	1.16E-04	3.70E-04	0.00E+00	0.00E+00	4.86E-04	2.21E-07	2.56E-06
59	Mn^{+3}	7.36E-13	3.37E-13	2.89E-05	2.02E-04	0.00E+00	0.00E+00	2.31E-04	1.05E-07	1.21E-06
60	MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	3.18E-12	7.42E-13	6.37E-05	0.00E+00	2.92E-02	5.86E+05	5.86E+05	2.66E+02	3.08E+03
62	Na^{+}	3.77E-09	7.23E-10	6.20E-02	2.02E-03	0.00E+00	0.00E+00	6.40E-02	2.91E-05	3.37E-04
63	NH3	5.47E-12	7.78E-13	6.67E-05	0.00E+00	1.26E-10	1.53E-03	1.60E-03	7.28E-07	8.42E-06
64	NH4+	3.02E-15	7.78E-13	3.90E-08	0.00E+00	0.00E+00	0.00E+00	3.90E-08	1.77E-11	2.05E-10
65	Ni^{+2}	6.88E-13	3.37E-13	2.89E-05	5.41E-05	0.00E+00	0.00E+00	8.30E-05	3.77E-08	4.37E-07
66	NO	3.98E-34	9.97E-35	8.54E-27	0.00E+00	0.00E+00	0.00E+00	8.54E-27	3.88E-30	4.50E-29
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.65E-50	2.85E-42	2.85E-42	1.29E-45	1.50E-44
68	NO_2^{-}	7.39E-10	2.84E-10	2.43E-02	5.04E-04	0.00E+00	0.00E+00	2.48E-02	1.13E-05	1.31E-04

	A	B	C	D	E	F	G	H	I	J
69	NO_3^-	1.49E-09	7.73E-10	6.63E-02	4.10E-04	0.00E+00	0.00E+00	6.67E-02	3.03E-05	3.51E-04
70	O_2	1.02E-12	2.73E-13	2.34E-05	0.00E+00	7.77E-03	1.78E+05	1.78E+05	8.09E+01	9.36E+02
71	O^-	0.00E+00	0.00E+00	0.00E+00	1.33E-03	0.00E+00	0.00E+00	1.33E-03	6.02E-07	6.97E-06
72	OH^-	3.52E-09	5.00E-10	4.29E-02	7.51E-03	0.00E+00	0.00E+00	5.04E-02	2.29E-05	2.65E-04
73	$OH(b)^-$	5.30E-17	7.52E-18	6.45E-10	1.98E-19	0.00E+00	0.00E+00	6.45E-10	2.93E-13	3.39E-12
74	Pb^{+2}	1.72E-13	2.97E-13	2.54E-05	6.94E-05	0.00E+00	0.00E+00	9.48E-05	4.31E-08	4.99E-07
75	Pd^{+2}	1.35E-14	1.20E-14	1.03E-06	2.90E-06	0.00E+00	0.00E+00	3.93E-06	1.79E-09	2.07E-08
76	PO_4^{-3}	2.34E-11	1.86E-11	1.59E-03	5.34E-04	0.00E+00	0.00E+00	2.13E-03	9.66E-07	1.12E-05
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	1.28E-14	1.10E-14	9.41E-07	9.21E-07	0.00E+00	0.00E+00	1.86E-06	8.47E-10	9.80E-09
79	Ru^{+3}	1.90E-14	1.60E-14	1.37E-06	8.34E-06	0.00E+00	0.00E+00	9.72E-06	4.42E-09	5.11E-08
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	3.44E-20	0.00E+00	0.00E+00	3.44E-20	1.56E-23	1.81E-22
81	SiO2	7.83E-12	3.92E-12	3.36E-04	1.84E-03	0.00E+00	0.00E+00	2.18E-03	9.91E-07	1.15E-05
82	SiO_4^{-4}	4.31E-19	3.31E-19	2.84E-11	2.77E-10	0.00E+00	0.00E+00	3.05E-10	1.39E-13	1.60E-12
83	SO_2	1.57E-37	8.39E-38	7.19E-30	0.00E+00	0.00E+00	0.00E+00	7.19E-30	3.27E-33	3.78E-32
84	SO_4^{-2}	3.58E-11	2.87E-11	2.46E-03	1.20E-04	0.00E+00	0.00E+00	2.58E-03	1.17E-06	1.36E-05
85	Sr^{+2}	6.86E-15	5.02E-15	4.30E-07	4.50E-06	0.00E+00	0.00E+00	4.93E-06	2.24E-09	2.59E-08
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	4.32E-37	0.00E+00	0.00E+00	4.32E-37	1.96E-40	2.27E-39
87	Ti^{+4}	4.10E-14	1.64E-14	1.40E-06	5.43E-06	0.00E+00	0.00E+00	6.84E-06	3.11E-09	3.60E-08
88	Zn^{+2}	1.39E-13	7.61E-14	6.52E-06	1.11E-04	0.00E+00	0.00E+00	1.17E-04	5.33E-08	6.17E-07
89	Zr^{+4}	1.13E-13	8.61E-14	7.38E-06	6.10E-04	0.00E+00	0.00E+00	6.18E-04	2.81E-07	3.25E-06
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	1.46E-11	1.07E-11	9.18E-04	3.46E-03	0.00E+00	0.00E+00	4.38E-03	1.99E-06	2.30E-05
94	$C_2O_4^{-2}$	1.46E-11	1.07E-11	9.18E-04	3.46E-03	0.00E+00	0.00E+00	4.38E-03	1.99E-06	2.30E-05
95	Formate	1.98E-18	7.46E-19	6.39E-11	7.80E-10	0.00E+00	0.00E+00	8.44E-10	3.84E-13	4.44E-12
96	Acetate	1.54E-18	7.58E-19	6.50E-11	7.93E-10	0.00E+00	0.00E+00	8.58E-10	3.90E-13	4.51E-12
97	Glycolate	1.02E-17	6.41E-18	5.50E-10	7.85E-10	0.00E+00	0.00E+00	1.33E-09	6.06E-13	7.02E-12
98	IDA	5.17E-18	5.75E-18	4.93E-10	2.45E-10	0.00E+00	0.00E+00	7.38E-10	3.35E-13	3.88E-12
99	Citrate	4.73E-19	7.58E-19	6.50E-11	3.14E-10	0.00E+00	0.00E+00	3.79E-10	1.72E-13	2.00E-12
100	HEDTA	2.21E-18	5.14E-18	4.41E-10	2.95E-10	0.00E+00	0.00E+00	7.36E-10	3.35E-13	3.87E-12
101	EDTA	2.66E-19	6.49E-19	5.57E-11	3.01E-10	0.00E+00	0.00E+00	3.57E-10	1.62E-13	1.88E-12
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	1.18E-09	3.83E-01	5.54E-04	9.23E-10	3.00E-01	3.61E-03	2.10E-09	6.83E-01	4.17E-03
106	^{241}Am	2.59E-13	8.41E-05	5.41E-08	6.60E-12	2.14E-03	1.38E-06	6.86E-12	2.23E-03	1.43E-06
107	^{243}Am	1.69E-16	5.49E-08	6.07E-10	5.33E-16	1.73E-07	1.91E-09	7.02E-16	2.28E-07	2.52E-09
108	^{14}C	9.10E-15	2.95E-06	1.46E-09	7.76E-16	2.52E-07	1.24E-10	9.88E-15	3.21E-06	1.58E-09
109	^{60}Co	5.97E-14	1.94E-05	3.78E-11	1.21E-12	3.94E-04	7.67E-10	1.27E-12	4.13E-04	8.05E-10
110	^{243}Cm	4.80E-17	1.56E-08	6.79E-13	1.53E-14	4.98E-06	2.17E-10	1.54E-14	5.00E-06	2.18E-10
111	^{244}Cm	1.14E-15	3.69E-07	1.00E-11	3.49E-13	1.13E-04	3.09E-09	3.50E-13	1.14E-04	3.10E-09
112	^{137}Cs	1.09E-09	3.54E-01	8.99E-06	1.43E-10	4.64E-02	1.18E-06	1.23E-09	4.00E-01	1.02E-05
113	^{152}Eu	1.95E-15	6.33E-07	8.03E-12	3.51E-14	1.14E-05	1.45E-10	3.71E-14	1.20E-05	1.53E-10
114	^{154}Eu	4.04E-13	1.31E-04	1.07E-09	3.81E-12	1.24E-03	1.01E-08	4.21E-12	1.37E-03	1.11E-08
115	^{155}Eu	1.17E-13	3.80E-05	1.72E-10	5.64E-13	1.83E-04	8.30E-10	6.81E-13	2.21E-04	1.00E-09
116	^{3}H	4.51E-14	1.46E-05	3.36E-12	8.22E-12	2.67E-03	6.12E-10	8.26E-12	2.68E-03	6.15E-10
117	^{129}I	3.54E-16	1.15E-07	1.44E-06	7.66E-17	2.49E-08	3.10E-07	4.31E-16	1.40E-07	1.75E-06
118	^{63}Ni	6.42E-13	2.08E-04	8.08E-09	1.32E-13	4.30E-05	1.67E-09	7.74E-13	2.51E-04	9.75E-09
119	^{237}Np	3.52E-16	1.14E-07	3.57E-07	8.99E-15	2.92E-06	9.12E-06	9.34E-15	3.03E-06	9.48E-06
120	^{238}Pu	1.16E-15	3.76E-07	4.84E-11	2.57E-14	8.32E-06	1.07E-09	2.68E-14	8.70E-06	1.12E-09
121	^{239}Pu	1.60E-14	5.21E-06	1.85E-07	2.27E-13	7.37E-05	2.62E-06	2.43E-13	7.90E-05	2.81E-06
122	^{240}Pu	4.16E-15	1.35E-06	1.31E-08	6.00E-14	1.95E-05	1.89E-07	6.41E-14	2.08E-05	2.02E-07
123	^{241}Pu	8.73E-14	2.83E-05	6.06E-10	1.61E-12	5.22E-04	1.12E-08	1.70E-12	5.51E-04	1.18E-08
124	^{242}Pu	3.15E-20	1.02E-11	5.73E-12	5.53E-18	1.80E-09	1.01E-09	5.56E-18	1.81E-09	1.01E-09
125	^{125}Sb	2.42E-13	7.86E-05	1.67E-10	2.35E-12	7.61E-04	1.62E-09	2.59E-12	8.40E-04	1.78E-09
126	^{151}Sm	3.39E-12	1.10E-03	9.21E-08	2.83E-11	9.18E-03	7.69E-07	3.17E-11	1.03E-02	8.61E-07
127	^{126}Sn	3.85E-15	1.25E-06	2.43E-07	1.10E-14	3.57E-06	6.93E-07	1.48E-14	4.82E-06	9.36E-07
128	^{90}Sr	8.35E-11	2.71E-02	4.32E-07	7.24E-10	2.35E-01	3.75E-06	8.07E-10	2.62E-01	4.18E-06
129	^{99}Tc	1.15E-12	3.72E-04	4.84E-05	2.89E-12	9.39E-04	1.22E-04	4.04E-12	1.31E-03	1.70E-04
130	^{232}Th	1.07E-17	3.47E-09	6.96E-05	2.97E-16	9.64E-08	1.93E-03	3.08E-16	9.99E-08	2.00E-03
131	^{233}U	3.57E-16	1.16E-07	2.65E-08	2.44E-14	7.90E-06	1.81E-06	2.47E-14	8.02E-06	1.83E-06
132	^{234}U	2.53E-16	8.21E-08	2.92E-08	1.27E-15	4.11E-07	1.46E-07	1.52E-15	4.93E-07	1.75E-07
133	^{235}U	9.97E-18	3.23E-09	3.30E-06	3.04E-17	9.88E-09	1.01E-05	4.04E-17	1.31E-08	1.34E-05
134	^{236}U	1.71E-17	5.54E-09	1.89E-07	4.18E-17	1.36E-08	4.63E-07	5.89E-17	1.91E-08	6.52E-07
135	^{238}U	1.98E-16	6.42E-08	4.21E-04	7.16E-16	2.32E-07	1.53E-03	9.14E-16	2.97E-07	1.95E-03
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-42

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
1	**Table C-21 PVP12 Stream Report**									
3	**Stream Number:**		PVP12							
4	**Stream Name:**		Carbon bed adsorber discharge							
5	**Configuration:**		MRQ-05-0049.acmf							
6	**Run Date / Time:**		12/14/2005 - 1:42:25 PM							
7	**Run Data File:**		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	Stream Properties									
10	Variable	Value	Units							
11	Density	9.01E-04	g/cm^3	(does not include solid phase)						
12	Enthalpy	-3.82E+06	BTU/hr							
13	Mass Flow	3.25E+04	Lb/hr							
14		7.81E+05	Lb/day							
15	Volumetric Flow	7.21E+04	GPM	(does not include solid phase)						
16		9.64E+03	ft^3/min	(does not include solid phase)						
17	Molar Flow	1.14E+03	Lbmol/hr							
18	Molecular Weight	2.85E+01	Lb/Lbmol							
19	Pressure	8.10E+02	mbar							
20	Temperature	3.49E+01	C							
21	Na Molarity	0.00E+00	mol/L							
22	pH	1.02E+01	pH							
23	Total TRU	5.47E-20	Ci/L							
24	Total Activity	5.84E-12	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	6.85E-11	1.92E-12	1.77E-04	4.34E-05	3.16E-02	7.81E+05	7.81E+05	3.55E+02	4.11E+03
29	Ag^+	3.05E-22	2.75E-22	2.85E-14	1.17E-13	0.00E+00	0.00E+00	1.45E-13	6.61E-17	7.65E-16
30	Al^{+3}	2.91E-18	6.55E-19	6.80E-11	1.36E-11	0.00E+00	0.00E+00	8.15E-11	3.71E-14	4.29E-13
31	As^{+3}	1.23E-21	7.69E-22	7.99E-14	1.37E-14	0.00E+00	0.00E+00	9.36E-14	4.25E-17	4.92E-16
32	B^{+3}	2.17E-20	1.96E-21	2.03E-13	3.44E-12	0.00E+00	0.00E+00	3.64E-12	1.66E-15	1.92E-14
33	Ba^{+2}	2.90E-22	3.32E-22	3.45E-14	1.08E-13	0.00E+00	0.00E+00	1.42E-13	6.45E-17	7.47E-16
34	Bi^{+3}	1.77E-22	3.09E-22	3.20E-14	3.03E-13	0.00E+00	0.00E+00	3.35E-13	1.52E-16	1.76E-15
35	Ca^{+2}	4.45E-19	1.49E-19	1.54E-11	2.21E-11	0.00E+00	0.00E+00	3.76E-11	1.71E-14	1.98E-13
36	Cd^{+2}	2.87E-22	2.69E-22	2.79E-14	2.38E-13	0.00E+00	0.00E+00	2.66E-13	1.21E-16	1.40E-15
37	Ce^{+3}	1.11E-20	1.30E-20	1.35E-12	1.22E-13	0.00E+00	0.00E+00	1.48E-12	6.71E-16	7.76E-15
38	Cl^-	3.85E-19	1.14E-19	1.18E-11	7.73E-14	0.00E+00	0.00E+00	1.19E-11	5.41E-15	6.26E-14
39	CO	1.30E-38	3.04E-39	3.15E-31	0.00E+00	1.13E-71	2.73E-64	3.15E-31	1.43E-34	1.66E-33
40	CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.12E-12	4.28E-05	4.28E-05	1.95E-08	2.25E-07
41	CO_3^{-2}	2.71E-18	1.36E-18	1.41E-10	1.30E-11	0.00E+00	0.00E+00	1.54E-10	7.00E-14	8.10E-13
42	Cr^{+3}	4.77E-20	2.07E-20	2.15E-12	2.04E-13	0.00E+00	0.00E+00	2.35E-12	1.07E-15	1.24E-14
43	Cu^{+2}	5.16E-22	2.74E-22	2.84E-14	4.42E-14	0.00E+00	0.00E+00	7.26E-14	3.30E-17	3.82E-16
44	F^-	1.66E-19	2.63E-20	2.74E-12	1.28E-12	0.00E+00	0.00E+00	4.02E-12	1.83E-15	2.11E-14
45	Fe^{+3}	1.67E-20	7.79E-21	8.09E-13	1.76E-11	0.00E+00	0.00E+00	1.84E-11	8.37E-15	9.69E-14
46	H_2O	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-03	1.65E+04	1.65E+04	7.49E+00	8.67E+01
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^+	6.35E-11	5.34E-13	5.55E-05	0.00E+00	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-35	7.49E-28	7.49E-28	3.40E-31	3.94E-30
50	HCO3-	2.41E-24	1.23E-24	1.27E-16	0.00E+00	0.00E+00	0.00E+00	1.27E-16	5.79E-20	6.70E-19
51	H2CO3	6.60E-28	3.42E-28	3.55E-20	0.00E+00	0.00E+00	0.00E+00	3.55E-20	1.61E-23	1.87E-22
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.11E-36	5.39E-29	5.39E-29	2.45E-32	2.84E-31
53	Hg^{+2}	6.92E-14	1.16E-13	1.20E-05	4.34E-05	0.00E+00	0.00E+00	5.55E-05	2.52E-08	2.92E-07
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.88E-34	1.57E-26	1.57E-26	7.15E-30	8.28E-29
55	K^+	8.32E-19	2.72E-19	2.82E-11	2.14E-13	0.00E+00	0.00E+00	2.84E-11	1.29E-14	1.49E-13
56	La^{+3}	1.31E-22	1.52E-22	1.58E-14	1.79E-13	0.00E+00	0.00E+00	1.95E-13	8.86E-17	1.03E-15
57	Li^+	1.74E-20	1.01E-21	1.05E-13	8.02E-14	0.00E+00	0.00E+00	1.85E-13	8.40E-17	9.72E-16
58	Mg^{+2}	3.92E-20	7.95E-21	8.25E-13	2.65E-12	0.00E+00	0.00E+00	3.47E-12	1.58E-15	1.83E-14
59	Mn^{+3}	4.34E-21	1.99E-21	2.07E-13	1.44E-12	0.00E+00	0.00E+00	1.65E-12	7.49E-16	8.67E-15
60	MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	2.62E-12	6.13E-13	6.37E-05	0.00E+00	2.41E-02	5.86E+05	5.86E+05	2.66E+02	3.08E+03
62	Na^+	2.22E-17	4.26E-18	4.43E-10	1.44E-11	0.00E+00	0.00E+00	4.57E-10	2.08E-13	2.40E-12
63	NH3	1.51E-12	2.14E-13	2.22E-05	0.00E+00	3.47E-11	5.12E-04	5.34E-04	2.43E-07	2.81E-06
64	NH4+	8.31E-16	2.14E-13	1.30E-08	0.00E+00	0.00E+00	0.00E+00	1.30E-08	5.91E-12	6.83E-11
65	Ni^{+2}	4.06E-21	1.99E-21	2.06E-13	3.87E-13	0.00E+00	0.00E+00	5.93E-13	2.70E-16	3.12E-15
66	NO	7.86E-36	1.97E-36	2.04E-28	0.00E+00	0.00E+00	0.00E+00	2.04E-28	9.29E-32	1.07E-30
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.97E-50	1.58E-42	1.58E-42	7.19E-46	8.32E-45
68	NO_2^-	4.36E-18	1.67E-18	1.74E-10	3.60E-12	0.00E+00	0.00E+00	1.77E-10	8.06E-14	9.33E-13
69	NO_3^-	8.81E-18	4.56E-18	4.73E-10	2.93E-12	0.00E+00	0.00E+00	4.76E-10	2.16E-13	2.51E-12
70	O_2	8.45E-13	2.26E-13	2.34E-05	0.00E+00	6.42E-03	1.78E+05	1.78E+05	8.09E+01	9.36E+02
71	O^{--}	0.00E+00	0.00E+00	0.00E+00	1.51E-11	0.00E+00	0.00E+00	1.51E-11	6.87E-15	7.95E-14
72	OH^-	2.08E-17	2.95E-18	3.06E-10	5.37E-11	0.00E+00	0.00E+00	3.60E-10	1.64E-13	1.89E-12
73	$OH(b)^-$	3.28E-25	4.66E-26	4.84E-18	1.49E-27	0.00E+00	0.00E+00	4.84E-18	2.20E-21	2.55E-20

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	1.01E-21	1.75E-21	1.82E-13	4.96E-13	0.00E+00	0.00E+00	6.77E-13	3.08E-16	3.56E-15
75	Pd^{+2}	7.99E-23	7.09E-23	7.37E-15	2.07E-14	0.00E+00	0.00E+00	2.81E-14	1.28E-17	1.48E-16
76	PO_4^{-3}	1.38E-19	1.10E-19	1.14E-11	3.81E-12	0.00E+00	0.00E+00	1.52E-11	6.90E-15	7.99E-14
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	7.54E-23	6.48E-23	6.72E-15	6.58E-15	0.00E+00	0.00E+00	1.33E-14	6.05E-18	7.00E-17
79	Ru^{+3}	1.12E-22	9.45E-23	9.81E-15	5.96E-14	0.00E+00	0.00E+00	6.94E-14	3.16E-17	3.65E-16
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	2.46E-28	0.00E+00	0.00E+00	2.46E-28	1.12E-31	1.29E-30
81	SiO2	4.61E-20	2.31E-20	2.40E-12	1.32E-11	0.00E+00	0.00E+00	1.56E-11	7.08E-15	8.19E-14
82	SiO_4^{-4}	2.54E-27	1.95E-27	2.03E-19	1.98E-18	0.00E+00	0.00E+00	2.18E-18	9.90E-22	1.15E-20
83	SO_2	7.59E-38	4.06E-38	4.21E-30	0.00E+00	0.00E+00	0.00E+00	4.21E-30	1.91E-33	2.22E-32
84	SO_4^{-2}	2.11E-19	1.69E-19	1.76E-11	8.60E-13	0.00E+00	0.00E+00	1.84E-11	8.37E-15	9.69E-14
85	Sr^{+2}	4.05E-23	2.96E-23	3.07E-15	3.21E-14	0.00E+00	0.00E+00	3.52E-14	1.60E-17	1.85E-16
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	3.09E-45	0.00E+00	0.00E+00	3.09E-45	1.40E-48	1.62E-47
87	Ti^{+4}	2.42E-22	9.66E-23	1.00E-14	3.88E-14	0.00E+00	0.00E+00	4.88E-14	2.22E-17	2.57E-16
88	Zn^{+2}	8.22E-22	4.49E-22	4.66E-14	7.91E-13	0.00E+00	0.00E+00	8.38E-13	3.81E-16	4.41E-15
89	Zr^{+4}	6.67E-22	5.08E-22	5.27E-14	4.36E-12	0.00E+00	0.00E+00	4.41E-12	2.01E-15	2.32E-14
90										
91	**Components**	**Aqueous Comp**			**Solid Comp**	**Gaseous**		**Total Comp**		
92	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**Mt/day**	**g/sec**
93	**Total**	4.30E-22	3.16E-22	3.28E-14	1.24E-13	0.00E+00	0.00E+00	1.56E-13	7.10E-17	8.22E-16
94	$C_2O_4^{-2}$	4.30E-22	3.16E-22	3.28E-14	1.24E-13	0.00E+00	0.00E+00	1.56E-13	7.10E-17	8.22E-16
95	Formate	6.83E-29	2.57E-29	2.66E-21	3.25E-20	0.00E+00	0.00E+00	3.52E-20	1.60E-23	1.85E-22
96	Acetate	5.29E-29	2.61E-29	2.71E-21	3.30E-20	0.00E+00	0.00E+00	3.57E-20	1.62E-23	1.88E-22
97	Glycolate	3.52E-28	2.21E-28	2.29E-20	3.27E-20	0.00E+00	0.00E+00	5.56E-20	2.53E-23	2.92E-22
98	IDA	1.78E-28	1.98E-28	2.05E-20	1.02E-20	0.00E+00	0.00E+00	3.07E-20	1.40E-23	1.62E-22
99	Citrate	1.63E-29	2.81E-29	2.71E-21	1.31E-20	0.00E+00	0.00E+00	1.58E-20	7.18E-24	8.31E-23
100	HEDTA	7.62E-29	1.77E-28	1.84E-20	1.23E-20	0.00E+00	0.00E+00	3.07E-20	1.39E-23	1.61E-22
101	EDTA	9.15E-30	2.23E-29	2.32E-21	1.25E-20	0.00E+00	0.00E+00	1.49E-20	6.76E-24	7.82E-23
102										
103	**Rad. Comp**	**Aqueous Rad. Comp**			**Solids Rad. Comp (1)**			**Total Rad. Comp (1)**		
104	**Unit**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**	**Ci/L**	**Ci/day**	**Lb/day**
105	**Total**	3.83E-14	1.50E-05	4.12E-07	5.60E-12	2.20E-03	8.93E-08	5.64E-12	2.22E-03	5.01E-07
106	^{241}Am	1.53E-21	6.01E-13	3.87E-16	3.89E-20	1.53E-11	9.85E-15	4.05E-20	1.59E-11	1.02E-14
107	^{243}Am	9.98E-25	3.92E-16	4.33E-18	3.14E-24	1.24E-15	1.37E-17	4.14E-24	1.63E-15	1.80E-17
108	^{14}C	7.51E-15	2.95E-06	1.46E-09	6.41E-16	2.52E-07	1.24E-10	8.15E-15	3.21E-06	1.58E-09
109	^{60}Co	3.52E-22	1.38E-13	2.70E-19	7.15E-21	2.81E-12	5.48E-18	7.51E-21	2.95E-12	5.75E-18
110	^{243}Cm	3.00E-25	1.18E-16	5.14E-21	9.05E-23	3.56E-14	1.55E-18	9.08E-23	3.57E-14	1.56E-18
111	^{244}Cm	6.70E-24	2.63E-15	7.17E-20	2.06E-21	8.09E-13	2.20E-17	2.06E-21	8.12E-13	2.21E-17
112	^{137}Cs	6.43E-18	2.53E-09	6.42E-14	8.43E-19	3.31E-10	8.42E-15	7.27E-18	2.86E-09	7.26E-14
113	^{152}Eu	1.15E-23	4.52E-15	5.74E-20	2.07E-22	8.14E-14	1.03E-18	2.19E-22	8.59E-14	1.09E-18
114	^{154}Eu	2.38E-21	9.37E-13	7.65E-18	2.24E-20	8.82E-12	7.20E-17	2.48E-20	9.76E-12	7.96E-17
115	^{155}Eu	6.90E-22	2.71E-13	1.23E-18	3.32E-21	1.31E-12	5.93E-18	4.01E-21	1.58E-12	7.16E-18
116	^{3}H	3.07E-14	1.21E-05	2.77E-12	5.60E-12	2.20E-03	5.05E-10	5.63E-12	2.21E-03	5.08E-10
117	^{129}I	8.36E-17	3.29E-08	4.10E-07	1.81E-17	7.10E-09	8.87E-08	1.02E-16	4.00E-08	4.99E-07
118	^{63}Ni	3.78E-21	1.49E-12	5.77E-17	7.81E-22	3.07E-13	1.19E-17	4.56E-21	1.79E-12	6.96E-17
119	^{237}Np	2.08E-24	8.16E-16	2.55E-15	5.30E-23	2.08E-14	6.52E-14	5.51E-23	2.16E-14	6.77E-14
120	^{238}Pu	6.84E-24	2.69E-15	3.46E-19	1.51E-22	5.95E-14	7.66E-18	1.58E-22	6.22E-14	8.00E-18
121	^{239}Pu	9.46E-23	3.72E-14	1.32E-15	1.34E-21	5.27E-13	1.87E-14	1.43E-21	5.64E-13	2.00E-14
122	^{240}Pu	2.45E-23	9.64E-15	9.36E-17	3.54E-22	1.39E-13	1.35E-15	3.78E-22	1.49E-13	1.44E-15
123	^{241}Pu	5.15E-22	2.02E-13	4.33E-18	9.49E-21	3.73E-12	7.99E-17	1.00E-20	3.93E-12	8.42E-17
124	^{242}Pu	1.97E-28	7.76E-20	4.34E-20	3.26E-26	1.28E-17	7.18E-18	3.28E-26	1.29E-17	7.22E-18
125	^{125}Sb	1.43E-21	5.62E-13	1.19E-18	1.38E-20	5.44E-12	1.16E-17	1.53E-20	6.00E-12	1.27E-17
126	^{151}Sm	2.00E-20	7.85E-12	6.58E-16	1.67E-19	6.56E-11	5.49E-15	1.87E-19	7.34E-11	6.15E-15
127	^{126}Sn	2.27E-23	8.93E-15	1.73E-15	6.48E-23	2.55E-14	4.95E-15	8.76E-23	3.44E-14	6.68E-15
128	^{90}Sr	4.92E-19	1.94E-10	3.09E-15	4.27E-18	1.68E-09	2.68E-14	4.76E-18	1.87E-09	2.99E-14
129	^{99}Tc	6.76E-21	2.66E-12	3.46E-13	1.71E-20	6.71E-12	8.72E-13	2.38E-20	9.36E-12	1.22E-12
130	^{232}Th	6.69E-26	2.63E-17	5.27E-13	1.75E-24	6.89E-16	1.38E-11	1.82E-24	7.15E-16	1.43E-11
131	^{233}U	2.10E-24	8.27E-16	1.89E-16	1.44E-22	5.64E-14	1.29E-14	1.46E-22	5.73E-14	1.31E-14
132	^{234}U	1.49E-24	5.87E-16	2.08E-16	7.47E-24	2.93E-15	1.04E-15	8.96E-24	3.52E-15	1.25E-15
133	^{235}U	6.23E-26	2.45E-17	2.50E-14	1.90E-25	7.49E-17	7.64E-14	2.53E-25	9.94E-17	1.01E-13
134	^{236}U	1.07E-25	4.20E-17	1.43E-15	2.61E-25	1.03E-16	3.50E-15	3.68E-25	1.45E-16	4.94E-15
135	^{238}U	1.17E-24	4.58E-16	3.01E-12	4.22E-24	1.66E-15	1.09E-11	5.39E-24	2.12E-15	1.39E-11
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Table C-22 RLD32 Stream Report

Stream Number:	RLD32
Stream Name:	LAW SBS condensate vessel vent
Configuration:	MRQ-05-0049.acmf
Run Date / Time:	12/14/2005 - 1:42:25 PM
Run Data File:	H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv

Stream Properties

Variable	Value	Units	
Density	1.13E-03	g/cm^3	(does not include solid phase)
Enthalpy	-6.80E+03	BTU/hr	
Mass Flow	4.42E+01	Lb/hr	
	1.06E+03	Lb/day	
Volumetric Flow	7.83E+01	GPM	(does not include solid phase)
	1.05E+01	ft^3/min	(does not include solid phase)
Molar Flow	1.56E+00	Lbmol/hr	
Molecular Weight	2.84E+01	Lb/Lbmol	
Pressure	1.00E+03	mbar	
Temperature	3.00E+01	C	
Na Molarity	0.00E+00	mol/L	
pH	3.75E+00	pH	
Total TRU	6.19E-15	Ci/L	
Total Activity	2.06E-12	Ci/L	

Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
Total	5.25E-08	7.90E-09	8.91E-04	7.57E-06	3.97E-02	1.06E+03	1.06E+03	4.82E-01	5.58E+00
Ag^{+}	0.00E+00	0.00E+00	0.00E+00	1.54E-10	0.00E+00	0.00E+00	1.54E-10	6.98E-14	8.08E-13
Al^{+3}	0.00E+00	0.00E+00	0.00E+00	3.62E-07	0.00E+00	0.00E+00	3.62E-07	1.85E-10	1.91E-09
As^{+3}	0.00E+00	0.00E+00	0.00E+00	2.72E-09	0.00E+00	0.00E+00	2.72E-09	1.24E-12	1.43E-11
B^{+3}	0.00E+00	0.00E+00	0.00E+00	1.12E-06	0.00E+00	0.00E+00	1.12E-06	5.11E-10	5.92E-09
Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	5.32E-11	0.00E+00	0.00E+00	5.32E-11	2.42E-14	2.80E-13
Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	1.18E-10	0.00E+00	0.00E+00	1.18E-10	5.38E-14	6.23E-13
Ca^{+2}	3.25E-12	1.09E-12	1.23E-07	3.06E-07	0.00E+00	0.00E+00	4.28E-07	1.95E-10	2.25E-09
Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.05E-09	0.00E+00	0.00E+00	1.05E-09	4.75E-13	5.50E-12
Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	1.20E-09	0.00E+00	0.00E+00	1.20E-09	5.45E-13	6.31E-12
Cl^{-}	1.23E-11	3.63E-12	4.10E-07	0.00E+00	0.00E+00	0.00E+00	4.10E-07	1.86E-10	2.16E-09
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO_2	1.32E-14	4.85E-15	5.47E-10	0.00E+00	1.19E-27	4.92E-23	5.47E-10	2.49E-13	2.88E-12
CO_3^{-2}	2.98E-12	1.49E-12	1.68E-07	0.00E+00	0.00E+00	0.00E+00	1.68E-07	7.64E-11	8.85E-10
Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	1.68E-08	0.00E+00	0.00E+00	1.68E-08	7.66E-12	8.86E-11
Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	2.23E-11	0.00E+00	0.00E+00	2.23E-11	1.01E-14	1.17E-13
F^{-}	6.91E-12	1.09E-12	1.23E-07	0.00E+00	0.00E+00	0.00E+00	1.23E-07	5.61E-11	6.50E-10
Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	2.27E-07	0.00E+00	0.00E+00	2.27E-07	1.03E-10	1.20E-09
H_2O	5.23E-08	7.87E-09	8.87E-04	0.00E+00	1.69E-03	2.87E+01	2.87E+01	1.30E-02	1.51E-01
$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H^{+}	1.78E-22	1.50E-24	1.69E-19	0.00E+00	0.00E+00	0.00E+00	1.69E-19	7.68E-23	8.89E-22
HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCO3-	0.00E+00	0.00E+00	0.00E+00	3.25E-23	0.00E+00	0.00E+00	3.25E-23	1.48E-26	1.71E-25
H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	3.99E-08	0.00E+00	0.00E+00	3.99E-08	1.81E-11	2.10E-10
HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K^{+}	9.69E-12	3.16E-12	3.56E-07	0.00E+00	0.00E+00	0.00E+00	3.56E-07	1.62E-10	1.88E-09
La^{+3}	0.00E+00	0.00E+00	0.00E+00	5.56E-11	0.00E+00	0.00E+00	5.56E-11	2.53E-14	2.92E-13
Li^{+}	7.20E-12	4.17E-13	4.70E-08	4.17E-08	0.00E+00	0.00E+00	8.87E-08	4.03E-11	4.67E-10
Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	5.75E-08	0.00E+00	0.00E+00	5.75E-08	2.61E-11	3.02E-10
Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	2.20E-09	0.00E+00	0.00E+00	2.20E-09	9.98E-13	1.16E-11
MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-02	7.91E+02	7.91E+02	3.60E-01	4.16E+00
Na^{+}	5.86E-11	1.12E-11	1.27E-06	0.00E+00	0.00E+00	0.00E+00	1.27E-06	5.77E-10	6.67E-09
NH3	5.24E-12	7.45E-13	8.40E-08	0.00E+00	0.00E+00	0.00E+00	8.40E-08	3.82E-11	4.42E-10
NH4+	1.76E-15	7.45E-13	2.99E-11	1.43E-24	0.00E+00	0.00E+00	2.99E-11	1.36E-14	1.57E-13
Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	1.98E-09	0.00E+00	0.00E+00	1.98E-09	8.99E-13	1.04E-11
NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_2^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NO_3^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.98E-03	2.40E+02	2.40E+02	1.09E-01	1.26E+00
O^{-}	0.00E+00	0.00E+00	0.00E+00	3.28E-06	0.00E+00	0.00E+00	3.28E-06	1.49E-09	1.72E-08
OH^{-}	5.69E-11	8.07E-12	9.10E-07	0.00E+00	0.00E+00	0.00E+00	9.10E-07	4.14E-10	4.79E-09
$OH(b)^{-}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	6.58E-10	0.00E+00	0.00E+00	6.58E-10	2.99E-13	3.46E-12
75	Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.07E-11	0.00E+00	0.00E+00	1.07E-11	4.87E-15	5.64E-14
76	PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	5.45E-08	0.00E+00	0.00E+00	5.45E-08	2.48E-11	2.87E-10
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	3.83E-11	0.00E+00	0.00E+00	3.83E-11	1.74E-14	2.02E-13
79	Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	9.13E-10	0.00E+00	0.00E+00	9.13E-10	4.15E-13	4.80E-12
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	0.00E+00	0.00E+00	0.00E+00	1.70E-06	0.00E+00	0.00E+00	1.70E-06	7.71E-10	8.93E-09
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	9.12E-22	0.00E+00	0.00E+00	9.12E-22	4.15E-25	4.80E-24
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85	Sr^{+2}	5.47E-17	4.00E-17	4.51E-12	4.72E-12	0.00E+00	0.00E+00	9.24E-12	4.20E-15	4.86E-14
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	5.23E-09	0.00E+00	0.00E+00	5.23E-09	2.38E-12	2.75E-11
88	Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	2.69E-07	0.00E+00	0.00E+00	2.69E-07	1.22E-10	1.42E-09
89	Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	8.27E-08	0.00E+00	0.00E+00	8.27E-08	3.76E-11	4.35E-10
90										
91	Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
92	Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
93	Total	0.00E+00	0.00E+00	0.00E+00	9.68E-06	0.00E+00	0.00E+00	9.68E-06	4.40E-09	5.09E-08
94	$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	9.68E-06	0.00E+00	0.00E+00	9.68E-06	4.40E-09	5.09E-08
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
104	Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
105	Total	6.65E-13	2.84E-07	4.53E-12	1.40E-12	5.96E-07	3.24E-08	2.06E-12	8.80E-07	3.24E-08
106	^{241}Am	0.00E+00	0.00E+00	0.00E+00	5.30E-15	2.26E-09	1.46E-12	5.30E-15	2.26E-09	1.46E-12
107	^{243}Am	0.00E+00	0.00E+00	0.00E+00	3.45E-18	1.47E-12	1.63E-14	3.45E-18	1.47E-12	1.63E-14
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109	^{60}Co	0.00E+00	0.00E+00	0.00E+00	2.78E-16	1.19E-10	2.31E-16	2.78E-16	1.19E-10	2.31E-16
110	^{243}Cm	0.00E+00	0.00E+00	0.00E+00	2.42E-19	1.03E-13	4.50E-18	2.42E-19	1.03E-13	4.50E-18
111	^{244}Cm	0.00E+00	0.00E+00	0.00E+00	5.71E-18	2.44E-12	6.64E-17	5.71E-18	2.44E-12	6.64E-17
112	^{137}Cs	0.00E+00	0.00E+00	0.00E+00	1.38E-13	5.88E-08	1.49E-12	1.38E-13	5.88E-08	1.49E-12
113	^{152}Eu	0.00E+00	0.00E+00	0.00E+00	1.58E-17	6.75E-12	8.56E-17	1.58E-17	6.75E-12	8.56E-17
114	^{154}Eu	0.00E+00	0.00E+00	0.00E+00	3.27E-15	1.40E-09	1.14E-14	3.27E-15	1.40E-09	1.14E-14
115	^{155}Eu	0.00E+00	0.00E+00	0.00E+00	9.45E-16	4.03E-10	1.83E-15	9.45E-16	4.03E-10	1.83E-15
116	^{3}H	0.00E+00	0.00E+00	0.00E+00	7.43E-15	3.17E-09	7.27E-16	7.43E-15	3.17E-09	7.27E-16
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	4.63E-17	1.98E-11	2.47E-10	4.63E-17	1.98E-11	2.47E-10
118	^{63}Ni	0.00E+00	0.00E+00	0.00E+00	1.13E-14	4.83E-09	1.87E-13	1.13E-14	4.83E-09	1.87E-13
119	^{237}Np	0.00E+00	0.00E+00	0.00E+00	1.66E-18	7.11E-13	2.22E-12	1.66E-18	7.11E-13	2.22E-12
120	^{238}Pu	0.00E+00	0.00E+00	0.00E+00	9.41E-18	4.02E-12	5.17E-16	9.41E-18	4.02E-12	5.17E-16
121	^{239}Pu	0.00E+00	0.00E+00	0.00E+00	1.30E-16	5.55E-11	1.97E-12	1.30E-16	5.55E-11	1.97E-12
122	^{240}Pu	0.00E+00	0.00E+00	0.00E+00	3.37E-17	1.44E-11	1.40E-13	3.37E-17	1.44E-11	1.40E-13
123	^{241}Pu	0.00E+00	0.00E+00	0.00E+00	7.08E-16	3.02E-10	6.47E-15	7.08E-16	3.02E-10	6.47E-15
124	^{242}Pu	0.00E+00	0.00E+00	0.00E+00	3.56E-21	1.52E-15	8.52E-16	3.56E-21	1.52E-15	8.52E-16
125	^{125}Sb	0.00E+00	0.00E+00	0.00E+00	4.82E-15	2.06E-09	4.37E-15	4.82E-15	2.06E-09	4.37E-15
126	^{151}Sm	0.00E+00	0.00E+00	0.00E+00	3.99E-15	1.70E-09	1.43E-13	3.99E-15	1.70E-09	1.43E-13
127	^{126}Sn	0.00E+00	0.00E+00	0.00E+00	3.10E-17	1.32E-11	2.57E-12	3.10E-17	1.32E-11	2.57E-12
128	^{90}Sr	6.65E-13	2.84E-07	4.53E-12	6.96E-13	2.97E-07	4.74E-12	1.36E-12	5.81E-07	9.27E-12
129	^{99}Tc	0.00E+00	0.00E+00	0.00E+00	5.25E-13	2.24E-07	2.91E-08	5.25E-13	2.24E-07	2.91E-08
130	^{232}Th	0.00E+00	0.00E+00	0.00E+00	4.99E-20	2.13E-14	4.27E-10	4.99E-20	2.13E-14	4.27E-10
131	^{233}U	0.00E+00	0.00E+00	0.00E+00	1.70E-18	7.26E-13	1.66E-13	1.70E-18	7.26E-13	1.66E-13
132	^{234}U	0.00E+00	0.00E+00	0.00E+00	1.19E-18	5.09E-13	1.81E-13	1.19E-18	5.09E-13	1.81E-13
133	^{235}U	0.00E+00	0.00E+00	0.00E+00	4.69E-20	2.00E-14	2.04E-11	4.69E-20	2.00E-14	2.04E-11
134	^{236}U	0.00E+00	0.00E+00	0.00E+00	8.03E-20	3.43E-14	1.17E-12	8.03E-20	3.43E-14	1.17E-12
135	^{238}U	0.00E+00	0.00E+00	0.00E+00	9.30E-19	3.97E-13	2.60E-09	9.30E-19	3.97E-13	2.60E-09
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
1	**Table C-23 RLD33 Stream Report**									
3	Stream Number:		RLD33							
4	Stream Name:		LAW Plant wash vessel vent							
5	Configuration:		MRQ-05-0049.acmf							
6	Run Date / Time:		12/14/2005 - 1:42:25 PM							
7	Run Data File:		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	Stream Properties									
10	Variable	Value	Units							
11	Density	1.13E-03	g/cm^3	(does not include solid phase)						
12	Enthalpy	-3.83E+02	BTU/hr							
13	Mass Flow	2.49E+00	Lb/hr							
14		5.97E+01	Lb/day							
15	Volumetric Flow	4.41E+00	GPM	(does not include solid phase)						
16		5.89E-01	ft^3/min	(does not include solid phase)						
17	Molar Flow	8.76E-02	Lbmol/hr							
18	Molecular Weight	2.84E+01	Lb/Lbmol							
19	Pressure	1.00E+03	mbar							
20	Temperature	3.00E+01	C							
21	Na Molarity	0.00E+00	mol/L							
22	pH	0.00E+00	pH							
23	Total TRU	0.00E+00	Ci/L							
24	Total Activity	0.00E+00	Ci/L							
25										
26	Component	Aqueous Comp			Solid Comp	Gaseous (1)		Total Comp		
27	Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	mt/day	g/sec
28	Total	1.76E-09	2.64E-10	1.68E-06	0.00E+00	3.97E-02	5.97E+01	5.97E+01	2.71E-02	3.14E-01
29	Ag^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
30	Al^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
31	As^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32	B^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
33	Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
34	Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
35	Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
36	Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
37	Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
38	Cl^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39	CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	CO_3^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42	Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
43	Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
44	F^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
45	Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
46	H_2O	1.76E-09	2.64E-10	1.68E-06	0.00E+00	1.69E-03	1.62E+00	1.62E+00	7.34E-04	8.50E-03
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56	La^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57	Li^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58	Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59	Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60	MnO_4^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-02	4.45E+01	4.45E+01	2.02E-02	2.34E-01
62	Na^+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
63	NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-27	3.01E-24	3.01E-24	1.37E-27	1.58E-26
64	NH4+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
66	NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	NO_2^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
69	NO_3^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70	O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.98E-03	1.35E+01	1.35E+01	6.15E-03	7.12E-02
71	O^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	OH^-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
73	$OH(b)^-$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-47

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75	Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76	PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79	Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85	Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Tl^{+4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88	Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
89	Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
90										
91	Components	Aqueous Comp			Solid Comp	Gaseous		Total Comp		
92	Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
93	Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
94	$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
104	Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
105	Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106	^{241}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107	^{243}Am	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109	^{60}Co	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110	^{243}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111	^{244}Cm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
112	^{137}Cs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
113	^{152}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
114	^{154}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
115	^{155}Eu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
116	^{3}H	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
118	^{63}Ni	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
119	^{237}Np	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120	^{238}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121	^{239}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122	^{240}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123	^{241}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
124	^{242}Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
125	^{125}Sb	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
126	^{151}Sm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
127	^{126}Sn	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
128	^{90}Sr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129	^{99}Tc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
130	^{232}Th	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
131	^{233}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
132	^{234}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
133	^{235}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
134	^{236}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
135	^{238}U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

	A	B	C	D	E	F	G	H	I	J
1	**Table C-24 RLD34 Stream Report**									
3	**Stream Number:**		RLD34							
4	**Stream Name:**		LAW C3/C5 drain/sump collection vessel vent							
5	**Configuration:**		MRQ-05-0049.acmf							
6	**Run Date / Time:**		12/14/2005 - 1:42:25 PM							
7	**Run Data File:**		H:\ACM v3.1\MRQ-05-0049\MRQ_05_0049A_Streams.csv							
8										
9	**Stream Properties**									
10	**Variable**	**Value**	**Units**							
11	Density	1.13E-03	g/cm^3	(does not include solid phase)						
12	Enthalpy	-6.81E+03	BTU/hr							
13	Mass Flow	4.42E+01	Lb/hr							
14		1.06E+03	Lb/day							
15	Volumetric Flow	7.83E+01	GPM	(does not include solid phase)						
16		1.05E+01	ft^3/min	(does not include solid phase)						
17	Molar Flow	1.56E+00	Lbmol/hr							
18	Molecular Weight	2.84E+01	Lb/Lbmol							
19	Pressure	1.00E+03	mbar							
20	Temperature	3.00E+01	C							
21	Na Molarity	0.00E+00	mol/L							
22	pH	2.94E+00	pH							
23	Total TRU	1.41E-16	Ci/L							
24	Total Activity	2.45E-13	Ci/L							
25										
26	**Component**	**Aqueous Comp**			**Solid Comp**	**Gaseous (1)**		**Total Comp**		
27	**Unit**	**mol/L**	**Lb/gal**	**Lb/day**	**Lb/day**	**mol/L**	**Lb/day**	**Lb/day**	**mt/day**	**g/sec**
28	**Total**	1.55E-09	2.38E-10	2.69E-05	5.04E-07	3.97E-02	1.06E+03	1.06E+03	4.82E-01	5.58E+00
29	Ag^{+}	0.00E+00	0.00E+00	0.00E+00	8.45E-11	0.00E+00	0.00E+00	8.45E-11	3.84E-14	4.45E-13
30	Al^{+3}	0.00E+00	0.00E+00	0.00E+00	8.25E-09	0.00E+00	0.00E+00	8.25E-09	3.75E-12	4.34E-11
31	As^{+3}	0.00E+00	0.00E+00	0.00E+00	5.44E-10	0.00E+00	0.00E+00	5.44E-10	2.47E-13	2.86E-12
32	B^{+3}	0.00E+00	0.00E+00	0.00E+00	6.39E-08	0.00E+00	0.00E+00	6.39E-08	2.90E-11	3.36E-10
33	Ba^{+2}	0.00E+00	0.00E+00	0.00E+00	5.42E-13	0.00E+00	0.00E+00	5.42E-13	2.46E-16	2.85E-15
34	Bi^{+3}	0.00E+00	0.00E+00	0.00E+00	4.46E-11	0.00E+00	0.00E+00	4.46E-11	2.03E-14	2.35E-13
35	Ca^{+2}	0.00E+00	0.00E+00	0.00E+00	1.95E-08	0.00E+00	0.00E+00	1.95E-08	8.89E-12	1.03E-10
36	Cd^{+2}	0.00E+00	0.00E+00	0.00E+00	6.50E-10	0.00E+00	0.00E+00	6.50E-10	2.96E-13	3.42E-12
37	Ce^{+3}	0.00E+00	0.00E+00	0.00E+00	3.45E-12	0.00E+00	0.00E+00	3.45E-12	1.57E-15	1.82E-14
38	Cl^{-}	1.23E-11	3.63E-12	4.10E-07	0.00E+00	0.00E+00	0.00E+00	4.10E-07	1.86E-10	2.16E-09
39	CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	CO_2	1.32E-14	4.85E-15	5.47E-10	0.00E+00	0.00E+00	0.00E+00	5.47E-10	2.49E-13	2.88E-12
41	CO_3^{-2}	2.98E-12	1.49E-12	1.68E-07	0.00E+00	0.00E+00	0.00E+00	1.68E-07	7.64E-11	8.85E-10
42	Cr^{+3}	0.00E+00	0.00E+00	0.00E+00	4.68E-09	0.00E+00	0.00E+00	4.68E-09	2.13E-12	2.46E-11
43	Cu^{+2}	0.00E+00	0.00E+00	0.00E+00	7.50E-12	0.00E+00	0.00E+00	7.50E-12	3.41E-15	3.95E-14
44	F^{-}	7.55E-13	1.20E-13	1.35E-08	0.00E+00	0.00E+00	0.00E+00	1.35E-08	6.14E-12	7.11E-11
45	Fe^{+3}	0.00E+00	0.00E+00	0.00E+00	5.18E-09	0.00E+00	0.00E+00	5.18E-09	2.35E-12	2.72E-11
46	H_2O	1.50E-09	2.26E-10	2.55E-05	0.00E+00	1.69E-03	2.87E+01	2.87E+01	1.30E-02	1.51E-01
47	$H_2O(b)$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	H^{+}	8.70E-25	7.32E-27	8.26E-22	0.00E+00	0.00E+00	0.00E+00	8.26E-22	3.75E-25	4.34E-24
49	HCL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	HCO3-	0.00E+00	0.00E+00	0.00E+00	3.73E-24	0.00E+00	0.00E+00	3.73E-24	1.69E-27	1.96E-26
51	H2CO3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	HF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	Hg^{+2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
54	HNO_3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	K^{+}	5.66E-12	1.85E-12	2.08E-07	0.00E+00	0.00E+00	0.00E+00	2.08E-07	9.46E-11	1.10E-09
56	La^{+3}	0.00E+00	0.00E+00	0.00E+00	7.74E-14	0.00E+00	0.00E+00	7.74E-14	3.52E-17	4.07E-16
57	Li^{+}	0.00E+00	0.00E+00	0.00E+00	4.17E-08	0.00E+00	0.00E+00	4.17E-08	1.89E-11	2.19E-10
58	Mg^{+2}	0.00E+00	0.00E+00	0.00E+00	1.48E-08	0.00E+00	0.00E+00	1.48E-08	6.72E-12	7.77E-11
59	Mn^{+3}	0.00E+00	0.00E+00	0.00E+00	6.61E-11	0.00E+00	0.00E+00	6.61E-11	3.00E-14	3.48E-13
60	MnO_4^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	N_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-02	7.91E+02	7.91E+02	3.60E-01	4.16E+00
62	Na^{+}	2.21E-11	4.24E-12	4.78E-07	0.00E+00	0.00E+00	0.00E+00	4.78E-07	2.17E-10	2.51E-09
63	NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64	NH4+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	Ni^{+2}	0.00E+00	0.00E+00	0.00E+00	4.76E-10	0.00E+00	0.00E+00	4.76E-10	2.16E-13	2.50E-12
66	NO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	NO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	NO_2^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
69	NO_3^{-}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70	O_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.98E-03	2.40E+02	2.40E+02	1.09E-01	1.26E+00
71	O^{-}	0.00E+00	0.00E+00	0.00E+00	2.43E-07	0.00E+00	0.00E+00	2.43E-07	1.10E-10	1.28E-09
72	OH^{-}	8.75E-12	1.24E-12	1.40E-07	0.00E+00	0.00E+00	0.00E+00	1.40E-07	6.37E-11	7.37E-10
73	$OH(b)^{-}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: C-49

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J
74	Pb^{+2}	0.00E+00	0.00E+00	0.00E+00	2.82E-10	0.00E+00	0.00E+00	2.82E-10	1.28E-13	1.48E-12
75	Pd^{+2}	0.00E+00	0.00E+00	0.00E+00	1.17E-13	0.00E+00	0.00E+00	1.17E-13	5.31E-17	6.14E-16
76	PO_4^{-3}	0.00E+00	0.00E+00	0.00E+00	3.14E-08	0.00E+00	0.00E+00	3.14E-08	1.43E-11	1.65E-10
77	Resin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78	Rh^{+3}	0.00E+00	0.00E+00	0.00E+00	1.16E-11	0.00E+00	0.00E+00	1.16E-11	5.27E-15	6.10E-14
79	Ru^{+3}	0.00E+00	0.00E+00	0.00E+00	2.04E-10	0.00E+00	0.00E+00	2.04E-10	9.29E-14	1.08E-12
80	S^{+6}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	SiO2	0.00E+00	0.00E+00	0.00E+00	5.16E-08	0.00E+00	0.00E+00	5.16E-08	2.34E-11	2.71E-10
82	SiO_4^{-4}	0.00E+00	0.00E+00	0.00E+00	2.77E-23	0.00E+00	0.00E+00	2.77E-23	1.26E-26	1.46E-25
83	SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	SO_4^{-2}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85	Sr^{+2}	0.00E+00	0.00E+00	0.00E+00	2.10E-13	0.00E+00	0.00E+00	2.10E-13	9.56E-17	1.11E-15
86	Sucrose	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
87	Ti^{+4}	0.00E+00	0.00E+00	0.00E+00	2.63E-11	0.00E+00	0.00E+00	2.63E-11	1.20E-14	1.38E-13
88	Zn^{+2}	0.00E+00	0.00E+00	0.00E+00	1.39E-08	0.00E+00	0.00E+00	1.39E-08	6.31E-12	7.31E-11
89	Zr^{+4}	0.00E+00	0.00E+00	0.00E+00	4.49E-09	0.00E+00	0.00E+00	4.49E-09	2.04E-12	2.36E-11
90										
91	Components	Aqueous Comp.			Solid Comp	Gaseous		Total Comp		
92	Unit	mol/L	Lb/gal	Lb/day	Lb/day	mol/L	Lb/day	Lb/day	Mt/day	g/sec
93	Total	0.00E+00	0.00E+00	0.00E+00	4.61E-07	0.00E+00	0.00E+00	4.61E-07	2.10E-10	2.43E-09
94	$C_2O_4^{-2}$	0.00E+00	0.00E+00	0.00E+00	4.61E-07	0.00E+00	0.00E+00	4.61E-07	2.10E-10	2.43E-09
95	Formate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Glycolate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
98	IDA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
99	Citrate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100	HEDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101	EDTA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
102										
103	Rad. Comp	Aqueous Rad. Comp			Solids Rad. Comp (1)			Total Rad. Comp (1)		
104	Unit	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day	Ci/L	Ci/day	Lb/day
105	Total	0.00E+00	0.00E+00	0.00E+00	2.45E-13	1.05E-07	8.58E-09	2.45E-13	1.05E-07	8.58E-09
106	^{241}Am	0.00E+00	0.00E+00	0.00E+00	1.21E-16	5.16E-11	3.32E-14	1.21E-16	5.16E-11	3.32E-14
107	^{243}Am	0.00E+00	0.00E+00	0.00E+00	7.85E-20	3.35E-14	3.70E-16	7.85E-20	3.35E-14	3.70E-16
108	^{14}C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109	^{60}Co	0.00E+00	0.00E+00	0.00E+00	8.38E-17	3.58E-11	6.97E-17	8.38E-17	3.58E-11	6.97E-17
110	^{243}Cm	0.00E+00	0.00E+00	0.00E+00	5.51E-21	2.35E-15	1.03E-19	5.51E-21	2.35E-15	1.03E-19
111	^{244}Cm	0.00E+00	0.00E+00	0.00E+00	1.30E-19	5.55E-14	1.51E-18	1.30E-19	5.55E-14	1.51E-18
112	^{137}Cs	0.00E+00	0.00E+00	0.00E+00	5.63E-14	2.40E-08	6.10E-13	5.63E-14	2.40E-08	6.10E-13
113	^{152}Eu	0.00E+00	0.00E+00	0.00E+00	3.60E-19	1.54E-13	1.95E-18	3.60E-19	1.54E-13	1.95E-18
114	^{154}Eu	0.00E+00	0.00E+00	0.00E+00	7.45E-17	3.18E-11	2.59E-16	7.45E-17	3.18E-11	2.59E-16
115	^{155}Eu	0.00E+00	0.00E+00	0.00E+00	2.15E-17	9.19E-12	4.17E-17	2.15E-17	9.19E-12	4.17E-17
116	^{3}H	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	^{129}I	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
118	^{63}Ni	0.00E+00	0.00E+00	0.00E+00	2.72E-15	1.16E-09	4.51E-14	2.72E-15	1.16E-09	4.51E-14
119	^{237}Np	0.00E+00	0.00E+00	0.00E+00	3.79E-20	1.62E-14	5.06E-14	3.79E-20	1.62E-14	5.06E-14
120	^{238}Pu	0.00E+00	0.00E+00	0.00E+00	2.14E-19	9.15E-14	1.18E-17	2.14E-19	9.15E-14	1.18E-17
121	^{239}Pu	0.00E+00	0.00E+00	0.00E+00	2.96E-18	1.26E-12	4.49E-14	2.96E-18	1.26E-12	4.49E-14
122	^{240}Pu	0.00E+00	0.00E+00	0.00E+00	7.67E-19	3.28E-13	3.18E-15	7.67E-19	3.28E-13	3.18E-15
123	^{241}Pu	0.00E+00	0.00E+00	0.00E+00	1.61E-17	6.88E-12	1.47E-16	1.61E-17	6.88E-12	1.47E-16
124	^{242}Pu	0.00E+00	0.00E+00	0.00E+00	8.12E-23	3.47E-17	1.94E-17	8.12E-23	3.47E-17	1.94E-17
125	^{125}Sb	0.00E+00	0.00E+00	0.00E+00	1.22E-15	5.21E-10	1.11E-15	1.22E-15	5.21E-10	1.11E-15
126	^{151}Sm	0.00E+00	0.00E+00	0.00E+00	5.36E-17	2.29E-11	1.92E-15	5.36E-17	2.29E-11	1.92E-15
127	^{126}Sn	0.00E+00	0.00E+00	0.00E+00	7.06E-19	3.01E-13	5.85E-14	7.06E-19	3.01E-13	5.85E-14
128	^{90}Sr	0.00E+00	0.00E+00	0.00E+00	3.10E-14	1.32E-08	2.11E-13	3.10E-14	1.32E-08	2.11E-13
129	^{99}Tc	0.00E+00	0.00E+00	0.00E+00	1.53E-13	6.54E-08	8.51E-09	1.53E-13	6.54E-08	8.51E-09
130	^{232}Th	0.00E+00	0.00E+00	0.00E+00	6.70E-22	2.86E-16	5.73E-12	6.70E-22	2.86E-16	5.73E-12
131	^{233}U	0.00E+00	0.00E+00	0.00E+00	3.88E-20	1.65E-14	3.79E-15	3.88E-20	1.65E-14	3.79E-15
132	^{234}U	0.00E+00	0.00E+00	0.00E+00	2.71E-20	1.16E-14	4.11E-15	2.71E-20	1.16E-14	4.11E-15
133	^{235}U	0.00E+00	0.00E+00	0.00E+00	1.07E-21	4.56E-16	4.65E-13	1.07E-21	4.56E-16	4.65E-13
134	^{236}U	0.00E+00	0.00E+00	0.00E+00	1.83E-21	7.81E-16	2.66E-14	1.83E-21	7.81E-16	2.66E-14
135	^{238}U	0.00E+00	0.00E+00	0.00E+00	2.12E-20	9.04E-15	5.93E-11	2.12E-20	9.04E-15	5.93E-11
136	(1) All radionuclides in gaseous streams are assumed to exist as solid particulate.									

Attachment D - Calculations

BY: E. Berrios
DATE: 12/22/05

CALCULATION SHEET

PROJECT: WTP
JOB NO : 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV:0
SHEET NO.:D-2

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	**Table D-1 Feed Rate Calculation**							LAW & HLW Solids						Total						
2	LAW & HLW Supernate			Represent		FRP01			Solids	Solids	Solids	Liquid	Liquid	FRP14	Feed rates					
3	Non-Rep Const	MW	mol/mol Na	Compound	mol/l	mol/hr			mol/mol Na	mol/l	mol/hr	mol/l	mol/hr	mol/hr						
4	Be	9.0	1.56E-05	Zr	6.24E-05	5.84E-02		Be	2.60E-04	1.04E-03	3.88E-02	6.24E-05	1.02E-01	1.41E-01	LAW Na mol	4.00	mol/l			
5	CN	26.0	1.66E-05	PO4	6.64E-05	6.21E-02		CN	7.10E-05	2.84E-04	1.06E-02	6.64E-05	1.09E-01	1.19E-01	LAW Flow	33.0	ft^3/hr	935	L/hr	FRP01
6	Co	58.9	1.28E-05	60Co	5.12E-05	4.79E-02		Co	8.18E-05	3.27E-04	1.22E-02	5.12E-05	8.38E-02	9.60E-02	HLW Liquid Flow	57.8	ft^3/hr	1637	L/hr	FRP14
7	Mo	95.9	6.45E-05	Bi	2.58E-04	2.41E-01		Mo	6.86E-05	2.74E-04	1.02E-02	2.58E-04	4.22E-01	4.33E-01	HLW Na mol	4.00	mol/l			
8	Sb	121.7	1.27E-05	Sb-125	5.08E-05	4.75E-02		Sb	2.06E-05	8.24E-05	3.08E-03	5.08E-05	8.32E-02	8.62E-02	HLW % solids	4.6	%			
9	Se	78.9	3.36E-05	F	1.34E-04	1.26E-01		Se	5.48E-05	2.19E-04	8.19E-03	1.34E-04	2.20E-01	2.28E-01	HLW density	1.25	g/cm^3			
10	Sn	118.7	3.20E-07	Sn-126	1.28E-06	1.20E-03		Sn	5.28E-05	2.11E-04	7.88E-03	1.28E-06	2.10E-03	9.98E-03	Stream density adj	1.31	g/cm^3			
11	Ta	180.9	1.13E-08	Zr	4.52E-06	4.23E-03		Ta	8.92E-04	3.57E-03	1.33E-01	4.52E-06	7.40E-03	1.41E-01	HLW solids density	2.6	g/cm^3			
12	Tl	204.3	9.13E-06	F	3.65E-05	3.42E-02		Tl	2.41E-05	9.64E-05	3.60E-03	3.65E-05	5.98E-02	6.34E-02	HLW solids rate	5048	lb/d			
13	U	238.0	5.23E-05	234U	2.09E-04	1.96E-01		U	1.09E-02	4.36E-02	1.63E+00	2.09E-04	3.42E-01	1.97E+00	HLW solids vol	1.3	ft^3/hr	37	L/hr	
14	V	50.9	2.02E-05	Bi	8.08E-05	7.56E-02		V	8.16E-05	3.26E-04	1.22E-02	8.08E-05	1.32E-01	1.44E-01						
15	W	183.8	9.80E-06	Zr	3.92E-05	3.67E-02		W	1.72E-04	6.88E-04	2.57E-02	3.92E-05	6.42E-02	8.99E-02						
16	Y	88.9	2.19E-06	Sr-90	8.76E-06	8.19E-03		Y	1.98E-04	7.92E-04	2.96E-02	8.76E-06	1.43E-02	4.39E-02						
17			Bq/mol Na		Bq/l	Bq/hr			Bq/mol Na	Bq/l	Bq/hr	Bq/l	Bq/hr	Bq/hr						
18	106Ru	106	1.17E+05	F	4.68E+05	4.38E+08		106Ru	7.02E+05	2.81E+06	1.05E+08	4.68E+05	7.66E+08	8.71E+08						
19	113mCd	113	1.81E+05	Cd	7.24E+05	6.77E+08		113mCd	5.31E+06	2.12E+07	7.93E+08	7.24E+05	1.19E+09	1.98E+09						
20	134Cs	134	1.96E+06	137Cs	7.84E+06	7.33E+09		134Cs	1.69E+06	6.76E+06	2.52E+08	7.84E+06	1.28E+10	1.31E+10						
21	137mBa	137	6.52E+09	137Cs	2.61E+10	2.44E+13		137mBa	4.80E+09	1.92E+10	7.17E+11	2.61E+10	4.27E+13	4.34E+13						
22	226Ra	226	3.48E-01	Zr	1.39E+00	1.30E+03		226Ra	7.07E+00	2.83E+01	1.06E+03	1.39E+00	2.28E+03	3.33E+03						
23	227Ac	227	2.71E+01	Zr	1.08E+02	1.01E+05		227Ac	2.77E+04	1.11E+05	4.14E+06	1.08E+02	1.77E+05	4.32E+06						
24	228Ra	228	4.13E+02	Zr	1.65E+03	1.55E+06		228Ra	2.03E+04	8.12E+04	3.03E+06	1.65E+03	2.70E+06	5.74E+06						
25	229Th	229	1.36E+01	232Th	5.44E+01	5.09E+04		229Th	7.58E+03	3.03E+04	1.13E+06	5.44E+01	8.90E+04	1.22E+06						
26	231Pa	231	2.85E+02	Zr	1.14E+03	1.07E+06		231Pa	2.33E+03	9.32E+03	3.48E+05	1.14E+03	1.87E+06	2.21E+06						
27	232U	232	3.60E+01	233U	1.44E+02	1.35E+05		232U	3.10E+04	1.24E+05	4.63E+06	1.44E+02	2.36E+05	4.87E+06						
28	59Ni	59	9.55E+04	63Ni	3.82E+05	3.57E+08		59Ni	4.13E+05	1.65E+06	6.17E+07	3.82E+05	6.25E+08	6.87E+08						
29	79Se	79	4.60E+03	F	1.84E+04	1.72E+07		79Se	7.18E+04	2.87E+05	1.07E+07	1.84E+04	3.01E+07	4.08E+07						
30	90Y	90	3.74E+08	90Sr	1.50E+09	1.40E+12		90Y	7.57E+10	3.03E+11	1.13E+13	1.50E+09	2.45E+12	1.38E+13						
31	93Zr	93	2.66E+05	Zr	1.06E+06	9.95E+08		93Zr	2.86E+06	1.14E+07	4.27E+08	1.06E+06	1.74E+09	2.17E+09						
32	93mNb	93	1.64E+05	Zr	6.56E+05	6.14E+08		93mNb	1.55E+06	6.20E+06	2.32E+08	6.56E+05	1.07E+09	1.31E+09						
33	242Cm	242	1.05E+04	243Cm	4.20E+04	3.93E+07		242Cm	3.40E+05	1.36E+06	5.08E+07	4.20E+04	6.87E+07	1.20E+08						
34																				
35	Tin Calc																			
36	126Sn	4.08E+04	Bq/mol Na LAW Feed		1.10E-06	Ci/mol Na														
37		6.72E+06	Bq/mol Na HLW Feed		1.82E-04	Ci/mol Na														
38		2.90E+01	Ci Sn/kg Sn																	
39		3.80E-08	kg/mol Na LAW																	
40		6.26E-06	kg/mol Na HLW																	
41		118.71	g/mol																	
42		3.20E-07	mol/mol Na LAW																	
43		5.28E-05	mol/mol Na HLW																	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: D-3

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Table D-2 PJV04 Calculation**									Unabated PT- RFD/PJM			
2			Total feed			Representatives			PJV04	Performance	Non-Rep Const	Non-Rep Const	
3	Non-Rep Const	MW	mol/hr	lb/d			Feed Rate	Units	Rate	Factor	g/sec	Corrected	Units
4	Be	9.0	1.99E-01	9.47E-02		Zr+4	1.25E+02	lb/d	4.49E-04	2.78E+05	1.79E-09	1.79E-09	g/sec
5	CN	26.0	1.81E-01	2.49E-01		PO4-3	3.24E+02	lb/d	7.57E-04	4.28E+05	3.06E-09	3.06E-09	g/sec
6	Co	58.9	1.44E-01	4.48E-01		60Co	9.63E+01	Ci/d	3.44E-04	2.80E+05	8.40E-09	8.40E-09	g/sec
7	Mo	95.9	6.74E-01	3.41E+00		Bi+3	1.76E+01	lb/d	6.20E-05	2.84E+05	6.32E-08	6.32E-08	g/sec
8	Sb	121.7	1.34E-01	8.59E-01		125Sb	3.18E+02	Ci/d	1.11E-03	2.86E+05	1.58E-08	1.58E-08	g/sec
9	Se	78.9	3.54E-01	1.47E+00		F-	1.35E+02	lb/d	3.75E-04	3.60E+05	2.15E-08	2.15E-08	g/sec
10	Sn	118.7	1.12E-02	7.01E-02		126Sn	1.69E+00	Ci/d	5.51E-06	3.06E+05	1.20E-09	1.20E-09	g/sec
11	Ta	180.9	1.45E-01	1.38E+00		Zr+4	1.25E+02	lb/d	4.49E-04	2.78E+05	2.62E-08	2.62E-08	g/sec
12	Tl	204.3	9.75E-02	1.05E+00		F-	1.35E+02	lb/d	3.75E-04	3.60E+05	1.54E-08	1.54E-08	g/sec
13	U	238.0	2.17E+00	2.72E+01		234U	1.08E-01	Ci/d	3.71E-07	2.93E+05	4.90E-07	4.90E-07	g/sec
14	V	50.9	2.20E-01	5.91E-01		Bi+3	1.76E+01	lb/d	6.20E-05	2.84E+05	1.09E-08	1.09E-08	g/sec
15	W	183.8	1.27E-01	1.23E+00		Zr+4	1.25E+02	lb/d	4.49E-04	2.78E+05	2.32E-08	2.32E-08	g/sec
16	Y	88.9	5.21E-02	2.45E-01		90Sr	9.92E+04	Ci/d	3.45E-01	2.87E+05	4.48E-09	4.48E-09	g/sec
17			Bq/hr	Ci/d							Ci/d		
18	106Ru	106	1.31E+09	8.49E-01		F-	1.35E+02	lb/d	3.75E-04	3.60E+05	2.36E-06	8.61E-04	Ci/yr
19	113mCd	113	2.66E+09	1.72E+00		Cd+2	1.26E+01	lb/d	4.82E-05	2.61E+05	6.60E-06	2.41E-03	Ci/yr
20	134Cs	134	2.04E+10	1.32E+01		137Cs	1.48E+05	Ci/d	3.29E-01	4.50E+05	2.94E-05	1.07E-02	Ci/yr
21	137mBa	137	6.78E+13	4.40E+04		137Cs	1.48E+05	Ci/d	3.29E-01	4.50E+05	9.77E-02	3.57E+01	Ci/yr
22	226Ra	226	4.64E+03	3.01E-06		Zr+4	1.25E+02	lb/d	4.49E-04	2.78E+05	1.08E-11	3.95E-09	Ci/yr
23	227Ac	227	4.42E+06	2.87E-03		Zr+4	1.25E+02	lb/d	4.49E-04	2.78E+05	1.03E-08	3.76E-06	Ci/yr
24	228Ra	228	7.28E+06	4.72E-03		Zr+4	1.25E+02	lb/d	4.49E-04	2.78E+05	1.70E-08	6.20E-06	Ci/yr
25	229Th	229	1.27E+06	8.25E-04		232Th	2.34E-02	Ci/d	8.40E-08	2.79E+05	2.96E-09	1.08E-06	Ci/yr
26	231Pa	231	3.28E+06	2.13E-03		Zr+4	1.25E+02	lb/d	4.49E-04	2.78E+05	7.65E-09	2.79E-06	Ci/yr
27	232U	232	5.00E+06	3.24E-03		233U	1.90E+00	Ci/d	6.84E-06	2.77E+05	1.17E-08	4.27E-06	Ci/yr
28	59Ni	59	1.04E+09	6.77E-01		63Ni	6.07E+01	Ci/d	1.27E-04	4.78E+05	1.42E-06	5.18E-04	Ci/yr
29	79Se	79	5.81E+07	3.77E-02		F-	1.35E+02	lb/d	3.75E-04	3.60E+05	1.05E-07	3.82E-05	Ci/yr
30	90Y	90	1.52E+13	9.83E+03		90Sr	9.92E+04	Ci/d	3.45E-01	2.87E+05	3.42E-02	1.25E+01	Ci/yr
31	93Zr	93	3.16E+09	2.05E+00		Zr+4	1.25E+02	lb/d	4.49E-04	2.78E+05	7.38E-06	2.69E-03	Ci/yr
32	93mNb	93	1.92E+09	1.24E+00		Zr+4	1.25E+02	lb/d	4.49E-04	2.78E+05	4.48E-06	1.63E-03	Ci/yr
33	242Cm	242	1.59E+08	1.03E-01		243Cm	1.19E+00	Ci/d	4.30E-06	2.76E+05	3.73E-07	1.36E-04	Ci/yr

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Table D-3 PVP01 Calculation**									Unabated PT- VV			
2			Total feed			Representatives			PVP01	Performance	Non-Rep Const	Non-Rep Const	
3	Non-Rep Const	MW	mol/hr	lb/d			Feed Rate	Units	Rate	Factor	g/sec	Corrected	Units
4	Be	9.0	1.99E-01	9.47E-02		Zr+4	1.25E+02	lb/d	6.18E-04	2.02E+05	2.47E-09	2.47E-09	g/sec
5	CN	26.0	1.81E-01	2.49E-01		PO4-3	3.24E+02	lb/d	2.13E-03	1.52E+05	8.60E-09	8.60E-09	g/sec
6	Co	58.9	1.44E-01	4.48E-01		60Co	9.63E+01	Ci/d	4.13E-04	2.33E+05	1.01E-08	1.01E-08	g/sec
7	Mo	95.9	6.74E-01	3.41E+00		Bi+3	1.76E+01	lb/d	4.68E-05	3.76E+05	4.77E-08	4.77E-08	g/sec
8	Sb	121.7	1.34E-01	8.59E-01		125Sb	3.18E+02	Ci/d	8.40E-04	3.79E+05	1.19E-08	1.19E-08	g/sec
9	Se	78.9	3.54E-01	1.47E+00		F-	1.35E+02	lb/d	5.62E-04	2.40E+05	3.23E-08	3.23E-08	g/sec
10	Sn	118.7	1.12E-02	7.01E-02		126Sn	1.69E+00	Ci/d	4.82E-06	3.50E+05	1.05E-09	1.05E-09	g/sec
11	Ta	180.9	1.45E-01	1.38E+00		Zr+4	1.25E+02	lb/d	6.18E-04	2.02E+05	3.60E-08	3.60E-08	g/sec
12	Tl	204.3	9.75E-02	1.05E+00		F-	1.35E+02	lb/d	5.62E-04	2.40E+05	2.31E-08	2.31E-08	g/sec
13	U	238.0	2.17E+00	2.72E+01		234U	1.08E-01	Ci/d	4.93E-07	2.20E+05	6.51E-07	6.51E-07	g/sec
14	V	50.9	2.20E-01	5.91E-01		Bi+3	1.76E+01	lb/d	4.68E-05	3.76E+05	8.27E-09	8.27E-09	g/sec
15	W	183.8	1.27E-01	1.23E+00		Zr+4	1.25E+02	lb/d	6.18E-04	2.02E+05	3.20E-08	3.20E-08	g/sec
16	Y	88.9	5.21E-02	2.45E-01		90Sr	9.92E+04	Ci/d	2.62E-01	3.79E+05	3.40E-09	3.40E-09	g/sec
17			Bq/hr	Ci/d							Ci/d		
18	106Ru	106	1.31E+09	8.49E-01		F-	1.35E+02	lb/d	5.62E-04	2.40E+05	3.54E-06	1.29E-03	Ci/yr
19	113mCd	113	2.66E+09	1.72E+00		Cd+2	1.26E+01	lb/d	3.73E-05	3.37E+05	5.11E-06	1.86E-03	Ci/yr
20	134Cs	134	2.04E+10	1.32E+01		137Cs	1.48E+05	Ci/d	4.00E-01	3.69E+05	3.58E-05	1.31E-02	Ci/yr
21	137mBa	137	6.78E+13	4.40E+04		137Cs	1.48E+05	Ci/d	4.00E-01	3.69E+05	1.19E-01	4.34E+01	Ci/yr
22	226Ra	226	4.64E+03	3.01E-06		Zr+4	1.25E+02	lb/d	6.18E-04	2.02E+05	1.49E-11	5.43E-09	Ci/yr
23	227Ac	227	4.42E+06	2.87E-03		Zr+4	1.25E+02	lb/d	6.18E-04	2.02E+05	1.42E-08	5.17E-06	Ci/yr
24	228Ra	228	7.28E+06	4.72E-03		Zr+4	1.25E+02	lb/d	6.18E-04	2.02E+05	2.34E-08	8.53E-06	Ci/yr
25	229Th	229	1.27E+06	8.25E-04		232Th	2.34E-02	Ci/d	9.99E-08	2.35E+05	3.52E-09	1.28E-06	Ci/yr
26	231Pa	231	3.28E+06	2.13E-03		Zr+4	1.25E+02	lb/d	6.18E-04	2.02E+05	1.05E-08	3.84E-06	Ci/yr
27	232U	232	5.00E+06	3.24E-03		233U	1.90E+00	Ci/d	8.02E-06	2.37E+05	1.37E-08	5.00E-06	Ci/yr
28	59Ni	59	1.04E+09	6.77E-01		63Ni	6.07E+01	Ci/d	2.51E-04	2.42E+05	2.80E-06	1.02E-03	Ci/yr
29	79Se	79	5.81E+07	3.77E-02		F-	1.35E+02	lb/d	5.62E-04	2.40E+05	1.57E-07	5.72E-05	Ci/yr
30	90Y	90	1.52E+13	9.83E+03		90Sr	9.92E+04	Ci/d	2.62E-01	3.79E+05	2.60E-02	9.48E+00	Ci/yr
31	93Zr	93	3.16E+09	2.05E+00		Zr+4	1.25E+02	lb/d	6.18E-04	2.02E+05	1.02E-05	3.71E-03	Ci/yr
32	93mNb	93	1.92E+09	1.24E+00		Zr+4	1.25E+02	lb/d	6.18E-04	2.02E+05	6.16E-06	2.25E-03	Ci/yr
33	242Cm	242	1.59E+08	1.03E-01		243Cm	1.19E+00	Ci/d	5.00E-06	2.38E+05	4.33E-07	1.58E-04	Ci/yr

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: D-5

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**Table D-4 LFP04 Calculation**									Unabated LAW Melter Feed						
2			Total feed			Representatives*			LFP04	Performance	Non-Rep Const	Non-Rep Const				
3	Non-Rep Const	MW	mol/hr	lb/d			Feed Rate	Units	Rate	Factor	g/sec	Corrected	Units			
4	Be	9.0	1.99E-01	9.47E-02		Zr+4	1.25E+02	lb/d	9.09E+00	1.37E+01	3.63E-05	3.63E-05	g/sec			
5	CN	26.0	1.81E-01	2.49E-01		PO4-3	3.24E+02	lb/d	2.25E+02	1.44E+00	9.09E-04	9.09E-04	g/sec			
6	Co	58.9	1.44E-01	4.48E-01		60Co	9.63E+01	Ci/d	2.41E+00	4.00E+01	5.89E-05	5.89E-05	g/sec			
7	Mo	95.9	6.74E-01	3.41E+00		Bi+3	1.76E+01	lb/d	9.60E-01	1.84E+01	9.77E-04	9.77E-04	g/sec			
8	Sb	121.7	1.34E-01	8.59E-01		125Sb	3.18E+02	Ci/d	1.68E+01	1.89E+01	2.39E-04	2.39E-04	g/sec			
9	Se	78.9	3.54E-01	1.47E+00		F-	1.35E+02	lb/d	8.80E+01	1.53E+00	5.05E-03	5.05E-03	g/sec			
10	Sn	118.7	1.12E-02	7.01E-02		126Sn	1.69E+00	Ci/d	2.65E-01	6.36E+00	5.80E-05	5.80E-05	g/sec			
11	Ta	180.9	1.45E-01	1.38E+00		Zr+4	1.25E+02	lb/d	9.09E+00	1.37E+01	5.30E-04	5.30E-04	g/sec			
12	Tl	204.3	9.75E-02	1.05E+00		F-	1.35E+02	lb/d	8.80E+01	1.53E+00	3.61E-03	3.61E-03	g/sec			
13	U	238.0	2.17E+00	2.72E+01		234U	1.08E-01	Ci/d	1.02E-02	1.06E+01	1.35E-02	1.35E-02	g/sec			
14	V	50.9	2.20E-01	5.91E-01		Bi+3	1.76E+01	lb/d	9.60E-01	1.84E+01	1.69E-04	1.69E-04	g/sec			
15	W	183.8	1.27E-01	1.23E+00		Zr+4	1.25E+02	lb/d	9.09E+00	1.37E+01	4.70E-04	4.70E-04	g/sec			
16	Y	88.9	5.21E-02	2.45E-01		90Sr	9.92E+04	Ci/d	5.82E+03	1.70E+01	7.55E-05	7.55E-05	g/sec			
17			Bq/hr	Ci/d							Ci/d					
18	106Ru	106	1.31E+09	8.49E-01		F-	1.35E+02	lb/d	8.80E+01	1.53E+00	5.53E-01	2.02E+02	Ci/yr	Ratio to GFC Addition		
19	113mCd	113	2.66E+09	1.72E+00		Cd+2	1.26E+01	lb/d	1.05E+00	1.19E+01	1.44E-01	5.27E+01	Ci/yr	GFC Zr	2.49E+03	lb/day
20	134Cs	134	2.04E+10	1.32E+01		137Cs	1.48E+05	Ci/d	1.19E+01	1.24E+04	1.07E-03	3.90E-01	Ci/yr	CRV Zr	9.09E+00	
21	137mBa	137	6.78E+13	4.40E+04		137Cs	1.48E+05	Ci/d	1.19E+01	1.24E+04	3.55E+00	1.29E+03	Ci/yr	Ratio	3.64E-03	
22	226Ra	226	4.64E+03	3.01E-06		Zr+4	1.25E+02	lb/d	9.09E+00	1.37E+01	2.19E-07	7.99E-05	Ci/yr			
23	227Ac	227	4.42E+06	2.87E-03		Zr+4	1.25E+02	lb/d	9.09E+00	1.37E+01	2.09E-04	7.61E-02	Ci/yr			
24	228Ra	228	7.28E+06	4.72E-03		Zr+4	1.25E+02	lb/d	9.09E+00	1.37E+01	3.44E-04	1.26E-01	Ci/yr			
25	229Th	229	1.27E+06	8.25E-04		232Th	2.34E-02	Ci/d	5.33E-04	4.40E+01	1.88E-05	6.85E-03	Ci/yr			
26	231Pa	231	3.28E+06	2.13E-03		Zr+4	1.25E+02	lb/d	9.09E+00	1.37E+01	1.55E-04	5.65E-02	Ci/yr			
27	232U	232	5.00E+06	3.24E-03		233U	1.90E+00	Ci/d	1.46E-02	1.30E+02	2.49E-05	9.09E-03	Ci/yr			
28	59Ni	59	1.04E+09	6.77E-01		63Ni	6.07E+01	Ci/d	4.35E+01	1.39E+00	4.86E-01	1.77E+02	Ci/yr			
29	79Se	79	5.81E+07	3.77E-02		F-	1.35E+02	lb/d	8.80E+01	1.53E+00	2.45E-02	8.96E+00	Ci/yr			
30	90Y	90	1.52E+13	9.83E+03		90Sr	9.92E+04	Ci/d	5.82E+03	1.70E+01	5.77E+02	2.11E+05	Ci/yr			
31	93Zr	93	3.16E+09	2.05E+00		Zr+4	1.25E+02	lb/d	9.09E+00	1.37E+01	1.49E-01	5.45E+01	Ci/yr			
32	93mNb	93	1.92E+09	1.24E+00		Zr+4	1.25E+02	lb/d	9.09E+00	1.37E+01	9.06E-02	3.31E+01	Ci/yr			
33	242Cm	242	1.59E+08	1.03E-01		243Cm	1.19E+00	Ci/d	2.07E-03	5.75E+02	1.79E-04	6.54E-02	Ci/yr			
34						* Zr+4 feed rates are corrected with the feed to glass former addition ratio										

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F
1	**Table D-5 LMP06 Calculation**					
2		LFP04		LMP06	LMP06	
3		Mass Rate	Melter	Mass Rate	Mass Rate	
4	Non-Rep Const	g/sec	DF	g/sec	Corrected	Units
5	Be	3.63E-05	200	1.81E-07	1.81E-07	g/sec
6	CN	9.09E-04	40	2.27E-05	2.27E-05	g/sec
7	Co	5.89E-05	200	2.95E-07	2.95E-07	g/sec
8	Mo	9.77E-04	80	1.22E-05	1.22E-05	g/sec
9	Sb	2.39E-04	80	2.99E-06	2.99E-06	g/sec
10	Se	5.05E-03	1.7	2.97E-03	2.97E-03	g/sec
11	Sn	5.80E-05	200	2.90E-07	2.90E-07	g/sec
12	Ta	5.30E-04	250	2.12E-06	2.12E-06	g/sec
13	Tl	3.61E-03	6	6.01E-04	6.01E-04	g/sec
14	U	1.35E-02	200	6.73E-05	6.73E-05	g/sec
15	V	1.69E-04	80	2.12E-06	2.12E-06	g/sec
16	W	4.70E-04	250	1.88E-06	1.88E-06	g/sec
17	Y	7.55E-05	100	7.55E-07	7.55E-07	g/sec
18		Ci/yr		Ci/yr		
19	106Ru	2.02E+02	3.9	5.18E+01	5.18E+01	Ci/yr
20	113mCd	5.27E+01	10	5.27E+00	5.27E+00	Ci/yr
21	134Cs	3.90E-01	2	1.95E-01	1.95E-01	Ci/yr
22	137mBa	1.29E+03	2	6.47E+02	6.47E+02	Ci/yr
23	226Ra	7.99E-05	6	1.33E-05	1.33E-05	Ci/yr
24	227Ac	7.61E-02	1370	5.56E-05	5.56E-05	Ci/yr
25	228Ra	1.26E-01	6	2.09E-02	2.09E-02	Ci/yr
26	229Th	6.85E-03	250	2.74E-05	2.74E-05	Ci/yr
27	231Pa	5.65E-02	1370	4.13E-05	4.13E-05	Ci/yr
28	232U	9.09E-03	200	4.54E-05	4.54E-05	Ci/yr
29	59Ni	1.77E+02	89	1.99E+00	1.99E+00	Ci/yr
30	79Se	8.96E+00	1.7	5.27E+00	5.27E+00	Ci/yr
31	90Y	2.11E+05	100	2.11E+03	2.11E+03	Ci/yr
32	93Zr	5.45E+01	300	1.82E-01	1.82E-01	Ci/yr
33	93mNb	3.31E+01	1000	3.31E-02	3.31E-02	Ci/yr
34	242Cm	6.54E-02	200	3.27E-04	3.27E-04	Ci/yr

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: D-7

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Table D-6 LVP01 Calculation**									Unabated LAW VV			
2			Total feed			Representatives			LVP01	Performance	Non-Rep Const	Non-Rep Const	
3	Non-Rep Const	MW	mol/hr	lb/d			Feed Rate	Units	Rate	Factor	g/sec	corrected	Units
4	Be	9.0	1.99E-01	9.47E-02		Zr+4	6.57E-01	g/sec	2.64E-07	2.49E+06	3.80E-08	3.80E-08	g/sec
5	CN	26.0	1.81E-01	2.49E-01		PO4-3	1.70E+00	g/sec	3.47E-08	4.91E+07	5.07E-09	5.07E-09	g/sec
6	Co	58.9	1.44E-01	4.48E-01		60Co	9.63E+01	Ci/d	7.25E-08	1.33E+09	3.37E-10	3.37E-10	g/sec
7	Mo	95.9	6.74E-01	3.41E+00		Bi+3	9.27E-02	g/sec	1.52E-10	6.09E+08	5.60E-09	5.60E-09	g/sec
8	Sb	121.7	1.34E-01	8.59E-01		125Sb	3.18E+02	Ci/d	5.07E-07	6.28E+08	1.37E-09	1.37E-09	g/sec
9	Se	78.9	3.54E-01	1.47E+00		F-	7.10E-01	g/sec	1.46E-08	4.86E+07	3.03E-08	3.03E-08	g/sec
10	Sn	118.7	1.12E-02	7.01E-02		126Sn	1.69E+00	Ci/d	7.97E-09	2.12E+08	3.31E-10	3.31E-10	g/sec
11	Ta	180.9	1.45E-01	1.38E+00		Zr+4	6.57E-01	g/sec	2.64E-07	2.49E+06	5.56E-07	5.56E-07	g/sec
12	Tl	204.3	9.75E-02	1.05E+00		F-	7.10E-01	g/sec	1.46E-08	4.86E+07	2.16E-08	2.16E-08	g/sec
13	U	238.0	2.17E+00	2.72E+01		234U	1.08E-01	Ci/d	3.06E-10	3.54E+08	7.69E-08	7.69E-08	g/sec
14	V	50.9	2.20E-01	5.91E-01		Bi+3	9.27E-02	g/sec	1.52E-10	6.09E+08	9.71E-10	9.71E-10	g/sec
15	W	183.8	1.27E-01	1.23E+00		Zr+4	6.57E-01	g/sec	2.64E-07	2.49E+06	4.93E-07	4.93E-07	g/sec
16	Y	88.9	5.21E-02	2.45E-01		90Sr	9.92E+04	Ci/d	1.75E-04	5.66E+08	4.32E-10	4.32E-10	g/sec
17			Bq/hr	Ci/d							Ci/d		
18	106Ru	106	1.31E+09	8.49E-01		F-	7.10E-01	g/sec	1.46E-08	4.86E+07	1.75E-08	6.37E-06	Ci/yr
19	113mCd	113	2.66E+09	1.72E+00		Cd+2	6.61E-02	g/sec	1.68E-10	3.95E+08	4.36E-09	1.59E-06	Ci/yr
20	134Cs	134	2.04E+10	1.32E+01		137Cs	1.48E+05	Ci/d	4.41E-07	3.36E+11	3.95E-11	1.44E-08	Ci/yr
21	137mBa	137	6.78E+13	4.40E+04		137Cs	1.48E+05	Ci/d	4.41E-07	3.36E+11	1.31E-07	4.78E-05	Ci/yr
22	226Ra	226	4.64E+03	3.01E-06		Zr+4	6.57E-01	g/sec	2.64E-07	2.49E+06	1.21E-12	4.41E-10	Ci/yr
23	227Ac	227	4.42E+06	2.87E-03		Zr+4	6.57E-01	g/sec	2.64E-07	2.49E+06	1.15E-09	4.20E-07	Ci/yr
24	228Ra	228	7.28E+06	4.72E-03		Zr+4	6.57E-01	g/sec	2.64E-07	2.49E+06	1.90E-09	6.92E-07	Ci/yr
25	229Th	229	1.27E+06	8.25E-04		232Th	1.23E-04	Ci/d	1.50E-11	8.22E+06	1.00E-10	3.67E-08	Ci/yr
26	231Pa	231	3.28E+06	2.13E-03		Zr+4	6.57E-01	g/sec	2.64E-07	2.49E+06	8.54E-10	3.12E-07	Ci/yr
27	232U	232	5.00E+06	3.24E-03		233U	1.90E+00	Ci/d	4.38E-10	4.34E+09	7.48E-13	2.73E-10	Ci/yr
28	59Ni	59	1.04E+09	6.77E-01		63Ni	6.07E+01	Ci/d	1.31E-06	4.63E+07	1.46E-08	5.34E-06	Ci/yr
29	79Se	79	5.81E+07	3.77E-02		F-	7.10E-01	g/sec	1.46E-08	4.86E+07	7.74E-10	2.83E-07	Ci/yr
30	90Y	90	1.52E+13	9.83E+03		90Sr	9.92E+04	Ci/d	1.75E-04	5.66E+08	1.74E-05	6.34E-03	Ci/yr
31	93Zr	93	3.16E+09	2.05E+00		Zr+4	6.57E-01	g/sec	2.64E-07	2.49E+06	8.24E-07	3.01E-04	Ci/yr
32	93mNb	93	1.92E+09	1.24E+00		Zr+4	6.57E-01	g/sec	2.64E-07	2.49E+06	5.00E-07	1.82E-04	Ci/yr
33	242Cm	242	1.59E+08	1.03E-01		243Cm	1.19E+00	Ci/d	6.22E-11	1.91E+10	5.38E-12	1.96E-09	Ci/yr

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	**Table D-7 HFP03 Calculation**									Unabated HLW Melter Feed					
2			Total feed			Representatives*			HFP03	Performance	Non-Rep Const	Non-Rep Const			
3	Non-Rep Const	MW	mol/hr	lb/d			Feed Rate	Units	Rate	Factor	g/sec	corrected	Units		
4	Be	9.0	1.99E-01	9.47E-02		Zr+4	1.25E+02	lb/d	1.25E+02	1.00E+00	4.98E-04	4.98E-04	g/sec		
5	CN	26.0	1.81E-01	2.49E-01		PO4-3	3.24E+02	lb/d	1.30E+02	2.50E+00	5.25E-04	5.25E-04	g/sec		
6	Co	58.9	1.44E-01	4.48E-01		60Co	9.63E+01	Ci/d	9.52E+01	1.01E+00	2.33E-03	2.33E-03	g/sec		
7	Mo	95.9	6.74E-01	3.41E+00		Bi+3	1.76E+01	lb/d	1.70E+01	1.04E+00	1.73E-02	1.73E-02	g/sec		
8	Sb	121.7	1.34E-01	8.59E-01		125Sb	3.18E+02	Ci/d	3.05E+02	1.05E+00	4.33E-03	4.33E-03	g/sec		
9	Se	78.9	3.54E-01	1.47E+00		F-	1.35E+02	lb/d	7.32E+01	1.84E+00	4.20E-03	4.20E-03	g/sec		
10	Sn	118.7	1.12E-02	7.01E-02		126Sn	1.69E+00	Ci/d	1.43E+00	1.18E+00	3.13E-04	3.13E-04	g/sec		
11	Ta	180.9	1.45E-01	1.38E+00		Zr+4	1.25E+02	lb/d	1.25E+02	1.00E+00	7.27E-03	7.27E-03	g/sec		
12	Tl	204.3	9.75E-02	1.05E+00		F-	1.35E+02	lb/d	7.32E+01	1.84E+00	3.00E-03	3.00E-03	g/sec		
13	U	238.0	2.17E+00	2.72E+01		234U	1.08E-01	Ci/d	9.95E-02	1.09E+00	1.31E-01	1.31E-01	g/sec		
14	V	50.9	2.20E-01	5.91E-01		Bi+3	1.76E+01	lb/d	1.70E+01	1.04E+00	2.99E-03	2.99E-03	g/sec		
15	W	183.8	1.27E-01	1.23E+00		Zr+4	1.25E+02	lb/d	1.25E+02	1.00E+00	6.45E-03	6.45E-03	g/sec		
16	Y	88.9	5.21E-02	2.45E-01		90Sr	9.92E+04	Ci/d	9.44E+04	1.05E+00	1.22E-03	1.22E-03	g/sec		
17			Bq/hr	Ci/d							Ci/d				
18	106Ru	106	1.31E+09	8.49E-01		F-	1.35E+02	lb/d	7.32E+01	1.84E+00	4.60E-01	1.68E+02	Ci/yr	Ratio to GFC Addition	
19	113mCd	113	2.66E+09	1.72E+00		Cd+2	1.26E+01	lb/d	1.31E+01	9.61E-01	1.79E+00	6.54E+02	Ci/yr	GFC Zr	2.12E+01
20	134Cs	134	2.04E+10	1.32E+01		137Cs	1.48E+05	Ci/d	1.53E+05	9.67E-01	1.37E+01	5.00E+03	Ci/yr	MFPV Zr	1.25E+02
21	137mBa	137	6.78E+13	4.40E+04		137Cs	1.48E+05	Ci/d	1.53E+05	9.67E-01	4.55E+04	1.66E+07	Ci/yr	Ratio	8.55E-01
22	226Ra	226	4.64E+03	3.01E-06		Zr+4	1.25E+02	lb/d	1.25E+02	1.00E+00	3.00E-06	1.10E-03	Ci/yr		
23	227Ac	227	4.42E+06	2.87E-03		Zr+4	1.25E+02	lb/d	1.25E+02	1.00E+00	2.86E-03	1.04E+00	Ci/yr		
24	228Ra	228	7.28E+06	4.72E-03		Zr+4	1.25E+02	lb/d	1.25E+02	1.00E+00	4.72E-03	1.72E+00	Ci/yr		
25	229Th	229	1.27E+06	8.25E-04		232Th	2.34E-02	Ci/d	2.33E-02	1.01E+00	8.21E-04	3.00E-01	Ci/yr		
26	231Pa	231	3.28E+06	2.13E-03		Zr+4	1.25E+02	lb/d	1.25E+02	1.00E+00	2.12E-03	7.76E-01	Ci/yr		
27	232U	232	5.00E+06	3.24E-03		233U	1.90E+00	Ci/d	1.91E+00	9.95E-01	3.26E-03	1.19E+00	Ci/yr		
28	59Ni	59	1.04E+09	6.77E-01		63Ni	6.07E+01	Ci/d	1.76E+01	3.45E+00	1.96E-01	7.16E+01	Ci/yr		
29	79Se	79	5.81E+07	3.77E-02		F-	1.35E+02	lb/d	7.32E+01	1.84E+00	2.04E-02	7.45E+00	Ci/yr		
30	90Y	90	1.52E+13	9.83E+03		90Sr	9.92E+04	Ci/d	9.44E+04	1.05E+00	9.35E+03	3.41E+06	Ci/yr		
31	93Zr	93	3.16E+09	2.05E+00		Zr+4	1.25E+02	lb/d	1.25E+02	1.00E+00	2.05E+00	7.48E+02	Ci/yr		
32	93mNb	93	1.92E+09	1.24E+00		Zr+4	1.25E+02	lb/d	1.25E+02	1.00E+00	1.24E+00	4.54E+02	Ci/yr		
33	242Cm	242	1.59E+08	1.03E-01		243Cm	1.19E+00	Ci/d	1.20E+00	9.89E-01	1.04E-01	3.80E+01	Ci/yr		
34						* Zr+4 feed rates are corrected with the feed to glass former addition ratio									

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: D-9

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F
1	**Table D-8 HMP06 Calculation**					
2		HFP03		HMP06	HMP06	
3		Mass Rate	Melter	Mass Rate	Mass Rate	
4	Non-Rep Const	g/sec	DF	g/sec	Corrected	
5	Be	4.98E-04	130	3.83E-06	3.83E-06	g/sec
6	CN	5.25E-04	40	1.31E-05	1.31E-05	g/sec
7	Co	2.33E-03	130	1.79E-05	1.79E-05	g/sec
8	Mo	1.73E-02	64.6	2.67E-04	2.67E-04	g/sec
9	Sb	4.33E-03	100	4.33E-05	4.33E-05	g/sec
10	Se	4.20E-03	2.1	2.00E-03	2.00E-03	g/sec
11	Sn	3.13E-04	130	2.41E-06	2.41E-06	g/sec
12	Ta	7.27E-03	130	5.59E-05	5.59E-05	g/sec
13	Tl	3.00E-03	130	2.31E-05	2.31E-05	g/sec
14	U	1.31E-01	130	1.01E-03	1.01E-03	g/sec
15	V	2.99E-03	130	2.30E-05	2.30E-05	g/sec
16	W	6.45E-03	130	4.96E-05	4.96E-05	g/sec
17	Y	1.22E-03	100	1.22E-05	1.22E-05	g/sec
18				Ci/d		
19	106Ru	4.60E-01	3.9	1.18E-01	4.31E+01	Ci/yr
20	113mCd	1.79E+00	10	1.79E-01	6.54E+01	Ci/yr
21	134Cs	1.37E+01	26.6	5.15E-01	1.88E+02	Ci/yr
22	137mBa	4.55E+04	26.6	1.71E+03	6.24E+05	Ci/yr
23	226Ra	3.00E-06	130	2.31E-08	8.43E-06	Ci/yr
24	227Ac	2.86E-03	130	2.20E-05	8.03E-03	Ci/yr
25	228Ra	4.72E-03	130	3.63E-05	1.32E-02	Ci/yr
26	229Th	8.21E-04	130	6.31E-06	2.30E-03	Ci/yr
27	231Pa	2.12E-03	130	1.63E-05	5.97E-03	Ci/yr
28	232U	3.26E-03	130	2.51E-05	9.16E-03	Ci/yr
29	59Ni	1.96E-01	76.2	2.57E-03	9.39E-01	Ci/yr
30	79Se	2.04E-02	2.1	9.72E-03	3.55E+00	Ci/yr
31	90Y	9.35E+03	100	9.35E+01	3.41E+04	Ci/yr
32	93Zr	2.05E+00	81	2.53E-02	9.24E+00	Ci/yr
33	93mNb	1.24E+00	130	9.56E-03	3.49E+00	Ci/yr
34	242Cm	1.04E-01	130	8.02E-04	2.93E-01	Ci/yr

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Table D-9 HOP10 Calculation**									Unabated HLW VV			
2			Total feed			Representatives			HOP10	Performance	Non-Rep Const	Non-Rep Const	
3	Non-Rep Const	MW	mol/hr	lb/d			Feed Rate	Units	Rate	Factor	g/sec	corrected	Units
4	Be	9.0	1.99E-01	9.47E-02		Zr+4	1.25E+02	lb/d	2.92E-05	4.28E+06	1.16E-10	1.16E-10	g/sec
5	CN	26.0	1.81E-01	2.49E-01		PO4-3	3.24E+02	lb/d	2.60E-05	1.25E+07	1.05E-10	1.05E-10	g/sec
6	Co	58.9	1.44E-01	4.48E-01		60Co	9.63E+01	Ci/d	1.90E-05	5.06E+06	4.66E-10	4.66E-10	g/sec
7	Mo	95.9	6.74E-01	3.41E+00		Bi+3	1.76E+01	lb/d	3.40E-06	5.19E+06	3.46E-09	3.46E-09	g/sec
8	Sb	121.7	1.34E-01	8.59E-01		125Sb	3.18E+02	Ci/d	6.10E-05	5.22E+06	8.66E-10	8.66E-10	g/sec
9	Se	78.9	3.54E-01	1.47E+00		F-	1.35E+02	lb/d	1.48E-05	9.13E+06	8.49E-10	8.49E-10	g/sec
10	Sn	118.7	1.12E-02	7.01E-02		126Sn	1.69E+00	Ci/d	2.87E-07	5.88E+06	6.26E-11	6.26E-11	g/sec
11	Ta	180.9	1.45E-01	1.38E+00		Zr+4	1.25E+02	lb/d	2.92E-05	4.28E+06	1.70E-09	1.70E-09	g/sec
12	Tl	204.3	9.75E-02	1.05E+00		F-	1.35E+02	lb/d	1.48E-05	9.13E+06	6.06E-10	6.06E-10	g/sec
13	U	238.0	2.17E+00	2.72E+01		234U	1.08E-01	Ci/d	1.99E-08	5.44E+06	2.63E-08	2.63E-08	g/sec
14	V	50.9	2.20E-01	5.91E-01		Bi+3	1.76E+01	lb/d	3.40E-06	5.19E+06	5.99E-10	5.99E-10	g/sec
15	W	183.8	1.27E-01	1.23E+00		Zr+4	1.25E+02	lb/d	2.92E-05	4.28E+06	1.51E-09	1.51E-09	g/sec
16	Y	88.9	5.21E-02	2.45E-01		90Sr	9.92E+04	Ci/d	1.89E-02	5.25E+06	2.45E-10	2.45E-10	g/sec
17			Bq/hr	Ci/d							Ci/d		
18	106Ru	106	1.31E+09	8.49E-01		F-	1.35E+02	lb/d	1.48E-05	9.13E+06	9.29E-08	3.39E-05	Ci/yr
19	113mCd	113	2.66E+09	1.72E+00		Cd+2	1.26E+01	lb/d	2.63E-06	4.78E+06	3.60E-07	1.31E-04	Ci/yr
20	134Cs	134	2.04E+10	1.32E+01		137Cs	1.48E+05	Ci/d	3.07E-02	4.83E+06	2.74E-06	1.00E-03	Ci/yr
21	137mBa	137	6.78E+13	4.40E+04		137Cs	1.48E+05	Ci/d	3.07E-02	4.83E+06	9.11E-03	3.33E+00	Ci/yr
22	226Ra	226	4.64E+03	3.01E-06		Zr+4	1.25E+02	lb/d	2.92E-05	4.28E+06	7.03E-13	2.57E-10	Ci/yr
23	227Ac	227	4.42E+06	2.87E-03		Zr+4	1.25E+02	lb/d	2.92E-05	4.28E+06	6.70E-10	2.44E-07	Ci/yr
24	228Ra	228	7.28E+06	4.72E-03		Zr+4	1.25E+02	lb/d	2.92E-05	4.28E+06	1.10E-09	4.03E-07	Ci/yr
25	229Th	229	1.27E+06	8.25E-04		232Th	2.34E-02	Ci/d	4.67E-09	5.02E+06	1.64E-10	6.00E-08	Ci/yr
26	231Pa	231	3.28E+06	2.13E-03		Zr+4	1.25E+02	lb/d	2.92E-05	4.28E+06	4.97E-10	1.82E-07	Ci/yr
27	232U	232	5.00E+06	3.24E-03		233U	1.90E+00	Ci/d	3.82E-07	4.97E+06	6.53E-10	2.38E-07	Ci/yr
28	59Ni	59	1.04E+09	6.77E-01		63Ni	6.07E+01	Ci/d	3.52E-06	1.73E+07	3.92E-08	1.43E-05	Ci/yr
29	79Se	79	5.81E+07	3.77E-02		F-	1.35E+02	lb/d	1.48E-05	9.13E+06	4.12E-09	1.50E-06	Ci/yr
30	90Y	90	1.52E+13	9.83E+03		90Sr	9.92E+04	Ci/d	1.89E-02	5.25E+06	1.87E-03	6.83E-01	Ci/yr
31	93Zr	93	3.16E+09	2.05E+00		Zr+4	1.25E+02	lb/d	2.92E-05	4.28E+06	4.80E-07	1.75E-04	Ci/yr
32	93mNb	93	1.92E+09	1.24E+00		Zr+4	1.25E+02	lb/d	2.92E-05	4.28E+06	2.91E-07	1.06E-04	Ci/yr
33	242Cm	242	1.59E+08	1.03E-01		243Cm	1.19E+00	Ci/d	2.41E-07	4.94E+06	2.09E-08	7.61E-06	Ci/yr

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: D-11

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Table D-10 PJV32 Calculation**									Unabated HLW RFD/PJM			
2			Total feed			Representatives			PJV32	Performance	Non-Rep Const	Non-Rep Const	
3	Non-Rep Const	MW	mol/hr	lb/d			Feed Rate	Units	Rate	Factor	g/sec	Corrected	Units
4	Be	9.0	1.99E-01	9.47E-02		Zr+4	1.25E+02	lb/d	4.83E-07	2.58E+08	1.93E-12	1.93E-12	g/sec
5	CN	26.0	1.81E-01	2.49E-01		PO4-3	3.24E+02	lb/d	2.04E-06	1.59E+08	8.26E-12	8.26E-12	g/sec
6	Co	58.9	1.44E-01	4.48E-01		60Co	9.63E+01	Ci/d	8.35E-07	1.15E+08	2.04E-11	2.04E-11	g/sec
7	Mo	95.9	6.74E-01	3.41E+00		Bi+3	1.76E+01	lb/d	1.85E-07	9.53E+07	1.88E-10	1.88E-10	g/sec
8	Sb	121.7	1.34E-01	8.59E-01		125Sb	3.18E+02	Ci/d	1.92E-06	1.66E+08	2.73E-11	2.73E-11	g/sec
9	Se	78.9	3.54E-01	1.47E+00		F-	1.35E+02	lb/d	9.03E-06	1.49E+07	5.19E-10	5.19E-10	g/sec
10	Sn	118.7	1.12E-02	7.01E-02		126Sn	1.69E+00	Ci/d	7.51E-09	2.25E+08	1.64E-12	1.64E-12	g/sec
11	Ta	180.9	1.45E-01	1.38E+00		Zr+4	1.25E+02	lb/d	4.83E-07	2.58E+08	2.82E-11	2.82E-11	g/sec
12	Tl	204.3	9.75E-02	1.05E+00		F-	1.35E+02	lb/d	9.03E-06	1.49E+07	3.70E-10	3.70E-10	g/sec
13	U	238.0	2.17E+00	2.72E+01		234U	1.08E-01	Ci/d	8.69E-10	1.25E+08	1.15E-09	1.15E-09	g/sec
14	V	50.9	2.20E-01	5.91E-01		Bi+3	1.76E+01	lb/d	1.85E-07	9.53E+07	3.26E-11	3.26E-11	g/sec
15	W	183.8	1.27E-01	1.23E+00		Zr+4	1.25E+02	lb/d	4.83E-07	2.58E+08	2.50E-11	2.50E-11	g/sec
16	Y	88.9	5.21E-02	2.45E-01		90Sr	9.92E+04	Ci/d	5.94E-04	1.67E+08	7.70E-12	7.70E-12	g/sec
17			Bq/hr	Ci/d							Ci/d		
18	106Ru	106	1.31E+09	8.49E-01		F-	1.35E+02	lb/d	9.03E-06	1.49E+07	5.68E-08	2.07E-05	Ci/yr
19	113mCd	113	2.66E+09	1.72E+00		Cd+2	1.26E+01	lb/d	8.30E-07	1.51E+07	1.14E-07	4.15E-05	Ci/yr
20	134Cs	134	2.04E+10	1.32E+01		137Cs	1.48E+05	Ci/d	3.23E-03	4.58E+07	2.89E-07	1.05E-04	Ci/yr
21	137mBa	137	6.78E+13	4.40E+04		137Cs	1.48E+05	Ci/d	3.23E-03	4.58E+07	9.59E-04	3.50E-01	Ci/yr
22	226Ra	226	4.64E+03	3.01E-06		Zr+4	1.25E+02	lb/d	4.83E-07	2.58E+08	1.16E-14	4.25E-12	Ci/yr
23	227Ac	227	4.42E+06	2.87E-03		Zr+4	1.25E+02	lb/d	4.83E-07	2.58E+08	1.11E-11	4.05E-09	Ci/yr
24	228Ra	228	7.28E+06	4.72E-03		Zr+4	1.25E+02	lb/d	4.83E-07	2.58E+08	1.83E-11	6.67E-09	Ci/yr
25	229Th	229	1.27E+06	8.25E-04		232Th	2.34E-02	Ci/d	2.02E-10	1.16E+08	7.12E-12	2.60E-09	Ci/yr
26	231Pa	231	3.28E+06	2.13E-03		Zr+4	1.25E+02	lb/d	4.83E-07	2.58E+08	8.23E-12	3.00E-09	Ci/yr
27	232U	232	5.00E+06	3.24E-03		233U	1.90E+00	Ci/d	1.67E-08	1.14E+08	2.85E-11	1.04E-08	Ci/yr
28	59Ni	59	1.04E+09	6.77E-01		63Ni	6.07E+01	Ci/d	1.25E-07	4.88E+08	1.39E-09	5.07E-07	Ci/yr
29	79Se	79	5.81E+07	3.77E-02		F-	1.35E+02	lb/d	9.03E-06	1.49E+07	2.52E-09	9.19E-07	Ci/yr
30	90Y	90	1.52E+13	9.83E+03		90Sr	9.92E+04	Ci/d	5.94E-04	1.67E+08	5.88E-05	2.15E-02	Ci/yr
31	93Zr	93	3.16E+09	2.05E+00		Zr+4	1.25E+02	lb/d	4.83E-07	2.58E+08	7.94E-09	2.90E-06	Ci/yr
32	93mNb	93	1.92E+09	1.24E+00		Zr+4	1.25E+02	lb/d	4.83E-07	2.58E+08	4.82E-09	1.76E-06	Ci/yr
33	242Cm	242	1.59E+08	1.03E-01		243Cm	1.19E+00	Ci/d	1.05E-08	1.13E+08	9.11E-10	3.32E-07	Ci/yr

CALCULATION SHEET

BY: E. Berrios
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PROJECT: WTP
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SHEET NO.: D-12

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K
1	**Table D-11 PVP12 Calculation**										
2		PVP01	PVP12	PVP12							
3		Feed Rate	Feed Rate	Feed Rate							
4	Non-Rep Const	g/sec	g/sec	Corrected	Units						
5	Be	2.47E-09	1.76E-17	0.00E+00	g/sec						
6	CN	8.60E-09	6.14E-17	0.00E+00	g/sec						
7	Co	1.01E-08	7.21E-17	0.00E+00	g/sec						
8	Mo	4.77E-08	3.41E-16	0.00E+00	g/sec	DFs					
9	Sb	1.19E-08	8.52E-17	0.00E+00	g/sec	Caustic				Carbon	Overall
10	Se	3.23E-08	2.31E-16	0.00E+00	g/sec	Scrubber	HEME	HEPA	Oxidizer	Bed	DF
11	Sn	1.05E-09	7.53E-18	0.00E+00	g/sec	3.5	200	200000	1	1	1.40E+08
12	Ta	3.60E-08	2.57E-16	0.00E+00	g/sec						
13	Tl	2.31E-08	1.65E-16	0.00E+00	g/sec						
14	U	6.51E-07	4.65E-15	4.65E-15	g/sec						
15	V	8.27E-09	5.91E-17	0.00E+00	g/sec						
16	W	3.20E-08	2.28E-16	0.00E+00	g/sec						
17	Y	3.40E-09	2.43E-17	0.00E+00	g/sec						
18		Ci/yr	Ci/yr								
19	106Ru	1.29E-03	9.22E-12	9.22E-12	Ci/yr						
20	113mCd	1.86E-03	1.33E-11	1.33E-11	Ci/yr						
21	134Cs	1.31E-02	9.35E-11	9.35E-11	Ci/yr						
22	137mBa	4.34E+01	3.10E-07	3.10E-07	Ci/yr						
23	226Ra	5.43E-09	3.88E-17	0.00E+00	Ci/yr						
24	227Ac	5.17E-06	3.70E-14	3.70E-14	Ci/yr						
25	228Ra	8.53E-06	6.09E-14	6.09E-14	Ci/yr						
26	229Th	1.28E-06	9.17E-15	9.17E-15	Ci/yr						
27	231Pa	3.84E-06	2.74E-14	2.74E-14	Ci/yr						
28	232U	5.00E-06	3.57E-14	3.57E-14	Ci/yr						
29	59Ni	1.02E-03	7.31E-12	7.31E-12	Ci/yr						
30	79Se	5.72E-05	4.09E-13	4.09E-13	Ci/yr						
31	90Y	9.48E+00	6.77E-08	6.77E-08	Ci/yr						
32	93Zr	3.71E-03	2.65E-11	2.65E-11	Ci/yr						
33	93mNb	2.25E-03	1.61E-11	1.61E-11	Ci/yr						
34	242Cm	1.58E-04	1.13E-12	1.13E-12	Ci/yr						

CALCULATION SHEET

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SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I
1	**Table D-12 PJV11 Calculation**								
2		PJV04	PJV11	PJV11					
3		Mass Rate	Mass Rate	Mass Rate					
4	Non-Rep Const	g/sec	g/sec	Corrected	Units				
5	Be	1.79E-09	1.79E-15	1.79E-15	g/sec				
6	CN	3.06E-09	3.06E-15	3.06E-15	g/sec				
7	Co	8.40E-09	8.40E-15	8.40E-15	g/sec				
8	Mo	6.32E-08	6.32E-14	6.32E-14	g/sec		DFs		
9	Sb	1.58E-08	1.58E-14	1.58E-14	g/sec				Overall
10	Se	2.15E-08	2.15E-14	2.15E-14	g/sec		Demister	HEPA	DF
11	Sn	1.20E-09	1.20E-15	1.20E-15	g/sec		5	200000	1.00E+06
12	Ta	2.62E-08	2.62E-14	2.62E-14	g/sec				
13	Tl	1.54E-08	1.54E-14	1.54E-14	g/sec				
14	U	4.90E-07	4.90E-13	4.90E-13	g/sec				
15	V	1.09E-08	1.09E-14	1.09E-14	g/sec				
16	W	2.32E-08	2.32E-14	2.32E-14	g/sec				
17	Y	4.48E-09	4.48E-15	4.48E-15	g/sec				
18		Ci/yr	Ci/yr						
19	106Ru	8.61E-04	8.61E-10	8.61E-10	Ci/yr				
20	113mCd	2.41E-03	2.41E-09	2.41E-09	Ci/yr				
21	134Cs	1.07E-02	1.07E-08	1.07E-08	Ci/yr				
22	137mBa	3.57E+01	3.57E-05	3.57E-05	Ci/yr				
23	226Ra	3.95E-09	3.95E-15	3.95E-15	Ci/yr				
24	227Ac	3.76E-06	3.76E-12	3.76E-12	Ci/yr				
25	228Ra	6.20E-06	6.20E-12	6.20E-12	Ci/yr				
26	229Th	1.08E-06	1.08E-12	1.08E-12	Ci/yr				
27	231Pa	2.79E-06	2.79E-12	2.79E-12	Ci/yr				
28	232U	4.27E-06	4.27E-12	4.27E-12	Ci/yr				
29	59Ni	5.18E-04	5.18E-10	5.18E-10	Ci/yr				
30	79Se	3.82E-05	3.82E-11	3.82E-11	Ci/yr				
31	90Y	1.25E+01	1.25E-05	1.25E-05	Ci/yr				
32	93Zr	2.69E-03	2.69E-09	2.69E-09	Ci/yr				
33	93mNb	1.63E-03	1.63E-09	1.63E-09	Ci/yr				
34	242Cm	1.36E-04	1.36E-10	1.36E-10	Ci/yr				

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**Table D-13 LVP18 Calculation**															
2		LMP06			LOP08	LVP01	LVP03	LVP18	LVP18							
3		Mass Rate	SBS	WESP	Mass Rate	Mass Rate	Mass Rate	Mass Rate	Mass Rate							
4	Non-Rep Const	g/sec	DF	DF	g/sec	g/sec	g/sec	g/sec	Corrected	Units						
5	Be	1.81E-07	40	11	4.12E-10	3.80E-08	3.84E-08	1.92E-13	1.92E-13	g/sec						
6	CN	2.27E-05	6.5	20	1.75E-07	5.07E-09	1.80E-07	8.99E-13	8.99E-13	g/sec						
7	Co	2.95E-07	3.2	20	4.60E-09	3.37E-10	4.94E-09	2.47E-14	2.47E-14	g/sec						
8	Mo	1.22E-05	8.7	480	2.93E-09	5.60E-09	8.53E-09	4.26E-14	4.26E-14	g/sec	DFs					
9	Sb	2.99E-06	3.7	12	6.72E-08	1.37E-09	6.86E-08	3.43E-13	3.43E-13	g/sec		Carbon			Caustic	Overall
10	Se	2.97E-03	8.4	100	3.54E-06	3.03E-08	3.57E-06	1.78E-11	1.78E-11	g/sec	HEPA	Bed	SCO	SCR	Scrubber	DF
11	Sn	2.90E-07	40	11	6.59E-10	3.31E-10	9.90E-10	4.95E-15	4.95E-15	g/sec	200000	1	1	1	1	200000
12	Ta	2.12E-06	73	50	5.81E-10	5.56E-07	5.56E-07	2.78E-12	2.78E-12	g/sec						
13	Tl	6.01E-04	73	100	8.23E-08	2.16E-08	1.04E-07	5.20E-13	5.20E-13	g/sec						
14	U	6.73E-05	40	11	1.53E-07	7.69E-08	2.30E-07	1.15E-12	1.15E-12	g/sec						
15	V	2.12E-06	5	860	4.92E-10	9.71E-10	1.46E-09	7.32E-15	7.32E-15	g/sec						
16	W	1.88E-06	73	50	5.15E-10	4.93E-07	4.93E-07	2.47E-12	2.47E-12	g/sec						
17	Y	7.55E-07	40	11	1.72E-09	4.32E-10	2.15E-09	1.07E-14	1.07E-14	g/sec						
18		Ci/yr			Ci/yr	Ci/yr	Ci/yr	Ci/yr								
19	106Ru	5.18E+01	3.6	4	3.59E+00	6.37E-06	3.59E+00	1.80E-05	1.80E-05	Ci/yr						
20	113mCd	5.27E+00	1.6	80	4.12E-02	1.59E-06	4.12E-02	2.06E-07	2.06E-07	Ci/yr						
21	134Cs	1.95E-01	2.4	30	2.71E-03	1.44E-08	2.71E-03	1.35E-08	1.35E-08	Ci/yr						
22	137mBa	6.47E+02	2.4	30	8.99E+00	4.78E-05	8.99E+00	4.49E-05	4.49E-05	Ci/yr						
23	226Ra	1.33E-05	73	50	3.65E-09	4.41E-10	4.09E-09	2.04E-14	2.04E-14	Ci/yr						
24	227Ac	5.56E-05	73	50	1.52E-08	4.20E-07	4.35E-07	2.18E-12	2.18E-12	Ci/yr						
25	228Ra	2.09E-02	73	50	5.73E-06	6.92E-07	6.42E-06	3.21E-11	3.21E-11	Ci/yr						
26	229Th	2.74E-05	73	50	7.50E-09	3.67E-08	4.42E-08	2.21E-13	2.21E-13	Ci/yr						
27	231Pa	4.13E-05	73	50	1.13E-08	3.12E-07	3.23E-07	1.62E-12	1.62E-12	Ci/yr						
28	232U	4.54E-05	40	11	1.03E-07	2.73E-10	1.04E-07	5.18E-13	5.18E-13	Ci/yr						
29	59Ni	1.99E+00	5.9	20	1.69E-02	5.34E-06	1.69E-02	8.44E-08	8.44E-08	Ci/yr						
30	79Se	5.27E+00	8	100	6.59E-03	2.83E-07	6.59E-03	3.29E-08	3.29E-08	Ci/yr						
31	90Y	2.11E+03	40	11	4.78E+00	6.34E-03	4.79E+00	2.40E-05	2.40E-05	Ci/yr						
32	93Zr	1.82E-01	17	10	1.07E-03	3.01E-04	1.37E-03	6.85E-09	6.85E-09	Ci/yr						
33	93mNb	3.31E-02	73	50	9.06E-06	1.82E-04	1.91E-04	9.57E-10	9.57E-10	Ci/yr						
34	242Cm	3.27E-04	40	11	7.43E-07	1.96E-09	7.45E-07	3.72E-12	3.72E-12	Ci/yr						

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	**Table D-14 HOP31 Calculation**																	
2		HMP06			HOP07	HOP10	HOP11		HOP13	HOP31	HOP31							
3		Mass Rate	SBS	WESP	Mass Rate	Mass Rate	Mass Rate	HEME	Mass Rate	Mass Rate	Mass Rate							
4	Non-Rep Const	g/sec	DF	DF	g/sec	g/sec	g/sec	DF	g/sec	g/sec	corrected	Units						
5	Be	3.83E-06	40	11	8.70E-09	1.16E-10	8.82E-09	90	9.80E-11	4.90E-16	0.00E+00	g/sec						
6	CN	1.31E-05	18.1	20	3.62E-08	1.05E-10	3.64E-08	90	4.04E-10	2.02E-15	2.02E-15	g/sec						
7	Co	1.79E-05	3.2	20	2.80E-07	4.66E-10	2.80E-07	100	2.80E-09	1.40E-14	1.40E-14	g/sec	DFs					
8	Mo	2.67E-04	8.7	200	1.54E-07	3.46E-09	1.57E-07	490	3.21E-10	1.60E-15	1.60E-15	g/sec		Carbon	Silver			Overall
9	Sb	4.33E-05	3.7	12	9.74E-07	8.66E-10	9.75E-07	90	1.08E-08	5.42E-14	5.42E-14	g/sec	HEPA	Bed	Mordenite	SCO	SCR	DF
10	Se	2.00E-03	5.9	200	1.70E-06	8.49E-10	1.70E-06	490	3.46E-09	1.73E-14	1.73E-14	g/sec	200000	1	1	1	1	200000
11	Sn	2.41E-06	40	11	5.47E-09	6.26E-11	5.54E-09	90	6.15E-11	3.08E-16	0.00E+00	g/sec						
12	Ta	5.59E-05	427	20	6.55E-09	1.70E-09	8.25E-09	470	1.76E-11	8.78E-17	0.00E+00	g/sec						
13	Tl	2.31E-05	427	20	2.70E-09	6.06E-10	3.31E-09	470	7.04E-12	3.52E-17	0.00E+00	g/sec						
14	U	1.01E-03	40	11	2.30E-06	2.63E-08	2.32E-06	90	2.58E-08	1.29E-13	1.29E-13	g/sec						
15	V	2.30E-05	4.6	370	1.35E-08	5.99E-10	1.41E-08	500	2.83E-11	1.41E-16	0.00E+00	g/sec						
16	W	4.96E-05	427	20	5.81E-09	1.51E-09	7.32E-09	470	1.56E-11	7.79E-17	0.00E+00	g/sec						
17	Y	1.22E-05	40	11	2.78E-08	2.45E-10	2.81E-08	90	3.12E-10	1.56E-15	1.56E-15	g/sec						
18		Ci/yr			Ci/yr	Ci/yr	Ci/yr		Ci/yr	Ci/yr								
19	106Ru	4.31E+01	3.6	20	5.98E-01	3.39E-05	5.98E-01	90	6.65E-03	3.32E-08	3.32E-08	Ci/yr						
20	113mCd	6.54E+01	1.6	80	5.11E-01	1.31E-04	5.11E-01	110	4.65E-03	2.32E-08	2.32E-08	Ci/yr						
21	134Cs	1.88E+02	2.4	30	2.61E+00	1.00E-03	2.61E+00	100	2.61E-02	1.31E-07	1.31E-07	Ci/yr						
22	137mBa	6.24E+05	2.4	30	8.67E+03	3.33E+00	8.67E+03	100	8.67E+01	4.34E-04	4.34E-04	Ci/yr						
23	226Ra	8.43E-06	427	20	9.87E-10	2.57E-10	1.24E-09	470	2.65E-12	1.32E-17	0.00E+00	Ci/yr						
24	227Ac	8.03E-03	427	20	9.41E-07	2.44E-07	1.19E-06	470	2.52E-09	1.26E-14	1.26E-14	Ci/yr						
25	228Ra	1.32E-02	427	20	1.55E-06	4.03E-07	1.95E-06	470	4.16E-09	2.08E-14	2.08E-14	Ci/yr						
26	229Th	2.30E-03	427	20	2.70E-07	6.00E-08	3.30E-07	470	7.02E-10	3.51E-15	3.51E-15	Ci/yr						
27	231Pa	5.97E-03	427	20	6.99E-07	1.82E-07	8.80E-07	470	1.87E-09	9.36E-15	9.36E-15	Ci/yr						
28	232U	9.16E-03	40	11	2.08E-05	2.38E-07	2.11E-05	90	2.34E-07	1.17E-12	1.17E-12	Ci/yr						
29	59Ni	9.39E-01	5.9	20	7.96E-03	1.43E-05	7.98E-03	90	8.86E-05	4.43E-10	4.43E-10	Ci/yr						
30	79Se	3.55E+00	5.9	200	3.01E-03	1.50E-06	3.01E-03	490	6.14E-06	3.07E-11	3.07E-11	Ci/yr						
31	90Y	3.41E+04	40	11	7.76E+01	6.83E-01	7.83E+01	90	8.70E-01	4.35E-06	4.35E-06	Ci/yr						
32	93Zr	9.24E+00	30	10	3.08E-02	1.75E-04	3.10E-02	90	3.44E-04	1.72E-09	1.72E-09	Ci/yr						
33	93mNb	3.49E+00	427	80	1.02E-04	1.06E-04	2.08E-04	110	1.89E-06	9.47E-12	9.47E-12	Ci/yr						
34	242Cm	2.93E-01	40	11	6.65E-04	7.61E-06	6.73E-04	90	7.47E-06	3.74E-11	3.74E-11	Ci/yr						

CALCULATION SHEET

BY: E. Berrios
DATE: 12/22/05

PROJECT: WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00003
SHEET REV: D
SHEET NO.: D-16

SUBJECT: Integrated Baseline Emissions Report Non-SSFM Represented Constituents Emissions Rate Estimation

	A	B	C	D	E	F	G
1	**Table D-15 PJV34 Calculation**						
2		PJV32	PJV34	PJV34			
3		Mass Rate	Mass Rate	Mass Rate			
4	Non-Rep Const	g/sec	g/sec	corrected	Units		
5	Be	1.93E-12	9.64E-18	0.00E+00	g/sec		
6	CN	8.26E-12	4.13E-17	0.00E+00	g/sec		
7	Co	2.04E-11	1.02E-16	0.00E+00	g/sec	DFs	
8	Mo	1.88E-10	9.42E-16	0.00E+00	g/sec		Overall
9	Sb	2.73E-11	1.37E-16	0.00E+00	g/sec	HEPA	DF
10	Se	5.19E-10	2.59E-15	2.59E-15	g/sec	200000	2.00E+05
11	Sn	1.64E-12	8.21E-18	0.00E+00	g/sec		
12	Ta	2.82E-11	1.41E-16	0.00E+00	g/sec		
13	Tl	3.70E-10	1.85E-15	1.85E-15	g/sec		
14	U	1.15E-09	5.74E-15	5.74E-15	g/sec		
15	V	3.26E-11	1.63E-16	0.00E+00	g/sec		
16	W	2.50E-11	1.25E-16	0.00E+00	g/sec		
17	Y	7.70E-12	3.85E-17	0.00E+00	g/sec		
18		Ci/yr	Ci/yr	Ci/d			
19	106Ru	2.07E-05	1.04E-10	1.04E-10	Ci/yr		
20	113mCd	4.15E-05	2.08E-10	2.08E-10	Ci/yr		
21	134Cs	1.05E-04	5.27E-10	5.27E-10	Ci/yr		
22	137mBa	3.50E-01	1.75E-06	1.75E-06	Ci/yr		
23	226Ra	4.25E-12	2.12E-17	0.00E+00	Ci/yr		
24	227Ac	4.05E-09	2.02E-14	2.02E-14	Ci/yr		
25	228Ra	6.67E-09	3.34E-14	3.34E-14	Ci/yr		
26	229Th	2.60E-09	1.30E-14	1.30E-14	Ci/yr		
27	231Pa	3.00E-09	1.50E-14	1.50E-14	Ci/yr		
28	232U	1.04E-08	5.20E-14	5.20E-14	Ci/yr		
29	59Ni	5.07E-07	2.54E-12	2.54E-12	Ci/yr		
30	79Se	9.19E-07	4.60E-12	4.60E-12	Ci/yr		
31	90Y	2.15E-02	1.07E-07	1.07E-07	Ci/yr		
32	93Zr	2.90E-06	1.45E-11	1.45E-11	Ci/yr		
33	93mNb	1.76E-06	8.79E-12	8.79E-12	Ci/yr		
34	242Cm	3.32E-07	1.66E-12	1.66E-12	Ci/yr		

Appendix D

Calculation: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

24590-WTP-M4C-FRP-00006, Rev B

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R10593815

Calculation Cover Sheet

ISSUED BY RPP-WTP PDC

RIVER PROTECTION PROJECT-WASTE TREATMENT PLANT	JOB NO.: 24590	
CALC NO. 24590-WTP-M4C-FRP-00006	GROUP Process Eng.	FACILITY Central
SUBJECT WTP Air Emissions Hazardous Organic Constituents Feed Concentrations		
CALCULATION STATUS DESIGNATION	☒ PRELIMINARY ☐ COMMITTED ☐ CONFIRMED ☐ SUPERSEDED BY: _____ ☐ CANCELLED	
SOFTWARE APPLICATIONS ☒ N/A		
QAS: ☐ YES ☐ NO	PROGRAM NAME:	VERSION/RELEASE NO.:

RECORD OF REVISIONS

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO	ORIGINATOR	CHECKED	APPROVED/ ACCEPTED	DATE
A	Initial Issue	29	A-8	E. Berrios	D. Blumenkranz	S. Saunders	04/11/05
B	Incorporate revised basis	29	A-8	E. Berrios	D. Blumenkranz	S. Saunders	12/6/05

Notes/Comments

Calculations were performed on a Compaq Personal Computer using the Microsoft Excel® 2000.

This calculation does not affect any structures, components, or services of the WTP.

This revision has extensive changes therefore no revision bars are used.

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1 Objective

The objective of this calculation is to develop bounding hazardous organic compounds feed concentrations to be used to estimate the hazardous organic compounds air emissions for the WTP process flues (i.e. Pretreatment vessel vents and PJM/RFD flues, LAW Offgas flue, and HLW offgas and PJM/RFD flues).

2 Inputs

The following data inputs were used to aid in the generation of the organic feed concentrations:

- Organic constituents to be evaluated were obtained from Table 2 of the *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-03-008). Since the issuance of this report, there have been changes to the organic constituents list where constituents have been deleted or considered to be Products of Incomplete Combustion (PIC) and therefore are not feed organics. Changes to this list are documented in CCN 097844. These changes decreased the number of hazardous organic constituents in the feed from 250 to 219. Furthermore, three other constituents have been deleted as they are part of the accounted for organic constituents in the feed. These are oxalic acid (144-62-7), formic acid (64-18-6), and acetic acid (64-19-7). This brings the total number of non-accounted for hazardous organic constituents in the feed to 216. The list of constituents is presented below.
- Detection limits or tank composition for each constituent were obtained from Table 8 of the *RPP-WTP Waste Feed Assessment* (RPT-24590-EN00003) and from Table 8-1 of the *Regulatory Data Quality Objectives Optimization Report* (24590-WTP-RPT-MGT-04-001). These limits in mg/l are presented in the table below. The values obtained from 24590-WTP-RPT-MGT-04-001 are marked with an asterisk ("*") in the table.
- The feed concentrations used for oxalic acid (144-62-7), formic acid (64-18-6), and acetic acid (64-19-7) are (24590-WTP-RPT-MGT-04-001):
  - 144-62-7: 3,000 mg/l
  - 64-18-6: 15,000 mg/l
  - 64-19-7: 21,704 mg/l

  As these constituents are part of the accounted for feed, no further calculations are necessary.
- Molecular weights and chemical formulas for each organic constituent were obtained from the website http://chemfinder.cambridgesoft.com. This information is also presented in the table below. Molecular weight for carbon is 12.011 g/mol and for sodium is 23 g/mol.

Hazardous Organic Constituents Data

CAS #	COPC	Chemical Formula	MW	Measured concentration or detection limit (mg/L)
100-00-5	p-Nitrochlorobenzene	C6H4ClNO2	157.56	0.20*
100-21-0	p-Phthalic acid	C8H6O4	166.13	0.3
100-41-4	Ethyl benzene	C8H10	106.16	0.02*
100-42-5	Styrene	C8H8	104.14	0.02*
10061-01-5	cis-1,3-Dichloropropene	C3H4Cl2	110.97	0.02*
10061-02-6	trans-1,3-Dichloropropene	C3H4Cl2	110.97	0.02*
101-55-3	4-Bromophenylphenyl ether	C12H9BrO	249.11	0.3

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 3

BY: E. Berríos
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

CAS #	COPC	Chemical Formula	MW	Measured concentration or detection limit (mg/L)
101-84-8	Diphenyl ether	C12H10O	170.21	0.066
106-35-4	3-Heptanone	C7H14O	114.19	0.02*
106-42-3	p-Xylene (Dimethyl benzene)	C8H10	106.16	0.04*
106-46-7	1,4-Dichlorobenzene	C6H4Cl2	147.01	0.02*
106-88-7	1,2-Epoxybutane	C4H8O	72.12	0.066
106-93-4	Ethylene dibromide (Dibromethane)	C2H4Br2	187.88	0.02*
106-97-8	Butane	C4H10	58.123	0.04*
106-99-0	1,3-Butadiene	C4H6	54.091	0.02*
107-02-8	Acrolein	C3H4O	56.06	0.03*
107-05-1	3-Chloropropene (Allyl chloride)	C3H5Cl	76.526	0.02*
107-06-2	1,2-Dichloroethane (Ethylene chloride)	C2H4Cl2	98.96	0.02*
107-12-0	Propionitrile	C3H5N	55.079	0.05*
107-13-1	Acrylonitrile	C3H3N	53.06	0.10*
107-18-6	2-Propene-1-ol	C3H6O	58.08	0.3
107-31-3	Formic acid, methyl ester	C2H4O2	60.05	0.3
107-66-4	Dibutylphosphate	C8H19O4P	210.21	0.3
107-87-9	2-Pentanone	C5H10O	86.133	0.10*
108-03-2	1-Nitropropane	C3H7NO2	89.09	0.3
108-05-4	Vinyl acetate	C4H6O2	86.09	0.3
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	C6H12O	100.16	0.04*
108-20-3	Bis(isopropyl)ether	C6H14O	102.18	0.066
108-38-3	m-Xylene (Dimethyl benzene)	C8H10	106.16	0.04*
108-39-4	m-Cresol	C7H8O	108.13	0.066
108-87-2	Methylcyclohexane	C7H14O	98.188	0.04*
108-88-3	Toluene	C7H8	92.13	0.02*
108-90-7	Chlorobenzene	C6H5Cl	112.56	0.02*
108-93-0	Cyclohexanol	C6H12O	100.16	0.066
108-94-1	Cyclohexanone	C6H10O	98.2	0.07*
108-95-2	Phenol	C6H6O	94.11	0.3*
109-66-0	n-Pentane	C5H12	72.15	0.06*
109-99-9	Tetrahydrofuran	C4H8O	72.1	0.02*
110-12-3	5-Methyl-2-hexanone	C7H14O	114.19	0.02*
110-43-0	2-Heptanone	C7H14O	114.19	0.02*
110-54-3	n-Hexane	C6H14	86.177	0.04*
110-62-3	n-Valeraldehyde	C5H10O	86.13	0.3
110-82-7	Cyclohexane	C6H12	84.161	0.03*
110-83-8	Cyclohexene	C6H10	82.145	0.02*
110-86-1	Pyridine	C5H5N	79.1	0.092*
111-65-9	n-Octane	C8H18	114.23	0.04*
111-76-2	Ethylene glycol monobutyl ether	C6H14O2	118	0.3
111-84-2	n-Nonane	C9H20	128.26	0.04*
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	C24H38O4	390.56	0.3
117-84-0	n-Dioctyl phthalate	C24H38O4	390.56	0.3

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 4

BY: E. Berrios
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

CAS #	COPC	Chemical Formula	MW	Measured concentration or detection limit (mg/L)
120-12-7	Anthracene	C14H10	178.22	0.3
120-82-1	1,2,4-Trichlorobenzene	C6H3Cl3	181.46	0.03*
120-83-2	2,4-Dichlorophenol	C6H4Cl2O	163.01	0.3
121-44-8	Triethylamine	C6H15N	101.19	0.066
121-69-7	Dimethylaniline	C8H11N	121.18	0.066
122-39-4	N,N-Diphenylamine	C12H11N	169.23	0.10*
123-19-3	4-Heptanone	C7H14O	114.19	0.02*
123-38-6	n-Propionaldehyde	C3H6O	58.08	0.09*
123-51-3	3-Methyl-1-butanol	C5H12O	88.15	0.066
123-86-4	Acetic acid n-butyl ester	C6H12O2	116.16	0.001*
123-91-1	1,4-Dioxane	C4H8O2	88.1	0.01*
126-73-8	Tributyl phosphate	C12H27O4P	266.32	0.2*
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	·C4H5N	67.09	0.04*
127-18-4	Perchloroethylene (tetrachloroethylene)	C2CL4	165.85	0.02*
127-19-5	N,N-Dimethylacetamide	C4H9NO	87.12	0.066
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	C15H24O	220.35	0.1*
129-00-0	Pyrene	C16H10	202.24	0.3
1321-64-8	Pentachloronaphthalene	C10H3Cl5	300.4	0.3
1321-65-9	Trichloronaphthalene	C10H5Cl3	231.51	0.3
132-64-9	Dibenzofuran	C12H8O	168.19	0.3
1335-87-1	Hexachloronaphthalene	C10H2Cl6	334.84	0.3
1335-88-2	Tetrachloronaphthalene	C10H4Cl4	265.95	0.3
1336-36-3	Polychlorinated biphenyls (PCBs)	**	322	0.0023
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	C4H8O2	88.1	0.001*
141-79-7	4-Methyl-3-penten-2-one	C6H10O	98.16	0.3
142-82-5	n-Heptane	C7H16	100.2	0.05*
156-60-5	trans-1,2-Dichloroethylene	C2H2Cl2	96.95	0.066
1634-04-4	Methyl tert-butyl ether	C5H12O	88.15	0.066
189-55-9	Dibenzo[a,i]pyrene	C24H14	302.37	0.3
189-64-0	Dibenzo[a,h]pyrene	C24H14	302.37	0.3
191-24-2	Benzo(g,h,i)perylene	C22H12	276.34	0.3
191-30-0	Benzo[a,i]pyrene	C24H14	302.37	0.3
192-65-4	Dibenzo[a,e]pyrene	C24H14	302.37	0.3
193-39-5	Indeno(1,2,3-cd)pyrene	C22H12	276.34	0.3
206-44-0	Fluoranthene	C16H10	202.26	0.3
208-96-8	Acenaphthylene	C12H8	152.21	0.3
2234-13-1	Octachloronaphthalene	C10Cl8	403.73	0.001*
224-42-0	Dibenz[a,j]acridine	C21H13N	279.34	0.3
226-36-8	Dibenz[a,h]acridine	C21H13N	279.34	0.3
25551-13-7	Trimethyl benzene	C9H12	120.19	0.066
26140-60-3	Terphenyls	C18H14	230.31	0.3
27154-33-2	Trichlorofluoroethane	C2H2Cl3F	151.4	0.066
287-92-3	Cyclopentane	C5H10	70.134	0.03*

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 5

BY: E. Berrios
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

CAS #	COPC	Chemical Formula	MW	Measured concentration or detection limit (mg/L)
3697-24-3	5-Methylchrysene	C19H14	242.32	0.3
3825-26-1	Ammonium perfluorooctanoate	C8H4F15NO2	431.1	0.3
4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	C4H6O	70.091	0.07*
50-00-0	Formaldehyde	CH2O	30.03	0.066
50-32-8	Benzo(a)pyrene	C20H12	252.3	0.2*
53-70-3	Dibenzo(a,h)anthracene	C22H14	278.33	0.2*
540-59-0	1,2-Dichloroethylene	C2H2Cl2	96.94	0.066
540-84-1	2,2,4-Trimethylpentane	C8H18	114.23	0.066
541-73-1	1,3-Dichlorobenzene	C6H4Cl2	147.01	0.02*
56-23-5	Carbon tetrachloride	CCl4	153.84	0.02*
563-80-4	3-Methyl-2-butanone	C5H10O	86.133	0.03*
56-49-5	3-Methylcholanthrene	C21H16	268.36	0.3
57-14-7	1,1-Dimethylhydrazine	C2H8N2	60.099	0.3
58-90-2	2,3,4,6-Tetrachlorophenol	C6H2Cl4O	231.9	0.3
591-78-6	2-Hexanone	C6H12O	100.16	0.04*
59-50-7	4-Chloro-3-methylphenol	C7H7ClO	142.58	0.3
59-89-2	N-Nitrosomorpholine	C4H8N2O2	116.12	0.3
602-87-9	5-Nitroacenaphthene	C12H9NO2	199.21	0.3
60-29-7	Ethyl ether	C4H10O	74.12	0.3
603-34-9	Triphenylamine	C18H15N	245.32	0.3
60-34-4	Methylhydrazine	CH6N2	46.072	0.066
60-35-5	Acetamide	C2H5NO	59.07	0.066
621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	C6H14N2O	130.19	0.3
624-83-9	Methyl isocyanate	C2H3NO	57.052	0.066
627-13-4	Nitric acid, propyl ester	C3H7NO3	105.09	0.025*
62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	C2H6N2O	74.1	0.30*
630-20-6	1,1,1,2-Tetrachloroethane	C2H2Cl4	167.85	0.066
64-17-5	Ethyl alcohol	C2H6O	46.069	0.07*
67-56-1	Methyl alcohol (Methanol)	CH4O	32.04	0.066
67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	C3H8O	60.096	0.01*
67-64-1	2-Propanone (Acetone)	C3H6O	58.08	0.10*
67-66-3	Chloroform	CHCl3	119.39	0.02*
67-72-1	Hexachloroethane	C2Cl6	236.74	0.3
684-16-2	Hexafluoroacetone	C3F6O	166.02	0.066
71-23-8	n-Propyl alcohol	C3H8O	60.096	0.02*
71-36-3	n-Butyl alcohol	C4H10O	74.1	0.03*
71-43-2	Benzene	C6H6	78.11	0.02*
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	C2H3Cl3	133.42	0.02*
74-83-9	Bromomethane (Methyl bromide)	CH3Br	94.95	0.02*
74-87-3	Chloromethane (Methyl chloride)	CH3Cl	50.49	0.02*
74-97-5	Bromochloromethane	CH2BrCl	129.39	0.066
74-99-7	Methylacetylene	C3H4	40.07	0.3
75-00-3	Chloroethane	C2H5Cl	64.52	0.02*

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 6

BY: E. Berríos
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

CAS #	COPC	Chemical Formula	MW	Measured concentration or detection limit (mg/L)
75-01-4	Vinyl chloride (1-Chloroethene)	C2H3Cl	62.5	0.02*
75-05-8	Acetonitrile	C2H3N	41.05	0.05*
75-07-0	Acetaldehyde	C2H4O	44.05	0.3
75-09-2	Dichloromethane (Methylene chloride)	CH2Cl2	84.94	0.02*
75-12-7	Formamide	CH3NO	45.04	0.3
75-15-0	Carbon disulfide	CS2	76.14	0.03*
75-21-8	Ethylene oxide (Oxirane)	C2H4O	44.05	0.01*
75-27-4	Bromodichloromethane	CHBrCl2	163.83	0.066
75-34-3	1,1-Dichloroethane	C2H4Cl2	98.97	0.02*
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	C2H2Cl2	96.95	0.04*
75-43-4	Dichlorofluoromethane	CHCl2F	102.92	0.02*
75-45-6	Chlorodifluoromethane	CHClF2	86.47	0.02*
75-50-3	Trimethylamine	C3H9N	59.11	0.066
75-52-5	Nitromethane	CH3NO2	61.04	0.3
75-55-8	2-Methylaziridine	C3H7N	57.1	0.3
75-61-6	Difluorodibromomethane	CBr2F2	209.82	0.066
75-63-8	Trifluorobromomethane	CBrF3	148.91	0.066
75-65-0	2-Methyl-2-propanol	C4H10O	74.122	0.04*
75-69-4	Trichlorofluoromethane	CCl3F	137.38	0.03*
75-71-8	Dichlorodifluoromethane	CCl2F2	120.92	0.04*
76-03-9	Trichloroacetic acid	C2HCl3O2	163.39	0.066
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	C2Cl4F2	203.83	0.3
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	C2Cl4F2	203.83	0.3
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	C2Cl3F3	187.38	0.04*
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	C2Cl2F4	170.92	0.05*
76-15-3	Chloropentafluoroethane	C2ClF5	154.47	0.066
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	C4H10O	74.12	0.3
78-87-5	1,2-Dichloropropane	C3H6Cl2	112.99	0.02*
78-92-2	1-Methylpropyl alcohol (2-Butanol)	C4H10O	74.122	0.02*
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	C4H8O	72.1	0.06*
79-00-5	1,1,2-Trichloroethane	C2H3Cl3	133.42	0.04*
79-01-6	Trichloroethylene	C2HCl3	131.4	0.04*
79-09-4	Propionic acid	C3H6O2	74.08	0.3
79-10-7	2-Propenoic acid	C3H4O2	72.06	0.3
79-20-9	Methyl acetate	C3H6O2	74.08	0.3
79-34-5	1,1,2,2-Tetrachloroethane	C2H2Cl4	167.86	0.0001*
83-32-9	Acenaphthene	C12H10	154.21	0.3
84-66-2	Diethyl phthalate	C12H14O4	222.24	0.3
84-74-2	Dibutyl phthalate	C16H22O4	278.34	0.3
85-01-8	Phenanthrene	C14H10	178.22	0.3
85-68-7	Butylbenzyl phthalate	C19H20O4	312.39	0.3
86-73-7	Fluorene	C13H10	166.22	0.3
87-68-3	Hexachlorobutadiene	C4Cl6	260.76	0.04*

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 7

BY: E. Berríos
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

CAS #	COPC	Chemical Formula	MW	Measured concentration or detection limit (mg/L)
88-06-2	2,4,6-Trichlorophenol	C6H3Cl3O	197.46	0.3
88-72-2	2-Nitrotoluene	C7H7NO2	137.13	0.066
88-75-5	2-Nitrophenol	C6H5NO3	139.11	0.3
88-89-1	Picric acid	C6H3N3O7	229.11	0.3
91-20-3	Naphthalene	C10H8	128.16	0.01
91-22-5	Quinoline	C9H7N	129.16	0.3
91-58-7	2-Chloronapthalene	C10H7Cl	162.61	0.3
92-52-4	1,1`-Biphenyl	C12H10	154.21	0.2*
92-93-3	4-Nitrobiphenyl	C12H9N02	199.21	0.3
95-13-6	Indene	C9H8	116.16	0.3
95-47-6	o-Xylene	C8H10	106.16	0.02*
95-48-7	o-Cresol (2-Methylphenol)	C7H8O	108.13	0.066
95-49-8	2-Chlorotoluene	C7H7Cl	126.59	0.3
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	C6H4Cl2	147.01	0.02*
95-57-8	2-Chlorophenol	C6H5ClO	128.56	0.3
95-95-4	2,4,5-Trichlorophenol	C6H3Cl3O	197.46	0.3
96-18-4	1,2,3-Trichloropropane	C3H5Cl3	147.43	0.004
96-22-0	3-Pentanone	C5H10O	86.133	0.1*
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	C22H30O2S	358.54	0.3
98-51-1	p-tert-Butyltoluene	C11H16	148.25	0.3
98-82-8	Cumene	C9H12	120.19	0.3
98-83-9	alpha-Methylstyrene	C9H10	118.18	0.066
98-86-2	Acetophenone	C8H8O	120.5	0.2*
98-95-3	Nitrobenzene	C6H5NO2	123.11	0.2*

* Values from 24590-WTP-RPT-MGT-04-001.
**1336-36-3 is a PCB from which 14 coplanar PCBs are calculated. One percent of 1336-36-3 feed concentration is considered to be the coplanar PCBs feed concentration.

- Batch conditions for all WTP Phase I tanks were obtained from the latest *Tank Farm Contractor Operation and Utilization Plan* (TFCOUP) (CHG 2005). Data used includes batch specific gravity, sodium concentration, and total organic carbon (TOC) concentration. HLW data was obtained from Tables C-1, C-3, and C-5. LAW data was obtained from Table D-2. The data used is presented in the tables below.

HLW Batch Data

Batch	1	2	3	4
Liquid SPG	1.09	1.28	1.48	1.22
Solid SPG	3.00	3.00	3.00	3.00
Liquid Na mol/l	1.37	4.44	8.56	3.84
Liquid TOC mol/l	3.97E-02	3.89E-02	1.95E-01	8.27E-02
Solid Na g/g solids	1.27E-01	4.84E-02	8.18E-02	1.19E-01
Solid TOC g/g solids	9.59E-03	9.59E-04	4.59E-03	1.71E-02

LAW Batch Data

Batch	SPG	Na (mol/l)	TOC (mol/l)
1	1.394	6.83	1.98E-01
2	1.470	9.19	2.71E-01
3	1.376	8.39	5.19E-01
4	1.485	9.85	2.97E-01
5	1.408	6.94	1.68E-01
6	1.394	6.93	1.67E-01
7	1.314	7.00	1.45E+00
8	1.314	6.99	1.44E+00
9	1.316	6.80	1.49E-01
10	1.437	7.00	1.90E-01
11	1.382	8.16	2.55E+00
12	1.464	9.69	4.81E-01
13	1.414	8.66	2.54E-01
14	1.352	6.98	1.25E-01
15	1.516	7.00	6.94E-02
16	1.394	6.99	2.15E-01
17	1.402	7.00	2.08E-01

- Statement of Work (SOW) maximums for TOC on LAW and HLW feed streams and Na for HLW stream are (DOE, 2000):
  - LAW: 0.5 mol TOC / mol Na (Table TS-7.1)
  - HLW: 11 g TOC / 100 g waste oxides (Table TS-8.2)
    19 g Na / 100 g waste oxides (Table TS-8.4)
- Per Section 4.2 of the *RPP-WTP Waste Feed Assessment* (RPT-24590-EN00003), the maximum TOC weight percent in the HLW and LAW feeds will be 4 wt % for air emissions purposes. This was based on providing sufficient margin for bounding conditions. Data from the latest TFCOUP (CHG 2005) shows that the maximum TOC value expected for the WTP Phase I tanks is lower than 4 wt% TOC. Therefore, the maximum TOC wt% per TFCOUP (CHG 2005) plus a contingency factor will be used as the basis for this calculation.
- Per Section 4.3 of the *RPP-WTP Waste Feed Assessment* (RPT-24590-EN00003), of the LAW and HLW TOC feed, 87.5% is non-hazardous organic constituents. The remainder, 12.5%, is assigned as hazardous organic constituents.

3 Background

Two hundred and fifty hazardous organic compounds were selected to be evaluated for the WTP air emissions profile. This list of organic compounds was selected with consideration to guidance provided in the *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 1998), the *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 1999), and through interactions with EPA Region 10 and the Washington State Department of Ecology. The original development of the air emissions organic feed concentrations was documented in the *RPP-WTP Waste Feed Assessment* (RPT-24590-EN00003). Since then the hazardous organic constituents list has been updated, in agreement with the regulatory agencies, and has decreased the number of hazardous organic constituents in the feed to 216. Based on this list of selected hazardous organic constituents, feed concentrations for each constituent have to be updated to support the air

emissions profile. This calculation provides these feed concentrations and supercedes the data provided in RPT-24590-EN00003.

4 Applicable Codes and Standards

N/A

5 Methodology

The same methodology used to estimate the hazardous organic feed concentration in the *RPP-WTP Waste Feed Assessment* (RPT-24590-EN00003) is used here.

- First, the TOC weight percent for each batch to be processed during Phase I of the WTP was calculated and compared to the equivalent TOC weight percent for that batch at SOW maximum. This was done to ensure that the batches are at or below the SOW maximum and also to determine what would be the maximum expected TOC wt% in any of the batches from the WTP Phase I. This TOC wt% is then used as the basis to develop the organic constituents air emissions feed concentrations. Data from the TFCOUP (CHG 2005) was used. The anticipated TOC was calculated the following way:

  For the LAW supernate, the density (ρ), sodium concentration, and TOC concentration was determined for each batch. The TOC mol/mol Na concentration for the batch was calculated by dividing the TOC concentration by the Na concentration:

$$\frac{X\frac{molTOC}{l}}{X\frac{molNa}{l}} = X\frac{molTOC}{molNa}$$

  The TOC weight percent for the batch was calculated the following way:

$$\frac{X\frac{molTOC}{molNa} * X\frac{molNa}{l} * 12.011\frac{gTOC}{molTOC}}{\rho\frac{g}{cc} * 1000\frac{cc}{l}} * 100\% = \text{X wt\% TOC}$$

  The maximum TOC wt% for that batch was calculated per SOW specifications the following way:

$$\frac{0.5\frac{molTOC}{molNa} * X\frac{molNa}{l} * 12.011\frac{gTOC}{molTOC}}{\rho\frac{g}{cc} * 1000\frac{cc}{l}} * 100\% = \text{X wt\% TOC @ SOW maximum}$$

For the HLW liquids, the same calculation method was used. The HLW supernate is assumed to have the same SOW maximum as the LAW supernate. For the HLW solids, the equivalent SOW maximum TOC mol/mol Na was calculated as follows:

TOC SOW max: 11 g / 100 g oxides
Na SOW max: 19 g / 100 g oxides
TOC MW: 12.011 g/mole
Na NW: 23 g/mole
Equivalent mol TOC/mol Na:

$$\frac{\frac{11gTOC}{100goxides} * \frac{moleTOC}{12.011gTOC}}{\frac{19gNa}{100goxides} * \frac{molNa}{23gNa}} = 1.1\, molTOC/molNa$$

For the HLW solids, the TOC wt% calculation for each batch was performed as follows:

Na g/g solids was converted to mol/l the following way:

$$X\frac{gNa}{gsolids} * \rho\frac{gsolids}{cc} * 1000\frac{cc}{l} * \frac{molNa}{23gNa} = X\frac{molNa}{l}$$

TOC g/g solids were converted to mol/l the same way:

$$X\frac{gTOC}{gsolids} * \rho\frac{gsolids}{cc} * 1000\frac{cc}{l} * \frac{molTOC}{12.011g} = X\frac{molTOC}{l}$$

The TOC mol/mol Na amount is then:

$$\frac{X\frac{molTOC}{l}}{X\frac{molNa}{l}} = X\frac{molTOC}{molNa}$$

The TOC wt% for each batch was then calculated the following way:

$$\frac{X\frac{molTOC}{molNa} * X\frac{molNa}{l} * 12.011\frac{gTOC}{molTOC}}{\rho\frac{gsolids}{cc} * 1000\frac{g}{cc}} * 100\% = \text{X wt\% TOC}$$

To compare to SOW maximums, the maximum possible TOC wt% for each batch was calculated the following way:

$$\frac{1.1\frac{molTOC}{molNa} * X\frac{molNa}{l} * 12.011\frac{gTOC}{molTOC}}{\rho\frac{gsolids}{cc} * 1000\frac{cc}{l}} \times 100\% = \text{X wt\% TOC @ SOW max}$$

- Since the LAW had the highest TOC concentration, the maximum batch concentration from all LAW tanks was selected and used to determine the organic feed concentrations. Next, the target TOC mg/L concentration for air emissions purposes was calculated the following way:
  TOC wt%: 2.22%
  Adding contingency factor or slightly above 10% = 2.5%
  % hazardous organics: Y% (new number calculated in previous step)
  ρ of feed: X g/cc
  ρ of hazardous organic carbon is:

$$\rho\frac{g}{cc} * 0.025 * Y * 1000\frac{cc}{l} * 1000\frac{mg}{g} = X_{target}\frac{mgTOC}{l}$$

- Now that the target mg TOC/l is known, the next step is to convert the organic constituent mg/l concentration to its equivalent mg TOC/l. This is needed so that the concentrations can be scaled up to the target concentration calculated in the previous step. This was done the following way:

  C_xH_y (example of organic constituent)
  Number of carbons in the compound: x
  MW of the compound: Z g/mole
  Detection limit/measured concentration for the compound: Y mg/l
  TOC MW: 12.011 g/mole
  Equivalent TOC concentration for the constituent is:

$$\frac{Y\frac{mg}{l} * xcarbons * 12.011\frac{gTOC}{molTOC}}{Z\frac{g}{mole}} = X\frac{mgTOC}{l}$$

After all the TOC equivalent concentrations were calculated, they were added together and compared to the target TOC mg/l. As the calculated concentration is lower than the target concentration, a scaling factor was applied to the calculated concentrations so that the goal concentration was reached. The scaling factor was calculated the following way:

$$\frac{X_{target}\frac{mgTOC}{l}}{\sum_{i=1}^{216} X_i\frac{mgTOC}{l}} = ScalingFactor$$

All calculated TOC mg/l concentrations were then multiplied by this scaling factor to arrive to the final desired mg TOC/l. The new TOC mg/l concentration was converted back to the organic compound mg/l concentration the following way:

$$X\frac{mgTOC}{l} * Z\frac{g}{mole} * \frac{molTOC}{12.011gTOC} * \frac{1}{Xcarbons} = Y_{bounding}\frac{mg}{l}organic$$

This is the final feed concentration for the hazardous organic constituent.

6 Assumptions

Assumptions Not Requiring Verification

The assumed TOC of the waste will be the maximum TOC wt% from any of the batches from the WTP Phase I per the latest version of the TFCOUP (CHG 2005). Since selected hazardous constituents from feed have been eliminated (CCN 097844), it is assumed that the percentage of accounted for organic constituents (e.g. oxalate, etc.) increases to 90 % (from 87.5%) of the maximum wt% TOC in the feed, while the remaining 10 % of the maximum wt% TOC in the feed is assumed to be hazardous organic constituents. This equates to a drop of 2.5% of the unaccounted for hazardous organic constituents in the feed. LAW and HLW feeds are assumed to contain equal concentrations of unaccounted for hazardous organic constituents. To account for uncertainty associated with this assumption, feed concentrations less than 1 part-per-million (ppm) are rounded to the nearest 1/10th ppm, feed concentrations between 0 and 10 ppm are rounded to single ppm levels, and feed concentrations in excess of 10 ppm are round up to the nearest 10 ppm.

7 Calculations

7.1 Calculation of anticipated TOC and SOW maximums for all LAW and HLW batches

This section calculates the anticipated TOC weight percent for all the WTP Phase I batches and also calculates the equivalent weight percent based on SOW maximums. This is done to determine the maximum TOC wt% per batch to be used as the basis for the organic feed concentrations in this calculation and to make sure that the batches are at or below the SOW maximum. Only the calculation for one batch in the categories of LAW supernate, HLW supernate, and HLW solids are shown as the rest of the calculations are identical. The calculations are presented in Attachment A Tables 1, 2, and 3.

7.1.1 LAW Batches

Refer to Attachment A Table 1 for this calculation. The calculation for LAW batch LAW-1 is shown here, as the rest of the calculations are the same. From section 2, the batch data for density, sodium concentration, and TOC concentration was obtained. For this batch:
Density: 1.39 g/cc (cell B6)
Na: 6.83 mol/l (cell B7)
TOC: 0.198 mol/l
The equivalent TOC mol/mol Na concentration is:

(0.198 mol TOC/l) / (6.83 mol Na/l) = 2.90E-02 mol TOC/mol Na (cell B8)

The equivalent TOC weight percent for this batch is:

[(2.90E-02 mol TOC/mol Na) × (6.83 mol Na/l) × (12.011 g TOC/mol TOC)] / [(1.39 g/cc)×(1000 cc/l)] × 100% = 0.17% (cell B9)

The equivalent TOC weight percent for this batch at SOW maximum concentration is:
[(0.5 mol TOC/mol Na) × (6.83 mol Na/l) × (12.011 g TOC/mol TOC)] / [(1.39 g/cc)×(1000 cc/l)] × 100% = 2.94% (cell B10)

Therefore, this batch is below the SOW maximum.

7.1.2 HLW Supernate Batches

Refer to Attachment A Table 2 for this calculation. The calculation for HLW batch HLW-1 is shown here, as the rest of the calculations are the same. From section 2, the batch data for density, sodium concentration, and TOC concentration was obtained. For this stream:
Density: 1.09 g/cc (cell B5)
Na: 1.37 mol/l (cell B6)
TOC: 3.97E-02 mol/l
The equivalent TOC mol/mol Na concentration is:

(3.97E-02 mol TOC/l) / (1.37 mol Na/l) = 2.90E-02 mol TOC/mol Na (cell B7)

The equivalent TOC weight percent for this batch is:

[(2.90E-02 mol TOC/mol Na) × (1.37 mol Na/l) × (12.011 g TOC/mol TOC)] / [(1.09 g/cc)×(1000 cc/l)] ×100% = 0.04% (cell B8)

The equivalent TOC weight percent for this batch at SOW maximum concentration is:

[(0.5 mol TOC/mol Na) × (1.37 mol Na/l) × (12.011 g TOC/mol TOC)] / [(1.09 g/cc)×(1000 cc/l)] ×100% = 0.75% (cell B9)

Therefore, this batch is below the SOW maximum.

7.1.3 HLW Solids Batches

Refer to Attachment A Table 3 for this calculation. The calculation for HLW batch HLW-1 is shown here, as the rest of the calculations are the same. From section 2, the batch data for density, sodium concentration, and TOC concentration was obtained. For this stream:
Density: 3 g/cc (cell B5)
Na: 0.127 g/g solids (cell B6)
TOC: 9.59E-03 g/g solids (cell B8)
Converting Na g/g solids to mol/l:

Na MW: 23 g/mol
0.127 g Na/g solids × 1 mol Na/23 g Na × 3.00 g solids/cc × 1000 cc/l = 16.6 mol Na/l (cell B7)

Converting TOC g/g solids to mol/l:

TOC MW: 12.011 g/mol
9.59E-03 g TOC/g solids × 1 mol TOC/12.011 g C × 3.00 g solids/cc × 1000 cc/l = 2.4 mol TOC/l (cell B9)

The TOC mol/mol Na concentration is therefore:

(2.4 mol TOC/l) / (16.6 mol Na/l) = 1.45E-01 mol TOC/mol Na (cell B10)

The equivalent TOC weight percent for this batch is:

[(1.45E-01 mol TOC/mol Na) × (16.6 mol Na/l) × (12.011 g TOC/mol TOC)] / [(3.00 g/cc)×(1000 cc/l)] × 100% = 0.96% (cell B11)

The equivalent TOC weight percent for this batch at SOW maximum concentration is:

[(1.1 mol TOC/mol Na) × (16.6 mol Na/l) × (12.011 g TOC/mol TOC)] / [(3.00 g/cc)×(1000 cc/l)] × 100% = 7.3% (cell B12)

Therefore, this batch is below the SOW maximum.

From the results, it is concluded that all batches are below the SOW maximum concentrations and that batch LAW-11 has the highest TOC weight percent (2.22 wt%). Adding a contingency factor of slightly over 10% to this value, the selected organic feed wt% used for the air emissions estimates is 2.5%.

7.2 Calculation of New Hazardous Organic Feed Composition and Target TOC Concentration

As stated in the *RPP-WTP Waste Feed Assessment* (RPT-24590-EN00003), the previous basis for calculating the hazardous organics feed concentrations was the following:

Number of hazardous organic constituents:	250
TOC feed weight percent:	4 wt%
% accounted for, non-hazardous:	87.5%
% not accounted for, assumed hazardous:	12.5%

The new basis for calculating the hazardous organics feed concentrations is the following:

Number of hazardous organic constituents:	216
TOC feed weight percent:	2.5 wt%
% accounted for, non-hazardous:	90%
% not accounted for, assumed hazardous:	10%

With this new basis, the target TOC concentration in the feed can be calculated. Per Table 1, the maximum LAW batch density is 1.38 g/cc (Table 1, cell K14). As stated above, the target TOC weight percent is 2.5 wt% and the amount of this TOC as hazardous organics is 10%. This means that the target hazardous TOC concentration, in mg/l, for this batch is (refer to Table 4 for the calculation):

1.38 g/cc (cell E1) × 1000 cc/l × 1000 mg/g × 0.025 mg TOC/mg (cell I1) × 0.10 = 3460 mg TOC/l (cell E2)

7.3 Conversion of detection limits and measured concentrations to TOC concentrations

Now that the target TOC concentration is set, the concentration for each organic constituent needs to be converted to total organic carbon concentration and scaled up to match the target TOC concentration. Only the calculation for

organic constituent p-Nitrochlorobenzene (CAS# 100-00-5) is shown, as the calculation is the same for the rest of the constituents. All calculations are shown in Attachment A Table 4.

First, the number of carbons for the constituent is determined from the chemical formula. The chemical formula for p-Nitrochlorobenzene is $C_6H_4ClNO_2$ (cell C5), which indicates that the constituent has 6 carbons (cell E5). The constituent's detection limit/measured concentration was taken from Section 2 and shown in cell F5 (0.3 mg/l) along with its molecular weight (157.56 g/mole) shown in cell D5. Converting this concentration to the carbon equivalent concentration gives:

[0.2 mg/l (cell F5) × 6 carbons (cell E5) × 12.011 g C/mol C] / 157.56 g/mol (cell D5) = 9.15E-02 mg C/l (cell G5)

After all the equivalent mg TOC/l were calculated, they were added together to determine the total mg TOC/l. From Attachment A Table 4 cell G207, this number is 18.3 mg TOC/l. This number is below the target TOC of 3460 mg TOC/l (Attachment A Table 4 cell E2). Therefore, a scaling factor was calculated in order to meet the target concentration. This scaling factor is:

3460 mg TOC/l (cell E2) / 18.3 mg TOC/l (cell G211) = 189 (cell I3)

All the calculated TOC concentrations were therefore multiplied by this scaling factor in order to achieve the target concentration. For p-Nitrochlorobenzene this number is:

9.15E-02 mg TOC/l (cell G5) × 189 (cell I3) = 1.73E+01 mg TOC/l (cell H5)

All the new scaled up concentrations were then added together to make sure the target concentration was achieved. This total is shown in cell H211 and is 3460 mg TOC/l that is the same as the target concentration shown in cell E2.

7.4 Final Organic Constituent Feed Concentration

Once the scaled up mg TOC/l concentrations were calculated, they were converted back to the original organic constituent concentration. For p-Nitrochlorobenzene this number is:

1.73E+01 mg TOC/l (cell H5) × 157.56 g/mol (cell D5) / (12.011 g TOC/mol TOC) / (6 carbons, cell E5) = 38 mg/l (cell I5)

Rounding this value to the nearest 10 ppm level (see Section 6), 40 mg/l is the computed feed concentration for LAW and HLW.

8 Results and Conclusions

The hazardous organic feed concentrations for air emissions purposes has been updated by analyzing data from the *Tank Farm Contractor Operation and Utilization Plan* (CHG 2005) and revalidating the original basis for the organic feed composition. The updated concentrations are shown below and will be used in future air emissions profile generation.

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 16

BY: E. Berríos
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

Updated Hazardous Organic Constituents Air Emissions Feed Concentrations

CAS #	COPC	Feed Concentration (mg/L)
100-00-5	p-Nitrochlorobenzene	40
100-21-0	p-Phthalic acid	60
100-41-4	Ethyl benzene	4
100-42-5	Styrene	4
10061-01-5	cis-1,3-Dichloropropene	4
10061-02-6	trans-1,3-Dichloropropene	4
101-55-3	4-Bromophenylphenyl ether	60
101-84-8	Diphenyl ether	10
106-35-4	3-Heptanone	4
106-42-3	p-Xylene (Dimethyl benzene)	10
106-46-7	1,4-Dichlorobenzene	4
106-88-7	1,2-Epoxybutane	10
106-93-4	Ethylene dibromide (Dibromethane)	4
106-97-8	Butane	10
106-99-0	1,3-Butadiene	4
107-02-8	Acrolein	10
107-05-1	3-Chloropropene (Allyl chloride)	4
107-06-2	1,2-Dichloroethane (Ethylene chloride)	4
107-12-0	Propionitrile	10
107-13-1	Acrylonitrile	20
107-18-6	2-Propene-1-ol	60
107-31-3	Formic acid, methyl ester	60
107-66-4	Dibutylphosphate	60
107-87-9	2-Pentanone	20
108-03-2	1-Nitropropane	60
108-05-4	Vinyl acetate	60
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	10
108-20-3	Bis(isopropyl)ether	10
108-38-3	m-Xylene (Dimethyl benzene)	10
108-39-4	m-Cresol	10
108-87-2	Methylcyclohexane	10
108-88-3	Toluene	4
108-90-7	Chlorobenzene	4
108-93-0	Cyclohexanol	10
108-94-1	Cyclohexanone	10
108-95-2	Phenol	60
109-66-0	n-Pentane	10
109-99-9	Tetrahydrofuran	4
110-12-3	5-Methyl-2-hexanone	4
110-43-0	2-Heptanone	4

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 17

BY: E. Berrios
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

CAS #	COPC	Feed Concentration (mg/L)
110-54-3	n-Hexane	10
110-62-3	n-Valeraldehyde	60
110-82-7	Cyclohexane	10
110-83-8	Cyclohexene	4
110-86-1	Pyridine	20
111-65-9	n-Octane	10
111-76-2	Ethylene glycol monobutyl ether	60
111-84-2	n-Nonane	10
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	60
117-84-0	n-Dioctyl phthalate	60
120-12-7	Anthracene	60
120-82-1	1,2,4-Trichlorobenzene	10
120-83-2	2,4-Dichlorophenol	60
121-44-8	Triethylamine	10
121-69-7	Dimethylaniline	10
122-39-4	N,N-Diphenylamine	20
123-19-3	4-Heptanone	4
123-38-6	n-Propionaldehyde	20
123-51-3	3-Methyl-1-butanol	10
123-86-4	Acetic acid n-butyl ester	0.2
123-91-1	1,4-Dioxane	2
126-73-8	Tributyl phosphate	40
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	10
127-18-4	Perchloroethylene (tetrachloroethylene)	4
127-19-5	N,N-Dimethylacetamide	10
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	20
129-00-0	Pyrene	60
1321-64-8	Pentachloronaphthalene	60
1321-65-9	Trichloronaphthalene	60
132-64-9	Dibenzofuran	60
1335-87-1	Hexachloronaphthalene	60
1335-88-2	Tetrachloronaphthalene	60
1336-36-3	Polychlorinated biphenyls (PCBs)	0.4
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	0.2
141-79-7	4-Methyl-3-penten-2-one	60
142-82-5	n-Heptane	10
156-60-5	trans-1,2-Dichloroethylene	10
1634-04-4	Methyl tert-butyl ether	10
189-55-9	Dibenzo[a,i]pyrene	60
189-64-0	Dibenzo[a,h]pyrene	60
191-24-2	Benzo(g,h,i)perylene	60
191-30-0	Benzo[a,i]pyrene	60

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 18

BY: E. Berrios
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

CAS #	COPC	Feed Concentration (mg/L)
192-65-4	Dibenzo[a,e]pyrene	60
193-39-5	Indeno(1,2,3-cd)pyrene	60
206-44-0	Fluoranthene	60
208-96-8	Acenaphthylene	60
2234-13-1	Octachloronaphthalene	0.2
224-42-0	Dibenz[a,j]acridine	60
226-36-8	Dibenz[a,h]acridine	60
25551-13-7	Trimethyl benzene	10
26140-60-3	Terphenyls	60
27154-33-2	Trichlorofluoroethane	10
287-92-3	Cyclopentane	10
3697-24-3	5-Methylchrysene	60
3825-26-1	Ammonium perfluorooctanoate	60
4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	10
50-00-0	Formaldehyde	10
50-32-8	Benzo(a)pyrene	38
53-70-3	Dibenzo(a,h)anthracene	38
540-59-0	1,2-Dichloroethylene	10
540-84-1	2,2,4-Trimethylpentane	10
541-73-1	1,3-Dichlorobenzene	4
56-23-5	Carbon tetrachloride	4
563-80-4	3-Methyl-2-butanone	10
56-49-5	3-Methylcholanthrene	60
57-14-7	1,1-Dimethylhydrazine	60
58-90-2	2,3,4,6-Tetrachlorophenol	60
591-78-6	2-Hexanone	10
59-50-7	4-Chloro-3-methylphenol	60
59-89-2	N-Nitrosomorpholine	60
602-87-9	5-Nitroacenaphthene	60
60-29-7	Ethyl ether	60
603-34-9	Triphenylamine	60
60-34-4	Methylhydrazine	10
60-35-5	Acetamide	10
621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	60
624-83-9	Methyl isocyanate	10
627-13-4	Nitric acid, propyl ester	5
62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	60
630-20-6	1,1,1,2-Tetrachloroethane	10
64-17-5	Ethyl alcohol	10
67-56-1	Methyl alcohol (Methanol)	10
67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	2
67-64-1	2-Propanone (Acetone)	20

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 19

BY: E. Berríos
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

CAS #	COPC	Feed Concentration (mg/L)
67-66-3	Chloroform	4
67-72-1	Hexachloroethane	60
684-16-2	Hexafluoroacetone	10
71-23-8	n-Propyl alcohol	4
71-36-3	n-Butyl alcohol	10
71-43-2	Benzene	4
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	4
74-83-9	Bromomethane (Methyl bromide)	4
74-87-3	Chloromethane (Methyl chloride)	4
74-97-5	Bromochloromethane	10
74-99-7	Methylacetylene	60
75-00-3	Chloroethane	4
75-01-4	Vinyl chloride (1-Chloroethene)	4
75-05-8	Acetonitrile	10
75-07-0	Acetaldehyde	60
75-09-2	Dichloromethane (Methylene chloride)	4
75-12-7	Formamide	60
75-15-0	Carbon disulfide	10
75-21-8	Ethylene oxide (Oxirane)	2
75-27-4	Bromodichloromethane	10
75-34-3	1,1-Dichloroethane	4
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	10
75-43-4	Dichlorofluoromethane	4
75-45-6	Chlorodifluoromethane	4
75-50-3	Trimethylamine	10
75-52-5	Nitromethane	60
75-55-8	2-Methylaziridine	60
75-61-6	Difluorodibromomethane	10
75-63-8	Trifluorobromomethane	10
75-65-0	2-Methyl-2-propanol	10
75-69-4	Trichlorofluoromethane	10
75-71-8	Dichlorodifluoromethane	10
76-03-9	Trichloroacetic acid	10
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	60
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	60
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	10
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	10
76-15-3	Chloropentafluoroethane	10
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	60
78-87-5	1,2-Dichloropropane	4
78-92-2	1-Methylpropyl alcohol (2-Butanol)	4
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	10

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: 20

BY: E. Berríos
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

CAS #	COPC	Feed Concentration (mg/L)
79-00-5	1,1,2-Trichloroethane	10
79-01-6	Trichloroethylene	10
79-09-4	Propionic acid	60
79-10-7	2-Propenoic acid	60
79-20-9	Methyl acetate	60
79-34-5	1,1,2,2-Tetrachloroethane	0.02
83-32-9	Acenaphthene	60
84-66-2	Diethyl phthalate	60
84-74-2	Dibutyl phthalate	60
85-01-8	Phenanthrene	60
85-68-7	Butylbenzyl phthalate	60
86-73-7	Fluorene	60
87-68-3	Hexachlorobutadiene	10
88-06-2	2,4,6-Trichlorophenol	60
88-72-2	2-Nitrotoluene	10
88-75-5	2-Nitrophenol	60
88-89-1	Picric acid	60
91-20-3	Naphthalene	2
91-22-5	Quinoline	60
91-58-7	2-Chloronapthalene	60
92-52-4	1,1`-Biphenyl	40
92-93-3	4-Nitrobiphenyl	60
95-13-6	Indene	60
95-47-6	o-Xylene	4
95-48-7	o-Cresol (2-Methylphenol)	10
95-49-8	2-Chlorotoluene	60
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	4
95-57-8	2-Chlorophenol	60
95-95-4	2,4,5-Trichlorophenol	60
96-18-4	1,2,3-Trichloropropane	1
96-22-0	3-Pentanone	20
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	60
98-51-1	p-tert-Butyltoluene	60
98-82-8	Cumene	60
98-83-9	alpha-Methylstyrene	10
98-86-2	Acetophenone	40
98-95-3	Nitrobenzene	40

9 References

9.1 Project Documents

CCN 097844, Meeting Minutes, Lee Bostic, September 3, 2004,"Discuss and resolve the outstanding risk assessment issues in the Risk Assessment Work Plan (RAWP)"

24590-WTP-RPT-MGT-04-001, Rev 0, *Regulatory Data Quality Objective Optimization Report*

24590-WTP-RPT-PO-03-008, Rev 1, *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant*

RPT-24590-EN00003, Rev 0, *RPP-WTP- Waste Feed Assessment*

9.2 Other Documents

CHG. 2005. *Tank Farm Contractor Operation and Utilization Plan*, HNF-SD-WM-SP-012, Revision 5D. CH2M HILL Hanford Group, Inc, Richland, WA.

DOE. 2000. *DOE Statement of Work*, DE-AC27-01RV14136, US Department of Energy, Office of River Protection, Richland, Washington, Modification No. M047.

EPA.1998. *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities*, EPA530-D-98-001A, Peer Review Draft. US Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.

EPA. 1999. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities*, EPA-530-D-99-001A, Peer Review Draft. US Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.

http://chemfinder.cambridgesoft.com

10 Attachments

Attachment A: Detailed Calculations

Attachment A
Detailed Calculations

CALCULATION SHEET

BY: E. Berrios
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

PROJECT.RPP-WTP
JOB NO.:24590
CALC NO..24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.. A-2

	A	B	C	D	E	F	G	H	I	J	K
1											
2											
3	**Table 1 - LAW Anticipated TOC Weight Percent per WTP Phase I Batch**										
4											
5	LAW	LAW-1	LAW-2	LAW-3	LAW-4	LAW-5	LAW-6	LAW-7	LAW-8		
6	density (g/cc)	1.39E+00	1.47E+00	1.38E+00	1.49E+00	1.41E+00	1.39E+00	1.31E+00	1.31E+00		
7	Na (mol/L)	6.83	9.19	8.39	9.85	6.94	6.93	7	6.99		
8	TOC (mol/mol Na)	2.90E-02	2.95E-02	6.19E-02	3.02E-02	2.42E-02	2.41E-02	2.07E-01	2.06E-01		
9	TOC wt%	0.17%	0.22%	0.45%	0.24%	0.14%	0.14%	1.33%	1.32%		
10	0.5 mol TOC/mol Na contract limit	2.94%	3.75%	3.66%	3.98%	2.96%	2.99%	3.20%	3.19%		
11											
12											Maximum
13	LAW	LAW-9	LAW-10	LAW-11	LAW-12	LAW-13	LAW-14	LAW-15	LAW-16	LAW-17	Batch
14	density (g/cc)	1.32E+00	1.44E+00	1.38E+00	1.46E+00	1.41E+00	1.35E+00	1.52E+00	1.39E+00	1.40E+00	1.38E+00
15	Na (mol/L)	6.8	7	8.16	9.69	8.66	6.98	7	6.99	7	8.16E+00
16	TOC (mol/mol Na)	2.19E-02	2.71E-02	3.13E-01	4.96E-02	2.93E-02	1.79E-02	9.91E-03	3.08E-02	2.97E-02	3.13E-01
17	TOC wt%	0.14%	0.16%	2.22%	0.39%	0.22%	0.11%	0.05%	0.19%	0.18%	2.22%
18	0.5 mol TOC/mol Na contract limit	3.10%	2.93%	3.55%	3.97%	3.68%	3.10%	2.77%	3.01%	3.00%	3.55%

CALCULATION SHEET

BY: E. Berríos
DATE: 11/23/05

PROJECT:RPP-WTP
JOB NO.:24590
CALC NO.:24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: A-3

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

	A	B	C	D	E	F
1						
2						
3	**Table 2 - HLW Anticipated Supernate TOC Weight Percent per WTP Phase I Batch**					
4	HLW liquids	HLW-1	HLW-2	HLW-3	HLW-4	Maximum
5	density (g/cc)	1.09	1.28	1.48	1.22	1.48
6	Na (mol/L)	1.37	4.44	8.56	3.84	8.56
7	TOC (mol/mol Na)	2.90E-02	8.76E-03	2.28E-02	2.15E-02	2.28E-02
8	TOC wt%	0.04%	0.04%	0.16%	0.08%	0.16%
9	0.5 mol TOC/mol Na contract limit	0.75%	2.08%	3.47%	1.89%	3.47%

CALCULATION SHEET

BY: E. Berríos
DATE: 11/23/05

PROJECT:RPP-WTP
JOB NO.:24590
CALC NO.:24590-WTP-M4C-FRP-00006
SHEET REV: B
SHEET NO.: A-4

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

	A	B	C	D	E	F
1						
2						
3	**Table 3 - HLW Anticipated Solids TOC Weight Percent per WTP Phase I Batch**					
4	HLW solids	HLW-1	HLW-2	HLW-3	HLW-4	Maximum
5	density (g/cc)	3	3	3	3	3
6	Na (g/g solids)	0.127	0.0484	0.0818	0.119	
7	Na (mol/l)	16.6	6.31	10.67	15.52	15.52
8	TOC (g/g solids)	9.59E-03	9.59E-04	4.59E-03	1.71E-02	
9	TOC (mol/l)	2.4	0.23975	1.1475	4.275	
10	TOC (mol/mol Na)	1.45E-01	3.80E-02	1.08E-01	2.75E-01	2.75E-01
11	TOC wt%	0.96%	0.10%	0.46%	1.71%	1.71%
12	1.1 mol TOC/mol Na contract limit	7.30%	2.78%	4.70%	6.84%	6.84%

CALCULATION SHEET

BY E. Berrios
DATE 11/23/05

SUBJECT. WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

PROJECT RPP-WTP
JOB NO 24590
CALC NO 24590-WTP-M4C-FRP-00006
SHEET REV B
SHEET NO . A-5

	A	B	C	D	E	F	G	H	I
1				spg	1.38E+00		Assumed TOC %		2 5%
2				Target C	3460	mg/L	Assumed Accounted		90 0%
3	**Table 4 Organic Constituent Feed Concentration Calculation**			MW C	12.011		Ratio		189
4	CAS #	COPC	Chemical Formula	MW	Carbons	mg/L	Eq Conc (mgC/L)	Ratioed Eq Conc (mg C/L)	Rat Conc (mg/L)
5	100-00-5	p-Nitrochlorobenzene	C6H4ClNO2	157 56	6	0 2	9.15E-02	1 73E+01	40
6	100-21-0	p-Phthalic acid	C8H6O4	166.13	8	0.3	1.74E-01	3 29E+01	60
7	100-41-4	Ethyl benzene	C8H10	106 16	8	0.02	1 81E-02	3.43E+00	4
8	100-42-5	Styrene	C8H8	104.14	8	0.02	1 85E-02	3 49E+00	4
9	10061-01-5	cis-1,3-Dichloropropene	C3H4Cl2	110.97	3	0 02	6.49E-03	1 23E+00	4
10	10061-02-6	trans-1,3-Dichloropropene	C3H4Cl2	110.97	3	0.02	6 49E-03	1.23E+00	4
11	101-55-3	4-Bromophenylphenyl ether	C12H9BrO	249.11	12	0.3	1.74E-01	3.29E+01	60
12	101-84-8	Diphenyl ether	C12H10O	170.21	12	0 066	5.59E-02	1 06E+01	10
13	106-35-4	3-Heptanone	C7H14O	114 19	7	0.02	1.47E-02	2.79E+00	4
14	106-42-3	p-Xylene (Dimethyl benzene)	C8H10	106.16	8	0 04	3.62E-02	6 85E+00	10
15	106-46-7	1,4-Dichlorobenzene	C6H4Cl2	147.01	6	0.02	9 80E-03	1.86E+00	4
16	106-88-7	1,2-Epoxybutane	C4H8O	72.12	4	0.066	4.40E-02	8.32E+00	10
17	106-93-4	Ethylene dibromide (Dibromethane)	C2H4Br2	187.88	2	0.02	2.56E-03	4 84E-01	4
18	106-97-8	Butane	C4H10	58 123	4	0 04	3.31E-02	6 26E+00	10
19	106-99-0	1,3-Butadiene	C4H6	54.091	4	0.02	1.78E-02	3 36E+00	4
20	107-02-8	Acrolein	C3H4O	56.06	3	0.03	1.93E-02	3 65E+00	10
21	107-05-1	3-Chloropropene (Allyl chloride)	C3H5Cl	76 526	3	0.02	9.42E-03	1.78E+00	4
22	107-06-2	1,2-Dichloroethane (Ethylene chloride)	C2H4Cl2	98 96	2	0.02	4.85E-03	9.19E-01	4
23	107-12-0	Propionitrile	C3H5N	55.079	3	0.05	3.27E-02	6 19E+00	10
24	107-13-1	Acrylonitrile	C3H3N	53.06	3	0.1	6.79E-02	1 29E+01	20
25	107-18-6	2-Propene-1-ol	C3H6O	58 08	3	0.3	1 86E-01	3.52E+01	60
26	107-31-3	Formic acid, methyl ester	C2H4O2	60.05	2	0.3	1.20E-01	2 27E+01	60
27	107-66-4	Dibutylphosphate	C8H19O4P	210.21	8	0.3	1 37E-01	2.60E+01	60
28	107-87-9	2-Pentanone	C5H10O	86.133	5	0.1	6.97E-02	1.32E+01	20
29	108-03-2	1-Nitropropane	C3H7NO2	89.09	3	0 3	1 21E-01	2.30E+01	60
30	108-05-4	Vinyl acetate	C4H6O2	86.09	4	0 3	1.67E-01	3.17E+01	60
31	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	C6H12O	100.16	6	0.04	2.88E-02	5.45E+00	10
32	108-20-3	Bis(isopropyl)ether	C6H14O	102.18	6	0 066	4 65E-02	8 81E+00	10
33	108-38-3	m-Xylene (Dimethyl benzene)	C8H10	106.16	8	0.04	3 62E-02	6.85E+00	10
34	108-39-4	m-Cresol	C7H8O	108.13	7	0 066	5.13E-02	9.72E+00	10
35	108-87-2	Methylcyclohexane	C7H14O	98.188	7	0.04	3.43E-02	6.48E+00	10
36	108-88-3	Toluene	C7H8	92.13	7	0.02	1.83E-02	3.46E+00	4
37	108-90-7	Chlorobenzene	C6H5Cl	112.56	6	0.02	1.28E-02	2 42E+00	4
38	108-93-0	Cyclohexanol	C6H12O	100.16	6	0.066	4.75E-02	8.99E+00	10
39	108-94-1	Cyclohexanone	C6H10O	98.2	6	0 07	5.14E-02	9.73E+00	10
40	108-95-2	Phenol	C6H6O	94.11	6	0 3	2.30E-01	4.35E+01	60
41	109-66-0	n-Pentane	C5H12	72.15	5	0.06	4.99E-02	9.46E+00	10
42	109-99-9	Tetrahydrofuran	C4H8O	72.1	4	0 02	1.33E-02	2.52E+00	4
43	110-12-3	5-Methyl-2-hexanone	C7H14O	114.19	7	0.02	1.47E-02	2.79E+00	4
44	110-43-0	2-Heptanone	C7H14O	114.19	7	0 02	1.47E-02	2.79E+00	4
45	110-54-3	n-Hexane	C6H14	86.177	6	0.04	3.35E-02	6 33E+00	10
46	110-62-3	n-Valeraldehyde	C5H10O	86 13	5	0.3	2 09E-01	3.96E+01	60
47	110-82-7	Cyclohexane	C6H12	84.161	6	0.03	2.57E-02	4 86E+00	10
48	110-83-8	Cyclohexene	C6H10	82.145	6	0.02	1.75E-02	3 32E+00	4
49	110-86-1	Pyridine	C5H5N	79.1	5	0.092	6.98E-02	1 32E+01	20
50	111-65-9	n-Octane	C8H18	114 23	8	0.04	3.36E-02	6 37E+00	10
51	111-76-2	Ethylene glycol monobutyl ether	C6H14O2	118	6	0.3	1.83E-01	3 47E+01	60
52	111-84-2	n-Nonane	C9H20	128.26	9	0 04	3.37E-02	6.38E+00	10
53	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	C24H38O4	390.56	24	0 3	2.21E-01	4.19E+01	60
54	117-84-0	n-Dioctyl phthalate	C24H38O4	390.56	24	0.3	2.21E-01	4.19E+01	60
55	120-12-7	Anthracene	C14H10	178.22	14	0 3	2.83E-01	5 36E+01	60
56	120-82-1	1,2,4-Trichlorobenzene	C6H3Cl3	181.46	6	0.03	1.19E-02	2 26E+00	10
57	120-83-2	2,4-Dichlorophenol	C6H4Cl2O	163.01	6	0.3	1.33E-01	2.51E+01	60
58	121-44-8	Triethylamine	C6H15N	101.19	6	0 066	4.70E-02	8.90E+00	10
59	121-69-7	Dimethylaniline	C8H11N	121.18	8	0.066	5 23E-02	9.91E+00	10
60	122-39-4	N,N-Diphenylamine	C12H11N	169.23	12	0.1	8.52E-02	1.61E+01	20
61	123-19-3	4-Heptanone	C7H14O	114.19	7	0 02	1.47E-02	2.79E+00	4
62	123-38-6	n-Propionaldehyde	C3H6O	58 08	3	0.09	5.58E-02	1 06E+01	20
63	123-51-3	3-Methyl-1-butanol	C5H12O	88 15	5	0 066	4.50E-02	8.51E+00	10
64	123-86-4	Acetic acid n-butyl ester	C6H12O2	116.16	6	0.001	6 20E-04	1.17E-01	0 2
65	123-91-1	1,4-Dioxane	C4H8O2	88.1	4	0 01	5.45E-03	1 03E+00	2
66	126-73-8	Tributyl phosphate	C12H27O4P	266.32	12	0.2	1.08E-01	2 05E+01	40
67	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	C4H5N	67 09	4	0 04	2.86E-02	5.42E+00	10

CALCULATION SHEET

BY: E. Berrios
DATE 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

PROJECT RPP-WTP
JOB NO. 24590
CALC NO 24590-WTP-M4C-FRP-00006
SHEET REV. B
SHEET NO A-6

	A	B	C	D	E	F	G	H	I
1				spg	1 38E+00		Assumed TOC %		2 5%
2				Target C	3460	mg/L	Assumed Accounted		90 0%
3	**Table 4 Organic Constituent Feed Concentration Calculation**			MW C	12.011		Ratio		189
4	CAS #	COPC	Chemical Formula	MW	Carbons	mg/L	Eq Conc (mgC/L)	Ratioed Eq Conc (mg C/L)	Rat. Conc (mg/L)
68	127-18-4	Perchloroethylene (tetrachloroethylene)	C2CL4	165.85	2	0 02	2.90E-03	5 48E-01	4
69	127-19-5	N,N-Dimethylacetamide	C4H9NO	87.12	4	0 066	3.64E-02	6.89E+00	10
70	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	C15H24O	220 35	15	0 1	8.18E-02	1.55E+01	20
71	129-00-0	Pyrene	C16H10	202 24	16	0 3	2.85E-01	5.40E+01	60
72	1321-64-8	Pentachloronaphthalene	C10H3Cl5	300.4	10	0.3	1.20E-01	2 27E+01	60
73	1321-65-9	Trichloronaphthalene	C10H5Cl3	231.51	10	0 3	1.56E-01	2.95E+01	60
74	132-64-9	Dibenzofuran	C12H8O	168 19	12	0 3	2.57E-01	4 87E+01	60
75	1335-87-1	Hexachloronaphthalene	C10H2Cl6	334.84	10	0.3	1.08E-01	2.04E+01	60
76	1335-88-2	Tetrachloronaphthalene	C10H4Cl4	265 95	10	0 3	1.35E-01	2.57E+01	60
77	1336-36-3	Polychlorinated biphenyls (PCBs)		322	12	0 0023	1 03E-03	1.95E-01	0.4
78	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	C4H8O2	88.1	4	0.001	5.45E-04	1.03E-01	0.2
79	141-79-7	4-Methyl-3-penten-2-one	C6H10O	98.16	6	0.3	2 20E-01	4.17E+01	60
80	142-82-5	n-Heptane	C7H16	100.2	7	0.05	4.20E-02	7.94E+00	10
81	156-60-5	trans-1,2-Dichloroethylene	C2H2Cl2	96.95	2	0.066	1.64E-02	3 10E+00	10
82	1634-04-4	Methyl tert-butyl ether	C5H12O	88.15	5	0.066	4.50E-02	8.51E+00	10
83	189-55-9	Dibenzo[a,i]pyrene	C24H14	302.37	24	0.3	2.86E-01	5.42E+01	60
84	189-64-0	Dibenzo[a,h]pyrene	C24H14	302.37	24	0 3	2.86E-01	5.42E+01	60
85	191-24-2	Benzo(g,h,i)perylene	C22H12	276 34	22	0.3	2 87E-01	5.43E+01	60
86	191-30-0	Benzo[a,i]pyrene	C24H14	302.37	24	0 3	2.86E-01	5 42E+01	60
87	192-65-4	Dibenzo[a,e]pyrene	C24H14	302.37	24	0 3	2.86E-01	5.42E+01	60
88	193-39-5	Indeno(1,2,3-cd)pyrene	C22H12	276 34	22	0 3	2 87E-01	5.43E+01	60
89	206-44-0	Fluoranthene	C16H10	202.26	16	0.3	2.85E-01	5.40E+01	60
90	208-96-8	Acenaphthylene	C12H8	152.21	12	0.3	2.84E-01	5.38E+01	60
91	2234-13-1	Octachloronaphthalene	C10Cl8	403.73	10	0 001	2.98E-04	5 63E-02	0 2
92	224-42-0	Dibenz[a,j]acridine	C21H13N	279.34	21	0.3	2.71E-01	5.13E+01	60
93	226-36-8	Dibenz[a,h]acridine	C21H13N	279.34	21	0.3	2.71E-01	5.13E+01	60
94	25551-13-7	Trimethyl benzene	C9H12	120 19	9	0.066	5.94E-02	1 12E+01	10
95	26140-60-3	Terphenyls	C18H14	230 31	18	0.3	2.82E-01	5.33E+01	60
96	27154-33-2	Trichlorofluoroethane	C2H2Cl3F	151 4	2	0.066	1.05E-02	1 98E+00	10
97	287-92-3	Cyclopentane	C5H10	70.134	5	0 03	2.57E-02	4.86E+00	10
98	3697-24-3	5-Methylchrysene	C19H14	242 32	19	0.3	2.83E-01	5.35E+01	60
99	3825-26-1	Ammonium perfluorooctanoate	C8H4F15NO2	431.1	8	0.3	6 69E-02	1.27E+01	60
100	4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	C4H6O	70.091	4	0.07	4.80E-02	9 08E+00	10
101	50-00-0	Formaldehyde	CH2O	30 03	1	0.066	2.64E-02	5 00E+00	10
102	50-32-8	Benzo(a)pyrene	C20H12	252 3	20	0.2	1.90E-01	3.61E+01	38
103	53-70-3	Dibenzo(a,h)anthracene	C22H14	278.33	22	0.2	1.90E-01	3 59E+01	38
104	540-59-0	1,2-Dichloroethylene	C2H2Cl2	96 94	2	0.066	1.64E-02	3 10E+00	10
105	540-84-1	2,2,4-Trimethylpentane	C8H18	114.23	8	0 066	5.55E-02	1.05E+01	10
106	541-73-1	1,3-Dichlorobenzene	C6H4Cl2	147 01	6	0.02	9 80E-03	1.86E+00	4
107	56-23-5	Carbon tetrachloride	CCl4	153 84	1	0.02	1.56E-03	2.96E-01	4
108	563-80-4	3-Methyl-2-butanone	C5H10O	86.133	5	0 03	2.09E-02	3 96E+00	10
109	56-49-5	3-Methylcholanthrene	C21H16	268.36	21	0 3	2.82E-01	5.34E+01	60
110	57-14-7	1,1-Dimethylhydrazine	C2H8N2	60.099	2	0 3	1.20E-01	2.27E+01	60
111	58-90-2	2,3,4,6-Tetrachlorophenol	C6H2Cl4O	231 9	6	0.3	9.32E-02	1.77E+01	60
112	591-78-6	2-Hexanone	C6H12O	100.16	6	0 04	2.88E-02	5.45E+00	10
113	59-50-7	4-Chloro-3-methylphenol	C7H7ClO	142 58	7	0.3	1 77E-01	3.35E+01	60
114	59-89-2	N-Nitrosomorpholine	C4H8N2O2	116.12	4	0.3	1 24E-01	2.35E+01	60
115	602-87-9	5-Nitroacenaphthene	C12H9NO2	199.21	12	0.3	2.17E-01	4 11E+01	60
116	60-29-7	Ethyl ether	C4H10O	74.12	4	0.3	1.94E-01	3.68E+01	60
117	603-34-9	Triphenylamine	C18H15N	245.32	18	0 3	2 64E-01	5.01E+01	60
118	60-34-4	Methylhydrazine	CH6N2	46.072	1	0.066	1 72E-02	3.26E+00	10
119	60-35-5	Acetamide	C2H5NO	59.07	2	0.066	2.68E-02	5.08E+00	10
120	621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	C6H14N2O	130.19	6	0 3	1.66E-01	3.14E+01	60
121	624-83-9	Methyl isocyanate	C2H3NO	57.052	2	0.066	2.78E-02	5.26E+00	10
122	627-13-4	Nitric acid, propyl ester	C3H7NO3	105 09	3	0.025	8.57E-03	1 62E+00	5
123	62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	C2H6N2O	74 1	2	0.3	9.73E-02	1.84E+01	60
124	630-20-6	1,1,1,2-Tetrachloroethane	C2H2Cl4	167.85	2	0.066	9 45E-03	1.79E+00	10
125	64-17-5	Ethyl alcohol	C2H6O	46.069	2	0 07	3.65E-02	6.91E+00	10
126	67-56-1	Methyl alcohol (Methanol)	CH4O	32.04	1	0 066	2.47E-02	4.68E+00	10
127	67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	C3H8O	60.096	3	0.01	6.00E-03	1.14E+00	2
128	67-64-1	2-Propanone (Acetone)	C3H6O	58.08	3	0.1	6.20E-02	1.17E+01	20
129	67-66-3	Chloroform	CHCl3	119 39	1	0.02	2.01E-03	3.81E-01	4
130	67-72-1	Hexachloroethane	C2Cl6	236.74	2	0.3	3.04E-02	5.76E+00	60

CALCULATION SHEET

BY E. Berrios
DATE: 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

PROJECT.RPP-WTP
JOB NO..24590
CALC NO 24590-WTP-M4C-FRP-00006
SHEET REV B
SHEET NO : A-7

	A	B	C	D	E	F	G	H	I
1				spg	1 38E+00		Assumed TOC %		2.5%
2				Target C	3460	mg/L	Assumed Accounted		90.0%
3	Table 4 Organic Constituent Feed Concentration Calculation			MW C	12.011		Ratio		189
4	CAS #	COPC	Chemical Formula	MW	Carbons	mg/L	Eq Conc (mgC/L)	Ratioed Eq Conc (mg C/L)	Rat. Conc (mg/L)
131	684-16-2	Hexafluoroacetone	C3F6O	166.02	3	0 066	1.43E-02	2.71E+00	10
132	71-23-8	n-Propyl alcohol	C3H8O	60 096	3	0 02	1.20E-02	2 27E+00	4
133	71-36-3	n-Butyl alcohol	C4H10O	74 1	4	0 03	1 95E-02	3.68E+00	10
134	71-43-2	Benzene	C6H6	78.11	6	0.02	1.85E-02	3.49E+00	4
135	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	C2H3Cl3	133.42	2	0.02	3.60E-03	6.82E-01	4
136	74-83-9	Bromomethane (Methyl bromide)	CH3Br	94.95	1	0 02	2.53E-03	4.79E-01	4
137	74-87-3	Chloromethane (Methyl chloride)	CH3Cl	50.49	1	0.02	4 76E-03	9.01E-01	4
138	74-97-5	Bromochloromethane	CH2BrCl	129.39	1	0.066	6.13E-03	1.16E+00	10
139	74-99-7	Methylacetylene	C3H4	40.07	3	0 3	2.70E-01	5.11E+01	60
140	75-00-3	Chloroethane	C2H5Cl	64.52	2	0.02	7.45E-03	1 41E+00	4
141	75-01-4	Vinyl chloride (1-Chloroethene)	C2H3Cl	62.5	2	0.02	7.69E-03	1 46E+00	4
142	75-05-8	Acetonitrile	C2H3N	41 05	2	0 05	2.93E-02	5.54E+00	10
143	75-07-0	Acetaldehyde	C2H4O	44.05	2	0 3	1.64E-01	3.10E+01	60
144	75-09-2	Dichloromethane (Methylene chloride)	CH2Cl2	84.94	1	0 02	2.83E-03	5.35E-01	4
145	75-12-7	Formamide	CH3NO	45.04	1	0 3	8.00E-02	1 51E+01	60
146	75-15-0	Carbon disulfide	CS2	76.14	1	0.03	4.73E-03	8.96E-01	10
147	75-21-8	Ethylene oxide (Oxirane)	C2H4O	44 05	2	0.01	5.45E-03	1.03E+00	2
148	75-27-4	Bromodichloromethane	CHBrCl2	163.83	1	0 066	4.84E-03	9 16E-01	10
149	75-34-3	1,1-Dichloroethane	C2H4Cl2	98.97	2	0 02	4.85E-03	9.19E-01	4
150	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	C2H2Cl2	96 95	2	0.04	9.91E-03	1 88E+00	10
151	75-43-4	Dichlorofluoromethane	CHCl2F	102.92	1	0.02	2.33E-03	4.42E-01	4
152	75-45-6	Chlorodifluoromethane	CHClF2	86.47	1	0 02	2.78E-03	5.26E-01	4
153	75-50-3	Trimethylamine	C3H9N	59.11	3	0.066	4.02E-02	7 62E+00	10
154	75-52-5	Nitromethane	CH3NO2	61.04	1	0.3	5.90E-02	1.12E+01	60
155	75-55-8	2-Methylaziridine	C3H7N	57 1	3	0.3	1.89E-01	3 58E+01	60
156	75-61-6	Difluorodibromomethane	CBr2F2	209 82	1	0 066	3.78E-03	7.15E-01	10
157	75-63-8	Trifluorobromomethane	CBrF3	148 91	1	0 066	5 32E-03	1 01E+00	10
158	75-65-0	2-Methyl-2-propanol	C4H10O	74.122	4	0.04	2 59E-02	4.91E+00	10
159	75-69-4	Trichlorofluoromethane	CCl3F	137.38	1	0.03	2.62E-03	4.97E-01	10
160	75-71-8	Dichlorodifluoromethane	CCl2F2	120.92	1	0.04	3.97E-03	7 52E-01	10
161	76-03-9	Trichloroacetic acid	C2HCl3O2	163.39	2	0.066	9.70E-03	1.84E+00	10
162	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	C2Cl4F2	203.83	2	0 3	3.54E-02	6.69E+00	60
163	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	C2Cl4F2	203.83	2	0.3	3 54E-02	6.69E+00	60
164	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	C2Cl3F3	187 38	2	0.04	5.13E-03	9 71E-01	10
165	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	C2Cl2F4	170.92	2	0 05	7.03E-03	1.33E+00	10
166	76-15-3	Chloropentafluoroethane	C2ClF5	154.47	2	0.066	1 03E-02	1 94E+00	10
167	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	C4H10O	74.12	4	0.3	1.94E-01	3.68E+01	60
168	78-87-5	1,2-Dichloropropane	C3H6Cl2	112.99	3	0.02	6.38E-03	1.21E+00	4
169	78-92-2	1-Methylpropyl alcohol (2-Butanol)	C4H10O	74 122	4	0.02	1.30E-02	2 45E+00	4
170	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	C4H8O	72.1	4	0.06	4 00E-02	7.57E+00	10
171	79-00-5	1,1,2-Trichloroethane	C2H3Cl3	133.42	2	0.04	7.20E-03	1 36E+00	10
172	79-01-6	Trichloroethylene	C2HCl3	131.4	2	0.04	7.31E-03	1.38E+00	10
173	79-09-4	Propionic acid	C3H6O2	74.08	3	0 3	1.46E-01	2 76E+01	60
174	79-20-9	Methyl acetate	C3H6O2	74 08	3	0.3	1 46E-01	2 76E+01	60
175	79-34-5	1,1,2,2-Tetrachloroethane	C2H2Cl4	167.86	2	0.0001	1.43E-05	2.71E-03	0.02
176	83-32-9	Acenaphthene	C12H10	154.21	12	0.3	2.80E-01	5.31E+01	60
177	84-66-2	Diethyl phthalate	C12H14O4	222.24	12	0 3	1.95E-01	3 68E+01	60
178	84-74-2	Dibutyl phthalate	C16H22O4	278.34	16	0.3	2 07E-01	3.92E+01	60
179	85-01-8	Phenanthrene	C14H10	178.22	14	0.3	2.83E-01	5.36E+01	60
180	85-68-7	Butylbenzyl phthalate	C19H20O4	312.39	19	0.3	2.19E-01	4.15E+01	60
181	86-73-7	Fluorene	C13H10	166.22	13	0 3	2 82E-01	5 34E+01	60
182	87-68-3	Hexachlorobutadiene	C4Cl6	260.76	4	0.04	7.37E-03	1.40E+00	10
183	88-06-2	2,4,6-Trichlorophenol	C6H3Cl3O	197.46	6	0.3	1.09E-01	2.07E+01	60
184	88-72-2	2-Nitrotoluene	C7H7NO2	137.13	7	0.066	4.05E-02	7 66E+00	10
185	88-75-5	2-Nitrophenol	C6H5NO3	139.11	6	0.3	1.55E-01	2.94E+01	60
186	88-89-1	Picric acid	C6H3N3O7	229 11	6	0 3	9.44E-02	1.79E+01	60
187	91-20-3	Naphthalene	C10H8	128.16	10	0.01	9.37E-03	1.77E+00	2
188	91-22-5	Quinoline	C9H7N	129.16	9	0.3	2.51E-01	4.75E+01	60
189	91-58-7	2-Chloronapthalene	C10H7Cl	162 61	10	0 3	2.22E-01	4.20E+01	60
190	92-52-4	1,1`-Biphenyl	C12H10	154.21	12	0 2	1.87E-01	3 54E+01	40
191	92-93-3	4-Nitrobiphenyl	C12H9N02	199.21	12	0.3	2.17E-01	4 11E+01	60
192	95-13-6	Indene	C9H8	116.16	9	0 3	2.79E-01	5.29E+01	60
193	95-47-6	o-Xylene	C8H10	106.16	8	0.02	1 81E-02	3.43E+00	4

CALCULATION SHEET

BY: E. Berrios
DATE 11/23/05

SUBJECT: WTP Air Emissions Hazardous Organic Constituents Feed Concentrations

PROJECT RPP-WTP
JOB NO. 24590
CALC NO 24590-WTP-M4C-FRP-00006
SHEET REV B
SHEET NO : A-8

	A	B	C	D	E	F	G	H	I
1				spg	1.38E+00		Assumed TOC %		2.5%
2				Target C	3460	mg/L	Assumed Accounted		90.0%
3	**Table 4 Organic Constituent Feed Concentration Calculation**			MW C	12.011		Ratio		189
4	CAS #	COPC	Chemical Formula	MW	Carbons	mg/L	Eq Conc (mgC/L)	Ratioed Eq Conc (mg C/L)	Rat Conc (mg/L)
194	95-48-7	o-Cresol (2-Methylphenol)	C7H8O	108.13	7	0.066	5.13E-02	9.72E+00	10
195	95-49-8	2-Chlorotoluene	C7H7Cl	126.59	7	0 3	1.99E-01	3.77E+01	60
196	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	C6H4Cl2	147.01	6	0 02	9.80E-03	1.86E+00	4
197	95-57-8	2-Chlorophenol	C6H5ClO	128.56	6	0.3	1.68E-01	3.18E+01	60
198	95-95-4	2,4,5-Trichlorophenol	C6H3Cl3O	197.46	6	0.3	1.09E-01	2.07E+01	60
199	96-18-4	1,2,3-Trichloropropane	C3H5Cl3	147 43	3	0.004	9 78E-04	1.85E-01	1
200	96-22-0	3-Pentanone	C5H10O	86 133	5	0 1	6.97E-02	1.32E+01	20
201	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	C22H30O2S	358.54	22	0 3	2.21E-01	4.19E+01	60
202	98-51-1	p-tert-Butyltoluene	C11H16	148.25	11	0.3	2.67E-01	5 06E+01	60
203	98-82-8	Cumene	C9H12	120.19	9	0.3	2.70E-01	5.11E+01	60
204	98-83-9	alpha-Methylstyrene	C9H10	118.18	9	0.066	6.04E-02	1 14E+01	10
205	98-86-2	Acetophenone	C8H8O	120.5	8	0.2	1.59E-01	3.02E+01	40
206	98-95-3	Nitrobenzene	C6H5NO2	123.11	6	0.2	1.17E-01	2 22E+01	40
207							1 83E+01	3460	

Appendix E

Calculation: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

24590-WTP-M4C-FRP-00001, Rev 0D

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R10593477

Calculation Cover Sheet

ISSUED BY
RPP-WTP PDC Sheet i

RIVER PROTECTION PROJECT-WASTE TREATMENT PLANT	JOB NO.: 24590	
CALC NO. 24590-WTP-M4C-FRP-00001	GROUP Process Eng.	FACILITY Central
SUBJECT WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector		
CALCULATION STATUS DESIGNATION	☒ PRELIMINARY ☐ COMMITTED ☐ CONFIRMED ☐ SUPERSEDED BY: _____ ☐ CANCELLED	
SOFTWARE APPLICATIONS ☒ N/A		
QAS: ☐ YES ☐ NO	PROGRAM NAME:	VERSION/RELEASE NO.:

RECORD OF REVISIONS

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	ORIGINATOR	CHECKED	APPROVED/ ACCEPTED	DATE
0D	Update the Feed Vector	151	D-57	E. Berrios EB	J.Cook JC	S. Saunders SS	12-7-05
0C	Update the HLW SOW Max for As and V	106	D-39	E. Berrios	J. Reynolds	S. Saunders	01/10/05
0B	Update the Feed Vector	105	D-39	E. Berrios	J. Reynolds	S. Saunders	06/17/04
0A	Update the Feed Vector	137	137	E. Berrios	T. Lix/J. Tadlock	O. Block	12/18/02
0	Initial Issue	43	43	E. Berrios	J. Reynolds	O. Block	04/01/02

Notes/Comments

Calculations were performed on a Compaq Personal Computer using the software Microsoft Excel® 2000.

This calculation does not affect any structures, systems, components, or services of the WTP.

This calculation is a complete rewrite therefore no revision bars are used.

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1 Objective

The objective of this calculation is to update the inorganic and radionuclide constituents feed vector used to estimate WTP air emissions by reconciling updated WTP tank feed sequence and tank waste composition per the most recent Best Basis Inventory (June 2005).

2 Inputs

2.1 Design Inputs

Air emissions feed vector is based on two main sources, the Statement of Work (SOW) maximum concentrations and the Tank Waste Information Network System (TWINS), which provides the Best Basis Inventory (BBI) for all Hanford Tanks. BBI values are used for all constituents that are scoped under the WTP air permits. Tanks evaluated for BBI information are based on the latest WTP feed delivery sequence as specified in Figure 2-4 of Revision 2 of the *River Protection Project System Plan* (Certa 2003). This Figure also provides the basis for the type of waste being processed for each tank (i.e. supernate, salt cake, or solids). This information determined which data from the BBI was going to be used for the analysis. The tanks and type of waste used for evaluation are:

LAW
- AN-102 supernate (Envelope C)
- AN-103 dissolved solids (salt cake) and supernate (Envelope A)
- AN-104 dissolved solids (salt cake) (Envelope A)
- AN-105 dissolved solids (salt cake) and supernate (Envelope A)
- AN-107 supernate (Envelope C)
- AP-101 supernate (Envelope A)
- AP-102 supernate (Envelope A)
- AP-103 supernate (Envelope A)
- AP-104 supernate (Envelope A)
- AP-105 supernate (Envelope A)
- AW-101 dissolved solids (salt cake) and supernate (Envelope A)
- AZ-101 supernate (Envelope B)
- AZ-102 supernate (Envelope B)
- SY-101 supernate (Envelope A)

HLW
- AW-104 solids (Envelope D)
- AY-101 solids (Envelope D)
- AY-102/C-106 solids (Envelope D)
- AZ-101 solids (Envelope D)
- AZ-102 solids (Envelope D)
- C-104 solids (Envelope D)
- C-107 solids (Envelope D)

The BBI for each tank is located in the TWINS website http://twinsweb.pnl.gov/twins.htm. The BBI is located under the subject area called Data.

The constituents tracked in this calculation are those required for air permit and environmental risk assessment purposes. These are identified in Tables 3 and 4 of the *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-PO-03-008). Not all constituents specified in these tables are present in the feed vector as they are products or byproducts of the process (e.g. NO_x, SO_x, acid gases).

For the LAW feed, the following Statement of Work (SOW) maximums, based on the *WTP Statement of Work* (DE-AC27-01RV14136) Specification 7, Tables TS-7.1 and TS-7.2, were used:

LAW SOW Maximums

Chemical Analyte	**mol/mol Na**
Al	2.5E-01
Ba	1.0E-04
Ca	4.0E-02
Cd	4.0E-03
Cl	8.9E-02
Cr	2.0E-02
F	2.0E-01
Fe	1.0E-02
Hg	1.4E-05
K	1.8E-01
La	8.3E-05
Ni	3.0E-03
NO_2	3.8E-01
NO_3	8.0E-01
Pb	6.8E-04
PO_4	1.3E-01
SO_4	7.0E-02
TIC* as CO_3	3.0E-01
TOC* as oxalate	5.0E-01
U	1.2E-03
Radionuclide	**Bq/mol Na**
TRU*	3.0E+06
^{137}Cs	2.0E+10
^{90}Sr	8.0E+08
^{99}Tc	7.1E+06
^{60}Co	3.7E+05
^{154}Eu	4.3E+06

* TRU is defined as alpha-emitting radionuclide constituents with an atomic number greater than 92 with half-life greater than 10 years. TIC is defined as total inorganic carbon and TOC is defined as total organic carbon.

For the HLW feed, the SOW maximums are based on grams per 100 grams of non-volatile waste oxides for inorganic constituents and Curies per 100 grams of non-volatile waste oxides for radionuclide constituents. SOW maximums are available for various non-volatile elements, volatile components, and radionuclide constituents. The HLW SOW maximums, per the *WTP Statement of Work* (DE-AC27-01RV14136) Specification 8, Tables TS-8.1, TS-8.2, TS-8.3, and TS-8.4 are:

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: 5

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

HLW Non-Volatile Elements SOW Maximums

Non-Volatile Element	Maximum (grams / 100 grams waste oxides)	Non-Volatile Element	Maximum (grams / 100 grams waste oxides)
As	0.16	Zn	0.42
B	1.3	Ag	0.55
Be	0.065	Al	14
Ce	0.81	Ba	4.5
Co	0.45	Bi	2.8
Cs	0.58	Ca	7.1
Cu	0.48	Cd	4.5
Hg	0.1	Cr	0.68
La	2.6	F	3.5
Li	0.14	Fe	29
Mn	6.5	K	1.3
Mo	0.65	Mg	2.1
Nd	1.7	Na	19
Pr	0.35	Th	5.0
Pu	0.054	Ni	2.4
Rb	0.19	P	1.7
Sb	0.84	Pb	1.1
Se	0.52	Pd	0.13
Sr	0.52	Rh	0.13
Ta	0.03	Ru	0.35
Tc	0.26	S	0.65
Te	0.13	Si	19
Tl	0.45	Ti	1.3
V	0.032	U	14
W	0.24	Zr	15
Y	0.16		

HLW Volatile Components SOW Maximums

Volatile Components	Maximum (grams / 100 grams waste oxides)
Cl	0.33
CO_3^{-2}	30
NO_2	36 (total NO_2/NO_3) as NO_3
NO_3	
TOC	11
CN	1.6
NH_3	1.6

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: 6

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

HLW Radionuclide Constituents SOW Maximums

Radionuclide	Maximum (Ci/100 grams waste oxide)	Radionuclide	Maximum (Ci/100 grams waste oxide)	Radionuclide	Maximum (Ci/100 grams waste oxide)
3H	6.5E-05	129I	2.9E-07	238Pu	3.5E-04
14C	6.5E-06	137Cs	1.5E+00	239Pu	3.1E-03
60Co	1.0E-02	152Eu	4.8E-04	241Pu	2.2E-02
90Sr	1.0E+01	154Eu	5.2E-02	241Am	9.0E-02
99Tc	1.5E-02	233U	2.0E-04	243+244Cm	3.0E-03
125Sb	3.2E-02	235U	2.5E-07		
126Sn	1.5E-04	237Np	7.4E-05		

For the purposes of charge balancing the feed vector, the following element charges were used. Charges are based on the CRC Handbook 71st Edition (CRC 1991). For compounds with multiple valance states, the most common valence state (or the state that is most appropriate for high level waste) has been used. The Steady-State Flowsheet Model (SSFM) only requires the inorganic constituents to be charge balanced thus the radionuclide constituents are not included in this step of the calculation.

Component Charges

Component	Charge	Component	Charge
Ag	1	NO_2	-1
Al	3	NO_3	-1
As	5	O	-2
B	3	OH	-1
Ba	2	Oxalate	-2
Be	2	Pb	2
Bi	3	Pd	2
Ca	2	PO_4	-3
Cd	2	Pr	3
Ce	3	Rb	1
Cl	-1	Rh	3
CN	-1	Ru	3
CO_3	-2	Sb	5
Co	3	Se	6
Cr	3	Ta	5
Cu	2	Si	4
F	-1	SO_4	-2
Fe	3	Sr	2
Hg	2	Te	4
K	1	Th	4
La	3	Ti	4
Li	1	Tl	3
Mg	2	U	6
Mn	4	V	3
Mo	6	W	6
Na	1	Y	3
Nd	3	Zn	2
Ni	2	Zr	4

Molecular weights of components were based on the CRC Handbook 71st Edition (CRC 1991). These are:

Analyte	MW g/mol	Analyte	MW g/mol
Ag	107.8	NO3	62.0
Al	27.0	O	16.0
As	74.9	OH	17.0
B	10.8	Oxalate	88.0
Ba	137.3	Pb	207.2
Be	9.0	Pd	105.4
Bi	208.9	PO4	95
Ca	40.1	Pr	140.9
Cd	112.4	Rb	85.5
Ce	140.1	Rh	102.9
Cl	35.5	Ru	101.1
CN	26.0	Sb	121.7
Co	58.9	Se	78.9
Cr	52	Si	28.1
Cu	63.5	SO4	96.1
F	19	Sr	87.6
Fe	55.9	Ta	180.9
Hg	200.6	Te	127.6
K	39.1	Th	232.0
La	138.9	Ti	47.9
Li	6.9	TIC as CO3	60.0
Mg	24.3	Tl	204.4
Mn	54.9	U(total)	238.0
Mo	95.9	V	50.9
Na	22.9	W	183.9
Nd	144.2	Y	88.9
NH3	17.0	Zn	65.4
Ni	58.7	Zr	91.2
NO2	46.0		

Conversion factor from Ci to Bq: 1Ci = 3.7E+10 Bq (Table 1-4 of [Perry, 1984])

2.2 Criteria

The following criteria were used in this calculation to develop the WTP air emissions inorganic and radionuclide constituents feed vector:

- For LAW inorganic constituents feed quantity selected is the calculated average value from all the tanks evaluated. This is different from previous air emissions feed vectors because as the WTP flowsheet has matured, it has been determined that a feed with all inorganic constituents at maximum concentrations imposes throughput restrictions in the flowsheet and does not provide a bounding condition. If the calculated average value is higher than SOW maximum, the SOW maximum value is selected as the feed concentration.

- For LAW radionuclide constituents feed quantity selected is the highest value from all the tanks evaluated. Unlike the inorganic constituents, the radionuclide constituents do not restrict the flowsheet with the same intensity as the inorganic constituents do. If the maximum radionuclide feed quantity is higher than SOW maximums, the SOW maximum number is used.
- For HLW inorganic constituents, the average feed concentrations were converted to equivalent SOW maximums by using the maximum values presented in Section 2 of this calculation. If the constituent did not have a SOW maximum value, then the average BBI feed concentration was used.
- For HLW radionuclide constituents, the maximum BBI feed concentrations were converted to equivalent SOW maximums by using the guidelines presented in Section 2 of this calculation. If the constituent did not have a SOW maximum value, then the maximum BBI feed concentration was used.
- For both LAW and HLW, the mercury (Hg) concentration selected is the maximum concentration to ensure bounding conditions for the constituent.
- The LAW transuranics are defined as: 237Np, 238Pu, 239Pu, 240Pu, 241Am, 242Cm, 242Pu, 243Am, 243Cm, and 244Cm, per the contract specifications.
- For the HLW feed contract maximum calculations, the non-volatile compounds are all those in the feed except Cl, CN, F, NH_3, NO_2, NO_3, OH, oxalate, PO_4, SO_4, and CO_3.
- Tanks analyzed are those specified in Figure 2-4 of revision 2 of the *River Protection Project System Plan* (Certa 2003). If the tanks to be processed by the WTP change, this calculation will need to be revised.

3 Background

Inorganic and radionuclide constituents feed vector used for air permitting and environmental risk assessment purposes is based on SOW maximum concentrations and BBI data. BBI data is used to calculate average concentrations for inorganic constituents and maximum concentration for radionuclide constituents. Since the release of the previous version of this calculation, changes have occurred to the SOW maximum concentrations that need to be reconciled along with changes in the tanks to be processed by the WTP. In addition, it was considered prudent to relook at the BBI data to ensure that the concentrations picked before were bounding, as the BBI is a living database. Reconciliation of this data is critical so that the feed vector used for air permitting purposes continuously provides a bounding air emissions profile.

4 Applicable Codes and Standards

No codes and standards were used in this calculation.

5 Methodology

The following methodology was used in this calculation.

5.1 LAW

- Data for the LAW tanks was obtained from the Best Basis Inventory on the web site http://twinsweb.pnl.gov/twins.htm. This data was downloaded in June 2005 and can be found in Attachment C sorted by tanks. Units of this data are:
  - Inorganic constituents: kg
  - Radionuclide constituents: Ci

- Per Figure 2-4 of the *River Protection Project System Plan* (Certa 2003), for tanks that have identified supernate as the type of waste feed being transferred, the supernate value was used. For those identified as dissolved solids, the salt cake value was used. For those identified as transferring both, the total number was used.
- Inorganic constituents' weight was converted to moles by multiplying by 1000 grams/kg and dividing by the molecular weight of the constituent in grams/mol. The average concentration in moles was then calculated for each constituent, except for Hg where the maximum concentration was used.
- Radionuclide constituents' maximum activity in Ci was selected.
- For LAW, Statement of Work maximums were compared to the calculated inorganic constituents feed concentration. If the calculated value was higher than the SOW maximum value, then the SOW maximum value was selected as the feed concentration. If the calculated value was lower than SOW maximum, the BBI average value was selected as the feed concentration.
- For the radionuclide constituents, the maximum concentration was selected and compared to SOW maximum values (in Bq/mol Na). If the SOW maximum value was lower than the calculated value, then the SOW value was selected as the feed concentration.
- Once the new feed quantities were selected as described in the bullets above, they were charge balanced (only inorganic constituents were considered as specified in Section 2.1). If the final overall charge was positive, then the amount of negative charges was adjusted to counteract the positive balance. If the final overall charge was negative, then the positive charges were adjusted to counteract the negative balance. The charge balance is only adjusted for constituents tracked in version 3.1 of the SSFM. These constituents are marked with a "Y" in the charge balance calculation sheets.
- After the charges were balanced, the final feed vector was converted to the units used by the Steady State Flowsheet Model. Chemical analytes were converted from moles to total mass in kg and the radionuclide constituents were converted from Bq/mol Na to total Ci.

5.2 HLW

- Data for the HLW tanks was obtained from the Best Basis Inventory on the web site http://twinsweb.pnl.gov/twins.htm. This data was downloaded in June 2005 and can be found in Attachment D sorted by tanks. All constituents were downloaded, as they are required to calculate the non-volatile waste oxides which in turn allows for calculation of SOW maximum inorganic and radionuclide concentrations. Units for this data are:
  - Inorganic constituents: kg
  - Radionuclide constituents: Ci
- For constituents that have several data points within a tank, these were added together to obtain a total inventory for the constituent. Only the sludge portion was considered in the calculation.
- Inorganic constituents' weight was converted to moles by multiplying by 1000 grams/kg and dividing by the molecular weight of the constituent in grams/mol. The average concentration in moles was then calculated for each constituent, except for Hg where the maximum concentration was used.
- Radionuclide constituents' maximum activity in Ci was selected.
- Statement of Work maximums were used for constituents that had one specified (see Section 6 for further details). Otherwise, the average BBI data was used. In order to determine to the SOW maximum, the amount of total non-volatile oxides had to be calculated. Once this number was obtained, the feed quantity required, per the SOW maximum, was calculated.
- For the radionuclide constituents, the maximum concentration was selected and compared to SOW maximum values (in Ci/100 g of oxides). If the SOW maximum value was lower than the calculated value, then the SOW value was selected as the feed concentration.

- For HLW inorganic constituents calculated average concentrations were converted to SOW maximums using the applicable grams/grams of oxide conversion shown in Section 2 of this calculation.
- Once the new feed quantities were selected, they were charge balanced (only inorganic constituents were considered as specified in Section 2.1). If the final overall charge was positive, then the amount of negative charges was adjusted to counteract the positive balance. If the final overall charge was negative, then the positive charges were adjusted to counteract the negative balance. The charge balance is only adjusted for constituents tracked in version 3.1 of the SSFM. These constituents are marked with a "Y" in the charge balance calculation sheets.
- After the charges were balanced, the final feed vector was converted to the units used by the Steady State Flowsheet Model. Chemical analytes were converted from moles back to total mass in kg and the radionuclide constituents were left in the units of Ci.

6 Assumptions

The following assumptions were used in this calculation and do not require verification:

- For HLW oxide calculation the contribution from the radionuclide constituents can be ignored, as the mass of these constituents is negligible when compared to the inorganic constituents.
- For the HLW inorganic SOW maximum concentrations, if all non-volatile g/100 g of oxides are added together, they add to over 100 g of oxides (~166 total g of oxides). What this means is that it is not physically possible to have all the inorganic constituents in the HLW feed stream come in at their SOW maximum values at the same time. Thus, in order to reduce this number down to 100 g of oxides, some constituents were selected to not be brought in at their SOW maximum values. A meeting was held with E&NS and Process Operations to identify constituents that do not typically contribute to human or ecological risks. The constituents selected were Bi, Ca, Na, Si, and Zr. These constituents will be considered to be at their BBI values as opposed to SOW maximums.

7 Calculations

These calculations were performed with a Microsoft Excel® 2000 spreadsheet on a Compaq PC workstation. A detailed calculation of each step is presented in this section for at least one constituent. The rest of the calculations are presented in the spreadsheets found in Attachment A for LAW and Attachment B for HLW.

7.1 LAW

7.1.1 Data Collection

The spreadsheet for the LAW portion of the calculation are located in Attachment A. Table A-1 shows the summarized raw data from the BBI for the chemical analytes in kilograms. This data was then converted to moles by multiplying by 1000 g/kg and dividing by the constituent's molecular weight in g/mole. This number is shown in Table A-2. Silver, for tank AN-102, is used as an example:

Ag: 9.56 kg Ag (Table A-1 cell D4)*1000g/kg*1 mole/107.8g Ag (Table A-2 cell C64)= 8.87E+01 mole Ag (Table A-2 cell E64)

Table A-2 shows the data in moles for all chemical analytes. The average feed quantity for each constituent was then selected except for Hg. The last column on Table A-2 shows the selected feed in units of mol.

For the radionuclide constituent, the raw data from BBI is presented in Table A-3. The maximum activity, in Ci, per constituent was selected and is shown in the last column of the table (Column R).

7.1.2 Inorganic and Radionuclide Constituents Feed Concentration

To determine the feed vector for the inorganic constituents, the data in moles was converted to mol/mol Na to match the units provided in the SOW maximum concentrations. This calculation is shown on Table A-4. The total Na amount is 2.71E+07 mol as shown in cell B29 of Table A-4. Column B includes the data in moles. Column C calculates the equivalent in mol/mol Na. Silver is used as an example. All other calculations are carried out identically.

Ag: 2.15E+02 moles Ag (cell B4) / 2.71E+07 mol Na (cell B29) = 7.92E-06 mol Ag/mol Na (cell C4)

Column D of Table A-4 provides the SOW maximum concentration for those available. If a SOW value exists, this value is compared to the one in column C. If the value in column C is greater, then the SOW value is selected. If the value in Column C is less, then the BBI average value is selected. Column E provides the inorganic constituents' feed vector before being charged balanced.

To determine the feed vector for radionuclide constituents, the data in Ci was converted to Bq/mol Na to match the units provided in the SOW maximum. This calculation is show on Table A-5. First, the Ci amount was converted to Ci/mol Na as shown in Column C. The Na amount was obtained from cell B29 of Table A-4. 106Ru is used as an example. All other calculations are carried out identically.

106Ru: 8.60E+01 Ci (cell B4) / 2.71E+07 mol Na (Table A-4 cell B29) = 3.17E-06 Ci 106Ru/mol Na (cell C4)

This number was then converted to Bq/mol Na by multiplying by the conversion factor 1Ci = 3.7E+10 Bq.

106Ru: 3.17E-06 Ci/mol Na (cell C4) * 3.7E+10 Bq/Ci = 1.17E+05 Bq/mol Na (cell D4)

Column E of Table A-5 provides the SOW maximums available. If an SOW value is available, then this value is used as the feed concentration. Finally, column F provides the radionuclide constituents' feed vector.

For the transuranics, the SOW maximum is given as a whole amount of 3.0E+06 Bq/mol Na. The LAW transuranics have atomic numbers greater than 92 and include 237Np, 238Pu, 239Pu, 240Pu, 241Am, 242Cm, 242Pu, 243Am, 243Cm, and 244Cm. The BBI concentrations of all these in Bq/mol Na were added together to determine the overall concentration (Column D of Table A-5 shows the BBI amounts of the transuranics in Bq/mol Na; these are repeated in column J). The summation is:
237Np = 2.61E+03 Bq/mol Na (cell J4)
238Pu = 1.47E+04 Bq/mol Na (cell J5)
239Pu = 2.03E+05 Bq/mol Na (cell J6)
240Pu = 5.28E+04 Bq/mol Na (cell J7)
241Am = 3.29E+06 Bq/mol Na (cell J8)
242Cm = 1.25E+04 Bq/mol Na (cell J9)
242Pu = 5.59 Bq/mol Na (cell J10)
243Am = 2.16E+03 Bq/mol Na (cell J11)
243Cm = 3.55E+02 Bq/mol Na (cell J12)
244Cm = 8.40E+03 Bq/mol Na (cell J13)
Total = 3.58E+06 Bq/mol Na (cell J14)

Since this amount is higher than the SOW maximum concentration, all concentrations were normalized so that the sum equals SOW maximum. This was done by dividing the individual transuranic feed quantity by the total transuranic feed quantity and then multiplying by the SOW maximum. These calculations are shown on column K of Table A-5.
237Np = 2.61E+03 Bq/mol Na (cell J4) / 3.58E+06 Bq/mol Na (cell J14)* 3.0E+06 Bq/mol Na (cell K14) = 2.18E+03 Bq/mol Na (cell K4)
238Pu = 1.47E+04 Bq/mol Na (cell J5) / 3.58E+06 Bq/mol Na (cell J14) * 3.0E+06 Bq/mol Na (cell K14) = 1.23E+04 Bq/mol Na (cell K5)
239Pu = 2.03E+05 Bq/mol Na (cell J6) / 3.58E+06 Bq/mol Na (cell J14) * 3.0E+06 Bq/mol Na (cell K14) = 1.70E+05 Bq/mol Na (cell K6)
240Pu = 5.28E+04 Bq/mol Na (cell J7) / 3.58E+06 Bq/mol Na (cell J14) * 3.0E+06 Bq/mol Na (cell K14) = 4.42E+04 Bq/mol Na (cell K7)
241Am = 3.29E+06 Bq/mol Na (cell J8) / 3.58E+06 Bq/mol Na (cell J14) * 3.0E+06 Bq/mol Na (cell K14) = 2.75E+06 Bq/mol Na (cell K8)
242Cm = 1.25E+04 Bq/mol Na (cell J9) / 3.58E+06 Bq/mol Na (cell J14) * 3.0E+06 Bq/mol Na (cell K14) = 1.05E+04 Bq/mol Na (cell K10)
242Pu = 5.59 Bq/mol Na (cell J10) / 3.58E+06 Bq/mol Na (cell J14) * 3.0E+06 Bq/mol Na (cell K14) = 4.68 Bq/mol Na (cell K11)
243Am = 2.16E+03 Bq/mol Na (cell J11) / 3.58E+06 Bq/mol Na (cell J14) * 3.0E+06 Bq/mol Na (cell K14) = 1.80E+03 Bq/mol Na (cell K12)
^{243}Cm = 3.55E+02 Bq/mol Na (cell J12) / 3.58E+06 Bq/mol Na (cell J14) * 3.0E+06 Bq/mol Na (cell K14) = 2.97E+02 Bq/mol Na (cell K13)
^{244}Cm = 8.40E+03 Bq/mol Na (cell J13) / 3.58E+06 Bq/mol Na (cell J14) * 3.0E+06 Bq/mol Na (cell K14) = 7.03E+03 Bq/mol Na (cell K14)
To verify the calculation, the new concentrations were added together to make sure they matched the SOW maximum. Total sum is 3.00E+06 Bq/mol Na, which is the same as the SOW maximum. These values are shown in column F of Table A-5 for the transuranics.

7.1.3 Feed Charge Balance

Once the feed quantities were determined, the feed was charge balanced. Table A-6 shows all the calculations described below. Only the inorganic constituents require charge balancing for Steady-State Flowsheet Model purposes.

First, the mol/mol Na concentrations were converted back to moles by multiplying by the total moles of Na (cell B29 from Table A-4). Then the feed quantity in moles was multiplied by the charge to get the total constituent's charge if the constituent is tracked in the SSFM. For example,

Ag
7.92E-06 mol Ag /mol Na (cell B4) * 2.71E+07 mol Na (Table A-4 cell B29) = 2.15E+02 moles Ag (cell C4)
Thus:
2.15E+02 moles Ag (cell C4) * +1 charge/mole (cell D4) = +215 mole charges (cell F4)

Column E determines if the constituent is tracked in the SSFM. If so, a "Y" is shown in the column, otherwise it is a "N". If the value in this column is "N", this constituent is not considered in the charge balancing and the values in the subsequent columns (F, G, and H) are zero.

After all charges were calculated, they were added together to get an overall charge. This was done by adding all the values in Column F for the inorganic constituents. The total charge calculated was 10,453,408. Being highly

positive, the negative charges required adjustment to counter balance. This was done by adjusting the OH charges by the same amount (10,453,408). This brought the charge total to zero. Feed concentrations specified before are the same for all the constituents except for OH. The new OH feed concentration is:
OH mole charges: -6,708,529 (cell F21)
OH mole charges added: -10,453,408 (cell N7)
OH charge: -1 (cell D21)
New total OH mole charges: -6,708,529 mole charges OH + (-10,453,408) added mole charges OH = -17,161,938 mole charges OH (cell G21)
New OH moles: -17,161,938 mole charges OH/ -1 mole charges/mole = 17,161,938 moles OH (cell H21)
New OH concentration: 17,161,938 moles OH (cell H21) / 2.71E+07 moles Na (Table A-4 cell B29) = 0.633 mol OH/mol Na (cell I21)

All other constituents were converted back to the original mol/mol Na as shown in Table A-6 columns G, H, and I. Calculations are similar to the ones used for OH. To obtain the final desired units, the inorganic constituents feed was converted to kg the following way:

Ag: 7.92E-06 mol Ag/mol Na (cell I4) * 2.71E+07 mol Na (Table A-4 cell B29) * 107.8 g Ag/mol (cell J4) * 1 kg / 1000g = 2.32E+01 kg Ag(cell L4)

Column L of Table A-6 shows the final LAW inorganic constituents feed concentrations in kilograms. Table A-7 shows the radionuclide constituents feed concentration. Column B of the table shows the same values as column F of Table A-5. These values were converted to Ci the following way (106Ru is used as an example):

1.17E+05 Bq 106Ru/mol Na (cell B64) * 2.71E+07 mol Na (Table A-4 cell B29) * 1 Ci/3.7E+10 Bq = 8.60E+01 Ci 106Ru (cell C64)

7.2 HLW

7.2.1 Data Collection

The spreadsheet for the HLW portion of the calculation can be located in Attachment B. Table B-1 shows the raw data from the BBI for the chemical analytes in kilograms. The average amount for each constituent was then calculated and shown in column K.

For the radionuclide constituents, the raw data from BBI is presented in Table B-2. The maximum activity, in Ci, per each constituent was selected and is shown in the last column of the table (column K).

7.2.2 Calculation of SOW Maximums with an Average Feed

For constituents with SOW maximum, this amount was selected for their feed concentration. For constituents without a SOW maximum, the BBI derived feed was used. To determine the SOW maximum, first the amount of non-volatile oxides had to be calculated. Non-volatile compounds include all components except Cl, CN, F, NH_3, NO_2, NO_3, OH, oxalate, PO_4, SO_4, TOC, and CO_3. Only inorganic constituents are taken into consideration, as the mass of radionuclide constituents is negligible when compared to the inorganic constituent mass. Table B-3 shows the calculation of the total oxides mass.

For the HLW inorganic SOW maximum concentrations, if all non-volatile g/100 g of oxides are added together, they add to over 100 g of oxides (~166 total g of oxides). What this means is that it is not physically possible to have all the inorganic constituents in the HLW feed stream come in at their SOW maximum values at the same

time. Thus, in order to reduce this number down to 100 g of oxides, some constituents were selected to not be brought in at their SOW maximum values. A meeting was held with E&NS and Process Operations to identify constituents that do not typically contribute to human or ecological risks. The constituents selected were Bi, Ca, Na, Si, and Zr. These constituents will be considered at their BBI values as opposed to their SOW maximums.

For inorganic constituents, silver is used as an example to demonstrate the calculation process. All the others are calculated identically.

The charge per each constituent was obtained as shown in Section 2 of this calculation. In order to calculate the amount of oxide ion needed to form the oxides, the constituent charge was divided by the charge of oxide ion.

Ag (O needed)
Charge = 1 (cell E4)
Mole of oxide ion needed per mole of Ag = 1/2 = 0.5 (cell F4)
Ag has a charge of +1, which means that the oxide to be formed is Ag_2O.

The mass of oxide ion associated with each constituent in the oxide form is then the number of oxide ion ratio times the moles of the constituent times the molecular weight of oxygen (16 g/mole).

Ag (Mass of oxide ion)
2.74E+02 kg Ag (cell B4) * 1000 g/kg * 1 mole / 107.8 g (cell C4) * 0.5 moles O / moles Ag (cell F4) * 16 g O / mole O = 2.03E+04 g O (cell G4) from Ag

Once all the oxide ion masses were calculated, the total amount of oxides in grams was calculated by adding all the constituents' weights together with the oxide ion weight. This total mass includes all constituents except Bi, Ca, Na, Si, Zr, OH, NH3, oxalate, PO4, SO4, Cl, CN, F, NO2, NO3, CO3, and TOC.

Total mass of inorganic constituents: 1.04E+08 grams (cell D112)
Total mass of oxide ion: 5.82E+07 grams (cell D111)
Total mass of oxides: 1.04E+08 g (cell D112) + 5.82E+07 g (cell D111) = 1.62E+08 g (cell D114)

The SOW maximum feed was then calculated by multiplying the constituents SOW maximum ratio by the total mass of oxides and dividing by 100. SOW maximum ratios used are those presented in Section 2. For example:

Ag:
Total mass oxides = 1.62E+08 grams (cell D114)
SOW maximum ratio = 0.55 g Ag / 100 g of oxides (cell H4)
SOW maximum feed quantity = 1.62E+08 g oxide (cell D114) * 0.55 g Ag /100 g of oxides (cell H4) = 8.93E+05 grams Ag (cell I4)

Table B-3 shows the rest of the calculations and the selected feed in grams for HLW inorganic constituents.

For the radionuclide constituents a similar approach was used. The SOW maximum Ci feed was calculated by multiplying the total oxide mass by the SOW maximum ratio and dividing by 100. 125Sb is used as an example:

125Sb
SOW maximum ratio: 3.20E-02 Ci 125Sb / 100 grams of oxides (cell C66)
Total oxide mass: 1.62E+08 grams (cell D114)

SOW maximum feed quantity = 1.62E+08 g oxide (cell D114) * 3.20E-02 Ci 125Sb / 100 g of oxides (cell C66)= 5.19E+04 Ci 125Sb (cell D66)

This value is repeated again in column E of Table B-3. Table B-3 shows the rest of the calculation for the remaining radionuclide constituents.

7.2.3 Feed Charge Balance

Once the final feed quantities were determined, the feed was charge balanced. Only the inorganic constituents require charge balancing for Steady-State Flowsheet Model purposes.

The feed quantity in kg was converted to moles. This amount was then multiplied by the constituent's charge to obtain the total charges. Ag is used as an example.

Ag
2.74E+02 kg Ag (cell B4) * 1000 g/kg * 1 mole / 107.8 g Ag (cell C4) = 2.54E+03 moles Ag (cell F4)

2.54E+03 moles Ag (cell F4) * +1 charge/mole Ag (cell E4) = +2,541 charges

Again, column G determines if the constituent is taken into consideration in the charge balance process. If the constituent has a "Y" value, it means it is tracked in the SSFM and is counted. Table B-4 shows the charge balance calculation for all the constituents.

The total charges were then added together to obtain the overall charge of the feed:

Total charge = +8,329,418 mol charges

Being positive, the amount of OH is then adjusted to counteract the positive charge. The added amount of OH is 8,329,418 mole charges.

The mole charges are then converted back to the original kg unit. Column J represents the final feed concentration (in kgmole) for inorganic constituents for air emissions purposes. Examples of the conversions are as follows:

Ag
2,541 mole charges (cell H4) / +1 charge/mole Ag (cell E4) * 107.8 g Ag/mole (cell C4) * 1 kg/1000g = 2.74E+02 kg Ag (cell I4)
2.74E+02 kg Ag (cell I4) / 107.8 kg Ag/kgmole = 2.54 kgmole Ag (cell J4)

Table B-5 shows the final radionuclide constituents feed concentrations for emissions purposes. These numbers are the same as those shown in column E of Table B-3 cells E64 through E109.

8 Results and Conclusions

The HLW and LAW feed vectors for the WTP air emissions profile have been developed in this calculation by using the SOW maximum concentrations and BBI data as the main basis. BBI data used is based on tanks expected to be processed by the WTP. These tanks are identified in Figure 2-4 of the *River Protection Project System Plan* (Certa 2003). The tables below show the final feed vector for LAW and HLW respectively. This feed vector will be incorporated in the SSFM to support future emissions profiles. This calculation will be updated if changes occur

to the SOW maximum concentrations and/or if the tanks to be processed by the WTP change. Also periodic comparisons to BBI data will be informally performed to determine any significant changes in inventory data.

LAW Chemical Analytes Emissions Feed Vector

Analyte	kg	Analyte	kg
Ag	2.32E+01	NO2	2.60E+05
Al	7.02E+04	NO3	4.74E+05
As	7.09E+01	OH	2.92E+05
B	1.70E+02	Oxalate	9.43E+03
Ba	2.71E+01	Pb	2.76E+02
Be	3.81E+00	Pd	1.09E+01
Bi	4.86E+01	PO4	1.01E+04
Ca	5.38E+02	Pr	6.98E-02
Cd	4.12E+01	Rb	4.16E+00
Ce	6.36E+01	Rh	1.02E+01
Cl	1.48E+04	Ru	1.50E+01
CN	1.17E+01	Sb	4.20E+01
Co	2.04E+01	Se	7.19E+01
Cr	3.24E+03	Si	5.64E+02
Cu	2.30E+01	SO4	2.44E+04
F	3.18E+03	Sr	4.13E+00
Fe	5.27E+02	Ta	5.53E+00
Hg	7.62E+01	Te	1.14E-01
K	3.48E+04	Th	6.59E+01
La	1.40E+01	Ti	7.93E+00
Li	1.96E+01	TIC as CO3	1.25E+05
Mg	7.27E+01	Tl	5.06E+01
Mn	1.78E+02	U(total)	3.37E+02
Mo	1.68E+02	V	2.78E+01
Na	6.21E+05	W	4.89E+01
Nd	8.32E+01	Y	5.29E+00
NH3	3.25E+02	Zn	4.05E+01
Ni	2.91E+02	Zr	4.17E+01

LAW Radionuclide Emissions Feed Vector

Analyte	Ci	Analyte	Ci
106Ru	8.60E+01	236U	7.76E-02
113mCd	1.33E+02	237Np	1.60E+00
125Sb	1.88E+03	238Pu	9.04E+00
126Sn	2.99E+01	238U	8.98E-01
129I	1.26E+00	239Pu	1.25E+02
134Cs	1.44E+03	240Pu	3.24E+01
137Cs	1.47E+07	241Am	2.02E+03
137mBa	4.78E+06	241Pu	6.80E+02
14C	4.13E+01	242Cm	7.69E+00
151Sm	2.64E+04	242Pu	3.43E-03
152Eu	1.52E+01	243Am	1.32E+00

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: 17

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Analyte	Ci	Analyte	Ci
154Eu	3.15E+03	243Cm	2.18E-01
155Eu	9.11E+02	244Cm	5.16E+00
226Ra	2.55E-04	3H	3.52E+02
227Ac	1.99E-02	59Ni	7.00E+01
228Ra	3.03E-01	60Co	2.71E+02
229Th	9.96E-03	63Ni	4.88E+03
231Pa	2.09E-01	79Se	3.37E+00
232Th	4.86E-02	90Sr	5.86E+05
232U	2.64E-02	90Y	2.74E+05
233U	1.62E+00	93mNb	1.20E+02
234U	1.15E+00	93Zr	1.95E+02
235U	4.53E-02	99Tc	5.20E+03

HLW Chemical Analytes Emissions Feed Vector

Analyte	kg	Analyte	kg
Ag	2.74E+02	NO2	1.56E+04
Al	3.85E+04	NO3	1.20E+04
As	1.72E+01	OH	1.42E+05
B	2.35E+02	Oxalate	4.66E+03
Ba	2.51E+02	Pb	2.14E+03
Be	6.31E+00	Pd	8.77E+01
Bi	1.30E+03	PO4	9.49E+03
Ca	1.50E+03	Pr	8.65E+01
Cd	9.19E+02	Rb	3.72E+01
Ce	3.14E+02	Rh	2.80E+01
Cl	3.07E+02	Ru	1.96E+02
CN	4.98E+00	Sb	6.75E+00
Co	1.30E+01	Se	1.17E+01
Cr	7.78E+02	Si	3.00E+03
Cu	1.07E+02	SO4	3.53E+03
F	5.55E+03	Sr	1.41E+02
Fe	3.98E+04	Ta	4.35E+02
Hg	1.56E+02	Te	4.92E+01
K	7.88E+02	Th	4.77E+03
La	4.65E+02	Ti	5.66E+01
Li	3.26E+01	TIC as CO3	3.45E+04
Mg	3.08E+02	Tl	1.33E+03
Mn	3.65E+03	U(total)	6.99E+03
Mo	1.78E+01	V	1.12E+01
Na	6.18E+04	W	8.52E+01
Nd	5.04E+02	Y	4.74E+01
NH3	1.14E-01	Zn	1.42E+02
Ni	1.63E+03	Zr	9.71E+03

HLW Radionuclide Emissions Feed Vector

Analyte	Ci	Analyte	Ci
106Ru	5.12E+01	236U	5.58E-01
113mCd	3.88E+02	237Np	1.20E+02
125Sb	5.19E+04	238Pu	5.68E+02
126Sn	2.43E+02	238U	9.56E+00
129I	4.71E-01	239Pu	5.03E+03
134Cs	1.23E+02	240Pu	1.33E+03
137Cs	2.43E+06	241Am	1.46E+05
137mBa	3.50E+05	241Pu	3.57E+04
14C	1.05E+01	242Cm	2.48E+01
151Sm	6.31E+05	242Pu	1.24E-01
152Eu	7.79E+02	243Am	1.18E+01
154Eu	8.44E+04	243Cm	2.05E+02
155Eu	1.25E+04	244Cm	4.66E+03
226Ra	5.16E-04	3H	1.05E+02
227Ac	2.02E+00	59Ni	3.01E+01
228Ra	1.48E+00	60Co	1.62E+04
229Th	5.53E-01	63Ni	2.81E+03
231Pa	1.70E-01	79Se	5.24E+00
232Th	3.97E+00	90Sr	1.62E+07
232U	2.26E+00	90Y	5.52E+06
233U	3.25E+02	93mNb	1.13E+02
234U	1.69E+01	93Zr	2.09E+02
235U	4.06E-01	99Tc	2.43E+04

9 References

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10 Attachments

Attachment A - LAW Calculations
Attachment B - HLW Calculations
Attachment C - LAW BBI Data
Attachment D - HLW BBI Data

Attachment A LAW Calculations

CALCULATION SHEET

BY E Bernos
DATE 12/05/05

SUBJECT WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

PROJECT RPP-WTP
JOB NO 24590
CALC NO 24590-WTP-M4C-FRP-00001
SHEET REV 0D
SHEET NO A-2

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Table A-1 LAW Chemical Analytes Feed Quantities in Kg															
2	Analyte	Units	Tank													
3			AN-102	AN-103	AN-104	AN-105	AN-107	AP-101	AP-102	AP-103	AP-104	AP-105	AW-101	AZ-101	AZ-102	SY-101
4	Ag	kg	9.56E+00	7.64E+01	3.73E+01	9.75E+01	6.26E+00	2.66E+00	0.00E+00	2.52E+01	2.91E+00	0.00E+00	6.23E+01	2.05E+00	1.61E+00	3.72E-01
5	Al	kg	4.56E+04	2.18E+05	5.13E+04	1.60E+05	3.70E+03	3.08E+04	1.25E+05	6.20E+04	6.98E+04	7.63E+04	1.15E+05	1.96E+04	1.13E+03	4.47E+03
6	As	kg	8.97E+01	1.60E+02	9.79E+01	2.28E+02	4.25E+00	5.31E+00	0.00E+00	1.17E+02	7.26E+00	0.00E+00	2.35E+02	3.21E+01	1.28E+01	3.44E+00
7	B	kg	1.39E+02	5.22E+02	3.44E+02	4.39E+02	7.38E+01	4.03E+01	0.00E+00	1.44E+02	2.05E+02	0.00E+00	3.70E+02	6.07E+01	2.57E+01	1.29E+01
8	Ba	kg	1.39E+01	7.98E+01	4.89E+01	1.14E+02	3.10E+01	1.39E+00	0.00E+00	7.29E+01	2.52E-01	0.00E+00	1.68E+01	2.52E-01	1.57E-01	1.36E-01
9	Be	kg	2.33E+00	9.38E+00	4.89E+00	1.14E+01	6.17E-01	5.56E+00	0.00E+00	7.56E+00	5.10E-01	0.00E+00	9.93E+00	9.53E-01	7.42E-02	1.14E-01
10	Bi	kg	9.00E+01	5.59E+01	3.18E+01	1.10E+02	2.73E+01	1.05E+01	9.10E+01	1.35E+02	1.16E+01	6.32E+01	4.78E+01	0.00E+00	0.00E+00	6.59E+00
11	Ca	kg	1.34E+03	3.39E+02	5.33E+02	1.96E+03	1.84E+03	3.25E+01	1.04E+02	2.58E+02	2.03E+02	1.13E+02	7.56E+02	2.38E+01	5.73E+00	1.37E+01
12	Cd	kg	1.95E+02	3.52E+01	2.46E+01	3.96E+01	2.07E+02	8.14E+00	0.00E+00	3.27E+01	6.36E+00	0.00E+00	2.38E+01	2.60E+00	1.67E+00	3.96E-01
13	Ce	kg	3.67E+01	1.60E+02	9.79E+01	2.28E+02	1.59E+02	3.15E-01	0.00E+00	1.46E+02	2.45E-01	0.00E+00	5.85E+01	1.91E-01	7.61E-02	3.32E+00
14	Cl	kg	1.33E+04	2.83E+04	1.11E+04	3.72E+04	5.82E+03	6.68E+03	2.44E+04	1.45E+04	2.16E+04	1.71E+04	2.50E+04	7.89E+02	2.36E+02	1.50E+03
15	CN	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.40E+01	0.00E+00	0.00E+00	1.09E+02	0.00E+00	0.00E+00	6.62E+00	2.44E+01	0.00E+00
16	Co	kg	2.22E+01	1.27E+02	1.96E+01	4.55E+01	1.36E+01	1.48E+00	0.00E+00	2.92E+01	2.89E+00	0.00E+00	2.33E+01	1.91E-01	7.42E-02	7.57E-01
17	Cr	kg	8.13E+02	2.51E+03	3.86E+03	7.34E+03	5.61E+02	7.27E+02	2.37E+03	1.99E+03	2.09E+03	1.69E+04	1.16E+03	2.22E+03	2.53E+03	2.87E+02
18	Cu	kg	7.85E+01	2.23E+01	1.90E+01	3.26E+01	9.49E+01	6.74E+00	0.00E+00	1.64E+01	1.62E+01	0.00E+00	3.18E+01	2.05E+00	1.30E+00	8.20E-01
19	F	kg	2.22E+02	3.53E+03	2.00E+03	6.14E+03	3.06E+02	7.95E+03	5.09E+02	2.77E+03	9.37E+02	7.15E+02	9.42E+03	6.51E+03	3.42E+03	3.71E+01
20	Fe	kg	1.14E+02	1.29E+02	2.86E+02	4.02E+02	5.43E+03	1.57E+01	2.39E+01	7.56E+01	2.10E+01	4.37E+01	8.19E+02	4.87E+00	2.23E+00	1.33E+00
21	Free OH	kg	3.07E+04	2.15E+05	9.15E+04	2.05E+05	5.93E+04	1.68E+05	1.30E+05	5.66E+04	8.18E+04	1.03E+05	3.93E+05	3.69E+04	8.13E+03	1.77E+04
22	Hg	kg	1.76E-01	1.51E+00	1.12E+00	1.94E+00	7.32E-01	3.36E-02	1.28E-05	0.00E+00	5.03E-03	7.41E-03	1.74E+00	1.80E-01	2.03E-01	7.59E-04
23	K	kg	7.52E+03	4.82E+04	8.91E+03	2.52E+04	5.70E+03	1.43E+05	1.65E+04	2.19E+04	8.76E+03	8.82E+03	1.67E+05	1.45E+04	1.05E+04	5.30E+02
24	La	kg	5.01E+01	2.26E-03	6.58E-04	2.34E-03	1.05E+02	1.90E-03	1.07E+01	1.88E+01	4.17E-01	3.62E+00	6.76E+00	0.00E+00	0.00E+00	3.92E-01
25	Li	kg	3.11E+00	9.69E+01	4.03E+01	6.45E+01	9.61E+00	1.43E+00	0.00E+00	1.17E+01	8.39E-02	0.00E+00	4.37E+01	2.92E+00	4.93E-01	2.16E-01
26	Mg	kg	6.94E+01	2.58E+02	9.79E+01	2.28E+02	4.57E+00	1.05E+01	0.00E+00	1.46E+02	1.16E+01	0.00E+00	1.63E+02	8.43E+00	1.71E+01	3.96E+00
27	Mn	kg	6.44E+01	2.58E+01	4.26E+01	7.24E+01	1.61E+03	5.48E+00	9.77E+00	1.51E+01	4.21E+00	9.15E+00	6.36E+02	0.00E+00	0.00E+00	3.77E-01
28	Mo	kg	1.68E+02	3.15E+02	1.24E+02	3.72E+02	1.10E+02	6.25E+01	0.00E+00	2.02E+02	2.62E+02	0.00E+00	2.51E+02	2.88E+02	1.78E+02	1.77E+01
29	Na	kg	7.17E+05	1.06E+06	4.81E+05	1.10E+06	6.85E+05	5.46E+05	7.88E+05	6.03E+05	5.35E+05	5.31E+05	1.02E+06	3.60E+05	2.04E+05	6.50E+04
30	Nd	kg	7.67E+01	2.58E+02	9.79E+01	2.28E+02	3.03E+02	1.05E+01	0.00E+00	1.16E+02	1.06E+01	0.00E+00	4.78E+01	8.43E+00	6.62E+00	1.53E+00
31	NH3	kg	4.65E+02	0.00E+00	0.00E+00	0.00E+00	1.54E+02	4.04E+02	0.00E+00	0.00E+00	3.53E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32	Ni	kg	1.32E+03	5.15E+01	1.50E+02	1.42E+02	1.73E+03	2.61E+01	3.49E+01	2.64E+02	1.91E+02	4.39E+01	1.08E+02	3.24E+00	3.81E+00	1.09E+01
33	NO2	kg	3.02E+05	4.30E+05	1.58E+05	4.59E+05	2.20E+05	1.72E+05	3.98E+05	2.72E+05	2.66E+05	1.88E+05	4.22E+05	1.99E+05	1.35E+05	1.96E+04
34	NO3	kg	7.24E+05	6.50E+05	2.96E+05	6.91E+05	6.89E+05	4.96E+05	6.78E+05	5.05E+05	4.19E+05	4.21E+05	8.19E+05	1.71E+05	2.73E+04	4.88E+04
35	Oxalate	kg	2.73E+03	1.62E+04	2.11E+04	2.19E+04	2.98E+03	4.49E+03	1.24E+04	3.90E+03	3.79E+03	5.60E+03	2.61E+04	3.27E+03	7.37E+03	1.35E+02
36	Pb	kg	5.50E+02	4.36E+02	1.03E+02	2.63E+02	1.24E+03	5.13E+01	2.09E+02	1.51E+02	5.81E+01	9.09E+01	6.93E+02	1.08E+01	0.00E+00	4.07E+00
37	Pd	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.01E+01	0.00E+00	0.00E+00	7.46E+00	0.00E+00	0.00E+00	6.49E+01	0.00E+00	0.00E+00
38	PO4	kg	1.80E+04	8.91E+03	1.05E+04	2.54E+04	5.09E+03	5.31E+03	1.31E+04	8.06E+03	1.90E+04	9.13E+03	1.07E+04	5.01E+03	1.49E+03	1.65E+03
39	Pr	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.29E-02	0.00E+00	0.00E+00	7.13E-01	0.00E+00	0.00E+00	1.91E-01	0.00E+00	0.00E+00
40	Rb	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E+01	0.00E+00	0.00E+00	1.18E+01	0.00E+00	0.00E+00	2.98E+01	0.00E+00	0.00E+00
41	Rh	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.19E+01	3.20E+01	0.00E+00	0.00E+00	2.28E+01	0.00E+00	0.00E+00	6.79E+00	0.00E+00	0.00E+00
42	Ru	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E+02	0.00E+00	0.00E+00	9.00E+01	0.00E+00	0.00E+00	1.52E+00	0.00E+00	0.00E+00
43	Sb	kg	7.25E-01	1.55E+02	5.88E+01	1.37E+02	1.01E+00	1.77E-01	0.00E+00	9.08E+01	1.12E-01	0.00E+00	1.41E+02	1.91E-01	1.13E-01	2.62E+00
44	Se	kg	9.03E+01	2.58E+02	9.79E+01	2.28E+02	2.66E+00	9.69E+00	0.00E+00	1.23E+02	2.85E+01	0.00E+00	1.20E+02	2.10E+01	2.19E+01	5.06E+00
45	Si	kg	7.76E+01	2.38E+03	1.60E+03	9.05E+02	4.30E+01	4.21E+02	1.82E+02	3.59E+02	1.51E+02	8.06E+01	1.31E+03	2.22E+02	1.62E+02	4.31E+00
46	SO4	kg	4.88E+04	1.10E+04	3.02E+04	2.84E+04	2.69E+04	1.62E+04	9.97E+03	1.61E+04	1.51E+04	1.19E+04	1.23E+04	5.24E+04	5.84E+04	3.61E+03
47	Sr	kg	7.99E+00	1.44E-01	5.25E+00	6.63E+00	6.18E+00	1.24E-01	4.68E+00	9.18E+00	1.12E+00	3.66E-01	2.58E+01	1.29E-01	1.20E-01	9.43E-02
48	Ta	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.67E+01	3.75E-01	0.00E+00	0.00E+00	1.44E-01	0.00E+00	0.00E+00	1.91E-01	0.00E+00	0.00E+00
49	Te	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.87E-01	0.00E+00	0.00E+00	7.13E-01	0.00E+00	0.00E+00	1.91E-01	0.00E+00	0.00E+00
50	Th	kg	7.15E+00	2.21E+00	7.43E-01	1.76E+00	5.80E+01	4.64E-02	4.43E+02	3.52E+02	1.06E+00	5.41E+01	1.16E+00	1.69E-04	9.99E-05	1.70E+00
51	Ti	kg	2.23E+00	2.58E+01	9.79E+00	2.28E+01	4.67E+00	2.66E+00	0.00E+00	1.51E+01	1.33E+00	0.00E+00	2.39E+01	2.05E+00	5.48E-01	9.19E-02
52	TIC as CO3	kg	2.12E+05	8.10E+04	1.57E+05	2.31E+05	2.43E+05	1.40E+05	4.89E+04	1.08E+05	7.21E+04	6.03E+04	1.14E+05	1.60E+05	1.07E+05	1.19E+04
53	Tl	kg	6.69E+00	0.00E+00	0.00E+00	4.55E+02	3.94E-01	7.59E-02	0.00E+00	0.00E+00	2.10E-01	0.00E+00	2.42E+02	1.91E-01	0.00E+00	3.65E+00
54	UTOTAL	kg	1.78E+02	1.20E+02	4.45E+02	2.71E+02	3.36E+02	2.30E+02	5.35E+01	4.81E+01	4.93E+01	3.44E+01	2.69E+03	9.14E+00	2.58E+02	1.77E+00
55	V	kg	9.00E+00	1.29E+02	4.89E+01	1.14E+02	2.30E+00	3.15E+00	0.00E+00	5.79E+01	5.39E+00	0.00E+00	1.28E+01	4.87E+00	1.76E+00	4.07E-01
56	W	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E+02	0.00E+00	0.00E+00	3.75E+02	0.00E+00	0.00E+00	1.88E+02	0.00E+00	0.00E+00
57	Y	kg	2.78E+00	0.00E+00	0.00E+00	0.00E+00	2.84E+01	6.66E+00	0.00E+00	3.06E+01	1.27E+00	0.00E+00	0.00E+00	4.22E+00	7.42E-02	0.00E+00
58	Zn	kg	9.13E+00	1.10E+02	5.20E+01	1.98E+02	6.22E+01	2.36E+01	0.00E+00	1.51E+01	2.23E+00	0.00E+00	8.90E+01	4.22E+00	1.11E+00	1.80E-01
59	Zr	kg	2.60E+01	3.25E+01	4.21E+01	4.43E+01	1.97E+02	5.90E+00	8.41E+00	1.48E+01	2.46E+00	8.36E+00	2.00E+02	0.00E+00	1.04E+00	2.40E-01

CALCULATION SHEET

BY E Bernos
DATE 12/05/05

SUBJECT WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

PROJECT RPP-WTP
JOB NO 24590
CALC NO . 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO A-3

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
61	Table A-2 LAW Chemical Analytes Feed Quantities in Moles																	
62	Analyte	MW	Units	Tank														
63		g/mole		AN-102	AN-103	AN-104	AN-105	AN-107	AP-101	AP-102	AP-103	AP-104	AP-105	AW-101	AZ-101	AZ-102	SY-101	Avg
64	Ag	107.8	mol	8.87E+01	7.09E+02	3.46E+02	9.04E+02	5.81E+01	2.47E+01	0.00E+00	2.34E+02	2.70E+01	0.00E+00	5.78E+02	1.90E+01	1.49E+01	3.45E+00	2.15E+02
65	Al	27.0	mol	1.69E+06	8.08E+06	1.90E+06	5.93E+06	1.37E+05	1.14E+06	4.63E+06	2.30E+06	2.59E+06	2.83E+06	4.26E+06	7.26E+05	4.19E+04	1.66E+05	2.60E+06
66	As	74.9	mol	1.20E+03	2.14E+03	1.31E+03	3.04E+03	5.67E+01	7.09E+01	0.00E+00	1.56E+03	9.69E+01	0.00E+00	3.14E+03	4.29E+02	1.71E+02	4.59E+01	9.47E+02
67	B	10.8	mol	1.29E+04	4.83E+04	3.19E+04	4.06E+04	6.83E+03	3.73E+03	0.00E+00	1.33E+04	1.90E+04	0.00E+00	3.43E+04	5.62E+03	2.38E+03	1.19E+03	1.57E+04
68	Ba	137.3	mol	1.01E+02	5.81E+02	3.56E+02	8.30E+02	2.26E+02	1.01E+01	0.00E+00	5.31E+02	1.84E+00	0.00E+00	1.22E+02	1.84E+00	1.14E+00	9.91E-01	1.97E+02
69	Be	9.0	mol	2.59E+02	1.04E+03	5.43E+02	1.27E+03	6.86E+01	6.18E+02	0.00E+00	8.40E+02	5.67E+01	0.00E+00	1.10E+03	1.06E+02	8.24E+00	1.27E+01	4.23E+02
70	Bi	208.9	mol	4.31E+02	2.68E+02	1.52E+02	5.27E+02	1.31E+02	5.03E+01	4.36E+02	6.46E+02	5.55E+01	3.03E+02	2.29E+02	0.00E+00	0.00E+00	3.15E+01	2.33E+02
71	Ca	40.1	mol	3.34E+04	8.46E+03	1.33E+04	4.89E+04	4.59E+04	8.11E+02	2.59E+03	6.44E+03	5.06E+03	2.82E+03	1.89E+04	5.94E+02	1.43E+02	3.42E+02	1.34E+04
72	Cd	112.4	mol	1.73E+03	3.13E+02	2.19E+02	3.52E+02	1.84E+03	7.24E+01	0.00E+00	2.91E+02	5.66E+01	0.00E+00	2.12E+02	2.31E+01	1.49E+01	3.52E+00	3.67E+02
73	Ce	140.1	mol	2.62E+02	1.14E+03	6.99E+02	1.63E+03	1.13E+03	2.25E+00	0.00E+00	1.04E+03	1.75E+00	0.00E+00	4.18E+02	1.36E+00	5.43E-01	2.37E+01	4.54E+02
74	Cl	35.5	mol	3.75E+05	7.98E+05	3.13E+05	1.05E+06	1.64E+05	1.88E+05	6.88E+05	4.09E+05	6.09E+05	4.82E+05	7.05E+05	2.23E+04	6.66E+03	4.23E+04	4.18E+05
75	CN	26.0	mol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.23E+02	0.00E+00	0.00E+00	4.19E+03	0.00E+00	0.00E+00	2.55E+02	9.38E+02	0.00E+00	4.51E+02
76	Co	58.9	mol	3.77E+02	2.16E+03	3.33E+02	7.72E+02	2.31E+02	2.51E+01	0.00E+00	4.96E+02	4.91E+01	0.00E+00	3.96E+02	3.24E+00	1.26E+00	1.29E+01	3.47E+02
77	Cr	52.0	mol	1.56E+04	4.83E+04	7.42E+04	1.41E+05	1.08E+04	1.40E+04	4.56E+04	3.83E+04	4.02E+04	3.25E+05	2.23E+04	4.27E+04	4.87E+04	5.52E+03	6.23E+04
78	Cu	63.5	mol	1.24E+03	3.51E+02	2.99E+02	5.13E+02	1.49E+03	1.06E+02	0.00E+00	2.58E+02	2.55E+02	0.00E+00	5.01E+02	3.23E+01	2.05E+01	1.29E+01	3.63E+02
79	F	19.0	mol	1.17E+04	1.86E+05	1.05E+05	3.23E+05	1.61E+04	4.18E+05	2.68E+04	1.46E+05	4.93E+04	3.76E+04	4.96E+05	3.43E+05	1.80E+05	1.95E+03	1.67E+05
80	Fe	55.9	mol	2.04E+03	2.31E+03	5.12E+03	7.20E+03	9.72E+04	2.81E+02	4.28E+02	1.35E+03	3.76E+02	7.82E+02	1.47E+04	8.72E+01	3.99E+01	2.38E+01	9.42E+03
81	Free OH	17.0	mol	1.81E+06	1.26E+07	5.38E+06	1.21E+07	3.49E+06	9.88E+06	7.65E+06	3.33E+06	4.81E+06	6.06E+06	2.31E+07	2.17E+06	4.78E+05	1.04E+06	6.71E+06
82	Hg*	200.6	mol	8.77E-01	7.53E+00	5.58E+00	9.67E+00	3.65E+00	1.67E-01	6.38E-05	0.00E+00	2.51E-02	3.69E-02	8.67E+00	8.97E-01	1.01E+00	3.78E-03	9.67E+00
83	K	39.1	mol	1.92E+05	1.23E+06	2.28E+05	6.45E+05	1.46E+05	3.66E+06	4.22E+05	5.60E+05	2.24E+05	2.26E+05	4.27E+06	3.71E+05	2.69E+05	1.36E+04	8.90E+05
84	La	138.9	mol	3.61E+02	1.63E-02	4.74E-03	1.68E-02	7.56E+02	1.37E-02	7.70E+01	1.35E+02	3.00E+00	2.61E+01	4.87E+01	0.00E+00	0.00E+00	2.82E+00	1.01E+02
85	Li	6.9	mol	4.51E+02	1.40E+04	5.84E+03	9.35E+03	1.39E+03	2.07E+02	0.00E+00	1.70E+03	1.22E+01	0.00E+00	6.33E+03	4.23E+02	7.14E+01	3.13E+01	2.85E+03
86	Mg	24.3	mol	2.86E+03	1.06E+04	4.03E+03	9.38E+03	1.88E+02	4.32E+02	0.00E+00	6.01E+03	4.77E+02	0.00E+00	6.71E+03	3.47E+02	7.04E+02	1.63E+02	2.99E+03
87	Mn	54.9	mol	1.17E+03	4.70E+02	7.76E+02	1.32E+03	2.93E+04	9.98E+01	1.78E+02	2.75E+02	7.67E+01	1.67E+02	1.16E+04	0.00E+00	0.00E+00	6.87E+00	3.25E+03
88	Mo	95.9	mol	1.75E+03	3.28E+03	1.29E+03	3.88E+03	1.15E+03	6.52E+02	0.00E+00	2.11E+03	2.73E+03	0.00E+00	2.62E+03	3.00E+03	1.86E+03	1.85E+02	1.75E+03
89	Na	22.9	mol	3.13E+07	4.63E+07	2.10E+07	4.80E+07	2.99E+07	2.38E+07	3.44E+07	2.63E+07	2.34E+07	2.32E+07	4.45E+07	1.57E+07	8.91E+06	2.84E+06	2.71E+07
90	Nd	144.2	mol	5.32E+02	1.79E+03	6.79E+02	1.58E+03	2.10E+03	7.28E+01	0.00E+00	8.04E+02	7.35E+01	0.00E+00	3.31E+02	5.85E+01	4.59E+01	1.06E+01	5.77E+02
91	NH3	17.0	mol	2.74E+04	0.00E+00	0.00E+00	0.00E+00	9.06E+03	2.38E+04	0.00E+00	0.00E+00	2.08E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E+04
92	Ni	58.7	mol	2.25E+04	8.77E+02	2.56E+03	2.42E+03	2.95E+04	4.45E+02	5.95E+02	4.50E+03	3.25E+03	7.48E+02	1.84E+03	5.52E+01	6.49E+01	1.86E+02	4.96E+03
93	NO2	46.0	mol	6.57E+06	9.35E+06	3.43E+06	9.98E+06	4.78E+06	3.74E+06	8.65E+06	5.91E+06	5.78E+06	4.09E+06	9.17E+06	4.33E+06	2.93E+06	4.26E+05	5.65E+06
94	NO3	62.0	mol	1.17E+07	1.05E+07	4.77E+06	1.11E+07	1.11E+07	8.00E+06	1.09E+07	8.15E+06	6.76E+06	6.79E+06	1.32E+07	2.76E+06	4.40E+05	7.87E+05	7.64E+06
95	Oxalate	88.0	mol	3.10E+04	1.84E+05	2.40E+05	2.49E+05	3.39E+04	5.10E+04	1.41E+05	4.43E+04	4.31E+04	6.36E+04	2.97E+05	3.72E+04	8.38E+04	1.53E+03	1.07E+05
96	Pb	207.2	mol	2.65E+03	2.10E+03	4.97E+02	1.27E+03	5.98E+03	2.48E+02	1.01E+03	7.29E+02	2.80E+02	4.39E+02	3.34E+03	5.21E+01	0.00E+00	1.96E+01	1.33E+03
97	Pd	105.4	mol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.60E+02	0.00E+00	0.00E+00	7.08E+01	0.00E+00	0.00E+00	6.16E+02	0.00E+00	0.00E+00	1.03E+02
98	PO4	95.0	mol	1.90E+05	9.38E+04	1.11E+05	2.67E+05	5.36E+04	5.59E+04	1.38E+05	8.49E+04	2.00E+05	9.61E+04	1.13E+05	5.28E+04	1.57E+04	1.74E+04	1.06E+05
99	Pr	140.9	mol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.17E-01	0.00E+00	0.00E+00	5.06E+00	0.00E+00	0.00E+00	1.36E+00	0.00E+00	0.00E+00	4.95E-01
100	Rb	85.5	mol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.95E+02	0.00E+00	0.00E+00	1.38E+02	0.00E+00	0.00E+00	3.49E+02	0.00E+00	0.00E+00	4.87E+01
101	Rh	102.9	mol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.96E+02	3.11E+02	0.00E+00	0.00E+00	2.22E+02	0.00E+00	0.00E+00	6.60E+01	0.00E+00	0.00E+00	9.96E+01
102	Ru	101.1	mol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E+03	0.00E+00	0.00E+00	8.90E+02	0.00E+00	0.00E+00	1.50E+01	0.00E+00	0.00E+00	1.48E+02
103	Sb	121.7	mol	5.96E+00	1.27E+03	4.83E+02	1.13E+03	8.30E+00	1.45E+00	0.00E+00	7.46E+02	9.20E-01	0.00E+00	1.16E+03	1.57E+00	9.29E-01	2.15E+01	3.45E+02
104	Se	78.9	mol	1.14E+03	3.27E+03	1.24E+03	2.89E+03	3.37E+01	1.23E+02	0.00E+00	1.56E+03	3.61E+02	0.00E+00	1.52E+03	2.66E+02	2.78E+02	6.41E+01	9.11E+02
105	Si	28.1	mol	2.76E+03	8.47E+04	5.69E+04	3.22E+04	1.53E+03	1.50E+04	6.48E+03	1.28E+04	5.37E+03	2.87E+03	4.66E+04	7.90E+03	5.77E+03	1.53E+02	2.01E+04
106	SO4	96.1	mol	5.08E+05	1.15E+05	3.14E+05	2.96E+05	2.80E+05	1.69E+05	1.04E+05	1.68E+05	1.57E+05	1.24E+05	1.28E+05	5.45E+05	6.08E+05	3.76E+04	2.54E+05
107	Sr	87.6	mol	9.12E+01	1.64E+00	5.99E+01	7.57E+01	7.05E+01	1.42E+00	5.34E+01	1.05E+02	1.28E+01	4.18E+00	1.80E+02	1.47E+00	1.37E+00	1.08E+00	4.71E+01
108	Ta	180.9	mol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E+02	2.07E+00	0.00E+00	0.00E+00	7.96E-01	0.00E+00	0.00E+00	1.06E+00	0.00E+00	0.00E+00	3.06E+01
109	Te	127.6	mol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.38E+00	0.00E+00	0.00E+00	5.59E+00	0.00E+00	0.00E+00	1.50E+00	0.00E+00	0.00E+00	8.91E-01
110	Th	232.0	mol	3.08E+01	9.53E+00	3.20E+00	7.59E+00	2.50E+02	2.00E-01	1.91E+03	1.52E+03	4.57E+00	2.33E+02	5.00E+00	7.28E-04	4.31E-04	7.33E+00	2.84E+02
111	Ti	47.9	mol	4.66E+01	5.39E+02	2.04E+02	4.76E+02	9.75E+01	5.55E+01	0.00E+00	3.15E+02	2.78E+01	0.00E+00	4.99E+02	4.28E+01	1.14E+01	1.92E+00	1.65E+02
112	TIC as CO3	60.0	mol	3.53E+06	1.35E+06	2.62E+06	3.85E+06	4.05E+06	2.33E+06	8.15E+05	1.80E+06	1.20E+06	1.01E+06	1.90E+06	2.67E+06	1.78E+06	1.98E+05	2.08E+06
113	Tl	204.4	mol	3.27E+01	0.00E+00	0.00E+00	2.23E+03	1.93E+00	3.71E-01	0.00E+00	0.00E+00	1.03E+00	0.00E+00	1.18E+03	9.34E-01	0.00E+00	1.79E+01	2.47E+02
114	U total	238.0	mol	7.48E+02	5.04E+02	1.87E+03	1.14E+03	1.41E+03	9.66E+02	2.25E+02	2.02E+02	2.07E+02	1.45E+02	1.13E+04	3.84E+01	1.08E+03	7.44E+00	1.42E+03
115	V	50.9	mol	1.77E+02	2.53E+03	9.61E+02	2.24E+03	4.52E+01	6.19E+01	0.00E+00	1.14E+03	1.06E+02	0.00E+00	2.51E+02	9.57E+01	3.46E+01	8.00E+00	5.47E+02
116	W	183.9	mol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.58E+02	0.00E+00	0.00E+00	2.04E+03	0.00E+00	0.00E+00	1.02E+03	0.00E+00	0.00E+00	2.66E+02
117	Y	88.9	mol	3.13E+01	0.00E+00	0.00E+00	0.00E+00	3.19E+02	7.49E+01	0.00E+00	3.44E+02	1.43E+01	0.00E+00	0.00E+00	4.75E+01	8.35E-01	0.00E+00	5.95E+01
118	Zn	65.4	mol	1.40E+02	1.68E+03	7.95E+02	3.03E+03	9.51E+02	3.61E+02	0.00E+00	2.31E+02	3.41E+01	0.00E+00	1.36E+03	6.45E+01	1.70E+01	2.75E+00	6.19E+02
119	Zr	91.2	mol	2.85E+02	3.56E+02	4.62E+02	4.86E+02	2.16E+03	6.47E+01	9.22E+01	1.62E+02	2.70E+01	9.17E+01	2.19E+03	0.00E+00	1.14E+01	2.63E+00	4.57E+02
120	*Value selected for Hg is the maximum of the tanks analyzed																	

CALCULATION SHEET

BY. E. Berrios
DATE: 12/05/05

SUBJECT. Update Emissions Run Feed Vector

PROJECT RPP-WTP
JOB NO.: 24590
CALC NO.. 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.. A-4

Table A-3 LAW Radionuclide Feed Quantities in Curies

Analyte	Units	Tank														
		AN-102	AN-103	AN-104	AN-105	AN-107	AP-101	AP-102	AP-103	AP-104	AP-105	AW-101	AZ-101	AZ-102	SY-101	MAX
106Ru	Ci	2.00E-05	5.76E-02	4.55E-02	5.65E-02	1.50E-05	1.42E-05	1.40E-05	1.48E-05	1.05E-05	1.81E-05	4.21E-02	2.87E+01	8.60E+01	9.22E-07	8.60E+01
113mCd	Ci	8.72E+01	8.11E+01	2.73E+01	8.34E+01	6.56E+01	6.21E+01	9.25E+01	9.47E+01	7.76E+01	7.53E+01	9.64E+01	1.33E+02	1.24E+02	7.39E+00	1.33E+02
125Sb	Ci	1.24E+01	2.03E+01	1.08E+01	2.05E+01	6.19E+00	8.79E+00	2.77E+01	2.91E+01	1.98E+01	2.07E+01	2.01E+01	1.88E+03	1.75E+03	1.84E+00	1.88E+03
126Sn	Ci	2.55E+01	1.95E+01	2.21E+00	1.73E+01	2.99E+01	3.57E+00	3.39E+00	3.66E+00	3.05E+00	2.93E+00	2.29E+01	7.85E+00	2.11E+00	2.87E-01	2.99E+01
129I	Ci	4.58E-01	1.22E+00	2.05E-01	8.51E-01	3.67E-01	5.88E-01	1.24E+00	1.26E+00	5.87E-01	8.51E-01	6.67E-01	3.24E-02	4.46E-02	8.11E-02	1.26E+00
134Cs	Ci	1.15E+01	1.07E+01	3.57E+00	1.10E+01	8.63E+00	5.75E+01	7.14E-01	3.56E+00	3.40E-01	1.90E+00	5.28E+01	1.44E+03	8.71E+02	3.57E-02	1.44E+03
137Cs	Ci	1.36E+06	1.73E+06	7.48E+05	1.41E+06	9.85E+05	5.87E+05	9.67E+05	7.75E+05	7.72E+05	5.39E+05	1.52E+06	5.06E+06	3.13E+06	5.58E+04	5.06E+06
137mBa	Ci	1.28E+06	1.64E+06	7.06E+05	1.33E+06	9.30E+05	5.54E+05	9.13E+05	7.32E+05	7.28E+05	5.09E+05	1.44E+06	4.78E+06	2.95E+06	5.27E+04	4.78E+06
14C	Ci	2.48E+00	1.41E+01	1.06E+01	1.39E+01	2.04E+00	9.36E-01	1.09E+01	4.13E+01	2.75E+00	2.61E+01	1.07E+01	6.25E+00	3.17E+00	1.74E+00	4.13E+01
151Sm	Ci	1.33E+04	2.63E+04	1.52E+04	2.64E+04	9.97E+03	9.43E+03	1.82E+04	1.93E+04	1.64E+04	1.58E+04	2.49E+04	1.26E+04	1.24E+04	1.55E+03	2.64E+04
152Eu	Ci	1.47E+00	3.01E+00	1.76E+00	3.02E+00	1.10E+00	1.04E+00	4.42E+00	4.69E+00	3.55E+00	3.40E+00	2.82E+00	1.52E+01	1.33E+01	3.34E-01	1.52E+01
154Eu	Ci	6.22E+02	1.65E+02	1.22E+02	1.98E+02	1.18E+03	6.25E+00	1.26E+02	4.78E+01	2.66E+01	8.05E+01	1.78E+02	1.55E+02	1.57E+02	3.23E+00	1.18E+03
155Eu	Ci	3.90E+01	8.01E+01	4.68E+01	8.03E+01	6.39E+02	2.78E+01	7.07E+01	5.16E+01	3.92E+01	6.18E+01	7.51E+01	9.11E+02	2.45E+02	1.12E+01	9.11E+02
226Ra	Ci	1.47E-04	1.36E-04	4.58E-05	1.40E-04	1.10E-04	1.04E-04	2.29E-04	2.55E-04	2.39E-04	2.15E-04	1.62E-04	2.22E-04	1.41E-04	2.12E-05	2.55E-04
227Ac	Ci	1.81E-02	1.68E-02	5.63E-03	1.73E-02	1.36E-02	1.28E-02	3.67E-03	3.01E-03	2.75E-03	2.61E-03	1.99E-02	1.46E-03	8.24E-04	2.58E-04	1.99E-02
228Ra	Ci	4.19E-02	3.87E-02	1.30E-02	3.98E-02	3.32E-02	2.96E-02	3.03E-01	1.26E-01	4.84E-02	6.51E-02	4.60E-02	1.45E-08	9.85E-09	4.97E-03	3.03E-01
229Th	Ci	7.26E-05	6.74E-05	2.26E-05	6.93E-05	5.46E-05	5.16E-05	9.96E-03	7.72E-03	3.86E-03	3.71E-03	8.01E-05	1.90E-06	9.38E-07	2.79E-04	9.96E-03
231Pa	Ci	1.90E-01	1.76E-01	5.91E-02	1.81E-01	1.43E-01	1.35E-01	6.36E-03	6.94E-03	6.22E-03	5.90E-03	2.09E-01	3.18E-03	1.78E-03	5.86E-04	2.09E-01
232Th	Ci	7.85E-04	2.44E-04	8.17E-05	1.93E-04	6.36E-03	5.10E-06	4.86E-02	3.86E-02	1.16E-04	5.97E-03	1.28E-04	1.86E-08	1.10E-08	1.87E-04	4.86E-02
232U	Ci	1.74E-03	1.18E-03	4.36E-03	2.65E-03	3.29E-03	2.25E-03	2.56E-02	9.94E-03	1.42E-02	4.30E-03	2.64E-02	1.49E-06	3.64E-05	2.50E-04	2.64E-02
233U	Ci	1.07E-01	7.21E-02	2.68E-01	1.63E-01	2.02E-01	1.98E-01	1.09E-01	4.20E-02	6.01E-02	1.81E-02	1.62E+00	4.92E-07	1.16E-05	1.06E-03	1.62E+00
234U	Ci	7.56E-02	5.11E-02	1.89E-01	1.15E-01	1.43E-01	1.18E-01	2.01E-02	1.76E-02	1.83E-02	1.31E-02	1.15E+00	4.42E-03	1.25E-01	6.29E-04	1.15E+00
235U	Ci	2.99E-03	2.02E-03	7.48E-03	4.56E-03	5.65E-03	4.20E-03	7.96E-04	7.35E-04	7.40E-04	5.31E-04	4.53E-02	1.65E-04	4.97E-03	2.61E-05	4.53E-02
236U	Ci	5.12E-03	3.46E-03	1.28E-02	7.80E-03	9.67E-03	8.97E-03	6.46E-04	6.13E-04	6.12E-04	5.32E-04	7.76E-02	4.22E-04	1.23E-02	1.72E-05	7.76E-02
238U	Ci	5.92E-02	4.00E-02	1.48E-01	9.03E-02	1.12E-01	7.65E-02	1.79E-02	1.61E-02	1.64E-02	1.15E-02	8.98E-01	3.04E-03	8.59E-02	5.90E-04	8.98E-01
241Pu	Ci	7.53E+01	1.88E+01	3.25E+01	3.08E+01	6.80E+02	2.02E+00	1.50E+00	4.29E+00	7.68E+00	1.35E+00	4.59E+02	3.37E+01	1.67E+02	6.28E-02	6.80E+02
3H	Ci	1.90E+00	7.04E+00	1.68E+01	4.20E+00	2.04E+00	1.50E+01	4.33E+01	2.06E+02	1.96E+00	3.52E+02	2.88E+01	5.17E+01	9.77E+01	2.17E+01	3.52E+02
59Ni	Ci	9.31E-01	1.27E+01	9.67E+00	1.25E+01	7.00E+01	6.63E-01	1.25E+00	1.22E+00	1.86E+00	1.17E+00	9.71E+00	6.93E+00	2.14E+00	7.30E-02	7.00E+01
60Co	Ci	1.83E+02	2.39E+01	1.86E+01	2.96E+01	2.12E+02	8.52E+00	1.50E+01	3.55E+01	3.10E+01	1.83E+01	3.19E+01	3.97E+01	3.94E+01	1.29E+00	2.12E+02
63Ni	Ci	8.67E+01	1.19E+03	9.03E+02	1.17E+03	4.88E+03	6.17E+01	1.17E+02	1.16E+02	1.76E+02	1.02E+02	9.07E+02	6.54E+02	2.05E+02	6.66E+00	4.88E+03
79Se	Ci	2.13E+00	2.33E+00	5.34E-01	3.12E+00	2.55E+00	3.95E-01	3.09E+00	2.21E+00	3.37E+00	1.79E+00	6.36E-01	3.14E+00	1.43E+00	2.58E-01	3.37E+00
90Sr	Ci	2.74E+05	5.87E+03	7.16E+04	2.88E+04	2.53E+05	4.12E+02	1.56E+03	8.15E+03	6.95E+03	1.08E+03	8.30E+04	2.81E+03	6.51E+03	1.04E+03	2.74E+05
90Y	Ci	2.74E+05	5.87E+03	7.16E+04	2.88E+04	2.53E+05	4.12E+02	1.56E+03	8.15E+03	6.95E+03	1.08E+03	8.30E+04	2.81E+03	6.51E+03	1.04E+03	2.74E+05
93mNb	Ci	8.45E+01	7.86E+01	2.64E+01	8.08E+01	6.35E+01	6.01E+01	2.94E+01	2.21E+01	1.57E+01	2.06E+01	9.34E+01	1.20E+02	6.13E+01	1.37E+00	1.20E+02
93Zr	Ci	1.02E+02	9.47E+01	3.18E+01	9.74E+01	7.66E+01	7.25E+01	3.41E+01	2.75E+01	1.88E+01	2.37E+01	1.13E+02	1.95E+02	1.05E+02	1.55E+00	1.95E+02
99Tc	Ci	4.93E+02	6.74E+02	3.32E+02	1.12E+03	2.57E+02	2.21E+02	6.54E+02	7.93E+02	7.20E+02	6.11E+02	8.18E+02	1.06E+03	6.98E+02	7.20E+01	1.12E+03
Transuranics		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
237Np	Ci	1.89E-01	5.11E-01	3.71E-01	5.08E-01	1.87E-01	2.29E-02	1.91E+00	1.68E-01	1.62E-02	1.14E+00	3.46E-01	1.22E-01	3.57E-01	9.58E-02	1.91E+00
238Pu	Ci	1.20E+00	2.98E-01	5.16E-01	4.89E-01	1.08E+01	3.21E-02	3.24E-02	9.77E-02	1.65E-01	6.38E-02	7.29E+00	4.70E-01	2.34E+00	1.45E-03	1.08E+01
239Pu	Ci	1.65E+01	4.11E+00	7.12E+00	6.75E+00	1.49E+02	4.42E-01	1.25E+00	3.16E+00	6.22E+00	1.12E+00	1.00E+02	4.55E+00	2.42E+01	6.81E-02	1.49E+02
240Pu	Ci	4.29E+00	1.07E+00	1.85E+00	1.76E+00	3.87E+01	1.15E-01	2.11E-01	5.28E-01	1.06E+00	1.84E-01	2.61E+01	1.30E+00	6.61E+00	1.08E-02	3.87E+01
241Am	Ci	5.63E+02	2.08E+01	4.71E+01	5.29E+01	2.41E+03	8.13E-01	7.00E+00	3.74E+01	9.64E+01	2.75E+00	1.05E+02	4.67E-01	2.07E+00	2.69E-01	2.41E+03
242Cm	Ci	1.10E+00	2.49E-02	1.23E-02	6.81E-02	9.19E+00	1.59E-03	2.25E-02	1.19E-01	4.43E-02	5.01E-03	2.75E-02	2.37E-04	6.57E-04	5.72E-04	9.19E+00
242Pu	Ci	4.54E-04	1.13E-04	1.96E-04	1.86E-04	4.10E-03	1.22E-05	1.29E-05	4.17E-05	6.83E-05	1.08E-05	2.77E-03	1.69E-04	7.97E-04	5.31E-07	4.10E-03
243Am	Ci	3.69E-01	1.37E-02	3.16E-02	3.50E-02	1.58E+00	5.34E-04	2.56E-04	1.39E-03	3.43E-03	9.73E-05	6.76E-02	1.06E-04	1.85E-04	9.17E-06	1.58E+00
243Cm	Ci	6.08E-02	1.38E-03	6.81E-04	3.76E-03	2.60E-01	8.79E-05	2.88E-03	1.60E-02	1.48E-01	1.78E-03	7.07E-02	4.24E-03	8.91E-05	1.39E-04	2.60E-01
244Cm	Ci	1.44E+00	3.26E-02	1.61E-02	8.89E-02	6.16E+00	2.08E-03	4.19E-02	2.22E-01	3.47E+00	3.51E-02	1.58E+00	9.86E-02	2.11E-03	2.57E-03	6.16E+00

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV· 0D
SHEET NO.. A-5

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Feed Vector

	A	B	C	D	E	F
1	**Table A-4 LAW Inorganic Feed Concentration Before Charge Balance**					
2	**Analyte**	**BBI**	**BBI**	**Cont Max**	**Feed Conc.**	
3		**mol**	**mol/mol Na**	**mol/mol Na**	**mol/mol Na**	
4	Ag	2.15E+02	7.92E-06	N/A	7.92E-06	
5	Al	2.60E+06	9 59E-02	2 50E-01	9 59E-02	
6	As	9.47E+02	3.49E-05	N/A	3.49E-05	
7	B	1.57E+04	5.80E-04	N/A	5 80E-04	
8	Ba	1.97E+02	7.28E-06	1.00E-04	7.28E-06	
9	Be	4.23E+02	1.56E-05	N/A	1.56E-05	
10	Bi	2 33E+02	8.58E-06	N/A	8.58E-06	
11	Ca	1.34E+04	4.94E-04	4.00E-02	4.94E-04	
12	Cd	3 67E+02	1.35E-05	4.00E-03	1.35E-05	
13	Ce	4.54E+02	1.67E-05	N/A	1.67E-05	
14	Cl	4.18E+05	1.54E-02	8.90E-02	1.54E-02	
15	CN	4.51E+02	1.66E-05	N/A	1.66E-05	
16	Co	3.47E+02	1.28E-05	N/A	1.28E-05	
17	Cr	6.23E+04	2.30E-03	2.00E-02	2.30E-03	
18	Cu	3.63E+02	1.34E-05	N/A	1.34E-05	
19	F	1.67E+05	6.16E-03	2.00E-01	6.16E-03	
20	Fe	9.42E+03	3.47E-04	1.00E-02	3.47E-04	
21	Free OH	6.71E+06	2.47E-01	N/A	2.47E-01	
22	Hg	9.67E+00	3.57E-07	1.40E-05	1.40E-05	
23	K	8.90E+05	3.28E-02	1.80E-01	3.28E-02	
24	La	1.01E+02	3.71E-06	8 30E-05	3.71E-06	
25	Li	2.85E+03	1.05E-04	N/A	1.05E-04	
26	Mg	2.99E+03	1.10E-04	N/A	1.10E-04	
27	Mn	3.25E+03	1.20E-04	N/A	1.20E-04	
28	Mo	1.75E+03	6.45E-05	N/A	6.45E-05	
29	Na	2 71E+07	1.00E+00	N/A	1.00E+00	
30	Nd	5.77E+02	2.13E-05	N/A	2.13E-05	
31	NH3	1 91E+04	7.05E-04	N/A	7.05E-04	
32	Ni	4.96E+03	1.83E-04	3.00E-03	1 83E-04	
33	NO2	5.65E+06	2.08E-01	3.80E-01	2.08E-01	
34	NO3	7.64E+06	2.82E-01	8.00E-01	2.82E-01	
35	Oxalate	1.07E+05	3.95E-03	5.00E-01	3.95E-03	
36	Pb	1.33E+03	4.91E-05	6.80E-04	4 91E-05	
37	Pd	1.03E+02	3.81E-06	N/A	3.81E-06	
38	PO4	1.06E+05	3.92E-03	1.30E-01	3.92E-03	
39	Pr	4 95E-01	1.83E-08	N/A	1.83E-08	
40	Rb	4.87E+01	1.80E-06	N/A	1.80E-06	
41	Rh	9.96E+01	3 67E-06	N/A	3.67E-06	
42	Ru	1.48E+02	5 46E-06	N/A	5.46E-06	
43	Sb	3.45E+02	1.27E-05	N/A	1.27E-05	
44	Se	9.11E+02	3.36E-05	N/A	3.36E-05	
45	Si	2.01E+04	7.40E-04	N/A	7.40E-04	
46	SO4	2 54E+05	9.36E-03	7.00E-02	9 36E-03	
47	Sr	4.71E+01	1 74E-06	N/A	1.74E-06	
48	Ta	3.06E+01	1.13E-06	N/A	1.13E-06	
49	Te	8.91E-01	3.28E-08	N/A	3.28E-08	
50	Th	2.84E+02	1 05E-05	N/A	1.05E-05	
51	Ti	1.65E+02	6.10E-06	N/A	6.10E-06	
52	TIC as CO3	2.08E+06	7.66E-02	3.00E-01	7.66E-02	
53	Tl	2.47E+02	9.13E-06	N/A	9.13E-06	
54	U(total)	1.42E+03	5.23E-05	1.20E-03	5.23E-05	
55	V	5 47E+02	2.02E-05	N/A	2.02E-05	
56	W	2.66E+02	9.80E-06	N/A	9.80E-06	
57	Y	5.95E+01	2.19E-06	N/A	2.19E-06	
58	Zn	6.19E+02	2 28E-05	N/A	2.28E-05	
59	Zr	4 57E+02	1.68E-05	N/A	1.68E-05	
60	N/A = none available					

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC. NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: A-6

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Feed Vector

	A	B	C	D	E	F	H	I	J	K
1	**Table A-5 LAW Radionuclide Feed Concentration**									
2	**Analyte**	**Ci**	**Ci/mol Na**	**Bq/mol Na**	**SOW Max**	**Feed Conc.**			Actual	SOW Max
3					**Bq/mol Na**	**Bq/mol Na**		TRU	Bq/mol Na	Bq/mol Na
4	106Ru	8.60E+01	3.17E-06	1.17E+05	N/A	1.17E+05		237Np	2.61E+03	2.18E+03
5	113mCd	1.33E+02	4.90E-06	1.81E+05	N/A	1.81E+05		238Pu	1.47E+04	1.23E+04
6	125Sb	1.88E+03	6.93E-05	2.56E+06	N/A	2.56E+06		239Pu	2.03E+05	1.70E+05
7	126Sn	2.99E+01	1.10E-06	4.08E+04	N/A	4.08E+04		240Pu	5.28E+04	4.42E+04
8	129I	1.26E+00	4.65E-08	1.72E+03	N/A	1.72E+03		241Am	3.29E+06	2.75E+06
9	134Cs	1.44E+03	5.31E-05	1.96E+06	N/A	1.96E+06		242Cm	1.25E+04	1.05E+04
10	137Cs	5.06E+06	1.87E-01	6.90E+09	2.00E+10	2.00E+10		242Pu	5.59E+00	4.68E+00
11	137mBa	4.78E+06	1.76E-01	6.52E+09	N/A	6.52E+09		243Am	2.16E+03	1.80E+03
12	14C	4.13E+01	1.52E-06	5.63E+04	N/A	5.63E+04		243Cm	3.55E+02	2.97E+02
13	151Sm	2.64E+04	9.73E-04	3.60E+07	N/A	3.60E+07		244Cm	8.40E+03	7.03E+03
14	152Eu	1.52E+01	5.60E-07	2.07E+04	N/A	2.07E+04		Total	3.58E+06	3.00E+06
15	154Eu	1.18E+03	4.35E-05	1.61E+06	4.30E+06	4.30E+06				
16	155Eu	9.11E+02	3.36E-05	1.24E+06	N/A	1.24E+06				
17	226Ra	2.55E-04	9.40E-12	3.48E-01	N/A	3.48E-01				
18	227Ac	1.99E-02	7.34E-10	2.71E+01	N/A	2.71E+01				
19	228Ra	3.03E-01	1.12E-08	4.13E+02	N/A	4.13E+02				
20	229Th	9.96E-03	3.67E-10	1.36E+01	N/A	1.36E+01				
21	231Pa	2.09E-01	7.71E-09	2.85E+02	N/A	2.85E+02				
22	232Th	4.86E-02	1.79E-09	6.63E+01	N/A	6.63E+01				
23	232U	2.64E-02	9.73E-10	3.60E+01	N/A	3.60E+01				
24	233U	1.62E+00	5.97E-08	2.21E+03	N/A	2.21E+03				
25	234U	1.15E+00	4.24E-08	1.57E+03	N/A	1.57E+03				
26	235U	4.53E-02	1.67E-09	6.18E+01	N/A	6.18E+01				
27	236U	7.76E-02	2.86E-09	1.06E+02	N/A	1.06E+02				
28	237Np	1.91E+00	7.04E-08	2.61E+03	2.18E+03	2.18E+03				
29	238Pu	1.08E+01	3.98E-07	1.47E+04	1.23E+04	1.23E+04				
30	238U	8.98E-01	3.31E-08	1.23E+03	N/A	1.23E+03				
31	239Pu	1.49E+02	5.49E-06	2.03E+05	1.70E+05	1.70E+05				
32	240Pu	3.87E+01	1.43E-06	5.28E+04	4.42E+04	4.42E+04				
33	241Am	2.41E+03	8.89E-05	3.29E+06	2.75E+06	2.75E+06				
34	241Pu	6.80E+02	2.51E-05	9.28E+05	N/A	9.28E+05				
35	242Cm	9.19E+00	3.39E-07	1.25E+04	1.05E+04	1.05E+04				
36	242Pu	4.10E-03	1.51E-10	5.59E+00	4.68E+00	4.68E+00				
37	243Am	1.58E+00	5.83E-08	2.16E+03	1.80E+03	1.80E+03				
38	243Cm	2.60E-01	9.59E-09	3.55E+02	2.97E+02	2.97E+02				
39	244Cm	6.16E+00	2.27E-07	8.40E+03	7.03E+03	7.03E+03				
40	3H	3.52E+02	1.30E-05	4.80E+05	N/A	4.80E+05				
41	59Ni	7.00E+01	2.58E-06	9.55E+04	N/A	9.55E+04				
42	60Co	2.12E+02	7.82E-06	2.89E+05	3.70E+05	3.70E+05				
43	63Ni	4.88E+03	1.80E-04	6.66E+06	N/A	6.66E+06				
44	79Se	3.37E+00	1.24E-07	4.60E+03	N/A	4.60E+03				
45	90Sr	2.74E+05	1.01E-02	3.74E+08	8.00E+08	8.00E+08				
46	90Y	2.74E+05	1.01E-02	3.74E+08	N/A	3.74E+08				
47	93mNb	1.20E+02	4.42E-06	1.64E+05	N/A	1.64E+05				
48	93Zr	1.95E+02	7.19E-06	2.66E+05	N/A	2.66E+05				
49	99Tc	1.12E+03	4.13E-05	1.53E+06	7.10E+06	7.10E+06				
50	N/A = none available									

CALCULATION SHEET

BY E Berrios
DATE 12/05/05

PROJECT RPP-WTP
JOB NO 24590
CALC NO 24590-WTP-M4C-FRP-00001
SHEET REV 0D
SHEET NO A-7

SUBJECT WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Table A-6 LAW Feed Charge Balance														
2 3	Analyte	Feed Conc. mol/mol Na	Feed Conc. Mol	charge	In ACM	mole charge	Adjusted Charges	New Moles	New mol/mol Na	MW g/mole	New Feed kgmole	New Feed kg			
4	Ag	7 92E-06	2 15E+02	1	Y	215	215	215	7 92E-06	107 8	2 15E-01	2 32E+01			
5	Al	9 59E-02	2 60E+06	3	Y	7,804,988	7,804,988	2,601,663	9 59E-02	27 0	2 60E+03	7 02E+04	Total charge		10,453,408
6	As	3 49E-05	9 47E+02	5	Y	4,734	4,734	947	3 49E-05	74 9	9 47E-01	7 09E+01	OH added		10,453,408
7	B	5 80E-04	1 57E+04	3	Y	47,151	47,151	15,717	5 80E-04	10 8	1 57E+01	1 70E+02	New total charge		2 854E-09
8	Ba	7 28E-06	1 97E+02	2	Y	395	395	197	7 28E-06	137 3	1 97E-01	2 71E+01			
9	Be	1 56E-05	4 23E+02	2	N	0	0	0	1 56E-05	9 0	4 23E-01	3 81E+00			
10	Bi	8 58E-06	2 33E+02	3	Y	698	698	233	8 58E-06	208 9	2 33E-01	4 86E+01			
11	Ca	4 94E-04	1 34E+04	2	Y	26,810	26,810	13,405	4 94E-04	40 1	1 34E+01	5 38E+02			
12	Cd	1 35E-05	3 67E+02	2	Y	733	733	367	1 35E-05	112 4	3.67E-01	4 12E+01			
13	Ce	1 67E-05	4 54E+02	3	Y	1,362	1,362	454	1 67E-05	140 1	4.54E-01	6 36E+01			
14	Cl	1 54E-02	4 18E+05	-1	Y	-418,144	-418,144	418,144	1 54E-02	35 5	4 18E+02	1 48E+04			
15	CN	1 66E-05	4 51E+02	-1	N	0	0	0	1 66E-05	26 0	4 51E-01	1 17E+01			
16	Co	1 28E-05	3 47E+02	3	N	0	0	0	1 28E-05	58 9	3 47E-01	2 04E+01			
17	Cr	2 30E-03	6 23E+04	3	Y	186,915	186,915	62,305	2 30E-03	52 0	6 23E+01	3 24E+03			
18	Cu	1 34E-05	3 63E+02	2	Y	726	726	363	1 34E-05	63 5	3 63E-01	2 30E+01			
19	F	6 16E-03	1 67E+05	-1	Y	-167,166	-167,166	167,166	6 16E-03	19 0	1 67E+02	3 18E+03			
20	Fe	3 47E-04	9 42E+03	3	Y	28,271	28,271	9,424	3 47E-04	55 9	9 42E+00	5 27E+02			
21	Free OH	2 47E-01	6 71E+06	-1	Y	-6,708,529	-17,161,938	17,161,938	6 33E-01	17 0	1 72E+04	2 92E+05			
22	Hg	1 40E-05	3 80E+02	2	Y	759	759	380	1 40E-05	200 6	3 80E-01	7 62E+01			
23	K	3 28E-02	8 90E+05	1	Y	889,733	889,733	889,733	3 28E-02	39 1	8 90E+02	3 48E+04			
24	La	3 71E-06	1 01E+02	3	Y	302	302	101	3 71E-06	138 9	1 01E-01	1 40E+01			
25	Li	1 05E-04	2 85E+03	1	Y	2,846	2,846	2,846	1 05E-04	6 9	2 85E+00	1 96E+01			
26	Mg	1 10E-04	2 99E+03	2	Y	5,987	5,987	2,994	1 10E-04	24 3	2 99E+00	7 27E+01			
27	Mn	1 20E-04	3 25E+03	4	Y	12,986	12,986	3,247	1 20E-04	54 9	3 25E+00	1 78E+02			
28	Mo	6 45E-05	1 75E+03	6	N	0	0	0	6 45E-05	95 9	1 75E+00	1 68E+02			
29	Na	1 00E+00	2 71E+07	1	Y	27,121,023	27,121,023	27,121,023	1 00E+00	22 9	2 71E+04	6 21E+05			
30	Nd	2 13E-05	5 77E+02	3	N	0	0	0	2 13E-05	144 2	5 77E-01	8 32E+01			
31	NH3	7 05E-04	1 91E+04	0	Y	0	0	0	7 05E-04	17 0	1 91E+01	3 25E+02			
32	Ni	1 83E-04	4 96E+03	2	Y	9,928	9,928	4,964	1 83E-04	58 7	4 96E+00	2 91E+02			
33	NO2	2 08E-01	5 65E+06	-1	Y	-5,653,106	-5,653,106	5,653,106	2 08E-01	46 0	5 65E+03	2 60E+05			
34	NO3	2 82E-01	7 64E+06	-1	Y	-7,644,124	-7,644,124	7,644,124	2 82E-01	62 0	7 64E+03	4 74E+05			
35	Oxalate	3 95E-03	1 07E+05	-2	Y	-214,229	-214,229	107,114	3 95E-03	88 0	1 07E+02	9 43E+03			
36	Pb	4 91E-05	1 33E+03	2	Y	2,661	2,661	1,331	4 91E-05	207 2	1 33E+00	2 76E+02			
37	Pd	3 81E-06	1 03E+02	2	Y	207	207	103	3 81E-06	105 4	1 03E-01	1 09E+01			
38	PO4	3 92E-03	1 06E+05	-3	Y	-318,935	-318,935	106,312	3 92E-03	95 0	1 06E+02	1 01E+04			
39	Pr	1 83E-08	4 95E-01	3	N	0	0	0	1 83E-08	140 9	4 95E-04	6 98E-02			
40	Rb	1 80E-06	4 87E+01	1	N	0	0	0	1 80E-06	85 5	4 87E-02	4 16E+00			
41	Rh	3 67E-06	9 96E+01	3	Y	299	299	100	3 67E-06	102 9	9 96E-02	1 02E+01			
42	Ru	5 46E-06	1 48E+02	3	Y	444	444	148	5 46E-06	101 1	1 48E-01	1 50E+01			
43	Sb	1 27E-05	3 45E+02	5	N	0	0	0	1 27E-05	121 7	3 45E-01	4 20E+01			
44	Se	3 36E-05	9 11E+02	6	N	0	0	0	3 36E-05	78 9	9 11E-01	7 19E+01			
45	Si	7 40E-04	2 01E+04	4	Y	80,300	80,300	20,075	7 40E-04	28 1	2 01E+01	5 64E+02			
46	SO4	9 36E-03	2 54E+05	-2	Y	-507,540	-507,540	253,770	9 36E-03	96 1	2 54E+02	2 44E+04			
47	Sr	1 74E-06	4 71E+01	2	Y	94	94	47	1 74E-06	87 6	4 71E-02	4 13E+00			
48	Ta	1 13E-06	3 06E+01	5	N	0	0	0	1 13E-06	180 9	3 06E-02	5 53E+00			
49	Te	3 28E-08	8 91E-01	4	N	0	0	0	3 28E-08	127 6	8 91E-04	1 14E-01			
50	Th	1 05E-05	2 84E+02	4	N	0	0	0	1 05E-05	232 0	2 84E-01	6 59E+01			
51	Ti	6 10E-06	1 65E+02	4	Y	662	662	165	6 10E-06	47 9	1 65E-01	7 93E+00			
52	TIC as CO3	7 66E-02	2 08E+06	-2	Y	-4,157,619	-4,157,619	2,078,810	7 66E-02	60 0	2 08E+03	1 25E+05			
53	Tl	9 13E-06	2 47E+02	3	N	0	0	0	9 13E-06	204 4	2 47E-01	5 06E+01			
54	U(total)	5 23E-05	1 42E+03	6	Y	8,507	8,507	1,418	5 23E-05	238 0	1 42E+00	3 37E+02			
55	V	2 02E-05	5 47E+02	3	N	0	0	0	2 02E-05	50 9	5 47E-01	2 78E+01			
56	W	9 80E-06	2 66E+02	6	N	0	0	0	9 80E-06	183 9	2 66E-01	4 89E+01			
57	Y	2 19E-06	5 95E+01	3	N	0	0	0	2 19E-06	88 9	5 95E-02	5 29E+00			
58	Zn	2 28E-05	6 19E+02	2	Y	1,238	1,238	619	2 28E-05	65 4	6 19E-01	4 05E+01			
59	Zr	1 68E-05	4 57E+02	4	Y	1,827	1,827	457	1 68E-05	91 2	4 57E-01	4 17E+01			

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: A-8

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

	A	B	C	D	E
61	**Table A-7 LAW Radionuclide Constituents Feed Vector**				
62	**Analyte**	**Feed Conc. Bq/mol Na**	**Ci**		
63					
64	106Ru	1.17E+05	8.60E+01		
65	113mCd	1.81E+05	1.33E+02		
66	125Sb	2.56E+06	1.88E+03		
67	126Sn	4.08E+04	2.99E+01		
68	129I	1.72E+03	1.26E+00		
69	134Cs	1.96E+06	1.44E+03		
70	137Cs	2.00E+10	1.47E+07		
71	137mBa	6.52E+09	4.78E+06		
72	14C	5.63E+04	4.13E+01		
73	151Sm	3.60E+07	2.64E+04		
74	152Eu	2.07E+04	1.52E+01		
75	154Eu	4.30E+06	3.15E+03		
76	155Eu	1.24E+06	9.11E+02		
77	226Ra	3.48E-01	2.55E-04		
78	227Ac	2.71E+01	1.99E-02		
79	228Ra	4.13E+02	3.03E-01		
80	229Th	1.36E+01	9.96E-03		
81	231Pa	2.85E+02	2.09E-01		
82	232Th	6.63E+01	4.86E-02		
83	232U	3.60E+01	2.64E-02		
84	233U	2.21E+03	1.62E+00		
85	234U	1.57E+03	1.15E+00		
86	235U	6.18E+01	4.53E-02		
87	236U	1.06E+02	7.76E-02		
88	237Np	2.18E+03	1.60E+00		
89	238Pu	1.23E+04	9.04E+00		
90	238U	1.23E+03	8.98E-01		
91	239Pu	1.70E+05	1.25E+02		
92	240Pu	4.42E+04	3.24E+01		
93	241Am	2.75E+06	2.02E+03		
94	241Pu	9.28E+05	6.80E+02		
95	242Cm	1.05E+04	7.69E+00		
96	242Pu	4.68E+00	3.43E-03		
97	243Am	1.80E+03	1.32E+00		
98	243Cm	2.97E+02	2.18E-01		
99	244Cm	7.03E+03	5.16E+00		
100	3H	4.80E+05	3.52E+02		
101	59Ni	9.55E+04	7.00E+01		
102	60Co	3.70E+05	2.71E+02		
103	63Ni	6.66E+06	4.88E+03		
104	79Se	4.60E+03	3.37E+00		
105	90Sr	8.00E+08	5.86E+05		
106	90Y	3.74E+08	2.74E+05		
107	93mNb	1.64E+05	1.20E+02		
108	93Zr	2.66E+05	1.95E+02		
109	99Tc	7.10E+06	5.20E+03		

Attachment B HLW Calculations

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO : 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: B-2

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

	A	B	C	D	E	F	G	H	I	J	K
1	**Table B-1 HLW Chemical Analytes Feed Quantities in kg**										
2	**Analyte**	**Units**	**Tank**								
3			**AW-104**	**AY-101**	**AY-102**	**AZ-101**	**AZ-102**	**C-104**	**C-106**	**C-107**	**Avg**
4	Ag	kg	2.46E+01	2.03E+02	4.67E+02	1.59E+01	1.30E+02	1.05E+03	7.84E+00	2.93E+02	2.74E+02
5	Al	kg	3.41E+03	3.49E+04	5.16E+04	3 94E+04	3.03E+04	8.96E+04	3.82E+02	5.83E+04	3.85E+04
6	As	kg	1.50E+01	1.36E+01	1 40E+01	1.36E+01	2.32E+01	4.84E+01	0.00E+00	9.90E+00	1.72E+01
7	B	kg	8.04E+00	2.17E+01	1.81E+01	8.56E+00	3.01E+01	1.78E+03	1.19E+00	1.10E+01	2.35E+02
8	Ba	kg	8.27E+00	2.81E+02	5.00E+02	1.41E+02	2.00E+02	1.46E+02	1.64E+00	7.27E+02	2.51E+02
9	Be	kg	1.11E+00	3.33E+00	7.10E-01	2.61E+00	3.20E+00	3.79E+01	5.65E-02	1.55E+00	6.31E+00
10	Bi	kg	1.32E+00	1.07E+01	1.73E+01	7.48E-01	9.05E+01	7.01E-01	2.94E+00	1.03E+04	1.30E+03
11	Ca	kg	9.18E+02	1.27E+03	3.47E+03	6.92E+02	1.31E+03	2.97E+03	1.18E+02	1.24E+03	1.50E+03
12	Cd	kg	0.00E+00	8 28E+01	9.01E+01	1.35E+03	4.72E+03	1.02E+03	1.44E+00	9.49E+01	9.19E+02
13	Ce	kg	1.50E+01	3.34E+02	7.59E+02	2.31E+02	3.17E+02	7.05E+01	5.70E+00	7.76E+02	3.14E+02
14	Cl	kg	4.65E+02	1.53E+02	5.67E+01	3.83E+01	7.70E+01	7.95E+02	6.13E+00	8.65E+02	3.07E+02
15	CN	kg	0.00E+00	0.00E+00	1.03E+01	1.42E+00	3.00E+00	1.90E+01	7.80E-02	6.08E+00	4.98E+00
16	Co	kg	3 00E+00	1.74E+01	2.69E+01	9.05E+00	1.11E+01	9.69E+00	3.75E-01	2 64E+01	1.30E+01
17	Cr	kg	1.62E+02	1.34E+03	1.55E+03	2.47E+02	5.50E+02	1.45E+03	3.78E+00	9.26E+02	7.78E+02
18	Cu	kg	1.49E+01	1.35E+02	2 20E+02	6.86E+01	5.25E+01	1.33E+02	2.31E+00	2.27E+02	1.07E+02
19	F	kg	8.53E+02	1.08E+03	4.56E+01	1.23E+03	4.60E+02	3.44E+04	5.41E-01	6.34E+03	5.55E+03
20	Fe	kg	2 31E+03	4.12E+04	8.98E+04	1.92E+04	3.61E+04	2.74E+04	2.07E+02	1.02E+05	3.98E+04
21	Free OH	kg	1.27E+03	4.92E-02	4.43E+01	2.69E+02	4.00E+01	0.00E+00	0.00E+00	0.00E+00	2.03E+02
22	Hg*	kg	1.03E-02	1.63E+01	1.56E+02	9.04E-01	4.98E+00	5.50E+01	1.93E+00	6.66E+01	1.56E+02
23	K	kg	1.79E+03	2.25E+02	5.24E+02	5.00E+02	1.50E+03	1.32E+03	1.77E+01	4.27E+02	7.88E+02
24	La	kg	2.00E+01	1.05E+03	6.15E+02	5.16E+02	1.20E+03	4.84E+01	2.44E+00	2.69E+02	4.65E+02
25	Li	kg	3 11E+00	2.91E+00	3.64E+01	2.03E+01	2.67E+01	6.01E+00	1.13E-01	1 65E+02	3.26E+01
26	Mg	kg	2.00E+02	4.39E+02	7 98E+02	1 27E+02	2.10E+02	2.05E+02	7.10E+00	4.75E+02	3.08E+02
27	Mn	kg	7.92E+02	1.83E+03	1.27E+04	4.27E+02	9.46E+02	6.97E+03	5.49E+02	5.01E+03	3.65E+03
28	Mo	kg	1.31E+01	1.12E+01	9.71E+00	2.04E+01	2.00E+01	2.17E+01	3.05E-01	4.56E+01	1.78E+01
29	Na	kg	3.48E+04	6.62E+04	7.17E+04	2.29E+04	2.70E+04	1.77E+05	1.85E+02	9.47E+04	6.18E+04
30	Nd	kg	1.50E+01	7.73E+02	9.88E+02	6.04E+02	9.06E+02	1.06E+02	9.00E+00	6.31E+02	5.04E+02
31	NH3	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.10E-01	0 00E+00	1 14E-01
32	Ni	kg	6.32E+01	1.69E+03	2.34E+03	7 99E+02	2.44E+03	2.62E+03	3 02E+01	3.08E+03	1.63E+03
33	NO2	kg	8.54E+03	1.60E+04	3.14E+03	9.34E+03	1.60E+04	3.63E+04	4.14E+01	3.51E+04	1.56E+04
34	NO3	kg	1.46E+04	2.08E+03	2.08E+02	7.84E+03	4.30E+03	1.95E+04	3.48E+01	4 75E+04	1.20E+04
35	Oxalate	kg	8.85E+02	2.68E+04	1.38E+03	9.32E+02	1.04E+03	5.58E+03	3.32E+02	3.65E+02	4.66E+03
36	Pb	kg	8.20E+01	9.33E+02	4.24E+03	1 42E+02	7.82E+02	8.32E+02	2.56E+01	1.01E+04	2.14E+03
37	Pd	kg	0 00E+00	0.00E+00	8.69E+00	6.92E+02	0.00E+00	0.00E+00	1.15E+00	0.00E+00	8.77E+01
38	PO4	kg	3.02E+02	2.53E+03	8.64E+03	1.62E+03	1.14E+03	3.19E+03	9.00E+01	5.84E+04	9.49E+03
39	Pr	kg	0.00E+00	0.00E+00	2.80E+02	1.43E+02	0.00E+00	5.71E+01	5.39E+00	2.07E+02	8.65E+01
40	Rb	kg	0.00E+00	7.85E-01	2.11E+00	7.57E+01	0 00E+00	2.18E+02	2.69E-01	8.39E-01	3.72E+01
41	Rh	kg	0.00E+00	1.06E+01	2.02E+01	2.63E+01	0.00E+00	1.21E+02	2.45E+00	4.33E+01	2.80E+01
42	Ru	kg	0.00E+00	0.00E+00	4.12E+02	2.08E+02	0.00E+00	0.00E+00	2.40E+00	9.46E+02	1.96E+02
43	Sb	kg	9 03E+00	0.00E+00	2 51E+00	9.80E-01	9.70E+00	2 91E+01	2.95E-01	2.39E+00	6 75E+00
44	Se	kg	1.53E+01	0.00E+00	5.87E-01	4 41E-01	2.35E+01	4.84E+01	6.24E-02	4.99E+00	1.17E+01
45	Si	kg	4.79E+02	2.01E+00	8.56E+03	1.10E+03	1.82E+03	1.02E+04	1.60E+01	1.86E+03	3.00E+03
46	SO4	kg	8.42E+02	2.80E+00	1.78E+03	7.30E+03	6.50E+03	3.40E+03	3 90E+00	8 38E+03	3.53E+03
47	Sr	kg	4.94E+00	4.50E+02	1.62E+02	1.03E+02	6.15E+01	8.69E+01	1.83E+00	2.56E+02	1.41E+02
48	Ta	kg	0.00E+00	3.48E+03	1.96E+00	1.05E+00	0.00E+00	1 43E+00	2.60E-01	8.43E-01	4.35E+02
49	Te	kg	0.00E+00	6.61E+01	8.84E+01	5.74E+01	0.00E+00	0.00E+00	2.40E+00	1.79E+02	4.92E+01
50	Th	kg	2.53E-02	5.22E+02	6.37E+02	7.42E+01	1.87E+02	3.61E+04	5.09E+00	6.58E+02	4.77E+03
51	Ti	kg	1.60E+01	3.97E+01	1.33E+02	1.85E+01	2.47E+01	9.74E+01	3.85E-01	1.23E+02	5.66E+01
52	TIC as CO3	kg	1.68E+04	1.10E+05	6.82E+04	1.32E+04	8.00E+03	4.82E+04	7.58E+01	1.14E+04	3.45E+04
53	Tl	kg	0.00E+00	8.02E-01	2.81E+00	4.53E-02	0.00E+00	9.69E+01	3.68E-01	5.40E+00	1 33E+01
54	TOC	kg	3.00E+03	7.42E+03	4.11E+03	2.60E+02	2.90E+02	1.41E+04	9.06E+01	7.32E+02	3.75E+03
55	UTOTAL	kg	7.02E+03	5.29E+02	1.73E+03	1 64E+03	7.06E+03	2.87E+04	2.70E+00	9 23E+03	6.99E+03
56	V	kg	7.53E+00	1.19E+01	8.80E+00	6.78E+00	2.33E+00	2.70E+01	2.94E-01	2.50E+01	1.12E+01
57	W	kg	0.00E+00	0.00E+00	0.00E+00	1.10E+01	0 00E+00	0.00E+00	0.00E+00	6.71E+02	8.52E+01
58	Y	kg	1.50E+00	9.06E+01	1.05E+02	3.26E+01	3.03E+01	2.36E+01	1.69E+00	9.43E+01	4.74E+01
59	Zn	kg	2.80E+01	5.39E+01	1.49E+02	2.28E+01	9.89E+01	6.05E+02	2.13E+00	1.76E+02	1.42E+02
60	Zr	kg	2.11E+03	5.88E+02	1.97E+02	5.63E+03	4 56E+03	6.45E+04	2.79E+00	7.37E+01	9.71E+03
61	*Value selected for Hg is the maximum of the tanks analyzed.										

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: B-3

BY: E. Berrios
DATE:12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Feed Vector

	A	B	C	D	E	F	G	H	I	J	K
1	**Table B-2 HLW Radionuclide Feed Quantities in Curies**										
2	**Analyte**	**Units**	**Tank**								
3			**AW-104**	**AY-101**	**AY-102**	**AZ-101**	**AZ-102**	**C-104**	**C-106**	**C-107**	**MAX**
4	106Ru	Ci	1.18E-02	2.98E-02	5.02E-04	5.12E+01	5.90E+00	1.80E-04	4.52E-05	2.08E-03	5.12E+01
5	113mCd	Ci	9.29E-01	1.87E+01	2.97E+00	3.88E+02	1.75E+02	3.10E+00	4.68E+00	3.76E+00	3.88E+02
6	125Sb	Ci	1.43E-01	2.46E+02	2.70E+01	2.94E+03	2.39E+03	7.68E+01	2.02E-01	1.31E+02	2.94E+03
7	126Sn	Ci	2.72E-01	1.38E+00	1.34E+01	5.39E-01	5.80E-01	8.29E-02	1.62E+00	2.21E-01	1.34E+01
8	129I	Ci	1.32E-02	8.40E-02	5.84E-02	3.61E-01	4.50E-03	6.66E-01	6.30E-04	7.15E-01	7.15E-01
9	134Cs	Ci	1.26E-01	1.26E+00	1.67E-02	4.88E+01	1.23E+02	5.41E-02	3.28E-03	1.62E-01	1.23E+02
10	137Cs	Ci	1.44E+04	6.50E+04	2.50E+05	2.43E+05	3.70E+05	8.86E+04	1.45E+03	5.89E+04	3.70E+05
11	137mBa	Ci	1.36E+04	6.14E+04	2.36E+05	2.29E+05	3.50E+05	8.36E+04	1.37E+03	5.56E+04	3.50E+05
12	14C	Ci	2.52E-02	1.21E+00	2.15E-01	3.46E-01	4.00E-01	1.82E+00	8.22E-03	5.56E-01	1.82E+00
13	151Sm	Ci	1.41E+02	2.45E+05	7.37E+04	1.18E+05	2.05E+05	5.73E+04	8.85E+03	6.31E+05	6.31E+05
14	152Eu	Ci	1.59E-02	3.60E+02	6.34E+01	1.42E+02	9.77E+01	1.53E+01	4.57E+00	1.37E+02	3.60E+02
15	154Eu	Ci	1.41E+00	5.62E+03	6.49E+03	1.06E+04	8.57E+03	8.54E+02	8.18E+01	1.25E+03	1.06E+04
16	155Eu	Ci	4.39E-01	2.27E+03	2.60E+03	1.13E+04	1.25E+04	4.38E+02	7.90E+01	6.49E+02	1.25E+04
17	226Ra	Ci	1.56E-06	2.30E-05	2.76E-06	7.73E-05	1.10E-05	1.31E-04	5.16E-04	8.64E-06	5.16E-04
18	227Ac	Ci	1.92E-04	1.89E-03	1.78E-05	3.10E-04	9.20E-05	2.02E+00	2.55E-03	2.86E-03	2.02E+00
19	228Ra	Ci	4.43E-04	7.20E-02	2.25E-02	2.75E-03	6.62E-03	1.48E+00	3.24E-03	2.75E-02	1.48E+00
20	229Th	Ci	7.72E-07	8.70E-06	7.30E-07	5.95E-07	1.92E-07	5.53E-01	1.91E-05	1.45E-02	5.53E-01
21	231Pa	Ci	2.02E-03	1.99E-02	2.98E-05	1.50E-03	4.60E-04	1.70E-01	2.53E-03	5.32E-04	1.70E-01
22	232Th	Ci	2.79E-06	5.74E-02	6.99E-02	8.16E-03	2.06E-02	3.97E+00	5.60E-04	7.24E-02	3.97E+00
23	232U	Ci	2.16E-03	8.04E-04	8.23E-04	2.68E-03	5.67E-03	2.26E+00	5.72E-04	7.61E-02	2.26E+00
24	233U	Ci	6.76E-02	4.70E-02	4.95E-02	1.50E-01	3.03E-01	3.37E+02	1.83E-03	4.72E+00	3.37E+02
25	234U	Ci	3.39E+00	2.08E-01	5.90E-01	7.78E-01	3.16E+00	1.69E+01	9.40E-04	3.12E+00	1.69E+01
26	235U	Ci	1.30E-01	8.86E-03	2.52E-02	2.94E-02	1.27E-01	4.38E-01	3.86E-05	1.34E-01	4.38E-01
27	236U	Ci	3.24E-01	8.14E-03	1.50E-02	7.11E-02	2.64E-01	5.58E-01	1.73E-05	5.11E-02	5.58E-01
28	237Np	Ci	2.05E-03	2.65E+00	3.73E+00	1.35E+01	1.89E+01	3.59E+00	5.41E-02	5.28E-02	1.89E+01
29	238Pu	Ci	4.95E+01	5.92E+01	6.10E+01	1.15E+02	1.95E+02	2.29E+02	2.70E+00	4.43E+01	2.29E+02
30	238U	Ci	2.34E+00	1.77E-01	5.78E-01	5.48E-01	2.35E+00	9.56E+00	9.02E-04	3.08E+00	9.56E+00
31	239Pu	Ci	4.90E+02	6.93E+02	1.59E+03	1.17E+03	1.31E+03	5.18E+03	1.67E+01	2.18E+03	5.18E+03
32	240Pu	Ci	1.38E+02	2.13E+02	3.67E+02	3.31E+02	3.44E+02	1.33E+03	3.57E+00	3.55E+02	1.33E+03
33	241Am	Ci	1.86E+01	1.32E+04	4.98E+03	2.56E+04	2.84E+04	6.34E+03	6.52E+01	6.69E+03	2.84E+04
34	241Pu	Ci	3.54E+03	2.97E+03	2.60E+03	8.16E+03	7.17E+03	1.25E+04	3.98E+01	1.78E+03	1.25E+04
35	242Cm	Ci	5.28E-04	1.96E+01	5.60E+00	1.12E+01	2.48E+01	2.07E+00	1.57E-01	2.62E+00	2.48E+01
36	242Pu	Ci	1.74E-02	3.04E-02	2.46E-02	4.16E-02	3.71E-02	1.24E-01	4.16E-04	1.63E-02	1.24E-01
37	243Am	Ci	1.83E-04	1.18E+01	2.72E+00	9.41E+00	9.39E+00	1.38E+00	3.06E-03	1.88E+00	1.18E+01
38	243Cm	Ci	3.13E-05	1.93E+00	2.12E+00	1.04E+00	2.86E+00	1.84E-01	3.02E-01	1.55E-01	2.86E+00
39	244Cm	Ci	7.43E-04	4.52E+01	5.01E+01	2.41E+01	6.50E+01	4.11E+00	7.26E+00	3.62E+00	6.50E+01
40	3H	Ci	2.01E-01	2.21E+00	3.47E+00	2.18E+00	1.73E+01	4.00E+01	1.02E-02	3.14E+00	4.00E+01
41	59Ni	Ci	1.15E-02	3.01E+01	2.43E+01	1.43E+01	9.86E+00	5.68E+00	1.05E+01	2.81E+00	3.01E+01
42	60Co	Ci	2.20E-01	4.51E+02	7.22E+01	7.40E+02	7.44E+02	1.82E+02	1.82E+01	1.67E+02	7.44E+02
43	63Ni	Ci	1.07E+00	2.81E+03	2.20E+03	1.36E+03	9.35E+02	5.28E+02	7.29E+01	2.61E+02	2.81E+03
44	79Se	Ci	4.61E-02	3.40E-01	5.41E-02	5.32E-01	1.30E-01	5.24E+00	9.57E-03	5.19E-02	5.24E+00
45	90Sr	Ci	5.22E+01	1.94E+06	4.63E+06	5.52E+06	3.91E+06	4.47E+05	6.61E+04	2.08E+06	5.52E+06
46	90Y	Ci	5.22E+01	1.94E+06	4.63E+06	5.52E+06	3.91E+06	4.47E+05	6.61E+04	2.08E+06	5.52E+06
47	93mNb	Ci	8.99E-01	1.13E+02	2.43E+00	4.67E+00	4.90E+00	1.45E+00	9.82E+00	3.72E+00	1.13E+02
48	93Zr	Ci	1.08E+00	2.09E+02	2.93E+00	7.34E+00	8.00E+00	1.79E+00	1.04E+01	4.50E+00	2.09E+02
49	99Tc	Ci	1.07E+01	1.44E+01	2.45E+01	5.03E+01	8.70E+01	5.76E+01	1.65E-01	3.77E+01	8.70E+01

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.:B-4

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

	A	B	C	D	E	F	G	H	I	J
1	Table B-3 HLW Oxide Mass Calculation									
2										
3	Analyte	Feed Kg	MW g/mol	Oxide	Charge	mole O needed for oxide	g O needed for oxide	SOW max g/100 g oxide	Feed grams	Feed All kg
4	Ag	2.74E+02	107 8	Ag2O	1	0.5	2.03E+04	0.55	8.93E+05	8.93E+02
5	Al	3.85E+04	27.0	Al2O3	3	1.5	3.42E+07	14	2.27E+07	2.27E+04
6	As	1.72E+01	74.9	As2O5	5	2 5	9.20E+03	0 160	2.60E+05	2.60E+02
7	B	2.35E+02	10.8	B2O3	3	1.5	5.22E+05	1.3	2.11E+06	2 11E+03
8	Ba	2.51E+02	137.3	BaO	2	1	2 92E+04	4.5	7 30E+06	7.30E+03
9	Be	6.31E+00	9.0	BeO	2	1	1.12E+04	0.065	1.05E+05	1.05E+02
10	Bi	1.30E+03	208 9	Bi2O3	3	0	0 00E+00	-	-	1.30E+03
11	Ca	1.50E+03	40.1	CaO	2	0	0.00E+00	-	-	1.50E+03
12	Cd	9.19E+02	112.4	CdO	2	1	1.31E+05	4.5	7.30E+06	7.30E+03
13	Ce	3.14E+02	140.1	Ce2O3	3	1.5	5.37E+04	0.81	1 31E+06	1.31E+03
14	Cl	3.07E+02	35.5	-	-1	0	0.00E+00	0.33	5.36E+05	5.36E+02
15	CN	4.98E+00	26.0	-	-1	0	0.00E+00	1.6	2.60E+06	2.60E+03
16	Co	1.30E+01	58.9	Co2O3	3	1.5	5.30E+03	0.45	7.30E+05	7.30E+02
17	Cr	7.78E+02	52.0	Cr2O3	3	1.5	3.59E+05	0.68	1.10E+06	1.10E+03
18	Cu	1.07E+02	63.5	CuO	2	1	2 69E+04	0.48	7.79E+05	7.79E+02
19	F	5.55E+03	19.0	-	-1	0	0.00E+00	3.5	5.68E+06	5.68E+03
20	Fe	3 98E+04	55.9	Fe2O3	3	1 5	1.71E+07	29	4.71E+07	4.71E+04
21	Free OH	2.03E+02	17.0	-	-1	0	0.00E+00	-	-	2.03E+02
22	Hg	1.56E+02	200.6	HgO	2	1	1 24E+04	0 1	1.62E+05	1.62E+02
23	K	7 88E+02	39.1	K2O	1	0.5	1.61E+05	1.3	2.11E+06	2 11E+03
24	La	4.65E+02	138.9	La2O3	3	1.5	8.04E+04	2.6	4.22E+06	4.22E+03
25	Li	3.26E+01	6.9	Li2O	1	0.5	3.78E+04	0.14	2.27E+05	2.27E+02
26	Mg	3.08E+02	24.3	MgO	2	1	2 03E+05	2.1	3.41E+06	3 41E+03
27	Mn	3.65E+03	54.9	MnO2	4	2	2.13E+06	6.5	1,05E+07	1 05E+04
28	Mo	1.78E+01	95.9	MoO3	6	3	8.89E+03	0.65	1.05E+06	1.05E+03
29	Na	6.18E+04	22.9	Na2O	1	0	0.00E+00	-	-	6.18E+04
30	Nd	5 04E+02	144.2	Nd2O3	3	1.5	8.39E+04	1.7	2 76E+06	2.76E+03
31	NH3	1 14E-01	17.0	-	0	0	0 00E+00	-	-	1.14E-01
32	Ni	1.63E+03	58.7	NiO	2	1	4.45E+05	2.4	3.89E+06	3.89E+03
33	NO2	1.56E+04	46.0	-	-1	0	0.00E+00	36	5 84E+07	3.30E+04
34	NO3	1 20E+04	62.0	-	-1	0	0.00E+00		5.84E+07	2.54E+04
35	Oxalate	4.66E+03	88.0	-	-2	0	0.00E+00	-	-	4.66E+03
36	Pb	2.14E+03	207 2	PbO	2	1	1.65E+05	1.1	1.79E+06	1.79E+03
37	Pd	8.77E+01	105.4	PdO	2	1	1.33E+04	0.13	2.11E+05	2.11E+02
38	PO4	9 49E+03	95.0	-	-3	0	0.00E+00	-	-	9.49E+03
39	Pr	8.65E+01	140.9	Pr2O3	3	1.5	1.47E+04	0.35	5.68E+05	5.68E+02
40	Rb	3.72E+01	85.5	Rb2O	1	0.5	3.48E+03	0.19	3.08E+05	3.08E+02
41	Rh	2 80E+01	102.9	Rh2O3	3	1.5	6.53E+03	0.13	2.11E+05	2.11E+02
42	Ru	1.96E+02	101.1	Ru2O3	3	1 5	4.65E+04	0.35	5.68E+05	5.68E+02
43	Sb	6.75E+00	121.7	Sb2O5	5	2.5	2 22E+03	0.84	1 36E+06	1.36E+03
44	Se	1 17E+01	78.9	SeO3	6	3	7.09E+03	0.52	8.44E+05	8.44E+02
45	Si	3.00E+03	28.1	SiO2	4	0	0.00E+00	-	-	3 00E+03
46	SO4	3.53E+03	96.1	-	-2	0	0.00E+00	-	-	3.53E+03
47	Sr	1.41E+02	87.6	SrO	2	1	2 57E+04	0.52	8.44E+05	8.44E+02
48	Ta	4 35E+02	180.9	Ta2O5	5	2.5	9.63E+04	0.03	4.87E+04	4.87E+01
49	Te	4.92E+01	127.6	TeO2	4	2	1.23E+04	0.13	2.11E+05	2.11E+02
50	Th	4.77E+03	232.0	ThO2	4	2	6 58E+05	5	8.11E+06	8 11E+03
51	Ti	5.66E+01	47.9	TiO2	4	2	3.78E+04	1 3	2.11E+06	2.11E+03
52	TIC as CO3	3.45E+04	60.0	-		0	0.00E+00	30	4 87E+07	4.87E+04
53	Tl	1.33E+01	204.4	Tl2O3	3	1.5	1.56E+03	0.45	7.30E+05	7.30E+02
54	TOC	3.75E+03	0.0	-		0	0.00E+00	11	1.79E+07	1.79E+04
55	UTOTAL	6.99E+03	238.0	UO3	6	3	1.41E+06	14	2.27E+07	2.27E+04
56	V	1.12E+01	50.9	V2O3	3	1.5	5.28E+03	0.032	5.19E+04	5.19E+01
57	W	8.52E+01	183.9	WO3	6	3	2.23E+04	0 24	3.89E+05	3.89E+02
58	Y	4.74E+01	88.9	Y2O3	3	1.5	1.28E+04	0 16	2.60E+05	2.60E+02
59	Zn	1.42E+02	65.4	ZnO	2	1	3.47E+04	0.42	6.82E+05	6.82E+02
60	Zr	9.71E+03	91.2	ZrO2	4	0	0.00E+00	-	-	9.71E+03

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.:B-5

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

	A	B	C	D	E
61	**Table B-3 HLW Oxide Mass Calculation (continued)**				
62	**Analyte**	**Feed**	**SOW max**	**Feed**	**Feed All**
63		**Ci**	**Ci/100 g**	**Ci**	**Ci**
64	106Ru	5.12E+01	-	-	5.12E+01
65	113mCd	3.88E+02	-	-	3.88E+02
66	125Sb	2.94E+03	3.20E-02	5.19E+04	5.19E+04
67	126Sn	1.34E+01	1.50E-04	2.43E+02	2.43E+02
68	129I	7.15E-01	2.90E-07	4.71E-01	4.71E-01
69	134Cs	1.23E+02	-	-	1.23E+02
70	137Cs	3.70E+05	1.50E+00	2.43E+06	2.43E+06
71	137mBa	3.50E+05	-	-	3.50E+05
72	14C	1.82E+00	6.50E-06	1.05E+01	1.05E+01
73	151Sm	6.31E+05	-	-	6.31E+05
74	152Eu	3.60E+02	4.80E-04	7.79E+02	7.79E+02
75	154Eu	1.06E+04	5.20E-02	8.44E+04	8.44E+04
76	155Eu	1.25E+04	-	-	1.25E+04
77	226Ra	5.16E-04	-	-	5.16E-04
78	227Ac	2.02E+00	-	-	2.02E+00
79	228Ra	1.48E+00	-	-	1.48E+00
80	229Th	5.53E-01	-	-	5.53E-01
81	231Pa	1.70E-01	-	-	1.70E-01
82	232Th	3.97E+00	-	-	3.97E+00
83	232U	2.26E+00	-	-	2.26E+00
84	233U	3.37E+02	2.00E-04	3.25E+02	3.25E+02
85	234U	1.69E+01	-	-	1.69E+01
86	235U	4.38E-01	2.50E-07	4.06E-01	4.06E-01
87	236U	5.58E-01	-	-	5.58E-01
88	237Np	1.89E+01	7.40E-05	1.20E+02	1.20E+02
89	238Pu	2.29E+02	3.50E-04	5.68E+02	5.68E+02
90	238U	9.56E+00	-	-	9.56E+00
91	239Pu	5.18E+03	3.10E-03	5.03E+03	5.03E+03
92	240Pu	1.33E+03	-	-	1.33E+03
93	241Am	2.84E+04	9.00E-02	1.46E+05	1.46E+05
94	241Pu	1.25E+04	2.20E-02	3.57E+04	3.57E+04
95	242Cm	2.48E+01	-	-	2.48E+01
96	242Pu	1.24E-01	-	-	1.24E-01
97	243Am	1.18E+01	-	-	1.18E+01
98	243Cm	2.86E+00	3.00E-03	4.87E+03	2.05E+02
99	244Cm	6.50E+01			4.66E+03
100	3H	4.00E+01	6.50E-05	1.05E+02	1.05E+02
101	59Ni	3.01E+01	-	-	3.01E+01
102	60Co	7.44E+02	1.00E-02	1.62E+04	1.62E+04
103	63Ni	2.81E+03	-	-	2.81E+03
104	79Se	5.24E+00	-	-	5.24E+00
105	90Sr	5.52E+06	1.00E+01	1.62E+07	1.62E+07
106	90Y	5.52E+06	-	-	5.52E+06
107	93mNb	1.13E+02	-	-	1.13E+02
108	93Zr	2.09E+02	-	-	2.09E+02
109	99Tc	8.70E+01	1.50E-02	2.43E+04	2.43E+04
110					
111		Total grams of O		5.82E+07 g	
112		Total grams inorg		1.04E+08 g	
113		Total grams rads		0.00E+00 g	
114		Total oxide mass		1.62E+08 g	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: B-6

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

	A	B	C	E	F	G	H	I	J	K	L	M
1	**Table B-4 HLW Feed Charge Balance**											
2 3	**Analyte**	**Feed Kg**	**MW g/mol**	**Charge**	**mole**	**In ACM**	**mol charge**	**Final Feed Kg**	**Final Feed kgmole**			
4	Ag	2 74E+02	107.8	1	2 54E+03	Y	2,541	2.74E+02	2.54E+00	Total charge		0
5	Al	3.85E+04	27 0	3	1 43E+06	Y	4,276,199	3.85E+04	1.43E+03	Adjust OH		8,329,418
6	As	1 72E+01	74 9	5	2.30E+02	Y	1,150	1.72E+01	2.30E-01			
7	B	2 35E+02	10.8	3	2.17E+04	Y	65,232	2.35E+02	2 17E+01			
8	Ba	2.51E+02	137.3	2	1.82E+03	Y	3,650	2.51E+02	1.82E+00			
9	Be	6.31E+00	9.0	2	7.01E+02	N	0	6.31E+00	7.01E-01			
10	Bi	1 30E+03	208.9	3	6.24E+03	Y	18,713	1.30E+03	6.24E+00			
11	Ca	1 50E+03	40 1	2	3.74E+04	Y	74,772	1.50E+03	3 74E+01			
12	Cd	9.19E+02	112.4	2	8.18E+03	Y	16,354	9.19E+02	8.18E+00			
13	Ce	3 14E+02	140 1	3	2 24E+03	Y	6,713	3.14E+02	2.24E+00			
14	Cl	3.07E+02	35.5	-1	8 65E+03	Y	-8,648	3.07E+02	8.65E+00			
15	CN	4.98E+00	26 0	-1	1.92E+02	N	0	4.98E+00	1.92E-01			
16	Co	1.30E+01	58 9	3	2.21E+02	N	0	1.30E+01	2.21E-01			
17	Cr	7.78E+02	52.0	3	1 50E+04	Y	44,899	7 78E+02	1 50E+01			
18	Cu	1.07E+02	63.5	2	1.68E+03	Y	3,358	1.07E+02	1.68E+00			
19	F	5.55E+03	19 0	-1	2 92E+05	Y	-292,142	5.55E+03	2.92E+02			
20	Fe	3 98E+04	55 9	3	7.12E+05	Y	2,135,087	3.98E+04	7.12E+02			
21	Free OH	2 03E+02	17 0	-1	1 19E+04	Y	-8,341,354	1.42E+05	8 34E+03			
22	Hg	1.56E+02	200.6	2	7.78E+02	Y	1,556	1.56E+02	7.78E-01			
23	K	7.88E+02	39 1	1	2.02E+04	Y	20,153	7 88E+02	2.02E+01			
24	La	4 65E+02	138.9	3	3.35E+03	Y	10,045	4.65E+02	3.35E+00			
25	Li	3 26E+01	6 9	1	4 72E+03	Y	4,720	3.26E+01	4 72E+00			
26	Mg	3 08E+02	24 3	2	1.27E+04	Y	25,323	3.08E+02	1.27E+01			
27	Mn	3.65E+03	54 9	4	6.66E+04	Y	266,265	3.65E+03	6.66E+01			
28	Mo	1 78E+01	95.9	6	1.85E+02	N	0	1 78E+01	1.85E-01			
29	Na	6.18E+04	22.9	1	2 70E+06	Y	2,698,772	6.18E+04	2 70E+03			
30	Nd	5 04E+02	144.2	3	3 50E+03	N	0	5.04E+02	3.50E+00			
31	NH3	1 14E-01	17 0	0	6.69E+00	Y	0	1.14E-01	6 69E-03			
32	Ni	1 63E+03	58.7	2	2.78E+04	Y	55,631	1 63E+03	2 78E+01			
33	NO2	1 56E+04	46 0	-1	3.38E+05	Y	-338,183	1 56E+04	3 38E+02			
34	NO3	1 20E+04	62.0	-1	1 94E+05	Y	-193,636	1 20E+04	1.94E+02			
35	Oxalate	4 66E+03	88 0	-2	5 29E+04	Y	-105,878	4 66E+03	5 29E+01			
36	Pb	2.14E+03	207 2	2	1.03E+04	Y	20,670	2.14E+03	1 03E+01			
37	Pd	8 77E+01	105.4	2	8.32E+02	Y	1,665	8.77E+01	8.32E-01			
38	PO4	9.49E+03	95 0	-3	9.99E+04	Y	-299,641	9.49E+03	9 99E+01			
39	Pr	8.65E+01	140.9	3	6.14E+02	N	0	8.65E+01	6.14E-01			
40	Rb	3.72E+01	85.5	1	4 35E+02	N	0	3 72E+01	4.35E-01			
41	Rh	2.80E+01	102 9	3	2 72E+02	Y	816	2.80E+01	2.72E-01			
42	Ru	1 96E+02	101 1	3	1 94E+03	Y	5,815	1.96E+02	1 94E+00			
43	Sb	6.75E+00	121.7	5	5.55E+01	N	0	6 75E+00	5 55E-02			
44	Se	1 17E+01	78.9	6	1.48E+02	N	0	1.17E+01	1.48E-01			
45	Si	3.00E+03	28 1	4	1 07E+05	Y	427,621	3 00E+03	1.07E+02			
46	SO4	3.53E+03	96 1	-2	3 67E+04	Y	-73,379	3 53E+03	3.67E+01			
47	Sr	1 41E+02	87.6	2	1.61E+03	Y	3,213	1.41E+02	1 61E+00			
48	Ta	4 35E+02	180 9	5	2 41E+03	N	0	4.35E+02	2.41E+00			
49	Te	4.92E+01	127.6	4	3 85E+02	N	0	4.92E+01	3 85E-01			
50	Th	4.77E+03	232 0	4	2.06E+04	N	0	4 77E+03	2 06E+01			
51	Ti	5.66E+01	47.9	4	1 18E+03	Y	4,726	5 66E+01	1.18E+00			
52	TIC as CO3	3.45E+04	60.0	-2	5.75E+05	Y	-1,149,066	3.45E+04	5.75E+02			
53	Tl	1.33E+01	204.4	3	6.50E+01	N	0	1 33E+01	6.50E-02			
54	TOC	3 75E+03	0 0		-	Y	0	3.75E+03	-			
55	UTOTAL	6.99E+03	238.0	6	2 94E+04	Y	176,208	6 99E+03	2.94E+01			
56	V	1 12E+01	50.9	3	2 20E+02	N	0	1 12E+01	2.20E-01			
57	W	8 52E+01	183 9	6	4.64E+02	N	0	8 52E+01	4 64E-01			
58	Y	4.74E+01	88.9	3	5 33E+02	N	0	4.74E+01	5.33E-01			
59	Zn	1 42E+02	65.4	2	2.17E+03	Y	4,340	1 42E+02	2.17E+00			
60	Zr	9.71E+03	91 2	4	1 06E+05	Y	425,720	9 71E+03	1 06E+02			

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: B-7

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

	A	B	C	E	F
62	**Table B-5 HLW Radionuclide Constituents Feed Vector**				
63	**Analyte**	**Units**	**Feed**		
64					
65	106Ru	Ci	5.12E+01		
66	113mCd	Ci	3.88E+02		
67	125Sb	Ci	5.19E+04		
68	126Sn	Ci	2.43E+02		
69	129I	Ci	4.71E-01		
70	134Cs	Ci	1.23E+02		
71	137Cs	Ci	2.43E+06		
72	137mBa	Ci	3.50E+05		
73	14C	Ci	1.05E+01		
74	151Sm	Ci	6.31E+05		
75	152Eu	Ci	7.79E+02		
76	154Eu	Ci	8.44E+04		
77	155Eu	Ci	1.25E+04		
78	226Ra	Ci	5.16E-04		
79	227Ac	Ci	2.02E+00		
80	228Ra	Ci	1.48E+00		
81	229Th	Ci	5.53E-01		
82	231Pa	Ci	1.70E-01		
83	232Th	Ci	3.97E+00		
84	232U	Ci	2.26E+00		
85	233U	Ci	3.25E+02		
86	234U	Ci	1.69E+01		
87	235U	Ci	4.06E-01		
88	236U	Ci	5.58E-01		
89	237Np	Ci	1.20E+02		
90	238Pu	Ci	5.68E+02		
91	238U	Ci	9.56E+00		
92	239Pu	Ci	5.03E+03		
93	240Pu	Ci	1.33E+03		
94	241Am	Ci	1.46E+05		
95	241Pu	Ci	3.57E+04		
96	242Cm	Ci	2.48E+01		
97	242Pu	Ci	1.24E-01		
98	243Am	Ci	1.18E+01		
99	243Cm	Ci	2.05E+02		
100	244Cm	Ci	4.66E+03		
101	3H	Ci	1.05E+02		
102	59Ni	Ci	3.01E+01		
103	60Co	Ci	1.62E+04		
104	63Ni	Ci	2.81E+03		
105	79Se	Ci	5.24E+00		
106	90Sr	Ci	1.62E+07		
107	90Y	Ci	5.52E+06		
108	93mNb	Ci	1.13E+02		
109	93Zr	Ci	2.09E+02		
110	99Tc	Ci	2.43E+04		

Attachment C LAW BBI Data

CALCULATION SHEET

BY. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-2

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-102	106Ru	Salt Cake	A2-SltSlr (Solid)	1.81E-02	Ci
241-AN-102	106Ru	Supernatant	NA	2.00E-05	Ci
241-AN-102	106Ru	Total		1.81E-02	Ci
241-AN-102	113mCd	Salt Cake	A2-SltSlr (Solid)	1.08E+01	Ci
241-AN-102	113mCd	Supernatant	NA	8.72E+01	Ci
241-AN-102	113mCd	Total		9.81E+01	Ci
241-AN-102	125Sb	Salt Cake	A2-SltSlr (Solid)	4.30E+00	Ci
241-AN-102	125Sb	Supernatant	NA	1.24E+01	Ci
241-AN-102	125Sb	Total		1.67E+01	Ci
241-AN-102	126Sn	Salt Cake	A2-SltSlr (Solid)	8.80E-01	Ci
241-AN-102	126Sn	Supernatant	NA	2.55E+01	Ci
241-AN-102	126Sn	Total		2.64E+01	Ci
241-AN-102	129I	Salt Cake	A2-SltSlr (Solid)	8.17E-02	Ci
241-AN-102	129I	Supernatant	NA	4.58E-01	Ci
241-AN-102	129I	Total		5.39E-01	Ci
241-AN-102	134Cs	Salt Cake	A2-SltSlr (Solid)	1.42E+00	Ci
241-AN-102	134Cs	Supernatant	NA	1.15E+01	Ci
241-AN-102	134Cs	Total		1.29E+01	Ci
241-AN-102	137Cs	Salt Cake	A2-SltSlr (Solid)	2.36E+05	Ci
241-AN-102	137Cs	Supernatant	NA	1.36E+06	Ci
241-AN-102	137Cs	Total		1.59E+06	Ci
241-AN-102	137mBa	Salt Cake	A2-SltSlr (Solid)	2.23E+05	Ci
241-AN-102	137mBa	Supernatant	NA	1.28E+06	Ci
241-AN-102	137mBa	Total		1.50E+06	Ci
241-AN-102	14C	Salt Cake	A2-SltSlr (Solid)	1.16E+00	Ci
241-AN-102	14C	Supernatant	NA	2.48E+00	Ci
241-AN-102	14C	Total		3.63E+00	Ci
241-AN-102	151Sm	Salt Cake	A2-SltSlr (Solid)	6.02E+03	Ci
241-AN-102	151Sm	Supernatant	NA	1.33E+04	Ci
241-AN-102	151Sm	Total		1.93E+04	Ci
241-AN-102	152Eu	Salt Cake	A2-SltSlr (Solid)	6.98E-01	Ci
241-AN-102	152Eu	Supernatant	NA	1.47E+00	Ci
241-AN-102	152Eu	Total		2.16E+00	Ci
241-AN-102	154Eu	Salt Cake	A2-SltSlr (Solid)	3.27E+02	Ci
241-AN-102	154Eu	Supernatant	NA	6.22E+02	Ci
241-AN-102	154Eu	Total		9.49E+02	Ci
241-AN-102	155Eu	Salt Cake	A2-SltSlr (Solid)	1.35E+02	Ci
241-AN-102	155Eu	Supernatant	NA	3.90E+01	Ci
241-AN-102	155Eu	Total		1.74E+02	Ci
241-AN-102	226Ra	Salt Cake	A2-SltSlr (Solid)	1.82E-05	Ci
241-AN-102	226Ra	Supernatant	NA	1.47E-04	Ci
241-AN-102	226Ra	Total		1.65E-04	Ci
241-AN-102	227Ac	Salt Cake	A2-SltSlr (Solid)	2.24E-03	Ci
241-AN-102	227Ac	Supernatant	NA	1.81E-02	Ci
241-AN-102	227Ac	Total		2.03E-02	Ci
241-AN-102	228Ra	Salt Cake	A2-SltSlr (Solid)	1.09E-02	Ci
241-AN-102	228Ra	Supernatant	NA	4.19E-02	Ci
241-AN-102	228Ra	Total		5.27E-02	Ci
241-AN-102	229Th	Salt Cake	A2-SltSlr (Solid)	8.99E-06	Ci
241-AN-102	229Th	Supernatant	NA	7.26E-05	Ci
241-AN-102	229Th	Total		8.16E-05	Ci
241-AN-102	231Pa	Salt Cake	A2-SltSlr (Solid)	2.35E-02	Ci
241-AN-102	231Pa	Supernatant	NA	1.90E-01	Ci
241-AN-102	231Pa	Total		2.13E-01	Ci
241-AN-102	232Th	Salt Cake	A2-SltSlr (Solid)	1.79E-02	Ci
241-AN-102	232Th	Supernatant	NA	7.85E-04	Ci
241-AN-102	232Th	Total		1.87E-02	Ci
241-AN-102	232U	Salt Cake	A2-SltSlr (Solid)	8.80E-03	Ci
241-AN-102	232U	Supernatant	NA	1.74E-03	Ci
241-AN-102	232U	Total		1.05E-02	Ci
241-AN-102	233U	Salt Cake	A2-SltSlr (Solid)	5.40E-01	Ci
241-AN-102	233U	Supernatant	NA	1.07E-01	Ci
241-AN-102	233U	Total		6.47E-01	Ci
241-AN-102	234U	Salt Cake	A2-SltSlr (Solid)	3.82E-01	Ci
241-AN-102	234U	Supernatant	NA	7.56E-02	Ci
241-AN-102	234U	Total		4.58E-01	Ci
241-AN-102	235U	Salt Cake	A2-SltSlr (Solid)	1.51E-02	Ci
241-AN-102	235U	Supernatant	NA	2.99E-03	Ci

Summary		
106Ru	2.00E-05	Ci
113mCd	8.72E+01	Ci
125Sb	1.24E+01	Ci
126Sn	2.55E+01	Ci
129I	4.58E-01	Ci
134Cs	1.15E+01	Ci
137Cs	1.36E+06	Ci
137mBa	1.28E+06	Ci
14C	2.48E+00	Ci
151Sm	1.33E+04	Ci
152Eu	1.47E+00	Ci
154Eu	6.22E+02	Ci
155Eu	3.90E+01	Ci
226Ra	1.47E-04	Ci
227Ac	1.81E-02	Ci
228Ra	4.19E-02	Ci
229Th	7.26E-05	Ci
231Pa	1.90E-01	Ci
232Th	7.85E-04	Ci
232U	1.74E-03	Ci
233U	1.07E-01	Ci
234U	7.56E-02	Ci
235U	2.99E-03	Ci
236U	5.12E-03	Ci
237Np	1.89E-01	Ci
238Pu	1.20E+00	Ci
238U	5.92E-02	Ci
239Pu	1.65E+01	Ci
240Pu	4.29E+00	Ci
241Am	5.63E+02	Ci
241Pu	7.53E+01	Ci
242Cm	1.10E+00	Ci
242Pu	4.54E-04	Ci
243Am	3.69E-01	Ci
243Cm	6.08E-02	Ci
244Cm	1.44E+00	Ci
3H	1.90E+00	Ci
59Ni	9.31E-01	Ci
60Co	1.83E+02	Ci
63Ni	8.67E+01	Ci
79Se	2.13E+00	Ci
90Sr	2.74E+05	Ci
90Y	2.74E+05	Ci
93mNb	8.45E+01	Ci
93Zr	1.02E+02	Ci
99Tc	4.93E+02	Ci

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.. 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-3

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AN-102	235U	Total		1.81E-02	Ci	
241-AN-102	236U	Salt Cake	A2-SltSlr (Solid)	2.59E-02	Ci	
241-AN-102	236U	Supernatant	NA	5.12E-03	Ci	
241-AN-102	236U	Total		3.10E-02	Ci	
241-AN-102	237Np	Salt Cake	A2-SltSlr (Solid)	1.47E-01	Ci	
241-AN-102	237Np	Supernatant	NA	1.89E-01	Ci	
241-AN-102	237Np	Total		3.36E-01	Ci	
241-AN-102	238Pu	Salt Cake	A2-SltSlr (Solid)	2.62E+00	Ci	
241-AN-102	238Pu	Supernatant	NA	1.20E+00	Ci	
241-AN-102	238Pu	Total		3.82E+00	Ci	
241-AN-102	238U	Salt Cake	A2-SltSlr (Solid)	3.00E-01	Ci	
241-AN-102	238U	Supernatant	NA	5.92E-02	Ci	
241-AN-102	238U	Total		3.59E-01	Ci	
241-AN-102	239Pu	Salt Cake	A2-SltSlr (Solid)	3.61E+01	Ci	
241-AN-102	239Pu	Supernatant	NA	1.65E+01	Ci	
241-AN-102	239Pu	Total		5.26E+01	Ci	
241-AN-102	240Pu	Salt Cake	A2-SltSlr (Solid)	9.40E+00	Ci	
241-AN-102	240Pu	Supernatant	NA	4.29E+00	Ci	
241-AN-102	240Pu	Total		1.37E+01	Ci	
241-AN-102	241Am	Salt Cake	A2-SltSlr (Solid)	5.35E+02	Ci	
241-AN-102	241Am	Supernatant	NA	5.63E+02	Ci	
241-AN-102	241Am	Total		1.10E+03	Ci	
241-AN-102	241Pu	Salt Cake	A2-SltSlr (Solid)	1.65E+02	Ci	
241-AN-102	241Pu	Supernatant	NA	7.53E+01	Ci	
241-AN-102	241Pu	Total		2.40E+02	Ci	
241-AN-102	242Cm	Salt Cake	A2-SltSlr (Solid)	1.48E-01	Ci	
241-AN-102	242Cm	Supernatant	NA	1.10E+00	Ci	
241-AN-102	242Cm	Total		1.25E+00	Ci	
241-AN-102	242Pu	Salt Cake	A2-SltSlr (Solid)	9.95E-04	Ci	
241-AN-102	242Pu	Supernatant	NA	4.54E-04	Ci	
241-AN-102	242Pu	Total		1.45E-03	Ci	
241-AN-102	243Am	Salt Cake	A2-SltSlr (Solid)	3.79E-01	Ci	
241-AN-102	243Am	Supernatant	NA	3.69E-01	Ci	
241-AN-102	243Am	Total		7.48E-01	Ci	
241-AN-102	243Cm	Salt Cake	A2-SltSlr (Solid)	8.16E-03	Ci	
241-AN-102	243Cm	Supernatant	NA	6.08E-02	Ci	
241-AN-102	243Cm	Total		6.89E-02	Ci	
241-AN-102	244Cm	Salt Cake	A2-SltSlr (Solid)	1.93E-01	Ci	
241-AN-102	244Cm	Supernatant	NA	1.44E+00	Ci	
241-AN-102	244Cm	Total		1.63E+00	Ci	
241-AN-102	3H	Salt Cake	A2-SltSlr (Solid)	9.80E-01	Ci	
241-AN-102	3H	Supernatant	NA	1.90E+00	Ci	
241-AN-102	3H	Total		2.88E+00	Ci	
241-AN-102	59Ni	Salt Cake	A2-SltSlr (Solid)	3.84E+00	Ci	
241-AN-102	59Ni	Supernatant	NA	9.31E-01	Ci	
241-AN-102	59Ni	Total		4.77E+00	Ci	
241-AN-102	60Co	Salt Cake	A2-SltSlr (Solid)	5.19E+01	Ci	
241-AN-102	60Co	Supernatant	NA	1.83E+02	Ci	
241-AN-102	60Co	Total		2.35E+02	Ci	
241-AN-102	63Ni	Salt Cake	A2-SltSlr (Solid)	3.59E+02	Ci	
241-AN-102	63Ni	Supernatant	NA	8.67E+01	Ci	
241-AN-102	63Ni	Total		4.45E+02	Ci	
241-AN-102	79Se	Salt Cake	A2-SltSlr (Solid)	1.93E-01	Ci	
241-AN-102	79Se	Supernatant	NA	2.13E+00	Ci	
241-AN-102	79Se	Total		2.32E+00	Ci	
241-AN-102	90Sr	Salt Cake	A2-SltSlr (Solid)	1.22E+05	Ci	
241-AN-102	90Sr	Supernatant	NA	2.74E+05	Ci	
241-AN-102	90Sr	Total		3.96E+05	Ci	
241-AN-102	90Y	Salt Cake	A2-SltSlr (Solid)	1.22E+05	Ci	
241-AN-102	90Y	Supernatant	NA	2.74E+05	Ci	
241-AN-102	90Y	Total		3.96E+05	Ci	
241-AN-102	93mNb	Salt Cake	A2-SltSlr (Solid)	1.05E+01	Ci	
241-AN-102	93mNb	Supernatant	NA	8.45E+01	Ci	
241-AN-102	93mNb	Total		9.50E+01	Ci	
241-AN-102	93Zr	Salt Cake	A2-SltSlr (Solid)	1.26E+01	Ci	
241-AN-102	93Zr	Supernatant	NA	1.02E+02	Ci	
241-AN-102	93Zr	Total		1.15E+02	Ci	
241-AN-102	99Tc	Salt Cake	A2-SltSlr (Solid)	1.20E+02	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-4

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-102	99Tc	Supernatant	NA	4.93E+02	Ci
241-AN-102	99Tc	Total		6.13E+02	Ci
241-AN-102	Ag	Salt Cake	A2-SltSlr (Solid)	1.45E+00	kg
241-AN-102	Ag	Supernatant	NA	9.56E+00	kg
241-AN-102	Ag	Total		1.10E+01	kg
241-AN-102	Al	Salt Cake	A2-SltSlr (Solid)	1.08E+04	kg
241-AN-102	Al	Supernatant	NA	4.56E+04	kg
241-AN-102	Al	Total		5.64E+04	kg
241-AN-102	As	Salt Cake	A2-SltSlr (Solid)	4.49E+01	kg
241-AN-102	As	Supernatant	NA	8.97E+01	kg
241-AN-102	As	Total		1.35E+02	kg
241-AN-102	B	Salt Cake	A2-SltSlr (Solid)	3.45E+01	kg
241-AN-102	B	Supernatant	NA	1.39E+02	kg
241-AN-102	B	Total		1.73E+02	kg
241-AN-102	Ba	Salt Cake	A2-SltSlr (Solid)	2.32E+01	kg
241-AN-102	Ba	Supernatant	NA	1.39E+01	kg
241-AN-102	Ba	Total		3.71E+01	kg
241-AN-102	Be	Salt Cake	A2-SltSlr (Solid)	6.49E-01	kg
241-AN-102	Be	Supernatant	NA	2.33E+00	kg
241-AN-102	Be	Total		2.98E+00	kg
241-AN-102	Bi	Salt Cake	A2-SltSlr (Solid)	1.26E+01	kg
241-AN-102	Bi	Supernatant	NA	9.00E+01	kg
241-AN-102	Bi	Total		1.03E+02	kg
241-AN-102	Ca	Salt Cake	A2-SltSlr (Solid)	3.62E+02	kg
241-AN-102	Ca	Supernatant	NA	1.34E+03	kg
241-AN-102	Ca	Total		1.70E+03	kg
241-AN-102	Cd	Salt Cake	A2-SltSlr (Solid)	3.17E+01	kg
241-AN-102	Cd	Supernatant	NA	1.95E+02	kg
241-AN-102	Cd	Total		2.27E+02	kg
241-AN-102	Ce	Salt Cake	A2-SltSlr (Solid)	3.40E+01	kg
241-AN-102	Ce	Supernatant	NA	3.67E+01	kg
241-AN-102	Ce	Total		7.07E+01	kg
241-AN-102	Cl	Salt Cake	A2-SltSlr (Solid)	1.07E+03	kg
241-AN-102	Cl	Supernatant	NA	1.33E+04	kg
241-AN-102	Cl	Total		1.44E+04	kg
241-AN-102	Co	Salt Cake	A2-SltSlr (Solid)	7.30E+00	kg
241-AN-102	Co	Supernatant	NA	2.22E+01	kg
241-AN-102	Co	Total		2.95E+01	kg
241-AN-102	Cr	Salt Cake	A2-SltSlr (Solid)	1.29E+03	kg
241-AN-102	Cr	Supernatant	NA	8.13E+02	kg
241-AN-102	Cr	Total		2.10E+03	kg
241-AN-102	Cu	Salt Cake	A2-SltSlr (Solid)	1.68E+01	kg
241-AN-102	Cu	Supernatant	NA	7.85E+01	kg
241-AN-102	Cu	Total		9.53E+01	kg
241-AN-102	F	Salt Cake	A2-SltSlr (Solid)	4.97E+02	kg
241-AN-102	F	Supernatant	NA	2.22E+02	kg
241-AN-102	F	Total		7.19E+02	kg
241-AN-102	Fe	Salt Cake	A2-SltSlr (Solid)	1.57E+03	kg
241-AN-102	Fe	Supernatant	NA	1.14E+02	kg
241-AN-102	Fe	Total		1.68E+03	kg
241-AN-102	Free OH	Salt Cake	A2-SltSlr (Solid)	3.48E+04	kg
241-AN-102	Free OH	Supernatant	NA	3.07E+04	kg
241-AN-102	Free OH	Total		6.55E+04	kg
241-AN-102	Hg	Salt Cake	A2-SltSlr (Solid)	4.44E-01	kg
241-AN-102	Hg	Supernatant	NA	1.76E-01	kg
241-AN-102	Hg	Total		6.20E-01	kg
241-AN-102	K	Salt Cake	A2-SltSlr (Solid)	1.09E+03	kg
241-AN-102	K	Supernatant	NA	7.52E+03	kg
241-AN-102	K	Total		8.61E+03	kg
241-AN-102	La	Salt Cake	A2-SltSlr (Solid)	3.32E+01	kg
241-AN-102	La	Supernatant	NA	5.01E+01	kg
241-AN-102	La	Total		8.34E+01	kg
241-AN-102	Li	Salt Cake	A2-SltSlr (Solid)	1.39E+01	kg
241-AN-102	Li	Supernatant	NA	3.11E+00	kg
241-AN-102	Li	Total		1.70E+01	kg
241-AN-102	Mg	Salt Cake	A2-SltSlr (Solid)	4.49E+01	kg
241-AN-102	Mg	Supernatant	NA	6.94E+01	kg
241-AN-102	Mg	Total		1.14E+02	kg

Summary		
Summary		
Ag	9.56E+00	kg
Al	4.56E+04	kg
As	8.97E+01	kg
B	1.39E+02	kg
Ba	1.39E+01	kg
Be	2.33E+00	kg
Bi	9.00E+01	kg
Ca	1.34E+03	kg
Cd	1.95E+02	kg
Ce	3.67E+01	kg
Cl	1.33E+04	kg
CN	0.00E+00	kg
Co	2.22E+01	kg
Cr	8.13E+02	kg
Cu	7.85E+01	kg
F	2.22E+02	kg
Fe	1.14E+02	kg
Free OH	3.07E+04	kg
Hg	1.76E-01	kg
K	7.52E+03	kg
La	5.01E+01	kg
Li	3.11E+00	kg
Mg	6.94E+01	kg
Mn	6.44E+01	kg
Mo	1.68E+02	kg
Na	7.17E+05	kg
Nd	7.67E+01	kg
NH3	4.65E+02	kg
Ni	1.32E+03	kg
NO2	3.02E+05	kg
NO3	7.24E+05	kg
Oxalate	2.73E+03	kg
Pb	5.50E+02	kg
Pd	0.00E+00	kg
PO4	1.80E+04	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	7.25E-01	kg
Se	9.03E+01	kg
Si	7.76E+01	kg
SO4	4.88E+04	kg
Sr	7.99E+00	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	7.15E+00	kg
Ti	2.23E+00	kg
TIC as CO3	2.12E+05	kg
Tl	6.69E+00	kg
TOC	8.37E+04	kg
UTOTAL	1.78E+02	kg
V	9.00E+00	kg
W	0.00E+00	kg
Y	2.78E+00	kg
Zn	9.13E+00	kg
Zr	2.60E+01	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-5

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AN-102	Mn	Salt Cake	A2-SltSlr (Solid)	3.62E+02	kg	
241-AN-102	Mn	Supernatant	NA	6.44E+01	kg	
241-AN-102	Mn	Total		4.27E+02	kg	
241-AN-102	Mo	Salt Cake	A2-SltSlr (Solid)	2.80E+01	kg	
241-AN-102	Mo	Supernatant	NA	1.68E+02	kg	
241-AN-102	Mo	Total		1.96E+02	kg	
241-AN-102	Na	Salt Cake	A2-SltSlr (Solid)	1.47E+05	kg	
241-AN-102	Na	Supernatant	NA	7.17E+05	kg	
241-AN-102	Na	Total		8.64E+05	kg	
241-AN-102	Nd	Salt Cake	A2-SltSlr (Solid)	6.51E+01	kg	
241-AN-102	Nd	Supernatant	NA	7.67E+01	kg	
241-AN-102	Nd	Total		1.42E+02	kg	
241-AN-102	NH3	Salt Cake	A2-SltSlr (Solid)	3.70E+01	kg	
241-AN-102	NH3	Supernatant	NA	4.65E+02	kg	
241-AN-102	NH3	Total		5.02E+02	kg	
241-AN-102	Ni	Salt Cake	A2-SltSlr (Solid)	2.20E+02	kg	
241-AN-102	Ni	Supernatant	NA	1.32E+03	kg	
241-AN-102	Ni	Total		1.54E+03	kg	
241-AN-102	NO2	Salt Cake	A2-SltSlr (Solid)	8.35E+04	kg	
241-AN-102	NO2	Supernatant	NA	3.02E+05	kg	
241-AN-102	NO2	Total		3.86E+05	kg	
241-AN-102	NO3	Salt Cake	A2-SltSlr (Solid)	1.98E+05	kg	
241-AN-102	NO3	Supernatant	NA	7.24E+05	kg	
241-AN-102	NO3	Total		9.23E+05	kg	
241-AN-102	Oxalate	Salt Cake	A2-SltSlr (Solid)	1.05E+04	kg	
241-AN-102	Oxalate	Supernatant	NA	2.73E+03	kg	
241-AN-102	Oxalate	Total		1.32E+04	kg	
241-AN-102	Pb	Salt Cake	A2-SltSlr (Solid)	2.12E+02	kg	
241-AN-102	Pb	Supernatant	NA	5.50E+02	kg	
241-AN-102	Pb	Total		7.63E+02	kg	
241-AN-102	PO4	Salt Cake	A2-SltSlr (Solid)	7.10E+03	kg	
241-AN-102	PO4	Supernatant	NA	1.80E+04	kg	
241-AN-102	PO4	Total		2.51E+04	kg	
241-AN-102	Sb	Salt Cake	A2-SltSlr (Solid)	2.64E+01	kg	
241-AN-102	Sb	Supernatant	NA	7.25E-01	kg	
241-AN-102	Sb	Total		2.71E+01	kg	
241-AN-102	Se	Salt Cake	A2-SltSlr (Solid)	4.50E+01	kg	
241-AN-102	Se	Supernatant	NA	9.03E+01	kg	
241-AN-102	Se	Total		1.35E+02	kg	
241-AN-102	Si	Salt Cake	A2-SltSlr (Solid)	1.46E+02	kg	
241-AN-102	Si	Supernatant	NA	7.76E+01	kg	
241-AN-102	Si	Total		2.24E+02	kg	
241-AN-102	SO4	Salt Cake	A2-SltSlr (Solid)	1.51E+04	kg	
241-AN-102	SO4	Supernatant	NA	4.88E+04	kg	
241-AN-102	SO4	Total		6.38E+04	kg	
241-AN-102	Sr	Salt Cake	A2-SltSlr (Solid)	3.94E+00	kg	
241-AN-102	Sr	Supernatant	NA	7.99E+00	kg	
241-AN-102	Sr	Total		1.19E+01	kg	
241-AN-102	Th	Salt Cake	A2-SltSlr (Solid)	1.63E+02	kg	
241-AN-102	Th	Supernatant	NA	7.15E+00	kg	
241-AN-102	Th	Total		1.70E+02	kg	
241-AN-102	Ti	Salt Cake	A2-SltSlr (Solid)	4.41E+00	kg	
241-AN-102	Ti	Supernatant	NA	2.23E+00	kg	
241-AN-102	Ti	Total		6.64E+00	kg	
241-AN-102	TIC as CO3	Salt Cake	A2-SltSlr (Solid)	6.55E+04	kg	
241-AN-102	TIC as CO3	Supernatant	NA	2.12E+05	kg	
241-AN-102	TIC as CO3	Total		2.78E+05	kg	
241-AN-102	Tl	Salt Cake	A2-SltSlr (Solid)	8.84E+01	kg	
241-AN-102	Tl	Supernatant	NA	6.69E+00	kg	
241-AN-102	Tl	Total		9.51E+01	kg	
241-AN-102	TOC	Salt Cake	A2-SltSlr (Solid)	2.07E+04	kg	
241-AN-102	TOC	Supernatant	NA	8.37E+04	kg	
241-AN-102	TOC	Total		1.04E+05	kg	
241-AN-102	UTOTAL	Salt Cake	A2-SltSlr (Solid)	8.99E+02	kg	
241-AN-102	UTOTAL	Supernatant	NA	1.78E+02	kg	
241-AN-102	UTOTAL	Total		1.08E+03	kg	
241-AN-102	V	Salt Cake	A2-SltSlr (Solid)	7.29E+00	kg	
241-AN-102	V	Supernatant	NA	9.00E+00	kg	

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-6

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-102	V	Total		1.63E+01	kg
241-AN-102	Y	Salt Cake	A2-SltSlr (Solid)	9.08E+00	kg
241-AN-102	Y	Supernatant	NA	2.78E+00	kg
241-AN-102	Y	Total		1.19E+01	kg
241-AN-102	Zn	Salt Cake	A2-SltSlr (Solid)	1.56E+01	kg
241-AN-102	Zn	Supernatant	NA	9.13E+00	kg
241-AN-102	Zn	Total		2.48E+01	kg
241-AN-102	Zr	Salt Cake	A2-SltSlr (Solid)	3.34E+02	kg
241-AN-102	Zr	Supernatant	NA	2.60E+01	kg
241-AN-102	Zr	Total		3.60E+02	kg

241-AN-103	106Ru	Supernatant	A2-SltSlr (Liquid)	1.07E-05	Ci
241-AN-103	106Ru	Salt Cake	A2-SltSlr (Solid)	5.76E-02	Ci
241-AN-103	106Ru	Total		5.76E-02	Ci
241-AN-103	113mCd	Supernatant	A2-SltSlr (Liquid)	4.66E+01	Ci
241-AN-103	113mCd	Salt Cake	A2-SltSlr (Solid)	3.45E+01	Ci
241-AN-103	113mCd	Total		8.11E+01	Ci
241-AN-103	125Sb	Supernatant	A2-SltSlr (Liquid)	6.60E+00	Ci
241-AN-103	125Sb	Salt Cake	A2-SltSlr (Solid)	1.37E+01	Ci
241-AN-103	125Sb	Total		2.03E+01	Ci
241-AN-103	126Sn	Supernatant	A2-SltSlr (Liquid)	1.67E+01	Ci
241-AN-103	126Sn	Salt Cake	A2-SltSlr (Solid)	2.80E+00	Ci
241-AN-103	126Sn	Total		1.95E+01	Ci
241-AN-103	129I	Supernatant	A2-SltSlr (Liquid)	7.16E-01	Ci
241-AN-103	129I	Salt Cake	A2-SltSlr (Solid)	5.03E-01	Ci
241-AN-103	129I	Total		1.22E+00	Ci
241-AN-103	134Cs	Supernatant	A2-SltSlr (Liquid)	6.13E+00	Ci
241-AN-103	134Cs	Salt Cake	A2-SltSlr (Solid)	4.53E+00	Ci
241-AN-103	134Cs	Total		1.07E+01	Ci
241-AN-103	137Cs	Supernatant	A2-SltSlr (Liquid)	1.19E+06	Ci
241-AN-103	137Cs	Salt Cake	A2-SltSlr (Solid)	5.40E+05	Ci
241-AN-103	137Cs	Total		1.73E+06	Ci
241-AN-103	137mBa	Supernatant	A2-SltSlr (Liquid)	1.13E+06	Ci
241-AN-103	137mBa	Salt Cake	A2-SltSlr (Solid)	5.10E+05	Ci
241-AN-103	137mBa	Total		1.64E+06	Ci
241-AN-103	14C	Supernatant	A2-SltSlr (Liquid)	6.55E-01	Ci
241-AN-103	14C	Salt Cake	A2-SltSlr (Solid)	1.34E+01	Ci
241-AN-103	14C	Total		1.41E+01	Ci
241-AN-103	151Sm	Supernatant	A2-SltSlr (Liquid)	7.08E+03	Ci
241-AN-103	151Sm	Salt Cake	A2-SltSlr (Solid)	1.92E+04	Ci
241-AN-103	151Sm	Total		2.63E+04	Ci
241-AN-103	152Eu	Supernatant	A2-SltSlr (Liquid)	7.83E-01	Ci
241-AN-103	152Eu	Salt Cake	A2-SltSlr (Solid)	2.22E+00	Ci
241-AN-103	152Eu	Total		3.01E+00	Ci
241-AN-103	154Eu	Supernatant	A2-SltSlr (Liquid)	5.78E+01	Ci
241-AN-103	154Eu	Salt Cake	A2-SltSlr (Solid)	1.07E+02	Ci
241-AN-103	154Eu	Total		1.65E+02	Ci
241-AN-103	155Eu	Supernatant	A2-SltSlr (Liquid)	2.08E+01	Ci
241-AN-103	155Eu	Salt Cake	A2-SltSlr (Solid)	5.92E+01	Ci
241-AN-103	155Eu	Total		8.01E+01	Ci
241-AN-103	226Ra	Supernatant	A2-SltSlr (Liquid)	7.83E-05	Ci
241-AN-103	226Ra	Salt Cake	A2-SltSlr (Solid)	5.80E-05	Ci
241-AN-103	226Ra	Total		1.36E-04	Ci
241-AN-103	227Ac	Supernatant	A2-SltSlr (Liquid)	9.64E-03	Ci
241-AN-103	227Ac	Salt Cake	A2-SltSlr (Solid)	7.13E-03	Ci
241-AN-103	227Ac	Total		1.68E-02	Ci
241-AN-103	228Ra	Supernatant	A2-SltSlr (Liquid)	2.23E-02	Ci
241-AN-103	228Ra	Salt Cake	A2-SltSlr (Solid)	1.65E-02	Ci
241-AN-103	228Ra	Total		3.87E-02	Ci
241-AN-103	229Th	Supernatant	A2-SltSlr (Liquid)	3.88E-05	Ci
241-AN-103	229Th	Salt Cake	A2-SltSlr (Solid)	2.87E-05	Ci
241-AN-103	229Th	Total		6.74E-05	Ci
241-AN-103	231Pa	Supernatant	A2-SltSlr (Liquid)	1.01E-01	Ci
241-AN-103	231Pa	Salt Cake	A2-SltSlr (Solid)	7.49E-02	Ci
241-AN-103	231Pa	Total		1.76E-01	Ci
241-AN-103	232Th	Supernatant	A2-SltSlr (Liquid)	1.40E-04	Ci

Summary		
106Ru	5.76E-02	Ci
113mCd	8.11E+01	Ci
125Sb	2.03E+01	Ci
126Sn	1.95E+01	Ci
129I	1.22E+00	Ci
134Cs	1.07E+01	Ci
137Cs	1.73E+06	Ci
137mBa	1.64E+06	Ci
14C	1.41E+01	Ci
151Sm	2.63E+04	Ci
152Eu	3.01E+00	Ci
154Eu	1.65E+02	Ci
155Eu	8.01E+01	Ci
226Ra	1.36E-04	Ci
227Ac	1.68E-02	Ci
228Ra	3.87E-02	Ci
229Th	6.74E-05	Ci
231Pa	1.76E-01	Ci
232Th	2.44E-04	Ci
232U	1.18E-03	Ci
233U	7.21E-02	Ci
234U	5.11E-02	Ci
235U	2.02E-03	Ci
236U	3.46E-03	Ci
237Np	5.11E-01	Ci
238Pu	2.98E-01	Ci
238U	4.00E-02	Ci
239Pu	4.11E+00	Ci
240Pu	1.07E+00	Ci
241Am	2.08E+01	Ci
241Pu	1.88E+01	Ci
242Cm	2.49E-02	Ci
242Pu	1.13E-04	Ci
243Am	1.37E-02	Ci
243Cm	1.38E-03	Ci
244Cm	3.26E-02	Ci
3H	7.04E+00	Ci
59Ni	1.27E+01	Ci
60Co	2.39E+01	Ci
63Ni	1.19E+03	Ci
79Se	2.33E+00	Ci
90Sr	5.87E+03	Ci
90Y	5.87E+03	Ci
93mNb	7.86E+01	Ci
93Zr	9.47E+01	Ci
99Tc	6.74E+02	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-7

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AN-103	232Th	Salt Cake	A2-SltSlr (Solid)	1.03E-04	Ci	
241-AN-103	232Th	Total		2.44E-04	Ci	
241-AN-103	232U	Supernatant	A2-SltSlr (Liquid)	3.40E-05	Ci	
241-AN-103	232U	Salt Cake	A2-SltSlr (Solid)	1.14E-03	Ci	
241-AN-103	232U	Total		1.18E-03	Ci	
241-AN-103	233U	Supernatant	A2-SltSlr (Liquid)	2.09E-03	Ci	
241-AN-103	233U	Salt Cake	A2-SltSlr (Solid)	7.01E-02	Ci	
241-AN-103	233U	Total		7.21E-02	Ci	
241-AN-103	234U	Supernatant	A2-SltSlr (Liquid)	1.48E-03	Ci	
241-AN-103	234U	Salt Cake	A2-SltSlr (Solid)	4.96E-02	Ci	
241-AN-103	234U	Total		5.11E-02	Ci	
241-AN-103	235U	Supernatant	A2-SltSlr (Liquid)	5.84E-05	Ci	
241-AN-103	235U	Salt Cake	A2-SltSlr (Solid)	1.96E-03	Ci	
241-AN-103	235U	Total		2.02E-03	Ci	
241-AN-103	236U	Supernatant	A2-SltSlr (Liquid)	1.00E-04	Ci	
241-AN-103	236U	Salt Cake	A2-SltSlr (Solid)	3.36E-03	Ci	
241-AN-103	236U	Total		3.46E-03	Ci	
241-AN-103	237Np	Supernatant	A2-SltSlr (Liquid)	4.14E-02	Ci	
241-AN-103	237Np	Salt Cake	A2-SltSlr (Solid)	4.69E-01	Ci	
241-AN-103	237Np	Total		5.11E-01	Ci	
241-AN-103	238Pu	Supernatant	A2-SltSlr (Liquid)	3.50E-02	Ci	
241-AN-103	238Pu	Salt Cake	A2-SltSlr (Solid)	2.63E-01	Ci	
241-AN-103	238Pu	Total		2.98E-01	Ci	
241-AN-103	238U	Supernatant	A2-SltSlr (Liquid)	1.16E-03	Ci	
241-AN-103	238U	Salt Cake	A2-SltSlr (Solid)	3.88E-02	Ci	
241-AN-103	238U	Total		4.00E-02	Ci	
241-AN-103	239Pu	Supernatant	A2-SltSlr (Liquid)	4.82E-01	Ci	
241-AN-103	239Pu	Salt Cake	A2-SltSlr (Solid)	3.63E+00	Ci	
241-AN-103	239Pu	Total		4.11E+00	Ci	
241-AN-103	240Pu	Supernatant	A2-SltSlr (Liquid)	1.25E-01	Ci	
241-AN-103	240Pu	Salt Cake	A2-SltSlr (Solid)	9.44E-01	Ci	
241-AN-103	240Pu	Total		1.07E+00	Ci	
241-AN-103	241Am	Supernatant	A2-SltSlr (Liquid)	1.15E+01	Ci	
241-AN-103	241Am	Salt Cake	A2-SltSlr (Solid)	9.23E+00	Ci	
241-AN-103	241Am	Total		2.08E+01	Ci	
241-AN-103	241Pu	Supernatant	A2-SltSlr (Liquid)	2.20E+00	Ci	
241-AN-103	241Pu	Salt Cake	A2-SltSlr (Solid)	1.66E+01	Ci	
241-AN-103	241Pu	Total		1.88E+01	Ci	
241-AN-103	242Cm	Supernatant	A2-SltSlr (Liquid)	2.26E-02	Ci	
241-AN-103	242Cm	Salt Cake	A2-SltSlr (Solid)	2.38E-03	Ci	
241-AN-103	242Cm	Total		2.49E-02	Ci	
241-AN-103	242Pu	Supernatant	A2-SltSlr (Liquid)	1.33E-05	Ci	
241-AN-103	242Pu	Salt Cake	A2-SltSlr (Solid)	9.99E-05	Ci	
241-AN-103	242Pu	Total		1.13E-04	Ci	
241-AN-103	243Am	Supernatant	A2-SltSlr (Liquid)	7.56E-03	Ci	
241-AN-103	243Am	Salt Cake	A2-SltSlr (Solid)	6.10E-03	Ci	
241-AN-103	243Am	Total		1.37E-02	Ci	
241-AN-103	243Cm	Supernatant	A2-SltSlr (Liquid)	1.24E-03	Ci	
241-AN-103	243Cm	Salt Cake	A2-SltSlr (Solid)	1.31E-04	Ci	
241-AN-103	243Cm	Total		1.38E-03	Ci	
241-AN-103	244Cm	Supernatant	A2-SltSlr (Liquid)	2.94E-02	Ci	
241-AN-103	244Cm	Salt Cake	A2-SltSlr (Solid)	3.11E-03	Ci	
241-AN-103	244Cm	Total		3.26E-02	Ci	
241-AN-103	3H	Supernatant	A2-SltSlr (Liquid)	2.03E+00	Ci	
241-AN-103	3H	Salt Cake	A2-SltSlr (Solid)	5.02E+00	Ci	
241-AN-103	3H	Total		7.04E+00	Ci	
241-AN-103	59Ni	Supernatant	A2-SltSlr (Liquid)	4.97E-01	Ci	
241-AN-103	59Ni	Salt Cake	A2-SltSlr (Solid)	1.22E+01	Ci	
241-AN-103	59Ni	Total		1.27E+01	Ci	
241-AN-103	60Co	Supernatant	A2-SltSlr (Liquid)	1.07E+01	Ci	
241-AN-103	60Co	Salt Cake	A2-SltSlr (Solid)	1.32E+01	Ci	
241-AN-103	60Co	Total		2.39E+01	Ci	
241-AN-103	63Ni	Supernatant	A2-SltSlr (Liquid)	4.63E+01	Ci	
241-AN-103	63Ni	Salt Cake	A2-SltSlr (Solid)	1.14E+03	Ci	
241-AN-103	63Ni	Total		1.19E+03	Ci	
241-AN-103	79Se	Supernatant	A2-SltSlr (Liquid)	1.66E+00	Ci	
241-AN-103	79Se	Salt Cake	A2-SltSlr (Solid)	6.77E-01	Ci	
241-AN-103	79Se	Total		2.33E+00	Ci	

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-8

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-103	90Sr	Supernatant	A2-SltSlr (Liquid)	3.34E+01	Ci
241-AN-103	90Sr	Salt Cake	A2-SltSlr (Solid)	5.84E+03	Ci
241-AN-103	90Sr	Total		5.87E+03	Ci
241-AN-103	90Y	Supernatant	A2-SltSlr (Liquid)	3.34E+01	Ci
241-AN-103	90Y	Salt Cake	A2-SltSlr (Solid)	5.84E+03	Ci
241-AN-103	90Y	Total		5.87E+03	Ci
241-AN-103	93mNb	Supernatant	A2-SltSlr (Liquid)	4.51E+01	Ci
241-AN-103	93mNb	Salt Cake	A2-SltSlr (Solid)	3.34E+01	Ci
241-AN-103	93mNb	Total		7.86E+01	Ci
241-AN-103	93Zr	Supernatant	A2-SltSlr (Liquid)	5.44E+01	Ci
241-AN-103	93Zr	Salt Cake	A2-SltSlr (Solid)	4.03E+01	Ci
241-AN-103	93Zr	Total		9.47E+01	Ci
241-AN-103	99Tc	Supernatant	A2-SltSlr (Liquid)	3.01E+02	Ci
241-AN-103	99Tc	Salt Cake	A2-SltSlr (Solid)	3.73E+02	Ci
241-AN-103	99Tc	Total		6.74E+02	Ci
241-AN-103	Ag	Supernatant	A2-SltSlr (Liquid)	3.72E+01	kg
241-AN-103	Ag	Salt Cake	A2-SltSlr (Solid)	3.92E+01	kg
241-AN-103	Ag	Total		7.64E+01	kg
241-AN-103	Al	Supernatant	A2-SltSlr (Liquid)	5.66E+04	kg
241-AN-103	Al	Salt Cake	A2-SltSlr (Solid)	1.61E+05	kg
241-AN-103	Al	Total		2.18E+05	kg
241-AN-103	As	Supernatant	A2-SltSlr (Liquid)	1.56E+01	kg
241-AN-103	As	Salt Cake	A2-SltSlr (Solid)	1.44E+02	kg
241-AN-103	As	Total		1.60E+02	kg
241-AN-103	B	Supernatant	A2-SltSlr (Liquid)	1.50E+02	kg
241-AN-103	B	Salt Cake	A2-SltSlr (Solid)	3.71E+02	kg
241-AN-103	B	Total		5.22E+02	kg
241-AN-103	Ba	Supernatant	A2-SltSlr (Liquid)	7.81E+00	kg
241-AN-103	Ba	Salt Cake	A2-SltSlr (Solid)	7.20E+01	kg
241-AN-103	Ba	Total		7.98E+01	kg
241-AN-103	Be	Supernatant	A2-SltSlr (Liquid)	2.18E+00	kg
241-AN-103	Be	Salt Cake	A2-SltSlr (Solid)	7.20E+00	kg
241-AN-103	Be	Total		9.38E+00	kg
241-AN-103	Bi	Supernatant	A2-SltSlr (Liquid)	1.56E+01	kg
241-AN-103	Bi	Salt Cake	A2-SltSlr (Solid)	4.03E+01	kg
241-AN-103	Bi	Total		5.59E+01	kg
241-AN-103	Ca	Supernatant	A2-SltSlr (Liquid)	1.56E+01	kg
241-AN-103	Ca	Salt Cake	A2-SltSlr (Solid)	3.24E+02	kg
241-AN-103	Ca	Total		3.39E+02	kg
241-AN-103	Cd	Supernatant	A2-SltSlr (Liquid)	9.92E+00	kg
241-AN-103	Cd	Salt Cake	A2-SltSlr (Solid)	2.53E+01	kg
241-AN-103	Cd	Total		3.52E+01	kg
241-AN-103	Ce	Supernatant	A2-SltSlr (Liquid)	1.56E+01	kg
241-AN-103	Ce	Salt Cake	A2-SltSlr (Solid)	1.44E+02	kg
241-AN-103	Ce	Total		1.60E+02	kg
241-AN-103	Cl	Supernatant	A2-SltSlr (Liquid)	1.80E+04	kg
241-AN-103	Cl	Salt Cake	A2-SltSlr (Solid)	1.03E+04	kg
241-AN-103	Cl	Total		2.83E+04	kg
241-AN-103	Co	Supernatant	A2-SltSlr (Liquid)	3.42E+00	kg
241-AN-103	Co	Salt Cake	A2-SltSlr (Solid)	1.24E+02	kg
241-AN-103	Co	Total		1.27E+02	kg
241-AN-103	Cr	Supernatant	A2-SltSlr (Liquid)	1.06E+03	kg
241-AN-103	Cr	Salt Cake	A2-SltSlr (Solid)	1.45E+03	kg
241-AN-103	Cr	Total		2.51E+03	kg
241-AN-103	Cu	Supernatant	A2-SltSlr (Liquid)	7.87E+00	kg
241-AN-103	Cu	Salt Cake	A2-SltSlr (Solid)	1.44E+01	kg
241-AN-103	Cu	Total		2.23E+01	kg
241-AN-103	F	Supernatant	A2-SltSlr (Liquid)	1.25E+03	kg
241-AN-103	F	Salt Cake	A2-SltSlr (Solid)	2.27E+03	kg
241-AN-103	F	Total		3.53E+03	kg
241-AN-103	Fe	Supernatant	A2-SltSlr (Liquid)	9.78E+00	kg
241-AN-103	Fe	Salt Cake	A2-SltSlr (Solid)	1.19E+02	kg
241-AN-103	Fe	Total		1.29E+02	kg
241-AN-103	Free OH	Supernatant	A2-SltSlr (Liquid)	1.27E+05	kg
241-AN-103	Free OH	Salt Cake	A2-SltSlr (Solid)	8.77E+04	kg
241-AN-103	Free OH	Total		2.15E+05	kg
241-AN-103	Hg	Supernatant	A2-SltSlr (Liquid)	9.45E-02	kg
241-AN-103	Hg	Salt Cake	A2-SltSlr (Solid)	1.41E+00	kg

Summary		
Ag	7.64E+01	kg
Al	2.18E+05	kg
As	1.60E+02	kg
B	5.22E+02	kg
Ba	7.98E+01	kg
Be	9.38E+00	kg
Bi	5.59E+01	kg
Ca	3.39E+02	kg
Cd	3.52E+01	kg
Ce	1.60E+02	kg
Cl	2.83E+04	kg
CN	0.00E+00	kg
Co	1.27E+02	kg
Cr	2.51E+03	kg
Cu	2.23E+01	kg
F	3.53E+03	kg
Fe	1.29E+02	kg
Free OH	2.15E+05	kg
Hg	1.51E+00	kg
K	4.82E+04	kg
La	2.26E-03	kg
Li	9.69E+01	kg
Mg	2.58E+02	kg
Mn	2.58E+01	kg
Mo	3.15E+02	kg
Na	1.06E+06	kg
Nd	2.58E+02	kg
NH3	0.00E+00	kg
Ni	5.15E+01	kg
NO2	4.30E+05	kg
NO3	6.50E+05	kg
Oxalate	1.62E+04	kg
Pb	4.36E+02	kg
Pd	0.00E+00	kg
PO4	8.91E+03	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	1.55E+02	kg
Se	2.58E+02	kg
Si	2.38E+03	kg
SO4	1.10E+04	kg
Sr	1.44E-01	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	2.21E+00	kg
Ti	2.58E+01	kg
TIC as CO3	8.10E+04	kg
Tl	0.00E+00	kg
TOC	1.05E+04	kg
UTOTAL	1.20E+02	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-9

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary		
241-AN-103	Hg	Total		1.51E+00	kg	V	1.29E+02	kg
241-AN-103	K	Supernatant	A2-SltSlr (Liquid)	3.15E+04	kg	W	0.00E+00	kg
241-AN-103	K	Salt Cake	A2-SltSlr (Solid)	1.68E+04	kg	Y	0.00E+00	kg
241-AN-103	K	Total		4.82E+04	kg	Zn	1.10E+02	kg
241-AN-103	La	Supernatant	A2-SltSlr (Liquid)	1.43E-03	kg	Zr	3.25E+01	kg
241-AN-103	La	Salt Cake	A2-SltSlr (Solid)	8.33E-04	kg			
241-AN-103	La	Total		2.26E-03	kg			
241-AN-103	Li	Supernatant	A2-SltSlr (Liquid)	4.70E+01	kg			
241-AN-103	Li	Salt Cake	A2-SltSlr (Solid)	4.99E+01	kg			
241-AN-103	Li	Total		9.69E+01	kg			
241-AN-103	Mg	Supernatant	A2-SltSlr (Liquid)	1.14E+02	kg			
241-AN-103	Mg	Salt Cake	A2-SltSlr (Solid)	1.44E+02	kg			
241-AN-103	Mg	Total		2.58E+02	kg			
241-AN-103	Mn	Supernatant	A2-SltSlr (Liquid)	1.14E+01	kg			
241-AN-103	Mn	Salt Cake	A2-SltSlr (Solid)	1.44E+01	kg			
241-AN-103	Mn	Total		2.58E+01	kg			
241-AN-103	Mo	Supernatant	A2-SltSlr (Liquid)	2.21E+02	kg			
241-AN-103	Mo	Salt Cake	A2-SltSlr (Solid)	9.46E+01	kg			
241-AN-103	Mo	Total		3.15E+02	kg			
241-AN-103	Na	Supernatant	A2-SltSlr (Liquid)	5.10E+05	kg			
241-AN-103	Na	Salt Cake	A2-SltSlr (Solid)	5.49E+05	kg			
241-AN-103	Na	Total		1.06E+06	kg			
241-AN-103	Nd	Supernatant	A2-SltSlr (Liquid)	1.14E+02	kg			
241-AN-103	Nd	Salt Cake	A2-SltSlr (Solid)	1.44E+02	kg			
241-AN-103	Nd	Total		2.58E+02	kg			
241-AN-103	Ni	Supernatant	A2-SltSlr (Liquid)	2.27E+01	kg			
241-AN-103	Ni	Salt Cake	A2-SltSlr (Solid)	2.88E+01	kg			
241-AN-103	Ni	Total		5.15E+01	kg			
241-AN-103	NO2	Supernatant	A2-SltSlr (Liquid)	2.46E+05	kg			
241-AN-103	NO2	Salt Cake	A2-SltSlr (Solid)	1.84E+05	kg			
241-AN-103	NO2	Total		4.30E+05	kg			
241-AN-103	NO3	Supernatant	A2-SltSlr (Liquid)	2.43E+05	kg			
241-AN-103	NO3	Salt Cake	A2-SltSlr (Solid)	4.07E+05	kg			
241-AN-103	NO3	Total		6.50E+05	kg			
241-AN-103	Oxalate	Supernatant	A2-SltSlr (Liquid)	9.49E+02	kg			
241-AN-103	Oxalate	Salt Cake	A2-SltSlr (Solid)	1.52E+04	kg			
241-AN-103	Oxalate	Total		1.62E+04	kg			
241-AN-103	Pb	Supernatant	A2-SltSlr (Liquid)	2.92E+02	kg			
241-AN-103	Pb	Salt Cake	A2-SltSlr (Solid)	1.44E+02	kg			
241-AN-103	Pb	Total		4.36E+02	kg			
241-AN-103	PO4	Supernatant	A2-SltSlr (Liquid)	3.18E+03	kg			
241-AN-103	PO4	Salt Cake	A2-SltSlr (Solid)	5.73E+03	kg			
241-AN-103	PO4	Total		8.91E+03	kg			
241-AN-103	Sb	Supernatant	A2-SltSlr (Liquid)	6.82E+01	kg			
241-AN-103	Sb	Salt Cake	A2-SltSlr (Solid)	8.63E+01	kg			
241-AN-103	Sb	Total		1.55E+02	kg			
241-AN-103	Se	Supernatant	A2-SltSlr (Liquid)	1.14E+02	kg			
241-AN-103	Se	Salt Cake	A2-SltSlr (Solid)	1.44E+02	kg			
241-AN-103	Se	Total		2.58E+02	kg			
241-AN-103	Si	Supernatant	A2-SltSlr (Liquid)	8.20E+02	kg			
241-AN-103	Si	Salt Cake	A2-SltSlr (Solid)	1.56E+03	kg			
241-AN-103	Si	Total		2.38E+03	kg			
241-AN-103	SO4	Supernatant	A2-SltSlr (Liquid)	2.42E+03	kg			
241-AN-103	SO4	Salt Cake	A2-SltSlr (Solid)	8.54E+03	kg			
241-AN-103	SO4	Total		1.10E+04	kg			
241-AN-103	Sr	Supernatant	A2-SltSlr (Liquid)	8.16E-04	kg			
241-AN-103	Sr	Salt Cake	A2-SltSlr (Solid)	1.43E-01	kg			
241-AN-103	Sr	Total		1.44E-01	kg			
241-AN-103	Th	Supernatant	A2-SltSlr (Liquid)	1.27E+00	kg			
241-AN-103	Th	Salt Cake	A2-SltSlr (Solid)	9.42E-01	kg			
241-AN-103	Th	Total		2.21E+00	kg			
241-AN-103	Ti	Supernatant	A2-SltSlr (Liquid)	1.14E+01	kg			
241-AN-103	Ti	Salt Cake	A2-SltSlr (Solid)	1.44E+01	kg			
241-AN-103	Ti	Total		2.58E+01	kg			
241-AN-103	TIC as CO3	Supernatant	A2-SltSlr (Liquid)	1.09E+04	kg			
241-AN-103	TIC as CO3	Salt Cake	A2-SltSlr (Solid)	7.01E+04	kg			
241-AN-103	TIC as CO3	Total		8.10E+04	kg			
241-AN-103	TOC	Supernatant	A2-SltSlr (Liquid)	5.76E+03	kg			

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO : 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-10

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-103	TOC	Salt Cake	A2-SltSlr (Solid)	4.76E+03	kg
241-AN-103	TOC	Total		1.05E+04	kg
241-AN-103	UTOTAL	Supernatant	A2-SltSlr (Liquid)	3.47E+00	kg
241-AN-103	UTOTAL	Salt Cake	A2-SltSlr (Solid)	1.17E+02	kg
241-AN-103	UTOTAL	Total		1.20E+02	kg
241-AN-103	V	Supernatant	A2-SltSlr (Liquid)	5.69E+01	kg
241-AN-103	V	Salt Cake	A2-SltSlr (Solid)	7.20E+01	kg
241-AN-103	V	Total		1.29E+02	kg
241-AN-103	Zn	Supernatant	A2-SltSlr (Liquid)	2.32E+01	kg
241-AN-103	Zn	Salt Cake	A2-SltSlr (Solid)	8.64E+01	kg
241-AN-103	Zn	Total		1.10E+02	kg
241-AN-103	Zr	Supernatant	A2-SltSlr (Liquid)	1.81E+01	kg
241-AN-103	Zr	Salt Cake	A2-SltSlr (Solid)	1.44E+01	kg
241-AN-103	Zr	Total		3.25E+01	kg

241-AN-104	106Ru	Supernatant	A2-SltSlr (Liquid)	1.13E-05	Ci
241-AN-104	106Ru	Salt Cake	A2-SltSlr (Solid)	4.55E-02	Ci
241-AN-104	106Ru	Total		4.55E-02	Ci
241-AN-104	113mCd	Supernatant	A2-SltSlr (Liquid)	4.94E+01	Ci
241-AN-104	113mCd	Salt Cake	A2-SltSlr (Solid)	2.73E+01	Ci
241-AN-104	113mCd	Total		7.67E+01	Ci
241-AN-104	125Sb	Supernatant	A2-SltSlr (Liquid)	1.96E-01	Ci
241-AN-104	125Sb	Salt Cake	A2-SltSlr (Solid)	1.08E+01	Ci
241-AN-104	125Sb	Total		1.10E+01	Ci
241-AN-104	126Sn	Supernatant	A2-SltSlr (Liquid)	1.06E+01	Ci
241-AN-104	126Sn	Salt Cake	A2-SltSlr (Solid)	2.21E+00	Ci
241-AN-104	126Sn	Total		1.28E+01	Ci
241-AN-104	129I	Supernatant	A2-SltSlr (Liquid)	4.83E-01	Ci
241-AN-104	129I	Salt Cake	A2-SltSlr (Solid)	2.05E-01	Ci
241-AN-104	129I	Total		6.88E-01	Ci
241-AN-104	134Cs	Supernatant	A2-SltSlr (Liquid)	6.50E+00	Ci
241-AN-104	134Cs	Salt Cake	A2-SltSlr (Solid)	3.57E+00	Ci
241-AN-104	134Cs	Total		1.01E+01	Ci
241-AN-104	137Cs	Supernatant	A2-SltSlr (Liquid)	1.13E+06	Ci
241-AN-104	137Cs	Salt Cake	A2-SltSlr (Solid)	7.48E+05	Ci
241-AN-104	137Cs	Total		1.88E+06	Ci
241-AN-104	137mBa	Supernatant	A2-SltSlr (Liquid)	1.07E+06	Ci
241-AN-104	137mBa	Salt Cake	A2-SltSlr (Solid)	7.06E+05	Ci
241-AN-104	137mBa	Total		1.77E+06	Ci
241-AN-104	14C	Supernatant	A2-SltSlr (Liquid)	6.98E-01	Ci
241-AN-104	14C	Salt Cake	A2-SltSlr (Solid)	1.06E+01	Ci
241-AN-104	14C	Total		1.13E+01	Ci
241-AN-104	151Sm	Supernatant	A2-SltSlr (Liquid)	7.51E+03	Ci
241-AN-104	151Sm	Salt Cake	A2-SltSlr (Solid)	1.52E+04	Ci
241-AN-104	151Sm	Total		2.27E+04	Ci
241-AN-104	152Eu	Supernatant	A2-SltSlr (Liquid)	8.31E-01	Ci
241-AN-104	152Eu	Salt Cake	A2-SltSlr (Solid)	1.76E+00	Ci
241-AN-104	152Eu	Total		2.59E+00	Ci
241-AN-104	154Eu	Supernatant	A2-SltSlr (Liquid)	1.31E-01	Ci
241-AN-104	154Eu	Salt Cake	A2-SltSlr (Solid)	1.22E+02	Ci
241-AN-104	154Eu	Total		1.22E+02	Ci
241-AN-104	155Eu	Supernatant	A2-SltSlr (Liquid)	1.97E-01	Ci
241-AN-104	155Eu	Salt Cake	A2-SltSlr (Solid)	4.68E+01	Ci
241-AN-104	155Eu	Total		4.70E+01	Ci
241-AN-104	226Ra	Supernatant	A2-SltSlr (Liquid)	8.30E-05	Ci
241-AN-104	226Ra	Salt Cake	A2-SltSlr (Solid)	4.58E-05	Ci
241-AN-104	226Ra	Total		1.29E-04	Ci
241-AN-104	227Ac	Supernatant	A2-SltSlr (Liquid)	1.02E-02	Ci
241-AN-104	227Ac	Salt Cake	A2-SltSlr (Solid)	5.63E-03	Ci
241-AN-104	227Ac	Total		1.59E-02	Ci
241-AN-104	228Ra	Supernatant	A2-SltSlr (Liquid)	2.36E-02	Ci
241-AN-104	228Ra	Salt Cake	A2-SltSlr (Solid)	1.30E-02	Ci
241-AN-104	228Ra	Total		3.66E-02	Ci
241-AN-104	229Th	Supernatant	A2-SltSlr (Liquid)	4.11E-05	Ci
241-AN-104	229Th	Salt Cake	A2-SltSlr (Solid)	2.26E-05	Ci
241-AN-104	229Th	Total		6.37E-05	Ci

Summary		
106Ru	4.55E-02	Ci
113mCd	2.73E+01	Ci
125Sb	1.08E+01	Ci
126Sn	2.21E+00	Ci
129I	2.05E-01	Ci
134Cs	3.57E+00	Ci
137Cs	7.48E+05	Ci
137mBa	7.06E+05	Ci
14C	1.06E+01	Ci
151Sm	1.52E+04	Ci
152Eu	1.76E+00	Ci
154Eu	1.22E+02	Ci
155Eu	4.68E+01	Ci
226Ra	4.58E-05	Ci
227Ac	5.63E-03	Ci
228Ra	1.30E-02	Ci
229Th	2.26E-05	Ci
231Pa	5.91E-02	Ci
232Th	8.17E-05	Ci
232U	4.36E-03	Ci
233U	2.68E-01	Ci
234U	1.89E-01	Ci
235U	7.48E-03	Ci
236U	1.28E-02	Ci
237Np	3.71E-01	Ci
238Pu	5.16E-01	Ci
238U	1.48E-01	Ci
239Pu	7.12E+00	Ci
240Pu	1.85E+00	Ci
241Am	4.71E+01	Ci
241Pu	3.25E+01	Ci
242Cm	1.23E-02	Ci
242Pu	1.96E-04	Ci
243Am	3.16E-02	Ci
243Cm	6.81E-04	Ci
244Cm	1.61E-02	Ci
3H	1.68E+01	Ci
59Ni	9.67E+00	Ci
60Co	1.86E+01	Ci
63Ni	9.03E+02	Ci
79Se	5.34E-01	Ci
90Sr	7.16E+04	Ci
90Y	7.16E+04	Ci
93mNb	2.64E+01	Ci
93Zr	3.18E+01	Ci
99Tc	3.32E+02	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO · 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-11

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AN-104	231Pa	Supernatant	A2-SltSlr (Liquid)	1.07E-01	Ci	
241-AN-104	231Pa	Salt Cake	A2-SltSlr (Solid)	5.91E-02	Ci	
241-AN-104	231Pa	Total		1.67E-01	Ci	
241-AN-104	232Th	Supernatant	A2-SltSlr (Liquid)	1.49E-04	Ci	
241-AN-104	232Th	Salt Cake	A2-SltSlr (Solid)	8.17E-05	Ci	
241-AN-104	232Th	Total		2.30E-04	Ci	
241-AN-104	232U	Supernatant	A2-SltSlr (Liquid)	9.71E-05	Ci	
241-AN-104	232U	Salt Cake	A2-SltSlr (Solid)	4.36E-03	Ci	
241-AN-104	232U	Total		4.46E-03	Ci	
241-AN-104	233U	Supernatant	A2-SltSlr (Liquid)	5.96E-03	Ci	
241-AN-104	233U	Salt Cake	A2-SltSlr (Solid)	2.68E-01	Ci	
241-AN-104	233U	Total		2.73E-01	Ci	
241-AN-104	234U	Supernatant	A2-SltSlr (Liquid)	4.22E-03	Ci	
241-AN-104	234U	Salt Cake	A2-SltSlr (Solid)	1.89E-01	Ci	
241-AN-104	234U	Total		1.94E-01	Ci	
241-AN-104	235U	Supernatant	A2-SltSlr (Liquid)	1.67E-04	Ci	
241-AN-104	235U	Salt Cake	A2-SltSlr (Solid)	7.48E-03	Ci	
241-AN-104	235U	Total		7.65E-03	Ci	
241-AN-104	236U	Supernatant	A2-SltSlr (Liquid)	2.86E-04	Ci	
241-AN-104	236U	Salt Cake	A2-SltSlr (Solid)	1.28E-02	Ci	
241-AN-104	236U	Total		1.31E-02	Ci	
241-AN-104	237Np	Supernatant	A2-SltSlr (Liquid)	1.33E-02	Ci	
241-AN-104	237Np	Salt Cake	A2-SltSlr (Solid)	3.71E-01	Ci	
241-AN-104	237Np	Total		3.84E-01	Ci	
241-AN-104	238Pu	Supernatant	A2-SltSlr (Liquid)	1.20E-02	Ci	
241-AN-104	238Pu	Salt Cake	A2-SltSlr (Solid)	5.16E-01	Ci	
241-AN-104	238Pu	Total		5.29E-01	Ci	
241-AN-104	238U	Supernatant	A2-SltSlr (Liquid)	3.30E-03	Ci	
241-AN-104	238U	Salt Cake	A2-SltSlr (Solid)	1.48E-01	Ci	
241-AN-104	238U	Total		1.52E-01	Ci	
241-AN-104	239Pu	Supernatant	A2-SltSlr (Liquid)	1.66E-01	Ci	
241-AN-104	239Pu	Salt Cake	A2-SltSlr (Solid)	7.12E+00	Ci	
241-AN-104	239Pu	Total		7.28E+00	Ci	
241-AN-104	240Pu	Supernatant	A2-SltSlr (Liquid)	4.32E-02	Ci	
241-AN-104	240Pu	Salt Cake	A2-SltSlr (Solid)	1.85E+00	Ci	
241-AN-104	240Pu	Total		1.90E+00	Ci	
241-AN-104	241Am	Supernatant	A2-SltSlr (Liquid)	8.06E-01	Ci	
241-AN-104	241Am	Salt Cake	A2-SltSlr (Solid)	4.71E+01	Ci	
241-AN-104	241Am	Total		4.79E+01	Ci	
241-AN-104	241Pu	Supernatant	A2-SltSlr (Liquid)	7.58E-01	Ci	
241-AN-104	241Pu	Salt Cake	A2-SltSlr (Solid)	3.25E+01	Ci	
241-AN-104	241Pu	Total		3.33E+01	Ci	
241-AN-104	242Cm	Supernatant	A2-SltSlr (Liquid)	1.56E-03	Ci	
241-AN-104	242Cm	Salt Cake	A2-SltSlr (Solid)	1.23E-02	Ci	
241-AN-104	242Cm	Total		1.39E-02	Ci	
241-AN-104	242Pu	Supernatant	A2-SltSlr (Liquid)	4.57E-06	Ci	
241-AN-104	242Pu	Salt Cake	A2-SltSlr (Solid)	1.96E-04	Ci	
241-AN-104	242Pu	Total		2.01E-04	Ci	
241-AN-104	243Am	Supernatant	A2-SltSlr (Liquid)	5.24E-04	Ci	
241-AN-104	243Am	Salt Cake	A2-SltSlr (Solid)	3.16E-02	Ci	
241-AN-104	243Am	Total		3.21E-02	Ci	
241-AN-104	243Cm	Supernatant	A2-SltSlr (Liquid)	8.62E-05	Ci	
241-AN-104	243Cm	Salt Cake	A2-SltSlr (Solid)	6.81E-04	Ci	
241-AN-104	243Cm	Total		7.67E-04	Ci	
241-AN-104	244Cm	Supernatant	A2-SltSlr (Liquid)	2.04E-03	Ci	
241-AN-104	244Cm	Salt Cake	A2-SltSlr (Solid)	1.61E-02	Ci	
241-AN-104	244Cm	Total		1.81E-02	Ci	
241-AN-104	3H	Supernatant	A2-SltSlr (Liquid)	2.38E+00	Ci	
241-AN-104	3H	Salt Cake	A2-SltSlr (Solid)	1.68E+01	Ci	
241-AN-104	3H	Total		1.92E+01	Ci	
241-AN-104	59Ni	Supernatant	A2-SltSlr (Liquid)	1.64E-01	Ci	
241-AN-104	59Ni	Salt Cake	A2-SltSlr (Solid)	9.67E+00	Ci	
241-AN-104	59Ni	Total		9.83E+00	Ci	
241-AN-104	60Co	Supernatant	A2-SltSlr (Liquid)	1.16E+00	Ci	
241-AN-104	60Co	Salt Cake	A2-SltSlr (Solid)	1.86E+01	Ci	
241-AN-104	60Co	Total		1.97E+01	Ci	
241-AN-104	63Ni	Supernatant	A2-SltSlr (Liquid)	6.15E+00	Ci	
241-AN-104	63Ni	Salt Cake	A2-SltSlr (Solid)	9.03E+02	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-12

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-104	63Ni	Total		9.09E+02	Ci
241-AN-104	79Se	Supernatant	A2-SltSlr (Liquid)	2.18E+00	Ci
241-AN-104	79Se	Salt Cake	A2-SltSlr (Solid)	5.34E-01	Ci
241-AN-104	79Se	Total		2.71E+00	Ci
241-AN-104	90Sr	Supernatant	A2-SltSlr (Liquid)	1.88E+02	Ci
241-AN-104	90Sr	Salt Cake	A2-SltSlr (Solid)	7.16E+04	Ci
241-AN-104	90Sr	Total		7.18E+04	Ci
241-AN-104	90Y	Supernatant	A2-SltSlr (Liquid)	1.88E+02	Ci
241-AN-104	90Y	Salt Cake	A2-SltSlr (Solid)	7.16E+04	Ci
241-AN-104	90Y	Total		7.18E+04	Ci
241-AN-104	93mNb	Supernatant	A2-SltSlr (Liquid)	4.79E+01	Ci
241-AN-104	93mNb	Salt Cake	A2-SltSlr (Solid)	2.64E+01	Ci
241-AN-104	93mNb	Total		7.43E+01	Ci
241-AN-104	93Zr	Supernatant	A2-SltSlr (Liquid)	5.77E+01	Ci
241-AN-104	93Zr	Salt Cake	A2-SltSlr (Solid)	3.18E+01	Ci
241-AN-104	93Zr	Total		8.95E+01	Ci
241-AN-104	99Tc	Supernatant	A2-SltSlr (Liquid)	4.62E+02	Ci
241-AN-104	99Tc	Salt Cake	A2-SltSlr (Solid)	3.32E+02	Ci
241-AN-104	99Tc	Total		7.94E+02	Ci
241-AN-104	Ag	Supernatant	A2-SltSlr (Liquid)	4.11E+01	kg
241-AN-104	Ag	Salt Cake	A2-SltSlr (Solid)	3.73E+01	kg
241-AN-104	Ag	Total		7.84E+01	kg
241-AN-104	Al	Supernatant	A2-SltSlr (Liquid)	8.96E+04	kg
241-AN-104	Al	Salt Cake	A2-SltSlr (Solid)	5.13E+04	kg
241-AN-104	Al	Total		1.41E+05	kg
241-AN-104	As	Supernatant	A2-SltSlr (Liquid)	2.53E+00	kg
241-AN-104	As	Salt Cake	A2-SltSlr (Solid)	9.79E+01	kg
241-AN-104	As	Total		1.00E+02	kg
241-AN-104	B	Supernatant	A2-SltSlr (Liquid)	1.50E+02	kg
241-AN-104	B	Salt Cake	A2-SltSlr (Solid)	3.44E+02	kg
241-AN-104	B	Total		4.94E+02	kg
241-AN-104	Ba	Supernatant	A2-SltSlr (Liquid)	9.03E+00	kg
241-AN-104	Ba	Salt Cake	A2-SltSlr (Solid)	4.89E+01	kg
241-AN-104	Ba	Total		5.80E+01	kg
241-AN-104	Be	Supernatant	A2-SltSlr (Liquid)	1.33E+00	kg
241-AN-104	Be	Salt Cake	A2-SltSlr (Solid)	4.89E+00	kg
241-AN-104	Be	Total		6.22E+00	kg
241-AN-104	Bi	Supernatant	A2-SltSlr (Liquid)	1.81E+01	kg
241-AN-104	Bi	Salt Cake	A2-SltSlr (Solid)	3.18E+01	kg
241-AN-104	Bi	Total		4.99E+01	kg
241-AN-104	Ca	Supernatant	A2-SltSlr (Liquid)	1.25E+01	kg
241-AN-104	Ca	Salt Cake	A2-SltSlr (Solid)	5.33E+02	kg
241-AN-104	Ca	Total		5.45E+02	kg
241-AN-104	Cd	Supernatant	A2-SltSlr (Liquid)	2.27E+00	kg
241-AN-104	Cd	Salt Cake	A2-SltSlr (Solid)	2.46E+01	kg
241-AN-104	Cd	Total		2.68E+01	kg
241-AN-104	Ce	Supernatant	A2-SltSlr (Liquid)	4.96E+01	kg
241-AN-104	Ce	Salt Cake	A2-SltSlr (Solid)	9.79E+01	kg
241-AN-104	Ce	Total		1.47E+02	kg
241-AN-104	Cl	Supernatant	A2-SltSlr (Liquid)	1.80E+04	kg
241-AN-104	Cl	Salt Cake	A2-SltSlr (Solid)	1.11E+04	kg
241-AN-104	Cl	Total		2.91E+04	kg
241-AN-104	Co	Supernatant	A2-SltSlr (Liquid)	4.33E+00	kg
241-AN-104	Co	Salt Cake	A2-SltSlr (Solid)	1.96E+01	kg
241-AN-104	Co	Total		2.39E+01	kg
241-AN-104	Cr	Supernatant	A2-SltSlr (Liquid)	7.80E+02	kg
241-AN-104	Cr	Salt Cake	A2-SltSlr (Solid)	3.86E+03	kg
241-AN-104	Cr	Total		4.64E+03	kg
241-AN-104	Cu	Supernatant	A2-SltSlr (Liquid)	1.11E+01	kg
241-AN-104	Cu	Salt Cake	A2-SltSlr (Solid)	1.90E+01	kg
241-AN-104	Cu	Total		3.01E+01	kg
241-AN-104	F	Supernatant	A2-SltSlr (Liquid)	1.05E+02	kg
241-AN-104	F	Salt Cake	A2-SltSlr (Solid)	2.00E+03	kg
241-AN-104	F	Total		2.10E+03	kg
241-AN-104	Fe	Supernatant	A2-SltSlr (Liquid)	1.08E+00	kg
241-AN-104	Fe	Salt Cake	A2-SltSlr (Solid)	2.86E+02	kg
241-AN-104	Fe	Total		2.87E+02	kg
241-AN-104	Free OH	Supernatant	A2-SltSlr (Liquid)	1.50E+05	kg

Summary		
Ag	3.73E+01	kg
Al	5.13E+04	kg
As	9.79E+01	kg
B	3.44E+02	kg
Ba	4.89E+01	kg
Be	4.89E+00	kg
Bi	3.18E+01	kg
Ca	5.33E+02	kg
Cd	2.46E+01	kg
Ce	9.79E+01	kg
Cl	1.11E+04	kg
CN	0.00E+00	kg
Co	1.96E+01	kg
Cr	3.86E+03	kg
Cu	1.90E+01	kg
F	2.00E+03	kg
Fe	2.86E+02	kg
Free OH	9.15E+04	kg
Hg	1.12E+00	kg
K	8.91E+03	kg
La	6.58E-04	kg
Li	4.03E+01	kg
Mg	9.79E+01	kg
Mn	4.26E+01	kg
Mo	1.24E+02	kg
Na	4.81E+05	kg
Nd	9.79E+01	kg
NH3	0.00E+00	kg
Ni	1.50E+02	kg
NO2	1.58E+05	kg
NO3	2.96E+05	kg
Oxalate	2.11E+04	kg
Pb	1.03E+02	kg
Pd	0.00E+00	kg
PO4	1.05E+04	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	5.88E+01	kg
Se	9.79E+01	kg
Si	1.60E+03	kg
SO4	3.02E+04	kg
Sr	5.25E+00	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	7.43E-01	kg
Ti	9.79E+00	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-13

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-104	Free OH	Salt Cake	A2-SltSlr (Solid)	9.15E+04	kg
241-AN-104	Free OH	Total		2.41E+05	kg
241-AN-104	Hg	Supernatant	A2-SltSlr (Liquid)	4.64E-02	kg
241-AN-104	Hg	Salt Cake	A2-SltSlr (Solid)	1.12E+00	kg
241-AN-104	Hg	Total		1.16E+00	kg
241-AN-104	K	Supernatant	A2-SltSlr (Liquid)	1.55E+04	kg
241-AN-104	K	Salt Cake	A2-SltSlr (Solid)	8.91E+03	kg
241-AN-104	K	Total		2.44E+04	kg
241-AN-104	La	Supernatant	A2-SltSlr (Liquid)	1.51E-03	kg
241-AN-104	La	Salt Cake	A2-SltSlr (Solid)	6.58E-04	kg
241-AN-104	La	Total		2.17E-03	kg
241-AN-104	Li	Supernatant	A2-SltSlr (Liquid)	2.74E+01	kg
241-AN-104	Li	Salt Cake	A2-SltSlr (Solid)	4.03E+01	kg
241-AN-104	Li	Total		6.77E+01	kg
241-AN-104	Mg	Supernatant	A2-SltSlr (Liquid)	2.83E+00	kg
241-AN-104	Mg	Salt Cake	A2-SltSlr (Solid)	9.79E+01	kg
241-AN-104	Mg	Total		1.01E+02	kg
241-AN-104	Mn	Supernatant	A2-SltSlr (Liquid)	1.33E+01	kg
241-AN-104	Mn	Salt Cake	A2-SltSlr (Solid)	4.26E+01	kg
241-AN-104	Mn	Total		5.59E+01	kg
241-AN-104	Mo	Supernatant	A2-SltSlr (Liquid)	1.86E+02	kg
241-AN-104	Mo	Salt Cake	A2-SltSlr (Solid)	1.24E+02	kg
241-AN-104	Mo	Total		3.11E+02	kg
241-AN-104	Na	Supernatant	A2-SltSlr (Liquid)	5.94E+05	kg
241-AN-104	Na	Salt Cake	A2-SltSlr (Solid)	4.81E+05	kg
241-AN-104	Na	Total		1.07E+06	kg
241-AN-104	Nd	Supernatant	A2-SltSlr (Liquid)	1.39E+02	kg
241-AN-104	Nd	Salt Cake	A2-SltSlr (Solid)	9.79E+01	kg
241-AN-104	Nd	Total		2.37E+02	kg
241-AN-104	Ni	Supernatant	A2-SltSlr (Liquid)	7.35E+00	kg
241-AN-104	Ni	Salt Cake	A2-SltSlr (Solid)	1.50E+02	kg
241-AN-104	Ni	Total		1.58E+02	kg
241-AN-104	NO2	Supernatant	A2-SltSlr (Liquid)	2.74E+05	kg
241-AN-104	NO2	Salt Cake	A2-SltSlr (Solid)	1.58E+05	kg
241-AN-104	NO2	Total		4.32E+05	kg
241-AN-104	NO3	Supernatant	A2-SltSlr (Liquid)	4.35E+05	kg
241-AN-104	NO3	Salt Cake	A2-SltSlr (Solid)	2.96E+05	kg
241-AN-104	NO3	Total		7.32E+05	kg
241-AN-104	Oxalate	Supernatant	A2-SltSlr (Liquid)	5.21E+02	kg
241-AN-104	Oxalate	Salt Cake	A2-SltSlr (Solid)	2.11E+04	kg
241-AN-104	Oxalate	Total		2.16E+04	kg
241-AN-104	Pb	Supernatant	A2-SltSlr (Liquid)	7.05E+01	kg
241-AN-104	Pb	Salt Cake	A2-SltSlr (Solid)	1.03E+02	kg
241-AN-104	Pb	Total		1.74E+02	kg
241-AN-104	PO4	Supernatant	A2-SltSlr (Liquid)	6.28E+03	kg
241-AN-104	PO4	Salt Cake	A2-SltSlr (Solid)	1.05E+04	kg
241-AN-104	PO4	Total		1.67E+04	kg
241-AN-104	Sb	Supernatant	A2-SltSlr (Liquid)	8.38E+01	kg
241-AN-104	Sb	Salt Cake	A2-SltSlr (Solid)	5.88E+01	kg
241-AN-104	Sb	Total		1.43E+02	kg
241-AN-104	Se	Supernatant	A2-SltSlr (Liquid)	2.53E+00	kg
241-AN-104	Se	Salt Cake	A2-SltSlr (Solid)	9.79E+01	kg
241-AN-104	Se	Total		1.00E+02	kg
241-AN-104	Si	Supernatant	A2-SltSlr (Liquid)	5.41E+02	kg
241-AN-104	Si	Salt Cake	A2-SltSlr (Solid)	1.60E+03	kg
241-AN-104	Si	Total		2.14E+03	kg
241-AN-104	SO4	Supernatant	A2-SltSlr (Liquid)	8.22E+03	kg
241-AN-104	SO4	Salt Cake	A2-SltSlr (Solid)	3.02E+04	kg
241-AN-104	SO4	Total		3.84E+04	kg
241-AN-104	Sr	Supernatant	A2-SltSlr (Liquid)	9.88E-02	kg
241-AN-104	Sr	Salt Cake	A2-SltSlr (Solid)	5.25E+00	kg
241-AN-104	Sr	Total		5.35E+00	kg
241-AN-104	Th	Supernatant	A2-SltSlr (Liquid)	1.35E+00	kg
241-AN-104	Th	Salt Cake	A2-SltSlr (Solid)	7.43E-01	kg
241-AN-104	Th	Total		2.09E+00	kg
241-AN-104	Ti	Supernatant	A2-SltSlr (Liquid)	3.50E-03	kg
241-AN-104	Ti	Salt Cake	A2-SltSlr (Solid)	9.79E+00	kg
241-AN-104	Ti	Total		9.79E+00	kg

Summary		
TIC as CO3	1.57E+05	kg
Tl	0.00E+00	kg
TOC	1.20E+04	kg
UTOTAL	4.45E+02	kg
V	4.89E+01	kg
W	0.00E+00	kg
Y	0.00E+00	kg
Zn	5.20E+01	kg
Zr	4.21E+01	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-14

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AN-104	TIC as CO3	Supernatant	A2-SltSlr (Liquid)	2.48E+04	kg		
241-AN-104	TIC as CO3	Salt Cake	A2-SltSlr (Solid)	1.57E+05	kg		
241-AN-104	TIC as CO3	Total		1.82E+05	kg		
241-AN-104	TOC	Supernatant	A2-SltSlr (Liquid)	7.22E+03	kg		
241-AN-104	TOC	Salt Cake	A2-SltSlr (Solid)	1.20E+04	kg		
241-AN-104	TOC	Total		1.93E+04	kg		
241-AN-104	UTOTAL	Supernatant	A2-SltSlr (Liquid)	9.91E+00	kg		
241-AN-104	UTOTAL	Salt Cake	A2-SltSlr (Solid)	4.45E+02	kg		
241-AN-104	UTOTAL	Total		4.55E+02	kg		
241-AN-104	V	Supernatant	A2-SltSlr (Liquid)	2.15E+01	kg		
241-AN-104	V	Salt Cake	A2-SltSlr (Solid)	4.89E+01	kg		
241-AN-104	V	Total		7.04E+01	kg		
241-AN-104	Zn	Supernatant	A2-SltSlr (Liquid)	3.37E+01	kg		
241-AN-104	Zn	Salt Cake	A2-SltSlr (Solid)	5.20E+01	kg		
241-AN-104	Zn	Total		8.57E+01	kg		
241-AN-104	Zr	Supernatant	A2-SltSlr (Liquid)	1.82E+01	kg		
241-AN-104	Zr	Salt Cake	A2-SltSlr (Solid)	4.21E+01	kg		
241-AN-104	Zr	Total		6.03E+01	kg		
241-AN-105	106Ru	Supernatant	A2-SltSlr (Liquid)	1.14E-05	Ci	Summary	
241-AN-105	106Ru	Salt Cake	A2-SltSlr (Solid)	5.65E-02	Ci	106Ru	5.65E-02 Ci
241-AN-105	106Ru	Total		5.65E-02	Ci	113mCd	8.34E+01 Ci
241-AN-105	113mCd	Supernatant	A2-SltSlr (Liquid)	4.95E+01	Ci	125Sb	2.05E+01 Ci
241-AN-105	113mCd	Salt Cake	A2-SltSlr (Solid)	3.39E+01	Ci	126Sn	1.73E+01 Ci
241-AN-105	113mCd	Total		8.34E+01	Ci	129I	8.51E-01 Ci
241-AN-105	125Sb	Supernatant	A2-SltSlr (Liquid)	7.02E+00	Ci	134Cs	1.10E+01 Ci
241-AN-105	125Sb	Salt Cake	A2-SltSlr (Solid)	1.35E+01	Ci	137Cs	1.41E+06 Ci
241-AN-105	125Sb	Total		2.05E+01	Ci	137mBa	1.33E+06 Ci
241-AN-105	126Sn	Supernatant	A2-SltSlr (Liquid)	1.45E+01	Ci	14C	1.39E+01 Ci
241-AN-105	126Sn	Salt Cake	A2-SltSlr (Solid)	2.75E+00	Ci	151Sm	2.64E+04 Ci
241-AN-105	126Sn	Total		1.73E+01	Ci	152Eu	3.02E+00 Ci
241-AN-105	129I	Supernatant	A2-SltSlr (Liquid)	5.96E-01	Ci	154Eu	1.98E+02 Ci
241-AN-105	129I	Salt Cake	A2-SltSlr (Solid)	2.55E-01	Ci	155Eu	8.03E+01 Ci
241-AN-105	129I	Total		8.51E-01	Ci	226Ra	1.40E-04 Ci
241-AN-105	134Cs	Supernatant	A2-SltSlr (Liquid)	6.51E+00	Ci	227Ac	1.73E-02 Ci
241-AN-105	134Cs	Salt Cake	A2-SltSlr (Solid)	4.45E+00	Ci	228Ra	3.98E-02 Ci
241-AN-105	134Cs	Total		1.10E+01	Ci	229Th	6.93E-05 Ci
241-AN-105	137Cs	Supernatant	A2-SltSlr (Liquid)	6.52E+05	Ci	231Pa	1.81E-01 Ci
241-AN-105	137Cs	Salt Cake	A2-SltSlr (Solid)	7.56E+05	Ci	232Th	1.93E-04 Ci
241-AN-105	137Cs	Total		1.41E+06	Ci	232U	2.65E-03 Ci
241-AN-105	137mBa	Supernatant	A2-SltSlr (Liquid)	6.15E+05	Ci	233U	1.63E-01 Ci
241-AN-105	137mBa	Salt Cake	A2-SltSlr (Solid)	7.13E+05	Ci	234U	1.15E-01 Ci
241-AN-105	137mBa	Total		1.33E+06	Ci	235U	4.56E-03 Ci
241-AN-105	14C	Supernatant	A2-SltSlr (Liquid)	7.31E-01	Ci	236U	7.80E-03 Ci
241-AN-105	14C	Salt Cake	A2-SltSlr (Solid)	1.32E+01	Ci	237Np	5.08E-01 Ci
241-AN-105	14C	Total		1.39E+01	Ci	238Pu	4.89E-01 Ci
241-AN-105	151Sm	Supernatant	A2-SltSlr (Liquid)	7.53E+03	Ci	238U	9.03E-02 Ci
241-AN-105	151Sm	Salt Cake	A2-SltSlr (Solid)	1.88E+04	Ci	239Pu	6.75E+00 Ci
241-AN-105	151Sm	Total		2.64E+04	Ci	240Pu	1.76E+00 Ci
241-AN-105	152Eu	Supernatant	A2-SltSlr (Liquid)	8.33E-01	Ci	241Am	5.29E+01 Ci
241-AN-105	152Eu	Salt Cake	A2-SltSlr (Solid)	2.18E+00	Ci	241Pu	3.08E+01 Ci
241-AN-105	152Eu	Total		3.02E+00	Ci	242Cm	6.81E-02 Ci
241-AN-105	154Eu	Supernatant	A2-SltSlr (Liquid)	4.59E+01	Ci	242Pu	1.86E-04 Ci
241-AN-105	154Eu	Salt Cake	A2-SltSlr (Solid)	1.52E+02	Ci	243Am	3.50E-02 Ci
241-AN-105	154Eu	Total		1.98E+02	Ci	243Cm	3.76E-03 Ci
241-AN-105	155Eu	Supernatant	A2-SltSlr (Liquid)	2.21E+01	Ci	244Cm	8.89E-02 Ci
241-AN-105	155Eu	Salt Cake	A2-SltSlr (Solid)	5.81E+01	Ci	3H	4.20E+00 Ci
241-AN-105	155Eu	Total		8.03E+01	Ci	59Ni	1.25E+01 Ci
241-AN-105	226Ra	Supernatant	A2-SltSlr (Liquid)	8.32E-05	Ci	60Co	2.96E+01 Ci
241-AN-105	226Ra	Salt Cake	A2-SltSlr (Solid)	5.69E-05	Ci	63Ni	1.17E+03 Ci
241-AN-105	226Ra	Total		1.40E-04	Ci	79Se	3.12E+00 Ci
241-AN-105	227Ac	Supernatant	A2-SltSlr (Liquid)	1.03E-02	Ci	90Sr	2.88E+04 Ci
241-AN-105	227Ac	Salt Cake	A2-SltSlr (Solid)	7.00E-03	Ci	90Y	2.88E+04 Ci
241-AN-105	227Ac	Total		1.73E-02	Ci	93mNb	8.08E+01 Ci
241-AN-105	228Ra	Supernatant	A2-SltSlr (Liquid)	2.36E-02	Ci	93Zr	9.74E+01 Ci
241-AN-105	228Ra	Salt Cake	A2-SltSlr (Solid)	1.62E-02	Ci	99Tc	1.12E+03 Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-15

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AN-105	228Ra	Total		3.98E-02	Ci	
241-AN-105	229Th	Supernatant	A2-SltSlr (Liquid)	4.12E-05	Ci	
241-AN-105	229Th	Salt Cake	A2-SltSlr (Solid)	2.81E-05	Ci	
241-AN-105	229Th	Total		6.93E-05	Ci	
241-AN-105	231Pa	Supernatant	A2-SltSlr (Liquid)	1.08E-01	Ci	
241-AN-105	231Pa	Salt Cake	A2-SltSlr (Solid)	7.35E-02	Ci	
241-AN-105	231Pa	Total		1.81E-01	Ci	
241-AN-105	232Th	Supernatant	A2-SltSlr (Liquid)	9.18E-05	Ci	
241-AN-105	232Th	Salt Cake	A2-SltSlr (Solid)	1.02E-04	Ci	
241-AN-105	232Th	Total		1.93E-04	Ci	
241-AN-105	232U	Supernatant	A2-SltSlr (Liquid)	7.77E-05	Ci	
241-AN-105	232U	Salt Cake	A2-SltSlr (Solid)	2.58E-03	Ci	
241-AN-105	232U	Total		2.65E-03	Ci	
241-AN-105	233U	Supernatant	A2-SltSlr (Liquid)	4.77E-03	Ci	
241-AN-105	233U	Salt Cake	A2-SltSlr (Solid)	1.58E-01	Ci	
241-AN-105	233U	Total		1.63E-01	Ci	
241-AN-105	234U	Supernatant	A2-SltSlr (Liquid)	3.37E-03	Ci	
241-AN-105	234U	Salt Cake	A2-SltSlr (Solid)	1.12E-01	Ci	
241-AN-105	234U	Total		1.15E-01	Ci	
241-AN-105	235U	Supernatant	A2-SltSlr (Liquid)	1.33E-04	Ci	
241-AN-105	235U	Salt Cake	A2-SltSlr (Solid)	4.42E-03	Ci	
241-AN-105	235U	Total		4.56E-03	Ci	
241-AN-105	236U	Supernatant	A2-SltSlr (Liquid)	2.29E-04	Ci	
241-AN-105	236U	Salt Cake	A2-SltSlr (Solid)	7.58E-03	Ci	
241-AN-105	236U	Total		7.80E-03	Ci	
241-AN-105	237Np	Supernatant	A2-SltSlr (Liquid)	4.75E-02	Ci	
241-AN-105	237Np	Salt Cake	A2-SltSlr (Solid)	4.61E-01	Ci	
241-AN-105	237Np	Total		5.08E-01	Ci	
241-AN-105	238Pu	Supernatant	A2-SltSlr (Liquid)	9.72E-02	Ci	
241-AN-105	238Pu	Salt Cake	A2-SltSlr (Solid)	3.92E-01	Ci	
241-AN-105	238Pu	Total		4.89E-01	Ci	
241-AN-105	238U	Supernatant	A2-SltSlr (Liquid)	2.64E-03	Ci	
241-AN-105	238U	Salt Cake	A2-SltSlr (Solid)	8.76E-02	Ci	
241-AN-105	238U	Total		9.03E-02	Ci	
241-AN-105	239Pu	Supernatant	A2-SltSlr (Liquid)	1.34E+00	Ci	
241-AN-105	239Pu	Salt Cake	A2-SltSlr (Solid)	5.41E+00	Ci	
241-AN-105	239Pu	Total		6.75E+00	Ci	
241-AN-105	240Pu	Supernatant	A2-SltSlr (Liquid)	3.48E-01	Ci	
241-AN-105	240Pu	Salt Cake	A2-SltSlr (Solid)	1.41E+00	Ci	
241-AN-105	240Pu	Total		1.76E+00	Ci	
241-AN-105	241Am	Supernatant	A2-SltSlr (Liquid)	3.20E+01	Ci	
241-AN-105	241Am	Salt Cake	A2-SltSlr (Solid)	2.09E+01	Ci	
241-AN-105	241Am	Total		5.29E+01	Ci	
241-AN-105	241Pu	Supernatant	A2-SltSlr (Liquid)	6.12E+00	Ci	
241-AN-105	241Pu	Salt Cake	A2-SltSlr (Solid)	2.47E+01	Ci	
241-AN-105	241Pu	Total		3.08E+01	Ci	
241-AN-105	242Cm	Supernatant	A2-SltSlr (Liquid)	6.26E-02	Ci	
241-AN-105	242Cm	Salt Cake	A2-SltSlr (Solid)	5.45E-03	Ci	
241-AN-105	242Cm	Total		6.81E-02	Ci	
241-AN-105	242Pu	Supernatant	A2-SltSlr (Liquid)	3.69E-05	Ci	
241-AN-105	242Pu	Salt Cake	A2-SltSlr (Solid)	1.49E-04	Ci	
241-AN-105	242Pu	Total		1.86E-04	Ci	
241-AN-105	243Am	Supernatant	A2-SltSlr (Liquid)	2.10E-02	Ci	
241-AN-105	243Am	Salt Cake	A2-SltSlr (Solid)	1.40E-02	Ci	
241-AN-105	243Am	Total		3.50E-02	Ci	
241-AN-105	243Cm	Supernatant	A2-SltSlr (Liquid)	3.46E-03	Ci	
241-AN-105	243Cm	Salt Cake	A2-SltSlr (Solid)	3.01E-04	Ci	
241-AN-105	243Cm	Total		3.76E-03	Ci	
241-AN-105	244Cm	Supernatant	A2-SltSlr (Liquid)	8.18E-02	Ci	
241-AN-105	244Cm	Salt Cake	A2-SltSlr (Solid)	7.11E-03	Ci	
241-AN-105	244Cm	Total		8.89E-02	Ci	
241-AN-105	3H	Supernatant	A2-SltSlr (Liquid)	5.80E-02	Ci	
241-AN-105	3H	Salt Cake	A2-SltSlr (Solid)	4.14E+00	Ci	
241-AN-105	3H	Total		4.20E+00	Ci	
241-AN-105	59Ni	Supernatant	A2-SltSlr (Liquid)	5.29E-01	Ci	
241-AN-105	59Ni	Salt Cake	A2-SltSlr (Solid)	1.20E+01	Ci	
241-AN-105	59Ni	Total		1.25E+01	Ci	
241-AN-105	60Co	Supernatant	A2-SltSlr (Liquid)	6.50E+00	Ci	

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-16

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-105	60Co	Salt Cake	A2-SltSlr (Solid)	2.31E+01	Ci
241-AN-105	60Co	Total		2.96E+01	Ci
241-AN-105	63Ni	Supernatant	A2-SltSlr (Liquid)	4.92E+01	Ci
241-AN-105	63Ni	Salt Cake	A2-SltSlr (Solid)	1.12E+03	Ci
241-AN-105	63Ni	Total		1.17E+03	Ci
241-AN-105	79Se	Supernatant	A2-SltSlr (Liquid)	2.46E+00	Ci
241-AN-105	79Se	Salt Cake	A2-SltSlr (Solid)	6.65E-01	Ci
241-AN-105	79Se	Total		3.12E+00	Ci
241-AN-105	90Sr	Supernatant	A2-SltSlr (Liquid)	7.73E+01	Ci
241-AN-105	90Sr	Salt Cake	A2-SltSlr (Solid)	2.87E+04	Ci
241-AN-105	90Sr	Total		2.88E+04	Ci
241-AN-105	90Y	Supernatant	A2-SltSlr (Liquid)	7.73E+01	Ci
241-AN-105	90Y	Salt Cake	A2-SltSlr (Solid)	2.87E+04	Ci
241-AN-105	90Y	Total		2.88E+04	Ci
241-AN-105	93mNb	Supernatant	A2-SltSlr (Liquid)	4.80E+01	Ci
241-AN-105	93mNb	Salt Cake	A2-SltSlr (Solid)	3.28E+01	Ci
241-AN-105	93mNb	Total		8.08E+01	Ci
241-AN-105	93Zr	Supernatant	A2-SltSlr (Liquid)	5.78E+01	Ci
241-AN-105	93Zr	Salt Cake	A2-SltSlr (Solid)	3.96E+01	Ci
241-AN-105	93Zr	Total		9.74E+01	Ci
241-AN-105	99Tc	Supernatant	A2-SltSlr (Liquid)	5 88E+02	Ci
241-AN-105	99Tc	Salt Cake	A2-SltSlr (Solid)	5.34E+02	Ci
241-AN-105	99Tc	Total		1.12E+03	Ci
241-AN-105	Ag	Supernatant	A2-SltSlr (Liquid)	3.96E+01	kg
241-AN-105	Ag	Salt Cake	A2-SltSlr (Solid)	5.79E+01	kg
241-AN-105	Ag	Total		9.75E+01	kg
241-AN-105	Al	Supernatant	A2-SltSlr (Liquid)	9.28E+04	kg
241-AN-105	Al	Salt Cake	A2-SltSlr (Solid)	6.76E+04	kg
241-AN-105	Al	Total		1.60E+05	kg
241-AN-105	As	Supernatant	A2-SltSlr (Liquid)	1.09E+02	kg
241-AN-105	As	Salt Cake	A2-SltSlr (Solid)	1.18E+02	kg
241-AN-105	As	Total		2.28E+02	kg
241-AN-105	B	Supernatant	A2-SltSlr (Liquid)	1.66E+02	kg
241-AN-105	B	Salt Cake	A2-SltSlr (Solid)	2.74E+02	kg
241-AN-105	B	Total		4.39E+02	kg
241-AN-105	Ba	Supernatant	A2-SltSlr (Liquid)	5.47E+01	kg
241-AN-105	Ba	Salt Cake	A2-SltSlr (Solid)	5.92E+01	kg
241-AN-105	Ba	Total		1.14E+02	kg
241-AN-105	Be	Supernatant	A2-SltSlr (Liquid)	5.44E+00	kg
241-AN-105	Be	Salt Cake	A2-SltSlr (Solid)	5.92E+00	kg
241-AN-105	Be	Total		1.14E+01	kg
241-AN-105	Bi	Supernatant	A2-SltSlr (Liquid)	7.03E+01	kg
241-AN-105	Bi	Salt Cake	A2-SltSlr (Solid)	3.96E+01	kg
241-AN-105	Bi	Total		1.10E+02	kg
241-AN-105	Ca	Supernatant	A2-SltSlr (Liquid)	1.09E+02	kg
241-AN-105	Ca	Salt Cake	A2-SltSlr (Solid)	1.85E+03	kg
241-AN-105	Ca	Total		1.96E+03	kg
241-AN-105	Cd	Supernatant	A2-SltSlr (Liquid)	5.44E+00	kg
241-AN-105	Cd	Salt Cake	A2-SltSlr (Solid)	3.41E+01	kg
241-AN-105	Cd	Total		3.96E+01	kg
241-AN-105	Ce	Supernatant	A2-SltSlr (Liquid)	1.09E+02	kg
241-AN-105	Ce	Salt Cake	A2-SltSlr (Solid)	1.18E+02	kg
241-AN-105	Ce	Total		2.28E+02	kg
241-AN-105	Cl	Supernatant	A2-SltSlr (Liquid)	2.15E+04	kg
241-AN-105	Cl	Salt Cake	A2-SltSlr (Solid)	1.57E+04	kg
241-AN-105	Cl	Total		3.72E+04	kg
241-AN-105	Co	Supernatant	A2-SltSlr (Liquid)	2.18E+01	kg
241-AN-105	Co	Salt Cake	A2-SltSlr (Solid)	2.37E+01	kg
241-AN-105	Co	Total		4.55E+01	kg
241-AN-105	Cr	Supernatant	A2-SltSlr (Liquid)	5.00E+02	kg
241-AN-105	Cr	Salt Cake	A2-SltSlr (Solid)	6.84E+03	kg
241-AN-105	Cr	Total		7.34E+03	kg
241-AN-105	Cu	Supernatant	A2-SltSlr (Liquid)	1.17E+01	kg
241-AN-105	Cu	Salt Cake	A2-SltSlr (Solid)	2.09E+01	kg
241-AN-105	Cu	Total		3.26E+01	kg
241-AN-105	F	Supernatant	A2-SltSlr (Liquid)	6.91E+02	kg
241-AN-105	F	Salt Cake	A2-SltSlr (Solid)	5 45E+03	kg
241-AN-105	F	Total		6.14E+03	kg

Summary		
Ag	9.75E+01	kg
Al	1.60E+05	kg
As	2.28E+02	kg
B	4.39E+02	kg
Ba	1.14E+02	kg
Be	1.14E+01	kg
Bi	1.10E+02	kg
Ca	1.96E+03	kg
Cd	3.96E+01	kg
Ce	2.28E+02	kg
Cl	3.72E+04	kg
CN	0.00E+00	kg
Co	4.55E+01	kg
Cr	7.34E+03	kg
Cu	3.26E+01	kg
F	6.14E+03	kg
Fe	4.02E+02	kg
Free OH	2.05E+05	kg
Hg	1.94E+00	kg
K	2.52E+04	kg
La	2.34E-03	kg
Li	6.45E+01	kg
Mg	2.28E+02	kg
Mn	7.24E+01	kg
Mo	3.72E+02	kg
Na	1.10E+06	kg
Nd	2.28E+02	kg
NH3	0.00E+00	kg
Ni	1.42E+02	kg
NO2	4.59E+05	kg
NO3	6.91E+05	kg
Oxalate	2.19E+04	kg
Pb	2.63E+02	kg
Pd	0.00E+00	kg
PO4	2.54E+04	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	1.37E+02	kg
Se	2.28E+02	kg
Si	9.05E+02	kg
SO4	2.84E+04	kg
Sr	6.63E+00	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-17

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-105	Fe	Supernatant	A2-SltSlr (Liquid)	5.47E+01	kg
241-AN-105	Fe	Salt Cake	A2-SltSlr (Solid)	3.48E+02	kg
241-AN-105	Fe	Total		4.02E+02	kg
241-AN-105	Free OH	Supernatant	A2-SltSlr (Liquid)	1.33E+05	kg
241-AN-105	Free OH	Salt Cake	A2-SltSlr (Solid)	7.22E+04	kg
241-AN-105	Free OH	Total		2.05E+05	kg
241-AN-105	Hg	Supernatant	A2-SltSlr (Liquid)	5.52E-01	kg
241-AN-105	Hg	Salt Cake	A2-SltSlr (Solid)	1.39E+00	kg
241-AN-105	Hg	Total		1.94E+00	kg
241-AN-105	K	Supernatant	A2-SltSlr (Liquid)	1.46E+04	kg
241-AN-105	K	Salt Cake	A2-SltSlr (Solid)	1.06E+04	kg
241-AN-105	K	Total		2.52E+04	kg
241-AN-105	La	Supernatant	A2-SltSlr (Liquid)	1.52E-03	kg
241-AN-105	La	Salt Cake	A2-SltSlr (Solid)	8.18E-04	kg
241-AN-105	La	Total		2.34E-03	kg
241-AN-105	Li	Supernatant	A2-SltSlr (Liquid)	1.33E+01	kg
241-AN-105	Li	Salt Cake	A2-SltSlr (Solid)	5.12E+01	kg
241-AN-105	Li	Total		6.45E+01	kg
241-AN-105	Mg	Supernatant	A2-SltSlr (Liquid)	1.09E+02	kg
241-AN-105	Mg	Salt Cake	A2-SltSlr (Solid)	1.18E+02	kg
241-AN-105	Mg	Total		2.28E+02	kg
241-AN-105	Mn	Supernatant	A2-SltSlr (Liquid)	1.09E+01	kg
241-AN-105	Mn	Salt Cake	A2-SltSlr (Solid)	6.15E+01	kg
241-AN-105	Mn	Total		7.24E+01	kg
241-AN-105	Mo	Supernatant	A2-SltSlr (Liquid)	2.15E+02	kg
241-AN-105	Mo	Salt Cake	A2-SltSlr (Solid)	1.57E+02	kg
241-AN-105	Mo	Total		3.72E+02	kg
241-AN-105	Na	Supernatant	A2-SltSlr (Liquid)	5.50E+05	kg
241-AN-105	Na	Salt Cake	A2-SltSlr (Solid)	5.52E+05	kg
241-AN-105	Na	Total		1.10E+06	kg
241-AN-105	Nd	Supernatant	A2-SltSlr (Liquid)	1.09E+02	kg
241-AN-105	Nd	Salt Cake	A2-SltSlr (Solid)	1.18E+02	kg
241-AN-105	Nd	Total		2.28E+02	kg
241-AN-105	Ni	Supernatant	A2-SltSlr (Liquid)	2.20E+01	kg
241-AN-105	Ni	Salt Cake	A2-SltSlr (Solid)	1.20E+02	kg
241-AN-105	Ni	Total		1.42E+02	kg
241-AN-105	NO2	Supernatant	A2-SltSlr (Liquid)	2.64E+05	kg
241-AN-105	NO2	Salt Cake	A2-SltSlr (Solid)	1.94E+05	kg
241-AN-105	NO2	Total		4.59E+05	kg
241-AN-105	NO3	Supernatant	A2-SltSlr (Liquid)	3.48E+05	kg
241-AN-105	NO3	Salt Cake	A2-SltSlr (Solid)	3.43E+05	kg
241-AN-105	NO3	Total		6.91E+05	kg
241-AN-105	Oxalate	Supernatant	A2-SltSlr (Liquid)	1.09E+03	kg
241-AN-105	Oxalate	Salt Cake	A2-SltSlr (Solid)	2.08E+04	kg
241-AN-105	Oxalate	Total		2.19E+04	kg
241-AN-105	Pb	Supernatant	A2-SltSlr (Liquid)	1.20E+02	kg
241-AN-105	Pb	Salt Cake	A2-SltSlr (Solid)	1.43E+02	kg
241-AN-105	Pb	Total		2.63E+02	kg
241-AN-105	PO4	Supernatant	A2-SltSlr (Liquid)	2.73E+03	kg
241-AN-105	PO4	Salt Cake	A2-SltSlr (Solid)	2.26E+04	kg
241-AN-105	PO4	Total		2.54E+04	kg
241-AN-105	Sb	Supernatant	A2-SltSlr (Liquid)	6.55E+01	kg
241-AN-105	Sb	Salt Cake	A2-SltSlr (Solid)	7.11E+01	kg
241-AN-105	Sb	Total		1.37E+02	kg
241-AN-105	Se	Supernatant	A2-SltSlr (Liquid)	1.09E+02	kg
241-AN-105	Se	Salt Cake	A2-SltSlr (Solid)	1.18E+02	kg
241-AN-105	Se	Total		2.28E+02	kg
241-AN-105	Si	Supernatant	A2-SltSlr (Liquid)	4.86E+02	kg
241-AN-105	Si	Salt Cake	A2-SltSlr (Solid)	4.19E+02	kg
241-AN-105	Si	Total		9.05E+02	kg
241-AN-105	SO4	Supernatant	A2-SltSlr (Liquid)	6.26E+03	kg
241-AN-105	SO4	Salt Cake	A2-SltSlr (Solid)	2.22E+04	kg
241-AN-105	SO4	Total		2.84E+04	kg
241-AN-105	Sr	Supernatant	A2-SltSlr (Liquid)	9.91E-02	kg
241-AN-105	Sr	Salt Cake	A2-SltSlr (Solid)	6.53E+00	kg
241-AN-105	Sr	Total		6.63E+00	kg
241-AN-105	Th	Supernatant	A2-SltSlr (Liquid)	8.33E-01	kg
241-AN-105	Th	Salt Cake	A2-SltSlr (Solid)	9.24E-01	kg

Summary		
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	1.76E+00	kg
Ti	2.28E+01	kg
TIC as CO3	2.31E+05	kg
Tl	4.55E+02	kg
TOC	2.23E+04	kg
UTOTAL	2.71E+02	kg
V	1.14E+02	kg
W	0.00E+00	kg
Y	0.00E+00	kg
Zn	1.98E+02	kg
Zr	4.43E+01	kg

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.. 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.. C-18

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AN-105	Th	Total		1.76E+00	kg	
241-AN-105	Ti	Supernatant	A2-SltSlr (Liquid)	1.09E+01	kg	
241-AN-105	Ti	Salt Cake	A2-SltSlr (Solid)	1.18E+01	kg	
241-AN-105	Ti	Total		2.28E+01	kg	
241-AN-105	TIC as CO3	Supernatant	A2-SltSlr (Liquid)	3.97E+04	kg	
241-AN-105	TIC as CO3	Salt Cake	A2-SltSlr (Solid)	1.91E+05	kg	
241-AN-105	TIC as CO3	Total		2.31E+05	kg	
241-AN-105	Tl	Supernatant	A2-SltSlr (Liquid)	2.18E+02	kg	
241-AN-105	Tl	Salt Cake	A2-SltSlr (Solid)	2.37E+02	kg	
241-AN-105	Tl	Total		4.55E+02	kg	
241-AN-105	TOC	Supernatant	A2-SltSlr (Liquid)	6.15E+03	kg	
241-AN-105	TOC	Salt Cake	A2-SltSlr (Solid)	1.62E+04	kg	
241-AN-105	TOC	Total		2.23E+04	kg	
241-AN-105	UTOTAL	Supernatant	A2-SltSlr (Liquid)	7.93E+00	kg	
241-AN-105	UTOTAL	Salt Cake	A2-SltSlr (Solid)	2.63E+02	kg	
241-AN-105	UTOTAL	Total		2.71E+02	kg	
241-AN-105	V	Supernatant	A2-SltSlr (Liquid)	5.47E+01	kg	
241-AN-105	V	Salt Cake	A2-SltSlr (Solid)	5.92E+01	kg	
241-AN-105	V	Total		1.14E+02	kg	
241-AN-105	Zn	Supernatant	A2-SltSlr (Liquid)	6.91E+01	kg	
241-AN-105	Zn	Salt Cake	A2-SltSlr (Solid)	1.29E+02	kg	
241-AN-105	Zn	Total		1.98E+02	kg	
241-AN-105	Zr	Supernatant	A2-SltSlr (Liquid)	1.12E+01	kg	
241-AN-105	Zr	Salt Cake	A2-SltSlr (Solid)	3.31E+01	kg	
241-AN-105	Zr	Total		4.43E+01	kg	

241-AN-107	106Ru	Supernatant	A2-SltSlr (Liquid)	1.50E-05	Ci	Summary	
241-AN-107	106Ru	Salt Cake	A2-SltSlr (Solid)	2.42E-02	Ci	106Ru	1.50E-05 Ci
241-AN-107	106Ru	Total		2.42E-02	Ci	113mCd	6.56E+01 Ci
241-AN-107	113mCd	Supernatant	A2-SltSlr (Liquid)	6.56E+01	Ci	125Sb	6.19E+00 Ci
241-AN-107	113mCd	Salt Cake	A2-SltSlr (Solid)	1.45E+01	Ci	126Sn	2.99E+01 Ci
241-AN-107	113mCd	Total		8.01E+01	Ci	129I	3.67E-01 Ci
241-AN-107	125Sb	Supernatant	A2-SltSlr (Liquid)	6.19E+00	Ci	134Cs	8.63E+00 Ci
241-AN-107	125Sb	Salt Cake	A2-SltSlr (Solid)	5.75E+00	Ci	137Cs	9.85E+05 Ci
241-AN-107	125Sb	Total		1.19E+01	Ci	137mBa	9.30E+05 Ci
241-AN-107	126Sn	Supernatant	A2-SltSlr (Liquid)	2.99E+01	Ci	14C	2.04E+00 Ci
241-AN-107	126Sn	Salt Cake	A2-SltSlr (Solid)	1.18E+00	Ci	151Sm	9.97E+03 Ci
241-AN-107	126Sn	Total		3.11E+01	Ci	152Eu	1.10E+00 Ci
241-AN-107	129I	Supernatant	A2-SltSlr (Liquid)	3.67E-01	Ci	154Eu	1.18E+03 Ci
241-AN-107	129I	Salt Cake	A2-SltSlr (Solid)	1.09E-01	Ci	155Eu	6.39E+02 Ci
241-AN-107	129I	Total		4.76E-01	Ci	226Ra	1.10E-04 Ci
241-AN-107	134Cs	Supernatant	A2-SltSlr (Liquid)	8.63E+00	Ci	227Ac	1.36E-02 Ci
241-AN-107	134Cs	Salt Cake	A2-SltSlr (Solid)	1.90E+00	Ci	228Ra	3.32E-02 Ci
241-AN-107	134Cs	Total		1.05E+01	Ci	229Th	5.46E-05 Ci
241-AN-107	137Cs	Supernatant	A2-SltSlr (Liquid)	9.85E+05	Ci	231Pa	1.43E-01 Ci
241-AN-107	137Cs	Salt Cake	A2-SltSlr (Solid)	3.01E+05	Ci	232Th	6.36E-03 Ci
241-AN-107	137Cs	Total		1.29E+06	Ci	232U	3.29E-03 Ci
241-AN-107	137mBa	Supernatant	A2-SltSlr (Liquid)	9.30E+05	Ci	233U	2.02E-01 Ci
241-AN-107	137mBa	Salt Cake	A2-SltSlr (Solid)	2.84E+05	Ci	234U	1.43E-01 Ci
241-AN-107	137mBa	Total		1.21E+06	Ci	235U	5.65E-03 Ci
241-AN-107	14C	Supernatant	A2-SltSlr (Liquid)	2.04E+00	Ci	236U	9.67E-03 Ci
241-AN-107	14C	Salt Cake	A2-SltSlr (Solid)	5.65E+00	Ci	237Np	1.87E-01 Ci
241-AN-107	14C	Total		7.69E+00	Ci	238Pu	1.08E+01 Ci
241-AN-107	151Sm	Supernatant	A2-SltSlr (Liquid)	9.97E+03	Ci	238U	1.12E-01 Ci
241-AN-107	151Sm	Salt Cake	A2-SltSlr (Solid)	8.06E+03	Ci	239Pu	1.49E+02 Ci
241-AN-107	151Sm	Total		1.80E+04	Ci	240Pu	3.87E+01 Ci
241-AN-107	152Eu	Supernatant	A2-SltSlr (Liquid)	1.10E+00	Ci	241Am	2.41E+03 Ci
241-AN-107	152Eu	Salt Cake	A2-SltSlr (Solid)	9.34E-01	Ci	241Pu	6.80E+02 Ci
241-AN-107	152Eu	Total		2.04E+00	Ci	242Cm	9.19E+00 Ci
241-AN-107	154Eu	Supernatant	A2-SltSlr (Liquid)	1.18E+03	Ci	242Pu	4.10E-03 Ci
241-AN-107	154Eu	Salt Cake	A2-SltSlr (Solid)	1.90E+03	Ci	243Am	1.58E+00 Ci
241-AN-107	154Eu	Total		3.08E+03	Ci	243Cm	2.60E-01 Ci
241-AN-107	155Eu	Supernatant	A2-SltSlr (Liquid)	6.39E+02	Ci	244Cm	6.16E+00 Ci
241-AN-107	155Eu	Salt Cake	A2-SltSlr (Solid)	1.06E+03	Ci	3H	2.04E+00 Ci
241-AN-107	155Eu	Total		1.70E+03	Ci	59Ni	7.00E+01 Ci
241-AN-107	226Ra	Supernatant	A2-SltSlr (Liquid)	1.10E-04	Ci	60Co	2.12E+02 Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-19

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-107	226Ra	Salt Cake	A2-SltSlr (Solid)	2.44E-05	Ci
241-AN-107	226Ra	Total		1.35E-04	Ci
241-AN-107	227Ac	Supernatant	A2-SltSlr (Liquid)	1.36E-02	Ci
241-AN-107	227Ac	Salt Cake	A2-SltSlr (Solid)	3.00E-03	Ci
241-AN-107	227Ac	Total		1.66E-02	Ci
241-AN-107	228Ra	Supernatant	A2-SltSlr (Liquid)	3.32E-02	Ci
241-AN-107	228Ra	Salt Cake	A2-SltSlr (Solid)	8.66E-03	Ci
241-AN-107	228Ra	Total		4.18E-02	Ci
241-AN-107	229Th	Supernatant	A2-SltSlr (Liquid)	5.46E-05	Ci
241-AN-107	229Th	Salt Cake	A2-SltSlr (Solid)	1.20E-05	Ci
241-AN-107	229Th	Total		6.66E-05	Ci
241-AN-107	231Pa	Supernatant	A2-SltSlr (Liquid)	1.43E-01	Ci
241-AN-107	231Pa	Salt Cake	A2-SltSlr (Solid)	3.15E-02	Ci
241-AN-107	231Pa	Total		1.74E-01	Ci
241-AN-107	232Th	Supernatant	A2-SltSlr (Liquid)	6.36E-03	Ci
241-AN-107	232Th	Salt Cake	A2-SltSlr (Solid)	5.91E-03	Ci
241-AN-107	232Th	Total		1.23E-02	Ci
241-AN-107	232U	Supernatant	A2-SltSlr (Liquid)	3.29E-03	Ci
241-AN-107	232U	Salt Cake	A2-SltSlr (Solid)	4.93E-03	Ci
241-AN-107	232U	Total		8.22E-03	Ci
241-AN-107	233U	Supernatant	A2-SltSlr (Liquid)	2.02E-01	Ci
241-AN-107	233U	Salt Cake	A2-SltSlr (Solid)	3.03E-01	Ci
241-AN-107	233U	Total		5.05E-01	Ci
241-AN-107	234U	Supernatant	A2-SltSlr (Liquid)	1.43E-01	Ci
241-AN-107	234U	Salt Cake	A2-SltSlr (Solid)	2.14E-01	Ci
241-AN-107	234U	Total		3.57E-01	Ci
241-AN-107	235U	Supernatant	A2-SltSlr (Liquid)	5.65E-03	Ci
241-AN-107	235U	Salt Cake	A2-SltSlr (Solid)	8.46E-03	Ci
241-AN-107	235U	Total		1.41E-02	Ci
241-AN-107	236U	Supernatant	A2-SltSlr (Liquid)	9.67E-03	Ci
241-AN-107	236U	Salt Cake	A2-SltSlr (Solid)	1.45E-02	Ci
241-AN-107	236U	Total		2.42E-02	Ci
241-AN-107	237Np	Supernatant	A2-SltSlr (Liquid)	1.87E-01	Ci
241-AN-107	237Np	Salt Cake	A2-SltSlr (Solid)	1.47E-01	Ci
241-AN-107	237Np	Total		3.34E-01	Ci
241-AN-107	238Pu	Supernatant	A2-SltSlr (Liquid)	1.08E+01	Ci
241-AN-107	238Pu	Salt Cake	A2-SltSlr (Solid)	5.14E+00	Ci
241-AN-107	238Pu	Total		1.59E+01	Ci
241-AN-107	238U	Supernatant	A2-SltSlr (Liquid)	1.12E-01	Ci
241-AN-107	238U	Salt Cake	A2-SltSlr (Solid)	1.68E-01	Ci
241-AN-107	238U	Total		2.80E-01	Ci
241-AN-107	239Pu	Supernatant	A2-SltSlr (Liquid)	1.49E+02	Ci
241-AN-107	239Pu	Salt Cake	A2-SltSlr (Solid)	7.08E+01	Ci
241-AN-107	239Pu	Total		2.20E+02	Ci
241-AN-107	240Pu	Supernatant	A2-SltSlr (Liquid)	3.87E+01	Ci
241-AN-107	240Pu	Salt Cake	A2-SltSlr (Solid)	1.84E+01	Ci
241-AN-107	240Pu	Total		5.71E+01	Ci
241-AN-107	241Am	Supernatant	A2-SltSlr (Liquid)	2.41E+03	Ci
241-AN-107	241Am	Salt Cake	A2-SltSlr (Solid)	1.20E+03	Ci
241-AN-107	241Am	Total		3.62E+03	Ci
241-AN-107	241Pu	Supernatant	A2-SltSlr (Liquid)	6.80E+02	Ci
241-AN-107	241Pu	Salt Cake	A2-SltSlr (Solid)	3.23E+02	Ci
241-AN-107	241Pu	Total		1.00E+03	Ci
241-AN-107	242Cm	Supernatant	A2-SltSlr (Liquid)	9.19E+00	Ci
241-AN-107	242Cm	Salt Cake	A2-SltSlr (Solid)	3.16E-01	Ci
241-AN-107	242Cm	Total		9.50E+00	Ci
241-AN-107	242Pu	Supernatant	A2-SltSlr (Liquid)	4.10E-03	Ci
241-AN-107	242Pu	Salt Cake	A2-SltSlr (Solid)	1.95E-03	Ci
241-AN-107	242Pu	Total		6.05E-03	Ci
241-AN-107	243Am	Supernatant	A2-SltSlr (Liquid)	1.58E+00	Ci
241-AN-107	243Am	Salt Cake	A2-SltSlr (Solid)	8.09E-01	Ci
241-AN-107	243Am	Total		2.39E+00	Ci
241-AN-107	243Cm	Supernatant	A2-SltSlr (Liquid)	2.60E-01	Ci
241-AN-107	243Cm	Salt Cake	A2-SltSlr (Solid)	1.74E-02	Ci
241-AN-107	243Cm	Total		2.78E-01	Ci
241-AN-107	244Cm	Supernatant	A2-SltSlr (Liquid)	6.16E+00	Ci
241-AN-107	244Cm	Salt Cake	A2-SltSlr (Solid)	4.12E-01	Ci
241-AN-107	244Cm	Total		6.57E+00	Ci

Summary		
63Ni	4.88E+03	Ci
79Se	2.55E+00	Ci
90Sr	2.53E+05	Ci
90Y	2.53E+05	Ci
93mNb	6.35E+01	Ci
93Zr	7.66E+01	Ci
99Tc	2.57E+02	Ci

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-20

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-107	3H	Supernatant	A2-SltSlr (Liquid)	2.04E+00	Ci
241-AN-107	3H	Salt Cake	A2-SltSlr (Solid)	7.60E+00	Ci
241-AN-107	3H	Total		9.63E+00	Ci
241-AN-107	59Ni	Supernatant	A2-SltSlr (Liquid)	7.00E+01	Ci
241-AN-107	59Ni	Salt Cake	A2-SltSlr (Solid)	5.14E+00	Ci
241-AN-107	59Ni	Total		7.51E+01	Ci
241-AN-107	60Co	Supernatant	A2-SltSlr (Liquid)	2.12E+02	Ci
241-AN-107	60Co	Salt Cake	A2-SltSlr (Solid)	6.41E+01	Ci
241-AN-107	60Co	Total		2.76E+02	Ci
241-AN-107	63Ni	Supernatant	A2-SltSlr (Liquid)	4.88E+03	Ci
241-AN-107	63Ni	Salt Cake	A2-SltSlr (Solid)	4.80E+02	Ci
241-AN-107	63Ni	Total		5.36E+03	Ci
241-AN-107	79Se	Supernatant	A2-SltSlr (Liquid)	2.55E+00	Ci
241-AN-107	79Se	Salt Cake	A2-SltSlr (Solid)	2.84E-01	Ci
241-AN-107	79Se	Total		2.84E+00	Ci
241-AN-107	90Sr	Supernatant	A2-SltSlr (Liquid)	2.53E+05	Ci
241-AN-107	90Sr	Salt Cake	A2-SltSlr (Solid)	2.14E+05	Ci
241-AN-107	90Sr	Total		4.67E+05	Ci
241-AN-107	90Y	Supernatant	A2-SltSlr (Liquid)	2.53E+05	Ci
241-AN-107	90Y	Salt Cake	A2-SltSlr (Solid)	2.14E+05	Ci
241-AN-107	90Y	Total		4.67E+05	Ci
241-AN-107	93mNb	Supernatant	A2-SltSlr (Liquid)	6.35E+01	Ci
241-AN-107	93mNb	Salt Cake	A2-SltSlr (Solid)	1.40E+01	Ci
241-AN-107	93mNb	Total		7.76E+01	Ci
241-AN-107	93Zr	Supernatant	A2-SltSlr (Liquid)	7.66E+01	Ci
241-AN-107	93Zr	Salt Cake	A2-SltSlr (Solid)	1.69E+01	Ci
241-AN-107	93Zr	Total		9.35E+01	Ci
241-AN-107	99Tc	Supernatant	A2-SltSlr (Liquid)	2.57E+02	Ci
241-AN-107	99Tc	Salt Cake	A2-SltSlr (Solid)	1.31E+02	Ci
241-AN-107	99Tc	Total		3.88E+02	Ci
241-AN-107	Ag	Supernatant	A2-SltSlr (Liquid)	6.26E+00	kg
241-AN-107	Ag	Salt Cake	A2-SltSlr (Solid)	1.38E+01	kg
241-AN-107	Ag	Total		2.01E+01	kg
241-AN-107	Al	Supernatant	A2-SltSlr (Liquid)	3.70E+03	kg
241-AN-107	Al	Salt Cake	A2-SltSlr (Solid)	2.23E+04	kg
241-AN-107	Al	Total		2.60E+04	kg
241-AN-107	As	Supernatant	A2-SltSlr (Liquid)	4.25E+00	kg
241-AN-107	As	Salt Cake	A2-SltSlr (Solid)	5.31E+01	kg
241-AN-107	As	Total		5.73E+01	kg
241-AN-107	B	Supernatant	A2-SltSlr (Liquid)	7.38E+01	kg
241-AN-107	B	Salt Cake	A2-SltSlr (Solid)	4.21E+01	kg
241-AN-107	B	Total		1.16E+02	kg
241-AN-107	Ba	Supernatant	A2-SltSlr (Liquid)	3.10E+01	kg
241-AN-107	Ba	Salt Cake	A2-SltSlr (Solid)	2.71E+01	kg
241-AN-107	Ba	Total		5.82E+01	kg
241-AN-107	Be	Supernatant	A2-SltSlr (Liquid)	6.17E-01	kg
241-AN-107	Be	Salt Cake	A2-SltSlr (Solid)	1.28E+00	kg
241-AN-107	Be	Total		1.90E+00	kg
241-AN-107	Bi	Supernatant	A2-SltSlr (Liquid)	2.73E+01	kg
241-AN-107	Bi	Salt Cake	A2-SltSlr (Solid)	1.41E+01	kg
241-AN-107	Bi	Total		4.14E+01	kg
241-AN-107	Ca	Supernatant	A2-SltSlr (Liquid)	1.84E+03	kg
241-AN-107	Ca	Salt Cake	A2-SltSlr (Solid)	4.66E+02	kg
241-AN-107	Ca	Total		2.30E+03	kg
241-AN-107	Cd	Supernatant	A2-SltSlr (Liquid)	2.07E+02	kg
241-AN-107	Cd	Salt Cake	A2-SltSlr (Solid)	4.97E+01	kg
241-AN-107	Cd	Total		2.56E+02	kg
241-AN-107	Ce	Supernatant	A2-SltSlr (Liquid)	1.59E+02	kg
241-AN-107	Ce	Salt Cake	A2-SltSlr (Solid)	7.46E+01	kg
241-AN-107	Ce	Total		2.34E+02	kg
241-AN-107	Cl	Supernatant	A2-SltSlr (Liquid)	5.82E+03	kg
241-AN-107	Cl	Salt Cake	A2-SltSlr (Solid)	1.35E+03	kg
241-AN-107	Cl	Total		7.17E+03	kg
241-AN-107	Co	Supernatant	A2-SltSlr (Liquid)	1.36E+01	kg
241-AN-107	Co	Salt Cake	A2-SltSlr (Solid)	7.06E+00	kg
241-AN-107	Co	Total		2.07E+01	kg
241-AN-107	Cr	Supernatant	A2-SltSlr (Liquid)	5.61E+02	kg
241-AN-107	Cr	Salt Cake	A2-SltSlr (Solid)	8.12E+02	kg

Summary		
Ag	6.26E+00	kg
Al	3.70E+03	kg
As	4.25E+00	kg
B	7.38E+01	kg
Ba	3.10E+01	kg
Be	6.17E-01	kg
Bi	2.73E+01	kg
Ca	1.84E+03	kg
Cd	2.07E+02	kg
Ce	1.59E+02	kg
Cl	5.82E+03	kg
CN	0.00E+00	kg
Co	1.36E+01	kg
Cr	5.61E+02	kg
Cu	9.49E+01	kg
F	3.06E+02	kg
Fe	5.43E+03	kg
Free OH	5.93E+04	kg
Hg	7.32E-01	kg
K	5.70E+03	kg
La	1.05E+02	kg
Li	9.61E+00	kg
Mg	4.57E+00	kg
Mn	1.61E+03	kg
Mo	1.10E+02	kg
Na	6.85E+05	kg
Nd	3.03E+02	kg
NH3	1.54E+02	kg
Ni	1.73E+03	kg
NO2	2.20E+05	kg
NO3	6.89E+05	kg
Oxalate	2.98E+03	kg
Pb	1.24E+03	kg
Pd	0.00E+00	kg
PO4	5.09E+03	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-21

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AN-107	Cr	Total		1.37E+03	kg
241-AN-107	Cu	Supernatant	A2-SltSlr (Liquid)	9.49E+01	kg
241-AN-107	Cu	Salt Cake	A2-SltSlr (Solid)	2.65E+01	kg
241-AN-107	Cu	Total		1.21E+02	kg
241-AN-107	F	Supernatant	A2-SltSlr (Liquid)	3.06E+02	kg
241-AN-107	F	Salt Cake	A2-SltSlr (Solid)	1.95E+02	kg
241-AN-107	F	Total		5.02E+02	kg
241-AN-107	Fe	Supernatant	A2-SltSlr (Liquid)	5.43E+03	kg
241-AN-107	Fe	Salt Cake	A2-SltSlr (Solid)	8.00E+03	kg
241-AN-107	Fe	Total		1.34E+04	kg
241-AN-107	Free OH	Supernatant	A2-SltSlr (Liquid)	5.93E+04	kg
241-AN-107	Free OH	Salt Cake	A2-SltSlr (Solid)	2.48E+02	kg
241-AN-107	Free OH	Total		5.96E+04	kg
241-AN-107	Hg	Supernatant	A2-SltSlr (Liquid)	7.32E-01	kg
241-AN-107	Hg	Salt Cake	A2-SltSlr (Solid)	5.94E-01	kg
241-AN-107	Hg	Total		1.33E+00	kg
241-AN-107	K	Supernatant	A2-SltSlr (Liquid)	5.70E+03	kg
241-AN-107	K	Salt Cake	A2-SltSlr (Solid)	1.76E+03	kg
241-AN-107	K	Total		7.46E+03	kg
241-AN-107	La	Supernatant	A2-SltSlr (Liquid)	1.05E+02	kg
241-AN-107	La	Salt Cake	A2-SltSlr (Solid)	3.86E+01	kg
241-AN-107	La	Total		1.44E+02	kg
241-AN-107	Li	Supernatant	A2-SltSlr (Liquid)	9.61E+00	kg
241-AN-107	Li	Salt Cake	A2-SltSlr (Solid)	2.17E+01	kg
241-AN-107	Li	Total		3.13E+01	kg
241-AN-107	Mg	Supernatant	A2-SltSlr (Liquid)	4.57E+00	kg
241-AN-107	Mg	Salt Cake	A2-SltSlr (Solid)	2.27E+01	kg
241-AN-107	Mg	Total		2.73E+01	kg
241-AN-107	Mn	Supernatant	A2-SltSlr (Liquid)	1.61E+03	kg
241-AN-107	Mn	Salt Cake	A2-SltSlr (Solid)	7.37E+02	kg
241-AN-107	Mn	Total		2.34E+03	kg
241-AN-107	Mo	Supernatant	A2-SltSlr (Liquid)	1.10E+02	kg
241-AN-107	Mo	Salt Cake	A2-SltSlr (Solid)	2.94E+01	kg
241-AN-107	Mo	Total		1.40E+02	kg
241-AN-107	Na	Supernatant	A2-SltSlr (Liquid)	6.85E+05	kg
241-AN-107	Na	Salt Cake	A2-SltSlr (Solid)	1.88E+05	kg
241-AN-107	Na	Total		8.72E+05	kg
241-AN-107	Nd	Supernatant	A2-SltSlr (Liquid)	3.03E+02	kg
241-AN-107	Nd	Salt Cake	A2-SltSlr (Solid)	1.49E+02	kg
241-AN-107	Nd	Total		4.51E+02	kg
241-AN-107	NH3	Supernatant	A2-SltSlr (Liquid)	1.54E+02	kg
241-AN-107	NH3	Salt Cake	A2-SltSlr (Solid)	4.51E+01	kg
241-AN-107	NH3	Total		1.99E+02	kg
241-AN-107	Ni	Supernatant	A2-SltSlr (Liquid)	1.73E+03	kg
241-AN-107	Ni	Salt Cake	A2-SltSlr (Solid)	4.61E+02	kg
241-AN-107	Ni	Total		2.19E+03	kg
241-AN-107	NO2	Supernatant	A2-SltSlr (Liquid)	2.20E+05	kg
241-AN-107	NO2	Salt Cake	A2-SltSlr (Solid)	5.38E+04	kg
241-AN-107	NO2	Total		2.74E+05	kg
241-AN-107	NO3	Supernatant	A2-SltSlr (Liquid)	6.89E+05	kg
241-AN-107	NO3	Salt Cake	A2-SltSlr (Solid)	1.47E+05	kg
241-AN-107	NO3	Total		8.37E+05	kg
241-AN-107	Oxalate	Supernatant	A2-SltSlr (Liquid)	2.98E+03	kg
241-AN-107	Oxalate	Salt Cake	A2-SltSlr (Solid)	1.87E+04	kg
241-AN-107	Oxalate	Total		2.16E+04	kg
241-AN-107	Pb	Supernatant	A2-SltSlr (Liquid)	1.24E+03	kg
241-AN-107	Pb	Salt Cake	A2-SltSlr (Solid)	5.10E+02	kg
241-AN-107	Pb	Total		1.75E+03	kg
241-AN-107	PO4	Supernatant	A2-SltSlr (Liquid)	5.09E+03	kg
241-AN-107	PO4	Salt Cake	A2-SltSlr (Solid)	6.00E+03	kg
241-AN-107	PO4	Total		1.11E+04	kg
241-AN-107	Rh	Supernatant	A2-SltSlr (Liquid)	8.19E+01	kg
241-AN-107	Rh	Salt Cake	A2-SltSlr (Solid)	4.27E+01	kg
241-AN-107	Rh	Total		1.25E+02	kg
241-AN-107	Sb	Supernatant	A2-SltSlr (Liquid)	1.01E+00	kg
241-AN-107	Sb	Salt Cake	A2-SltSlr (Solid)	3.20E+01	kg
241-AN-107	Sb	Total		3.30E+01	kg
241-AN-107	Se	Supernatant	A2-SltSlr (Liquid)	2.66E+00	kg

Summary		
Rh	8.19E+01	kg
Ru	0.00E+00	kg
Sb	1.01E+00	kg
Se	2.66E+00	kg
Si	4.30E+01	kg
SO4	2.69E+04	kg
Sr	6.18E+00	kg
Ta	7.67E+01	kg
Te	0.00E+00	kg
Th	5.80E+01	kg
Ti	4.67E+00	kg
TIC as CO3	2.43E+05	kg
Tl	3.94E-01	kg
TOC	1.07E+05	kg
UTOTAL	3.36E+02	kg
V	2.30E+00	kg
W	0.00E+00	kg
Y	2.84E+01	kg
Zn	6.22E+01	kg
Zr	1.97E+02	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-22

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AN-107	Se	Salt Cake	A2-SltSlr (Solid)	3.57E+01	kg	
241-AN-107	Se	Total		3.84E+01	kg	
241-AN-107	Si	Supernatant	A2-SltSlr (Liquid)	4.30E+01	kg	
241-AN-107	Si	Salt Cake	A2-SltSlr (Solid)	1.08E+02	kg	
241-AN-107	Si	Total		1.51E+02	kg	
241-AN-107	SO4	Supernatant	A2-SltSlr (Liquid)	2.69E+04	kg	
241-AN-107	SO4	Salt Cake	A2-SltSlr (Solid)	6.58E+03	kg	
241-AN-107	SO4	Total		3.35E+04	kg	
241-AN-107	Sr	Supernatant	A2-SltSlr (Liquid)	6.18E+00	kg	
241-AN-107	Sr	Salt Cake	A2-SltSlr (Solid)	5.66E+00	kg	
241-AN-107	Sr	Total		1.18E+01	kg	
241-AN-107	Ta	Supernatant	A2-SltSlr (Liquid)	7.67E+01	kg	
241-AN-107	Ta	Salt Cake	A2-SltSlr (Solid)	2.92E-01	kg	
241-AN-107	Ta	Total		7.70E+01	kg	
241-AN-107	Th	Supernatant	A2-SltSlr (Liquid)	5.80E+01	kg	
241-AN-107	Th	Salt Cake	A2-SltSlr (Solid)	5.37E+01	kg	
241-AN-107	Th	Total		1.12E+02	kg	
241-AN-107	Ti	Supernatant	A2-SltSlr (Liquid)	4.67E+00	kg	
241-AN-107	Ti	Salt Cake	A2-SltSlr (Solid)	4.43E+00	kg	
241-AN-107	Ti	Total		9.10E+00	kg	
241-AN-107	TIC as CO3	Supernatant	A2-SltSlr (Liquid)	2.43E+05	kg	
241-AN-107	TIC as CO3	Salt Cake	A2-SltSlr (Solid)	8.53E+04	kg	
241-AN-107	TIC as CO3	Total		3.28E+05	kg	
241-AN-107	Tl	Supernatant	A2-SltSlr (Liquid)	3.94E-01	kg	
241-AN-107	Tl	Salt Cake	A2-SltSlr (Solid)	7.10E+01	kg	
241-AN-107	Tl	Total		7.14E+01	kg	
241-AN-107	TOC	Supernatant	A2-SltSlr (Liquid)	1 07E+05	kg	
241-AN-107	TOC	Salt Cake	A2-SltSlr (Solid)	4.03E+04	kg	
241-AN-107	TOC	Total		1.47E+05	kg	
241-AN-107	UTOTAL	Supernatant	A2-SltSlr (Liquid)	3.36E+02	kg	
241-AN-107	UTOTAL	Salt Cake	A2-SltSlr (Solid)	5.03E+02	kg	
241-AN-107	UTOTAL	Total		8.39E+02	kg	
241-AN-107	V	Supernatant	A2-SltSlr (Liquid)	2.30E+00	kg	
241-AN-107	V	Salt Cake	A2-SltSlr (Solid)	7.06E+00	kg	
241-AN-107	V	Total		9.36E+00	kg	
241-AN-107	Y	Supernatant	A2-SltSlr (Liquid)	2.84E+01	kg	
241-AN-107	Y	Salt Cake	A2-SltSlr (Solid)	3.49E+01	kg	
241-AN-107	Y	Total		6.33E+01	kg	
241-AN-107	Zn	Supernatant	A2-SltSlr (Liquid)	6.22E+01	kg	
241-AN-107	Zn	Salt Cake	A2-SltSlr (Solid)	7.05E+01	kg	
241-AN-107	Zn	Total		1.33E+02	kg	
241-AN-107	Zr	Supernatant	A2-SltSlr (Liquid)	1.97E+02	kg	
241-AN-107	Zr	Salt Cake	A2-SltSlr (Solid)	1.67E+02	kg	
241-AN-107	Zr	Total		3.64E+02	kg	

241-AP-101	106Ru	Supernatant	A2-SltCk (Liquid)	1.42E-05	Ci	Summary		
241-AP-101	106Ru	Total		1.42E-05	Ci	106Ru	1.42E-05	Ci
241-AP-101	113mCd	Supernatant	A2-SltCk (Liquid)	6.21E+01	Ci	113mCd	6.21E+01	Ci
241-AP-101	113mCd	Total		6.21E+01	Ci	125Sb	8.79E+00	Ci
241-AP-101	125Sb	Supernatant	A2-SltCk (Liquid)	8.79E+00	Ci	126Sn	3.57E+00	Ci
241-AP-101	125Sb	Total		8.79E+00	Ci	129I	5.88E-01	Ci
241-AP-101	126Sn	Supernatant	A2-SltCk (Liquid)	3.57E+00	Ci	134Cs	5.75E+01	Ci
241-AP-101	126Sn	Total		3.57E+00	Ci	137Cs	5.87E+05	Ci
241-AP-101	129I	Supernatant	A2-SltCk (Liquid)	5.88E-01	Ci	137mBa	5.54E+05	Ci
241-AP-101	129I	Total		5.88E-01	Ci	14C	9.36E-01	Ci
241-AP-101	134Cs	Supernatant	A2-SltCk (Liquid)	5.75E+01	Ci	151Sm	9.43E+03	Ci
241-AP-101	134Cs	Total		5.75E+01	Ci	152Eu	1.04E+00	Ci
241-AP-101	137Cs	Supernatant	A2-SltCk (Liquid)	5.87E+05	Ci	154Eu	6.25E+00	Ci
241-AP-101	137Cs	Total		5.87E+05	Ci	155Eu	2.78E+01	Ci
241-AP-101	137mBa	Supernatant	A2-SltCk (Liquid)	5.54E+05	Ci	226Ra	1.04E-04	Ci
241-AP-101	137mBa	Total		5.54E+05	Ci	227Ac	1.28E-02	Ci
241-AP-101	14C	Supernatant	A2-SltCk (Liquid)	9.36E-01	Ci	228Ra	2.96E-02	Ci
241-AP-101	14C	Total		9.36E-01	Ci	229Th	5.16E-05	Ci
241-AP-101	151Sm	Supernatant	A2-SltCk (Liquid)	9.43E+03	Ci	231Pa	1.35E-01	Ci
241-AP-101	151Sm	Total		9.43E+03	Ci	232Th	5.10E-06	Ci
241-AP-101	152Eu	Supernatant	A2-SltCk (Liquid)	1.04E+00	Ci	232U	2.25E-03	Ci

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-23

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-101	152Eu	Total		1.04E+00	Ci
241-AP-101	154Eu	Supernatant	A2-SltCk (Liquid)	6.25E+00	Ci
241-AP-101	154Eu	Total		6.25E+00	Ci
241-AP-101	155Eu	Supernatant	A2-SltCk (Liquid)	2.78E+01	Ci
241-AP-101	155Eu	Total		2.78E+01	Ci
241-AP-101	226Ra	Supernatant	A2-SltCk (Liquid)	1.04E-04	Ci
241-AP-101	226Ra	Total		1.04E-04	Ci
241-AP-101	227Ac	Supernatant	A2-SltCk (Liquid)	1.28E-02	Ci
241-AP-101	227Ac	Total		1.28E-02	Ci
241-AP-101	228Ra	Supernatant	A2-SltCk (Liquid)	2.96E-02	Ci
241-AP-101	228Ra	Total		2.96E-02	Ci
241-AP-101	229Th	Supernatant	A2-SltCk (Liquid)	5.16E-05	Ci
241-AP-101	229Th	Total		5.16E-05	Ci
241-AP-101	231Pa	Supernatant	A2-SltCk (Liquid)	1.35E-01	Ci
241-AP-101	231Pa	Total		1.35E-01	Ci
241-AP-101	232Th	Supernatant	A2-SltCk (Liquid)	5.10E-06	Ci
241-AP-101	232Th	Total		5.10E-06	Ci
241-AP-101	232U	Supernatant	A2-SltCk (Liquid)	2.25E-03	Ci
241-AP-101	232U	Total		2.25E-03	Ci
241-AP-101	233U	Supernatant	A2-SltCk (Liquid)	1.98E-01	Ci
241-AP-101	233U	Total		1.98E-01	Ci
241-AP-101	234U	Supernatant	A2-SltCk (Liquid)	1.18E-01	Ci
241-AP-101	234U	Total		1.18E-01	Ci
241-AP-101	235U	Supernatant	A2-SltCk (Liquid)	4.20E-03	Ci
241-AP-101	235U	Total		4.20E-03	Ci
241-AP-101	236U	Supernatant	A2-SltCk (Liquid)	8.97E-03	Ci
241-AP-101	236U	Total		8.97E-03	Ci
241-AP-101	237Np	Supernatant	A2-SltCk (Liquid)	2.29E-02	Ci
241-AP-101	237Np	Total		2.29E-02	Ci
241-AP-101	238Pu	Supernatant	A2-SltCk (Liquid)	3.21E-02	Ci
241-AP-101	238Pu	Total		3.21E-02	Ci
241-AP-101	238U	Supernatant	A2-SltCk (Liquid)	7.65E-02	Ci
241-AP-101	238U	Total		7.65E-02	Ci
241-AP-101	239Pu	Supernatant	A2-SltCk (Liquid)	4.42E-01	Ci
241-AP-101	239Pu	Total		4.42E-01	Ci
241-AP-101	240Pu	Supernatant	A2-SltCk (Liquid)	1.15E-01	Ci
241-AP-101	240Pu	Total		1.15E-01	Ci
241-AP-101	241Am	Supernatant	A2-SltCk (Liquid)	8.13E-01	Ci
241-AP-101	241Am	Total		8.13E-01	Ci
241-AP-101	241Pu	Supernatant	A2-SltCk (Liquid)	2.02E+00	Ci
241-AP-101	241Pu	Total		2.02E+00	Ci
241-AP-101	242Cm	Supernatant	A2-SltCk (Liquid)	1.59E-03	Ci
241-AP-101	242Cm	Total		1.59E-03	Ci
241-AP-101	242Pu	Supernatant	A2-SltCk (Liquid)	1.22E-05	Ci
241-AP-101	242Pu	Total		1.22E-05	Ci
241-AP-101	243Am	Supernatant	A2-SltCk (Liquid)	5.34E-04	Ci
241-AP-101	243Am	Total		5.34E-04	Ci
241-AP-101	243Cm	Supernatant	A2-SltCk (Liquid)	8.79E-05	Ci
241-AP-101	243Cm	Total		8.79E-05	Ci
241-AP-101	244Cm	Supernatant	A2-SltCk (Liquid)	2.08E-03	Ci
241-AP-101	244Cm	Total		2.08E-03	Ci
241-AP-101	3H	Supernatant	A2-SltCk (Liquid)	1.50E+01	Ci
241-AP-101	3H	Total		1.50E+01	Ci
241-AP-101	59Ni	Supernatant	A2-SltCk (Liquid)	6.63E-01	Ci
241-AP-101	59Ni	Total		6.63E-01	Ci
241-AP-101	60Co	Supernatant	A2-SltCk (Liquid)	8.52E+00	Ci
241-AP-101	60Co	Total		8.52E+00	Ci
241-AP-101	63Ni	Supernatant	A2-SltCk (Liquid)	6.17E+01	Ci
241-AP-101	63Ni	Total		6.17E+01	Ci
241-AP-101	79Se	Supernatant	A2-SltCk (Liquid)	3.95E-01	Ci
241-AP-101	79Se	Total		3.95E-01	Ci
241-AP-101	90Sr	Supernatant	A2-SltCk (Liquid)	4.12E+02	Ci
241-AP-101	90Sr	Total		4.12E+02	Ci
241-AP-101	90Y	Supernatant	A2-SltCk (Liquid)	4.12E+02	Ci
241-AP-101	90Y	Total		4.12E+02	Ci
241-AP-101	93mNb	Supernatant	A2-SltCk (Liquid)	6.01E+01	Ci
241-AP-101	93mNb	Total		6.01E+01	Ci
241-AP-101	93Zr	Supernatant	A2-SltCk (Liquid)	7.25E+01	Ci

Summary		
233U	1.98E-01	Ci
234U	1.18E-01	Ci
235U	4.20E-03	Ci
236U	8.97E-03	Ci
237Np	2.29E-02	Ci
238Pu	3.21E-02	Ci
238U	7.65E-02	Ci
239Pu	4.42E-01	Ci
240Pu	1.15E-01	Ci
241Am	8.13E-01	Ci
241Pu	2.02E+00	Ci
242Cm	1.59E-03	Ci
242Pu	1.22E-05	Ci
243Am	5.34E-04	Ci
243Cm	8.79E-05	Ci
244Cm	2.08E-03	Ci
3H	1.50E+01	Ci
59Ni	6.63E-01	Ci
60Co	8.52E+00	Ci
63Ni	6.17E+01	Ci
79Se	3.95E-01	Ci
90Sr	4.12E+02	Ci
90Y	4.12E+02	Ci
93mNb	6.01E+01	Ci
93Zr	7.25E+01	Ci
99Tc	2.21E+02	Ci

CALCULATION SHEET

PROJECT. RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-24

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-101	93Zr	Total		7.25E+01	Ci
241-AP-101	99Tc	Supernatant	A2-SltCk (Liquid)	2.21E+02	Ci
241-AP-101	99Tc	Total		2.21E+02	Ci
241-AP-101	Ag	Supernatant	A2-SltCk (Liquid)	2.66E+00	kg
241-AP-101	Ag	Total		2.66E+00	kg
241-AP-101	Al	Supernatant	A2-SltCk (Liquid)	3.08E+04	kg
241-AP-101	Al	Total		3.08E+04	kg
241-AP-101	As	Supernatant	A2-SltCk (Liquid)	5.31E+00	kg
241-AP-101	As	Total		5.31E+00	kg
241-AP-101	B	Supernatant	A2-SltCk (Liquid)	4.03E+01	kg
241-AP-101	B	Total		4.03E+01	kg
241-AP-101	Ba	Supernatant	A2-SltCk (Liquid)	1.39E+00	kg
241-AP-101	Ba	Total		1.39E+00	kg
241-AP-101	Be	Supernatant	A2-SltCk (Liquid)	5.56E+00	kg
241-AP-101	Be	Total		5.56E+00	kg
241-AP-101	Bi	Supernatant	A2-SltCk (Liquid)	1.05E+01	kg
241-AP-101	Bi	Total		1.05E+01	kg
241-AP-101	Ca	Supernatant	A2-SltCk (Liquid)	3.25E+01	kg
241-AP-101	Ca	Total		3.25E+01	kg
241-AP-101	Cd	Supernatant	A2-SltCk (Liquid)	8.14E+00	kg
241-AP-101	Cd	Total		8.14E+00	kg
241-AP-101	Ce	Supernatant	A2-SltCk (Liquid)	3.15E-01	kg
241-AP-101	Ce	Total		3.15E-01	kg
241-AP-101	Cl	Supernatant	A2-SltCk (Liquid)	6.68E+03	kg
241-AP-101	Cl	Total		6 68E+03	kg
241-AP-101	CN	Supernatant	A2-SltCk (Liquid)	2.40E+01	kg
241-AP-101	CN	Total		2.40E+01	kg
241-AP-101	Co	Supernatant	A2-SltCk (Liquid)	1.48E+00	kg
241-AP-101	Co	Total		1.48E+00	kg
241-AP-101	Cr	Supernatant	A2-SltCk (Liquid)	7.27E+02	kg
241-AP-101	Cr	Total		7.27E+02	kg
241-AP-101	Cu	Supernatant	A2-SltCk (Liquid)	6.74E+00	kg
241-AP-101	Cu	Total		6.74E+00	kg
241-AP-101	F	Supernatant	A2-SltCk (Liquid)	7.95E+03	kg
241-AP-101	F	Total		7.95E+03	kg
241-AP-101	Fe	Supernatant	A2-SltCk (Liquid)	1.57E+01	kg
241-AP-101	Fe	Total		1.57E+01	kg
241-AP-101	Free OH	Supernatant	A2-SltCk (Liquid)	1.68E+05	kg
241-AP-101	Free OH	Total		1.68E+05	kg
241-AP-101	Hg	Supernatant	A2-SltCk (Liquid)	3.36E-02	kg
241-AP-101	Hg	Total		3.36E-02	kg
241-AP-101	K	Supernatant	A2-SltCk (Liquid)	1.43E+05	kg
241-AP-101	K	Total		1.43E+05	kg
241-AP-101	La	Supernatant	A2-SltCk (Liquid)	1.90E-03	kg
241-AP-101	La	Total		1.90E-03	kg
241-AP-101	Li	Supernatant	A2-SltCk (Liquid)	1.43E+00	kg
241-AP-101	Li	Total		1.43E+00	kg
241-AP-101	Mg	Supernatant	A2-SltCk (Liquid)	1.05E+01	kg
241-AP-101	Mg	Total		1.05E+01	kg
241-AP-101	Mn	Supernatant	A2-SltCk (Liquid)	5.48E+00	kg
241-AP-101	Mn	Total		5.48E+00	kg
241-AP-101	Mo	Supernatant	A2-SltCk (Liquid)	6.25E+01	kg
241-AP-101	Mo	Total		6.25E+01	kg
241-AP-101	Na	Supernatant	A2-SltCk (Liquid)	5.46E+05	kg
241-AP-101	Na	Total		5.46E+05	kg
241-AP-101	Nd	Supernatant	A2-SltCk (Liquid)	1.05E+01	kg
241-AP-101	Nd	Total		1.05E+01	kg
241-AP-101	NH3	Supernatant	A2-SltCk (Liquid)	4.04E+02	kg
241-AP-101	NH3	Total		4.04E+02	kg
241-AP-101	Ni	Supernatant	A2-SltCk (Liquid)	2.61E+01	kg
241-AP-101	Ni	Total		2.61E+01	kg
241-AP-101	NO2	Supernatant	A2-SltCk (Liquid)	1.72E+05	kg
241-AP-101	NO2	Total		1.72E+05	kg
241-AP-101	NO3	Supernatant	A2-SltCk (Liquid)	4.96E+05	kg
241-AP-101	NO3	Total		4.96E+05	kg
241-AP-101	Oxalate	Supernatant	A2-SltCk (Liquid)	4.49E+03	kg
241-AP-101	Oxalate	Total		4.49E+03	kg
241-AP-101	Pb	Supernatant	A2-SltCk (Liquid)	5.13E+01	kg

Summary	
Summary	
Ag	2.66E+00 kg
Al	3.08E+04 kg
As	5.31E+00 kg
B	4.03E+01 kg
Ba	1.39E+00 kg
Be	5.56E+00 kg
Bi	1.05E+01 kg
Ca	3.25E+01 kg
Cd	8.14E+00 kg
Ce	3.15E-01 kg
Cl	6.68E+03 kg
CN	2.40E+01 kg
Co	1.48E+00 kg
Cr	7.27E+02 kg
Cu	6.74E+00 kg
F	7.95E+03 kg
Fe	1.57E+01 kg
Free OH	1.68E+05 kg
Hg	3.36E-02 kg
K	1.43E+05 kg
La	1.90E-03 kg
Li	1.43E+00 kg
Mg	1.05E+01 kg
Mn	5.48E+00 kg
Mo	6.25E+01 kg
Na	5.46E+05 kg
Nd	1.05E+01 kg
NH3	4.04E+02 kg
Ni	2.61E+01 kg
NO2	1.72E+05 kg
NO3	4.96E+05 kg
Oxalate	4.49E+03 kg
Pb	5.13E+01 kg
Pd	8.01E+01 kg
PO4	5.31E+03 kg
Pr	7.29E-02 kg
Rb	1.67E+01 kg
Rh	3.20E+01 kg
Ru	1.18E+02 kg
Sb	1.77E-01 kg
Se	9.69E+00 kg
Si	4.21E+02 kg
SO4	1.62E+04 kg
Sr	1.24E-01 kg
Ta	3.75E-01 kg
Te	6.87E-01 kg
Th	4.64E-02 kg
Ti	2.66E+00 kg
TIC as CO3	1.40E+05 kg
Tl	7.59E-02 kg
TOC	8.00E+03 kg
UTOTAL	2.30E+02 kg
V	3.15E+00 kg
W	1.21E+02 kg
Y	6.66E+00 kg
Zn	2.36E+01 kg
Zr	5.90E+00 kg

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-25

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AP-101	Pb	Total		5.13E+01	kg	
241-AP-101	Pd	Supernatant	A2-SltCk (Liquid)	8.01E+01	kg	
241-AP-101	Pd	Total		8.01E+01	kg	
241-AP-101	PO4	Supernatant	A2-SltCk (Liquid)	5.31E+03	kg	
241-AP-101	PO4	Total		5.31E+03	kg	
241-AP-101	Pr	Supernatant	A2-SltCk (Liquid)	7.29E-02	kg	
241-AP-101	Pr	Total		7.29E-02	kg	
241-AP-101	Rb	Supernatant	A2-SltCk (Liquid)	1.67E+01	kg	
241-AP-101	Rb	Total		1.67E+01	kg	
241-AP-101	Rh	Supernatant	A2-SltCk (Liquid)	3.20E+01	kg	
241-AP-101	Rh	Total		3.20E+01	kg	
241-AP-101	Ru	Supernatant	A2-SltCk (Liquid)	1.18E+02	kg	
241-AP-101	Ru	Total		1.18E+02	kg	
241-AP-101	Sb	Supernatant	A2-SltCk (Liquid)	1.77E-01	kg	
241-AP-101	Sb	Total		1.77E-01	kg	
241-AP-101	Se	Supernatant	A2-SltCk (Liquid)	9.69E+00	kg	
241-AP-101	Se	Total		9.69E+00	kg	
241-AP-101	Si	Supernatant	A2-SltCk (Liquid)	4.21E+02	kg	
241-AP-101	Si	Total		4.21E+02	kg	
241-AP-101	SO4	Supernatant	A2-SltCk (Liquid)	1.62E+04	kg	
241-AP-101	SO4	Total		1.62E+04	kg	
241-AP-101	Sr	Supernatant	A2-SltCk (Liquid)	1.24E-01	kg	
241-AP-101	Sr	Total		1.24E-01	kg	
241-AP-101	Ta	Supernatant	A2-SltCk (Liquid)	3.75E-01	kg	
241-AP-101	Ta	Total		3.75E-01	kg	
241-AP-101	Te	Supernatant	A2-SltCk (Liquid)	6.87E-01	kg	
241-AP-101	Te	Total		6.87E-01	kg	
241-AP-101	Th	Supernatant	A2-SltCk (Liquid)	4.64E-02	kg	
241-AP-101	Th	Total		4.64E-02	kg	
241-AP-101	Ti	Supernatant	A2-SltCk (Liquid)	2.66E+00	kg	
241-AP-101	Ti	Total		2.66E+00	kg	
241-AP-101	TIC as CO3	Supernatant	A2-SltCk (Liquid)	1.40E+05	kg	
241-AP-101	TIC as CO3	Total		1.40E+05	kg	
241-AP-101	Tl	Supernatant	A2-SltCk (Liquid)	7.59E-02	kg	
241-AP-101	Tl	Total		7.59E-02	kg	
241-AP-101	TOC	Supernatant	A2-SltCk (Liquid)	8.00E+03	kg	
241-AP-101	TOC	Total		8.00E+03	kg	
241-AP-101	UTOTAL	Supernatant	A2-SltCk (Liquid)	2.30E+02	kg	
241-AP-101	UTOTAL	Total		2.30E+02	kg	
241-AP-101	V	Supernatant	A2-SltCk (Liquid)	3.15E+00	kg	
241-AP-101	V	Total		3.15E+00	kg	
241-AP-101	W	Supernatant	A2-SltCk (Liquid)	1.21E+02	kg	
241-AP-101	W	Total		1.21E+02	kg	
241-AP-101	Y	Supernatant	A2-SltCk (Liquid)	6.66E+00	kg	
241-AP-101	Y	Total		6.66E+00	kg	
241-AP-101	Zn	Supernatant	A2-SltCk (Liquid)	2.36E+01	kg	
241-AP-101	Zn	Total		2.36E+01	kg	
241-AP-101	Zr	Supernatant	A2-SltCk (Liquid)	5.90E+00	kg	
241-AP-101	Zr	Total		5.90E+00	kg	

241-AP-102	106Ru	Sludge	NA	2.42E-07	Ci	Summary	
241-AP-102	106Ru	Supernatant	Waste Transfer	1.40E-05	Ci	106Ru	1.40E-05 Ci
241-AP-102	106Ru	Total		1.43E-05	Ci	113mCd	9.25E+01 Ci
241-AP-102	113mCd	Sludge	NA	1.53E+00	Ci	125Sb	2.77E+01 Ci
241-AP-102	113mCd	Supernatant	Waste Transfer	9.25E+01	Ci	126Sn	3.39E+00 Ci
241-AP-102	113mCd	Total		9.41E+01	Ci	129I	1.24E+00 Ci
241-AP-102	125Sb	Sludge	NA	7.30E-01	Ci	134Cs	7.14E-01 Ci
241-AP-102	125Sb	Supernatant	Waste Transfer	2.77E+01	Ci	137Cs	9.67E+05 Ci
241-AP-102	125Sb	Total		2.84E+01	Ci	137mBa	9.13E+05 Ci
241-AP-102	126Sn	Sludge	NA	5.71E-02	Ci	14C	1.09E+01 Ci
241-AP-102	126Sn	Supernatant	Waste Transfer	3.39E+00	Ci	151Sm	1.82E+04 Ci
241-AP-102	126Sn	Total		3.45E+00	Ci	152Eu	4.42E+00 Ci
241-AP-102	129I	Sludge	NA	1.77E-02	Ci	154Eu	1.26E+02 Ci
241-AP-102	129I	Supernatant	Waste Transfer	1.24E+00	Ci	155Eu	7.07E+01 Ci
241-AP-102	129I	Total		1.25E+00	Ci	226Ra	2.29E-04 Ci
241-AP-102	134Cs	Sludge	NA	7.13E-03	Ci	227Ac	3.67E-03 Ci

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-26

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-102	134Cs	Supernatant	Waste Transfer	7.14E-01	Ci
241-AP-102	134Cs	Total		7.21E-01	Ci
241-AP-102	137Cs	Sludge	NA	1.25E+04	Ci
241-AP-102	137Cs	Supernatant	Waste Transfer	9.67E+05	Ci
241-AP-102	137Cs	Total		9.80E+05	Ci
241-AP-102	137mBa	Sludge	NA	1.18E+04	Ci
241-AP-102	137mBa	Supernatant	Waste Transfer	9.13E+05	Ci
241-AP-102	137mBa	Total		9.25E+05	Ci
241-AP-102	14C	Sludge	NA	7.41E-01	Ci
241-AP-102	14C	Supernatant	Waste Transfer	1.09E+01	Ci
241-AP-102	14C	Total		1.16E+01	Ci
241-AP-102	151Sm	Sludge	NA	3.08E+02	Ci
241-AP-102	151Sm	Supernatant	Waste Transfer	1.82E+04	Ci
241-AP-102	151Sm	Total		1.85E+04	Ci
241-AP-102	152Eu	Sludge	NA	7.34E-02	Ci
241-AP-102	152Eu	Supernatant	Waste Transfer	4.42E+00	Ci
241-AP-102	152Eu	Total		4.49E+00	Ci
241-AP-102	154Eu	Sludge	NA	6.16E+00	Ci
241-AP-102	154Eu	Supernatant	Waste Transfer	1.26E+02	Ci
241-AP-102	154Eu	Total		1.32E+02	Ci
241-AP-102	155Eu	Sludge	NA	1.37E+00	Ci
241-AP-102	155Eu	Supernatant	Waste Transfer	7.07E+01	Ci
241-AP-102	155Eu	Total		7.20E+01	Ci
241-AP-102	226Ra	Sludge	NA	3.82E-06	Ci
241-AP-102	226Ra	Supernatant	Waste Transfer	2.29E-04	Ci
241-AP-102	226Ra	Total		2.33E-04	Ci
241-AP-102	227Ac	Sludge	NA	4.04E-05	Ci
241-AP-102	227Ac	Supernatant	Waste Transfer	3.67E-03	Ci
241-AP-102	227Ac	Total		3.71E-03	Ci
241-AP-102	228Ra	Sludge	NA	4.70E-03	Ci
241-AP-102	228Ra	Supernatant	Waste Transfer	3.03E-01	Ci
241-AP-102	228Ra	Total		3.08E-01	Ci
241-AP-102	229Th	Sludge	NA	1.66E-04	Ci
241-AP-102	229Th	Supernatant	Waste Transfer	9.96E-03	Ci
241-AP-102	229Th	Total		1.01E-02	Ci
241-AP-102	231Pa	Sludge	NA	1.09E-04	Ci
241-AP-102	231Pa	Supernatant	Waste Transfer	6.36E-03	Ci
241-AP-102	231Pa	Total		6.47E-03	Ci
241-AP-102	232Th	Sludge	NA	7.70E-04	Ci
241-AP-102	232Th	Supernatant	Waste Transfer	4.86E-02	Ci
241-AP-102	232Th	Total		4.94E-02	Ci
241-AP-102	232U	Sludge	NA	2.22E-03	Ci
241-AP-102	232U	Supernatant	Waste Transfer	2.56E-02	Ci
241-AP-102	232U	Total		2.78E-02	Ci
241-AP-102	233U	Sludge	NA	9.38E-03	Ci
241-AP-102	233U	Supernatant	Waste Transfer	1.09E-01	Ci
241-AP-102	233U	Total		1.18E-01	Ci
241-AP-102	234U	Sludge	NA	1.63E-03	Ci
241-AP-102	234U	Supernatant	Waste Transfer	2.01E-02	Ci
241-AP-102	234U	Total		2.17E-02	Ci
241-AP-102	235U	Sludge	NA	6.47E-05	Ci
241-AP-102	235U	Supernatant	Waste Transfer	7.96E-04	Ci
241-AP-102	235U	Total		8.61E-04	Ci
241-AP-102	236U	Sludge	NA	5.22E-05	Ci
241-AP-102	236U	Supernatant	Waste Transfer	6.46E-04	Ci
241-AP-102	236U	Total		6.99E-04	Ci
241-AP-102	237Np	Sludge	NA	3.88E-02	Ci
241-AP-102	237Np	Supernatant	Waste Transfer	1.91E+00	Ci
241-AP-102	237Np	Total		1.95E+00	Ci
241-AP-102	238Pu	Sludge	NA	1.85E-03	Ci
241-AP-102	238Pu	Supernatant	Waste Transfer	3.24E-02	Ci
241-AP-102	238Pu	Total		3.43E-02	Ci
241-AP-102	238U	Sludge	NA	1.45E-03	Ci
241-AP-102	238U	Supernatant	Waste Transfer	1.79E-02	Ci
241-AP-102	238U	Total		1.93E-02	Ci
241-AP-102	239Pu	Sludge	NA	7.21E-02	Ci
241-AP-102	239Pu	Supernatant	Waste Transfer	1.25E+00	Ci
241-AP-102	239Pu	Total		1.32E+00	Ci

Summary		
228Ra	3.03E-01	Ci
229Th	9.96E-03	Ci
231Pa	6.36E-03	Ci
232Th	4.86E-02	Ci
232U	2.56E-02	Ci
233U	1.09E-01	Ci
234U	2.01E-02	Ci
235U	7.96E-04	Ci
236U	6.46E-04	Ci
237Np	1.91E+00	Ci
238Pu	3.24E-02	Ci
238U	1.79E-02	Ci
239Pu	1.25E+00	Ci
240Pu	2.11E-01	Ci
241Am	7.00E+00	Ci
241Pu	1.50E+00	Ci
242Cm	2.25E-02	Ci
242Pu	1.29E-05	Ci
243Am	2.56E-04	Ci
243Cm	2.88E-03	Ci
244Cm	4.19E-02	Ci
3H	4.33E+01	Ci
59Ni	1.25E+00	Ci
60Co	1.50E+01	Ci
63Ni	1.17E+02	Ci
79Se	3.09E+00	Ci
90Sr	1.56E+03	Ci
90Y	1.56E+03	Ci
93mNb	2.94E+01	Ci
93Zr	3.41E+01	Ci
99Tc	6.54E+02	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-27

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AP-102	240Pu	Sludge	NA	1.22E-02	Ci		
241-AP-102	240Pu	Supernatant	Waste Transfer	2.11E-01	Ci		
241-AP-102	240Pu	Total		2.23E-01	Ci		
241-AP-102	241Am	Sludge	NA	1.07E-01	Ci		
241-AP-102	241Am	Supernatant	Waste Transfer	7.00E+00	Ci		
241-AP-102	241Am	Total		7.11E+00	Ci		
241-AP-102	241Pu	Sludge	NA	8.58E-02	Ci		
241-AP-102	241Pu	Supernatant	Waste Transfer	1.50E+00	Ci		
241-AP-102	241Pu	Total		1.58E+00	Ci		
241-AP-102	242Cm	Sludge	NA	2.77E-04	Ci		
241-AP-102	242Cm	Supernatant	Waste Transfer	2.25E-02	Ci		
241-AP-102	242Cm	Total		2.27E-02	Ci		
241-AP-102	242Pu	Sludge	NA	7.41E-07	Ci		
241-AP-102	242Pu	Supernatant	Waste Transfer	1.29E-05	Ci		
241-AP-102	242Pu	Total		1.36E-05	Ci		
241-AP-102	243Am	Sludge	NA	3.89E-06	Ci		
241-AP-102	243Am	Supernatant	Waste Transfer	2.56E-04	Ci		
241-AP-102	243Am	Total		2.60E-04	Ci		
241-AP-102	243Cm	Sludge	NA	2.29E-05	Ci		
241-AP-102	243Cm	Supernatant	Waste Transfer	2.88E-03	Ci		
241-AP-102	243Cm	Total		2.91E-03	Ci		
241-AP-102	244Cm	Sludge	NA	1.97E-04	Ci		
241-AP-102	244Cm	Supernatant	Waste Transfer	4.19E-02	Ci		
241-AP-102	244Cm	Total		4.21E-02	Ci		
241-AP-102	3H	Sludge	NA	4.09E+00	Ci		
241-AP-102	3H	Supernatant	Waste Transfer	4.33E+01	Ci		
241-AP-102	3H	Total		4.74E+01	Ci		
241-AP-102	59Ni	Sludge	NA	3.82E-02	Ci		
241-AP-102	59Ni	Supernatant	Waste Transfer	1.25E+00	Ci		
241-AP-102	59Ni	Total		1.29E+00	Ci		
241-AP-102	60Co	Sludge	NA	2.13E-01	Ci		
241-AP-102	60Co	Supernatant	Waste Transfer	1.50E+01	Ci		
241-AP-102	60Co	Total		1.52E+01	Ci		
241-AP-102	63Ni	Sludge	NA	3.51E+00	Ci		
241-AP-102	63Ni	Supernatant	Waste Transfer	1.17E+02	Ci		
241-AP-102	63Ni	Total		1.20E+02	Ci		
241-AP-102	79Se	Sludge	NA	5.05E-03	Ci		
241-AP-102	79Se	Supernatant	Waste Transfer	3.09E+00	Ci		
241-AP-102	79Se	Total		3.09E+00	Ci		
241-AP-102	90Sr	Sludge	NA	5.66E+01	Ci		
241-AP-102	90Sr	Supernatant	Waste Transfer	1.56E+03	Ci		
241-AP-102	90Sr	Total		1.62E+03	Ci		
241-AP-102	90Y	Sludge	NA	5.66E+01	Ci		
241-AP-102	90Y	Supernatant	Waste Transfer	1.56E+03	Ci		
241-AP-102	90Y	Total		1.62E+03	Ci		
241-AP-102	93mNb	Sludge	NA	3.99E-01	Ci		
241-AP-102	93mNb	Supernatant	Waste Transfer	2.94E+01	Ci		
241-AP-102	93mNb	Total		2.98E+01	Ci		
241-AP-102	93Zr	Sludge	NA	4.62E-01	Ci		
241-AP-102	93Zr	Supernatant	Waste Transfer	3.41E+01	Ci		
241-AP-102	93Zr	Total		3.46E+01	Ci		
241-AP-102	99Tc	Sludge	NA	1.05E+01	Ci		
241-AP-102	99Tc	Supernatant	Waste Transfer	6.54E+02	Ci		
241-AP-102	99Tc	Total		6.65E+02	Ci		
241-AP-102	Al	Sludge	NA	1.57E+04	kg	Summary	
241-AP-102	Al	Supernatant	Waste Transfer	1.25E+05	kg	Ag	0.00E+00 kg
241-AP-102	Al	Total		1.41E+05	kg	Al	1.25E+05 kg
241-AP-102	Bi	Sludge	NA	1.52E+00	kg	As	0.00E+00 kg
241-AP-102	Bi	Supernatant	Waste Transfer	9.10E+01	kg	B	0.00E+00 kg
241-AP-102	Bi	Total		9.26E+01	kg	Ba	0.00E+00 kg
241-AP-102	Ca	Sludge	NA	1.65E+04	kg	Be	0.00E+00 kg
241-AP-102	Ca	Supernatant	Waste Transfer	1.04E+02	kg	Bi	9.10E+01 kg
241-AP-102	Ca	Total		1.66E+04	kg	Ca	1.04E+02 kg
241-AP-102	Cl	Sludge	NA	2.91E+02	kg	Cd	0.00E+00 kg
241-AP-102	Cl	Supernatant	Waste Transfer	2.44E+04	kg	Ce	0.00E+00 kg
241-AP-102	Cl	Total		2.47E+04	kg	Cl	2.44E+04 kg
241-AP-102	Cr	Sludge	NA	2.59E+01	kg	CN	0.00E+00 kg
241-AP-102	Cr	Supernatant	Waste Transfer	2.37E+03	kg	Co	0.00E+00 kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-28

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-102	Cr	Total		2.40E+03	kg
241-AP-102	F	Sludge	NA	8.21E+00	kg
241-AP-102	F	Supernatant	Waste Transfer	5.09E+02	kg
241-AP-102	F	Total		5.18E+02	kg
241-AP-102	Fe	Sludge	NA	9.07E-01	kg
241-AP-102	Fe	Supernatant	Waste Transfer	2.39E+01	kg
241-AP-102	Fe	Total		2.48E+01	kg
241-AP-102	Free OH	Sludge	NA	1.20E+03	kg
241-AP-102	Free OH	Supernatant	Waste Transfer	1.30E+05	kg
241-AP-102	Free OH	Total		1.31E+05	kg
241-AP-102	Hg	Sludge	NA	0.00E+00	kg
241-AP-102	Hg	Supernatant	Waste Transfer	1.28E-05	kg
241-AP-102	Hg	Total		1.28E-05	kg
241-AP-102	K	Sludge	NA	1.85E+02	kg
241-AP-102	K	Supernatant	Waste Transfer	1.65E+04	kg
241-AP-102	K	Total		1.66E+04	kg
241-AP-102	La	Sludge	NA	4.60E-01	kg
241-AP-102	La	Supernatant	Waste Transfer	1.07E+01	kg
241-AP-102	La	Total		1.11E+01	kg
241-AP-102	Mn	Sludge	NA	1.49E+00	kg
241-AP-102	Mn	Supernatant	Waste Transfer	9.77E+00	kg
241-AP-102	Mn	Total		1.13E+01	kg
241-AP-102	Na	Sludge	NA	9.18E+03	kg
241-AP-102	Na	Supernatant	Waste Transfer	7.88E+05	kg
241-AP-102	Na	Total		7.98E+05	kg
241-AP-102	Ni	Sludge	NA	1.28E+00	kg
241-AP-102	Ni	Supernatant	Waste Transfer	3.49E+01	kg
241-AP-102	Ni	Total		3.61E+01	kg
241-AP-102	NO2	Sludge	NA	4.67E+03	kg
241-AP-102	NO2	Supernatant	Waste Transfer	3.98E+05	kg
241-AP-102	NO2	Total		4.03E+05	kg
241-AP-102	NO3	Sludge	NA	7.58E+03	kg
241-AP-102	NO3	Supernatant	Waste Transfer	6.78E+05	kg
241-AP-102	NO3	Total		6.86E+05	kg
241-AP-102	Oxalate	Sludge	NA	4.10E+01	kg
241-AP-102	Oxalate	Supernatant	Waste Transfer	1.24E+04	kg
241-AP-102	Oxalate	Total		1.25E+04	kg
241-AP-102	Pb	Sludge	NA	2.65E+00	kg
241-AP-102	Pb	Supernatant	Waste Transfer	2.09E+02	kg
241-AP-102	Pb	Total		2.11E+02	kg
241-AP-102	PO4	Sludge	NA	2.65E+04	kg
241-AP-102	PO4	Supernatant	Waste Transfer	1.31E+04	kg
241-AP-102	PO4	Total		3.96E+04	kg
241-AP-102	Si	Sludge	NA	3.74E+00	kg
241-AP-102	Si	Supernatant	Waste Transfer	1.82E+02	kg
241-AP-102	Si	Total		1.86E+02	kg
241-AP-102	SO4	Sludge	NA	1.51E+02	kg
241-AP-102	SO4	Supernatant	Waste Transfer	9.97E+03	kg
241-AP-102	SO4	Total		1.01E+04	kg
241-AP-102	Sr	Sludge	NA	1.53E-01	kg
241-AP-102	Sr	Supernatant	Waste Transfer	4.68E+00	kg
241-AP-102	Sr	Total		4.83E+00	kg
241-AP-102	Th	Sludge	NA	6.99E+00	kg
241-AP-102	Th	Supernatant	Waste Transfer	4 43E+02	kg
241-AP-102	Th	Total		4.50E+02	kg
241-AP-102	TIC as CO3	Sludge	NA	1.10E+03	kg
241-AP-102	TIC as CO3	Supernatant	Waste Transfer	4.89E+04	kg
241-AP-102	TIC as CO3	Total		5.00E+04	kg
241-AP-102	TOC	Sludge	NA	2.16E+02	kg
241-AP-102	TOC	Supernatant	Waste Transfer	1.22E+04	kg
241-AP-102	TOC	Total		1.24E+04	kg
241-AP-102	UTOTAL	Sludge	NA	4.36E+00	kg
241-AP-102	UTOTAL	Supernatant	Waste Transfer	5.35E+01	kg
241-AP-102	UTOTAL	Total		5.79E+01	kg
241-AP-102	Zr	Sludge	NA	8.25E-01	kg
241-AP-102	Zr	Supernatant	Waste Transfer	8.41E+00	kg
241-AP-102	Zr	Total		9.24E+00	kg

Summary		
Cr	2.37E+03	kg
Cu	0.00E+00	kg
F	5.09E+02	kg
Fe	2.39E+01	kg
Free OH	1.30E+05	kg
Hg	1.28E-05	kg
K	1.65E+04	kg
La	1.07E+01	kg
Li	0.00E+00	kg
Mg	0.00E+00	kg
Mn	9.77E+00	kg
Mo	0.00E+00	kg
Na	7.88E+05	kg
Nd	0.00E+00	kg
NH3	0.00E+00	kg
Ni	3.49E+01	kg
NO2	3.98E+05	kg
NO3	6.78E+05	kg
Oxalate	1.24E+04	kg
Pb	2.09E+02	kg
Pd	0.00E+00	kg
PO4	1.31E+04	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	0.00E+00	kg
Se	0.00E+00	kg
Si	1.82E+02	kg
SO4	9.97E+03	kg
Sr	4.68E+00	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	4.43E+02	kg
Ti	0.00E+00	kg
TIC as CO3	4.89E+04	kg
Tl	0.00E+00	kg
TOC	1.22E+04	kg
UTOTAL	5.35E+01	kg
V	0.00E+00	kg
W	0.00E+00	kg
Y	0.00E+00	kg
Zn	0.00E+00	kg
Zr	8.41E+00	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.. C-29

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-103	106Ru	Supernatant	NA	1.48E-05	Ci
241-AP-103	106Ru	Total		1.48E-05	Ci
241-AP-103	113mCd	Supernatant	NA	9.47E+01	Ci
241-AP-103	113mCd	Total		9.47E+01	Ci
241-AP-103	125Sb	Supernatant	NA	2.91E+01	Ci
241-AP-103	125Sb	Total		2.91E+01	Ci
241-AP-103	126Sn	Supernatant	NA	3.66E+00	Ci
241-AP-103	126Sn	Total		3.66E+00	Ci
241-AP-103	129I	Supernatant	NA	1.26E+00	Ci
241-AP-103	129I	Total		1.26E+00	Ci
241-AP-103	134Cs	Supernatant	NA	3.56E+00	Ci
241-AP-103	134Cs	Total		3.56E+00	Ci
241-AP-103	137Cs	Supernatant	NA	7.75E+05	Ci
241-AP-103	137Cs	Total		7.75E+05	Ci
241-AP-103	137mBa	Supernatant	NA	7.31E+05	Ci
241-AP-103	137mBa	Total		7.32E+05	Ci
241-AP-103	14C	Supernatant	NA	4.13E+01	Ci
241-AP-103	14C	Total		4.13E+01	Ci
241-AP-103	151Sm	Supernatant	NA	1.93E+04	Ci
241-AP-103	151Sm	Total		1.93E+04	Ci
241-AP-103	152Eu	Supernatant	NA	4.69E+00	Ci
241-AP-103	152Eu	Total		4.69E+00	Ci
241-AP-103	154Eu	Supernatant	NA	4.78E+01	Ci
241-AP-103	154Eu	Total		4.78E+01	Ci
241-AP-103	155Eu	Supernatant	NA	5.16E+01	Ci
241-AP-103	155Eu	Total		5.16E+01	Ci
241-AP-103	226Ra	Supernatant	NA	2.55E-04	Ci
241-AP-103	226Ra	Total		2.55E-04	Ci
241-AP-103	227Ac	Supernatant	NA	3.01E-03	Ci
241-AP-103	227Ac	Total		3.01E-03	Ci
241-AP-103	228Ra	Supernatant	NA	1.26E-01	Ci
241-AP-103	228Ra	Total		1.26E-01	Ci
241-AP-103	229Th	Supernatant	NA	7.72E-03	Ci
241-AP-103	229Th	Total		7.72E-03	Ci
241-AP-103	231Pa	Supernatant	NA	6.94E-03	Ci
241-AP-103	231Pa	Total		6.94E-03	Ci
241-AP-103	232Th	Supernatant	NA	3.86E-02	Ci
241-AP-103	232Th	Total		3.86E-02	Ci
241-AP-103	232U	Supernatant	NA	9.94E-03	Ci
241-AP-103	232U	Total		9.94E-03	Ci
241-AP-103	233U	Supernatant	NA	4.20E-02	Ci
241-AP-103	233U	Total		4.20E-02	Ci
241-AP-103	234U	Supernatant	NA	1.76E-02	Ci
241-AP-103	234U	Total		1.76E-02	Ci
241-AP-103	235U	Supernatant	NA	7.35E-04	Ci
241-AP-103	235U	Total		7.35E-04	Ci
241-AP-103	236U	Supernatant	NA	6.13E-04	Ci
241-AP-103	236U	Total		6.13E-04	Ci
241-AP-103	237Np	Supernatant	NA	1.68E-01	Ci
241-AP-103	237Np	Total		1.68E-01	Ci
241-AP-103	238Pu	Supernatant	NA	9.77E-02	Ci
241-AP-103	238Pu	Total		9.77E-02	Ci
241-AP-103	238U	Supernatant	NA	1.61E-02	Ci
241-AP-103	238U	Total		1.61E-02	Ci
241-AP-103	239Pu	Supernatant	NA	3.16E+00	Ci
241-AP-103	239Pu	Total		3.16E+00	Ci
241-AP-103	240Pu	Supernatant	NA	5.28E-01	Ci
241-AP-103	240Pu	Total		5.28E-01	Ci
241-AP-103	241Am	Supernatant	NA	3.74E+01	Ci
241-AP-103	241Am	Total		3.74E+01	Ci
241-AP-103	241Pu	Supernatant	NA	4.29E+00	Ci
241-AP-103	241Pu	Total		4.29E+00	Ci
241-AP-103	242Cm	Supernatant	NA	1.19E-01	Ci
241-AP-103	242Cm	Total		1.19E-01	Ci
241-AP-103	242Pu	Supernatant	NA	4.17E-05	Ci
241-AP-103	242Pu	Total		4.17E-05	Ci

Summary		
106Ru	1.48E-05	Ci
113mCd	9.47E+01	Ci
125Sb	2.91E+01	Ci
126Sn	3.66E+00	Ci
129I	1.26E+00	Ci
134Cs	3.56E+00	Ci
137Cs	7.75E+05	Ci
137mBa	7.32E+05	Ci
14C	4.13E+01	Ci
151Sm	1.93E+04	Ci
152Eu	4.69E+00	Ci
154Eu	4.78E+01	Ci
155Eu	5.16E+01	Ci
226Ra	2.55E-04	Ci
227Ac	3.01E-03	Ci
228Ra	1.26E-01	Ci
229Th	7.72E-03	Ci
231Pa	6.94E-03	Ci
232Th	3.86E-02	Ci
232U	9.94E-03	Ci
233U	4.20E-02	Ci
234U	1.76E-02	Ci
235U	7.35E-04	Ci
236U	6.13E-04	Ci
237Np	1.68E-01	Ci
238Pu	9.77E-02	Ci
238U	1.61E-02	Ci
239Pu	3.16E+00	Ci
240Pu	5.28E-01	Ci
241Am	3.74E+01	Ci
241Pu	4.29E+00	Ci
242Cm	1.19E-01	Ci
242Pu	4.17E-05	Ci
243Am	1.39E-03	Ci
243Cm	1.60E-02	Ci
244Cm	2.22E-01	Ci
3H	2.06E+02	Ci
59Ni	1.22E+00	Ci
60Co	3.55E+01	Ci
63Ni	1.16E+02	Ci
79Se	2.21E+00	Ci
90Sr	8.15E+03	Ci
90Y	8.15E+03	Ci
93mNb	2.21E+01	Ci
93Zr	2.75E+01	Ci
99Tc	7.93E+02	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-30

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary		
241-AP-103	243Am	Supernatant	NA	1.39E-03	Ci			
241-AP-103	243Am	Total		1.39E-03	Ci			
241-AP-103	243Cm	Supernatant	NA	1.60E-02	Ci			
241-AP-103	243Cm	Total		1.60E-02	Ci			
241-AP-103	244Cm	Supernatant	NA	2.22E-01	Ci			
241-AP-103	244Cm	Total		2.22E-01	Ci			
241-AP-103	3H	Supernatant	NA	2.06E+02	Ci			
241-AP-103	3H	Total		2.06E+02	Ci			
241-AP-103	59Ni	Supernatant	NA	1.22E+00	Ci			
241-AP-103	59Ni	Total		1.22E+00	Ci			
241-AP-103	60Co	Supernatant	NA	3.55E+01	Ci			
241-AP-103	60Co	Total		3.55E+01	Ci			
241-AP-103	63Ni	Supernatant	NA	1.16E+02	Ci			
241-AP-103	63Ni	Total		1.16E+02	Ci			
241-AP-103	79Se	Supernatant	NA	2.21E+00	Ci			
241-AP-103	79Se	Total		2.21E+00	Ci			
241-AP-103	90Sr	Supernatant	NA	8.15E+03	Ci			
241-AP-103	90Sr	Total		8.15E+03	Ci			
241-AP-103	90Y	Supernatant	NA	8.15E+03	Ci			
241-AP-103	90Y	Total		8.15E+03	Ci			
241-AP-103	93mNb	Supernatant	NA	2.21E+01	Ci			
241-AP-103	93mNb	Total		2.21E+01	Ci			
241-AP-103	93Zr	Supernatant	NA	2.75E+01	Ci			
241-AP-103	93Zr	Total		2.75E+01	Ci			
241-AP-103	99Tc	Supernatant	NA	7.93E+02	Ci			
241-AP-103	99Tc	Total		7.93E+02	Ci			
241-AP-103	Ag	Supernatant	NA	2.52E+01	kg	Summary		
241-AP-103	Ag	Total		2.52E+01	kg	Ag	2.52E+01	kg
241-AP-103	Al	Supernatant	NA	6.20E+04	kg	Al	6.20E+04	kg
241-AP-103	Al	Total		6.20E+04	kg	As	1.17E+02	kg
241-AP-103	As	Supernatant	NA	1.17E+02	kg	B	1.44E+02	kg
241-AP-103	As	Total		1.17E+02	kg	Ba	7.29E+01	kg
241-AP-103	B	Supernatant	NA	1.44E+02	kg	Be	7.56E+00	kg
241-AP-103	B	Total		1.44E+02	kg	Bi	1.35E+02	kg
241-AP-103	Ba	Supernatant	NA	7.29E+01	kg	Ca	2.58E+02	kg
241-AP-103	Ba	Total		7.29E+01	kg	Cd	3.27E+01	kg
241-AP-103	Be	Supernatant	NA	7.56E+00	kg	Ce	1.46E+02	kg
241-AP-103	Be	Total		7.56E+00	kg	Cl	1.45E+04	kg
241-AP-103	Bi	Supernatant	NA	1.35E+02	kg	CN	0.00E+00	kg
241-AP-103	Bi	Total		1.35E+02	kg	Co	2.92E+01	kg
241-AP-103	Ca	Supernatant	NA	2.58E+02	kg	Cr	1.99E+03	kg
241-AP-103	Ca	Total		2.58E+02	kg	Cu	1.64E+01	kg
241-AP-103	Cd	Supernatant	NA	3.27E+01	kg	F	2.77E+03	kg
241-AP-103	Cd	Total		3.27E+01	kg	Fe	7.56E+01	kg
241-AP-103	Ce	Supernatant	NA	1.46E+02	kg	Free OH	5.66E+04	kg
241-AP-103	Ce	Total		1.46E+02	kg	Hg	0.00E+00	kg
241-AP-103	Cl	Supernatant	NA	1.45E+04	kg	K	2.19E+04	kg
241-AP-103	Cl	Total		1.45E+04	kg	La	1.88E+01	kg
241-AP-103	Co	Supernatant	NA	2.92E+01	kg	Li	1.17E+01	kg
241-AP-103	Co	Total		2.92E+01	kg	Mg	1.46E+02	kg
241-AP-103	Cr	Supernatant	NA	1.99E+03	kg	Mn	1.51E+01	kg
241-AP-103	Cr	Total		1.99E+03	kg	Mo	2.02E+02	kg
241-AP-103	Cu	Supernatant	NA	1.64E+01	kg	Na	6.03E+05	kg
241-AP-103	Cu	Total		1.64E+01	kg	Nd	1.16E+02	kg
241-AP-103	F	Supernatant	NA	2.77E+03	kg	NH3	0.00E+00	kg
241-AP-103	F	Total		2.77E+03	kg	Ni	2.64E+02	kg
241-AP-103	Fe	Supernatant	NA	7.56E+01	kg	NO2	2.72E+05	kg
241-AP-103	Fe	Total		7.56E+01	kg	NO3	5.05E+05	kg
241-AP-103	Free OH	Supernatant	NA	5.66E+04	kg	Oxalate	3.90E+03	kg
241-AP-103	Free OH	Total		5.66E+04	kg	Pb	1.51E+02	kg
241-AP-103	Hg	Supernatant	NA	0.00E+00	kg	Pd	0.00E+00	kg
241-AP-103	Hg	Total		0.00E+00	kg	PO4	8.06E+03	kg
241-AP-103	K	Supernatant	NA	2.19E+04	kg	Pr	0.00E+00	kg
241-AP-103	K	Total		2.19E+04	kg	Rb	0.00E+00	kg
241-AP-103	La	Supernatant	NA	1.88E+01	kg	Rh	0.00E+00	kg
241-AP-103	La	Total		1.88E+01	kg	Ru	0.00E+00	kg
241-AP-103	Li	Supernatant	NA	1.17E+01	kg	Sb	9.08E+01	kg
241-AP-103	Li	Total		1.17E+01	kg	Se	1.23E+02	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-31

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-103	Mg	Supernatant	NA	1.46E+02	kg
241-AP-103	Mg	Total		1.46E+02	kg
241-AP-103	Mn	Supernatant	NA	1.51E+01	kg
241-AP-103	Mn	Total		1.51E+01	kg
241-AP-103	Mo	Supernatant	NA	2.02E+02	kg
241-AP-103	Mo	Total		2.02E+02	kg
241-AP-103	Na	Supernatant	NA	6.03E+05	kg
241-AP-103	Na	Total		6.03E+05	kg
241-AP-103	Nd	Supernatant	NA	1.16E+02	kg
241-AP-103	Nd	Total		1.16E+02	kg
241-AP-103	Ni	Supernatant	NA	2.64E+02	kg
241-AP-103	Ni	Total		2.64E+02	kg
241-AP-103	NO2	Supernatant	NA	2.72E+05	kg
241-AP-103	NO2	Total		2.72E+05	kg
241-AP-103	NO3	Supernatant	NA	5.05E+05	kg
241-AP-103	NO3	Total		5.05E+05	kg
241-AP-103	Oxalate	Supernatant	NA	3.90E+03	kg
241-AP-103	Oxalate	Total		3.90E+03	kg
241-AP-103	Pb	Supernatant	NA	1.51E+02	kg
241-AP-103	Pb	Total		1.51E+02	kg
241-AP-103	PO4	Supernatant	NA	8.06E+03	kg
241-AP-103	PO4	Total		8.06E+03	kg
241-AP-103	Sb	Supernatant	NA	9.08E+01	kg
241-AP-103	Sb	Total		9.08E+01	kg
241-AP-103	Se	Supernatant	NA	1.23E+02	kg
241-AP-103	Se	Total		1.23E+02	kg
241-AP-103	Si	Supernatant	NA	3.59E+02	kg
241-AP-103	Si	Total		3.59E+02	kg
241-AP-103	SO4	Supernatant	NA	1.61E+04	kg
241-AP-103	SO4	Total		1.61E+04	kg
241-AP-103	Sr	Supernatant	NA	9.18E+00	kg
241-AP-103	Sr	Total		9.18E+00	kg
241-AP-103	Th	Supernatant	NA	3.52E+02	kg
241-AP-103	Th	Total		3.52E+02	kg
241-AP-103	Ti	Supernatant	NA	1.51E+01	kg
241-AP-103	Ti	Total		1.51E+01	kg
241-AP-103	TIC as CO3	Supernatant	NA	1.08E+05	kg
241-AP-103	TIC as CO3	Total		1.08E+05	kg
241-AP-103	TOC	Supernatant	NA	2.46E+04	kg
241-AP-103	TOC	Total		2.46E+04	kg
241-AP-103	UTOTAL	Supernatant	NA	4.81E+01	kg
241-AP-103	UTOTAL	Total		4.81E+01	kg
241-AP-103	V	Supernatant	NA	5.79E+01	kg
241-AP-103	V	Total		5.79E+01	kg
241-AP-103	Y	Supernatant	NA	3.06E+01	kg
241-AP-103	Y	Total		3.06E+01	kg
241-AP-103	Zn	Supernatant	NA	1.51E+01	kg
241-AP-103	Zn	Total		1.51E+01	kg
241-AP-103	Zr	Supernatant	NA	1.48E+01	kg
241-AP-103	Zr	Total		1.48E+01	kg

Summary		
Si	3.59E+02	kg
SO4	1.61E+04	kg
Sr	9.18E+00	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	3.52E+02	kg
Ti	1.51E+01	kg
TIC as CO3	1.08E+05	kg
Tl	0.00E+00	kg
TOC	2.46E+04	kg
UTOTAL	4.81E+01	kg
V	5.79E+01	kg
W	0.00E+00	kg
Y	3.06E+01	kg
Zn	1.51E+01	kg
Zr	1.48E+01	kg

241-AP-104	106Ru	Supernatant	NA	1.05E-05	Ci
241-AP-104	106Ru	Total		1.05E-05	Ci
241-AP-104	113mCd	Supernatant	NA	7.76E+01	Ci
241-AP-104	113mCd	Total		7.76E+01	Ci
241-AP-104	125Sb	Supernatant	NA	1.98E+01	Ci
241-AP-104	125Sb	Total		1.98E+01	Ci
241-AP-104	126Sn	Supernatant	NA	3.05E+00	Ci
241-AP-104	126Sn	Total		3.05E+00	Ci
241-AP-104	129I	Supernatant	NA	5.87E-01	Ci
241-AP-104	129I	Total		5.87E-01	Ci
241-AP-104	134Cs	Supernatant	NA	3.40E-01	Ci
241-AP-104	134Cs	Total		3.40E-01	Ci
241-AP-104	137Cs	Supernatant	NA	7.72E+05	Ci
241-AP-104	137Cs	Total		7.72E+05	Ci
241-AP-104	137mBa	Supernatant	NA	7.28E+05	Ci

Summary		
106Ru	1.05E-05	Ci
113mCd	7.76E+01	Ci
125Sb	1.98E+01	Ci
126Sn	3.05E+00	Ci
129I	5.87E-01	Ci
134Cs	3.40E-01	Ci
137Cs	7.72E+05	Ci
137mBa	7.28E+05	Ci
14C	2.75E+00	Ci
151Sm	1.64E+04	Ci
152Eu	3.55E+00	Ci
154Eu	2.66E+01	Ci
155Eu	3.92E+01	Ci
226Ra	2.39E-04	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-32

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-104	137mBa	Total		7.28E+05	Ci
241-AP-104	14C	Supernatant	NA	2.75E+00	Ci
241-AP-104	14C	Total		2.75E+00	Ci
241-AP-104	151Sm	Supernatant	NA	1.64E+04	Ci
241-AP-104	151Sm	Total		1.64E+04	Ci
241-AP-104	152Eu	Supernatant	NA	3.55E+00	Ci
241-AP-104	152Eu	Total		3.55E+00	Ci
241-AP-104	154Eu	Supernatant	NA	2.66E+01	Ci
241-AP-104	154Eu	Total		2.66E+01	Ci
241-AP-104	155Eu	Supernatant	NA	3.92E+01	Ci
241-AP-104	155Eu	Total		3.92E+01	Ci
241-AP-104	226Ra	Supernatant	NA	2.39E-04	Ci
241-AP-104	226Ra	Total		2.39E-04	Ci
241-AP-104	227Ac	Supernatant	NA	2.75E-03	Ci
241-AP-104	227Ac	Total		2.75E-03	Ci
241-AP-104	228Ra	Supernatant	NA	4.84E-02	Ci
241-AP-104	228Ra	Total		4.84E-02	Ci
241-AP-104	229Th	Supernatant	NA	3.86E-03	Ci
241-AP-104	229Th	Total		3.86E-03	Ci
241-AP-104	231Pa	Supernatant	NA	6.22E-03	Ci
241-AP-104	231Pa	Total		6.22E-03	Ci
241-AP-104	232Th	Supernatant	NA	1.16E-04	Ci
241-AP-104	232Th	Total		1.16E-04	Ci
241-AP-104	232U	Supernatant	NA	1.42E-02	Ci
241-AP-104	232U	Total		1.42E-02	Ci
241-AP-104	233U	Supernatant	NA	6.01E-02	Ci
241-AP-104	233U	Total		6.01E-02	Ci
241-AP-104	234U	Supernatant	NA	1.83E-02	Ci
241-AP-104	234U	Total		1.83E-02	Ci
241-AP-104	235U	Supernatant	NA	7.40E-04	Ci
241-AP-104	235U	Total		7.40E-04	Ci
241-AP-104	236U	Supernatant	NA	6.12E-04	Ci
241-AP-104	236U	Total		6.12E-04	Ci
241-AP-104	237Np	Supernatant	NA	1.62E-02	Ci
241-AP-104	237Np	Total		1.62E-02	Ci
241-AP-104	238Pu	Supernatant	NA	1.65E-01	Ci
241-AP-104	238Pu	Total		1.65E-01	Ci
241-AP-104	238U	Supernatant	NA	1.64E-02	Ci
241-AP-104	238U	Total		1.64E-02	Ci
241-AP-104	239Pu	Supernatant	NA	6.22E+00	Ci
241-AP-104	239Pu	Total		6.22E+00	Ci
241-AP-104	240Pu	Supernatant	NA	1.06E+00	Ci
241-AP-104	240Pu	Total		1.06E+00	Ci
241-AP-104	241Am	Supernatant	NA	9.64E+01	Ci
241-AP-104	241Am	Total		9.64E+01	Ci
241-AP-104	241Pu	Supernatant	NA	7.68E+00	Ci
241-AP-104	241Pu	Total		7.68E+00	Ci
241-AP-104	242Cm	Supernatant	NA	4.43E-02	Ci
241-AP-104	242Cm	Total		4.43E-02	Ci
241-AP-104	242Pu	Supernatant	NA	6.83E-05	Ci
241-AP-104	242Pu	Total		6.83E-05	Ci
241-AP-104	243/244Cm	Supernatant	NA	3.87E+00	Ci
241-AP-104	243/244Cm	Total		3.87E+00	Ci
241-AP-104	243Am	Supernatant	NA	3.43E-03	Ci
241-AP-104	243Am	Total		3.43E-03	Ci
241-AP-104	243Cm	Supernatant	NA	1.48E-01	Ci
241-AP-104	243Cm	Total		1.48E-01	Ci
241-AP-104	244Cm	Supernatant	NA	3.47E+00	Ci
241-AP-104	244Cm	Total		3.47E+00	Ci
241-AP-104	3H	Supernatant	NA	1.96E+00	Ci
241-AP-104	3H	Total		1.96E+00	Ci
241-AP-104	59Ni	Supernatant	NA	1.86E+00	Ci
241-AP-104	59Ni	Total		1.86E+00	Ci
241-AP-104	60Co	Supernatant	NA	3.10E+01	Ci
241-AP-104	60Co	Total		3.10E+01	Ci
241-AP-104	63Ni	Supernatant	NA	1.76E+02	Ci
241-AP-104	63Ni	Total		1.76E+02	Ci
241-AP-104	79Se	Supernatant	NA	3.37E+00	Ci

Summary		
227Ac	2.75E-03	Ci
228Ra	4.84E-02	Ci
229Th	3.86E-03	Ci
231Pa	6.22E-03	Ci
232Th	1.16E-04	Ci
232U	1.42E-02	Ci
233U	6.01E-02	Ci
234U	1.83E-02	Ci
235U	7.40E-04	Ci
236U	6.12E-04	Ci
237Np	1.62E-02	Ci
238Pu	1.65E-01	Ci
238U	1.64E-02	Ci
239Pu	6.22E+00	Ci
240Pu	1.06E+00	Ci
241Am	9.64E+01	Ci
241Pu	7.68E+00	Ci
242Cm	4.43E-02	Ci
242Pu	6.83E-05	Ci
243Am	3.43E-03	Ci
243Cm	1.48E-01	Ci
244Cm	3.47E+00	Ci
3H	1.96E+00	Ci
59Ni	1.86E+00	Ci
60Co	3.10E+01	Ci
63Ni	1.76E+02	Ci
79Se	3.37E+00	Ci
90Sr	6.95E+03	Ci
90Y	6.95E+03	Ci
93mNb	1.57E+01	Ci
93Zr	1.88E+01	Ci
99Tc	7.20E+02	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO : 24590-WTP-M4C-FRP-00001
SHEET REV· 0D
SHEET NO.: C-33

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-104	79Se	Total		3.37E+00	Ci
241-AP-104	90Sr	Supernatant	NA	6.95E+03	Ci
241-AP-104	90Sr	Total		6.95E+03	Ci
241-AP-104	90Y	Supernatant	NA	6.95E+03	Ci
241-AP-104	90Y	Total		6.95E+03	Ci
241-AP-104	93mNb	Supernatant	NA	1.57E+01	Ci
241-AP-104	93mNb	Total		1.57E+01	Ci
241-AP-104	93Zr	Supernatant	NA	1.88E+01	Ci
241-AP-104	93Zr	Total		1.88E+01	Ci
241-AP-104	99Tc	Supernatant	NA	7.20E+02	Ci
241-AP-104	99Tc	Total		7.20E+02	Ci
241-AP-104	Ag	Supernatant	NA	2.91E+00	kg
241-AP-104	Ag	Total		2.91E+00	kg
241-AP-104	Al	Supernatant	NA	6.98E+04	kg
241-AP-104	Al	Total		6.98E+04	kg
241-AP-104	As	Supernatant	NA	7.26E+00	kg
241-AP-104	As	Total		7.26E+00	kg
241-AP-104	B	Supernatant	NA	2.05E+02	kg
241-AP-104	B	Total		2.05E+02	kg
241-AP-104	Ba	Supernatant	NA	2.52E-01	kg
241-AP-104	Ba	Total		2.52E-01	kg
241-AP-104	Be	Supernatant	NA	5.10E-01	kg
241-AP-104	Be	Total		5.10E-01	kg
241-AP-104	Bi	Supernatant	NA	1.16E+01	kg
241-AP-104	Bi	Total		1.16E+01	kg
241-AP-104	Ca	Supernatant	NA	2.03E+02	kg
241-AP-104	Ca	Total		2.03E+02	kg
241-AP-104	Cd	Supernatant	NA	6.36E+00	kg
241-AP-104	Cd	Total		6.36E+00	kg
241-AP-104	Ce	Supernatant	NA	2 45E-01	kg
241-AP-104	Ce	Total		2.45E-01	kg
241-AP-104	Cl	Supernatant	NA	2.16E+04	kg
241-AP-104	Cl	Total		2.16E+04	kg
241-AP-104	CN	Supernatant	NA	1.09E+02	kg
241-AP-104	CN	Total		1.09E+02	kg
241-AP-104	Co	Supernatant	NA	2.89E+00	kg
241-AP-104	Co	Total		2.89E+00	kg
241-AP-104	Cr	Supernatant	NA	2.09E+03	kg
241-AP-104	Cr	Total		2.09E+03	kg
241-AP-104	Cu	Supernatant	NA	1.62E+01	kg
241-AP-104	Cu	Total		1.62E+01	kg
241-AP-104	F	Supernatant	NA	9.37E+02	kg
241-AP-104	F	Total		9.37E+02	kg
241-AP-104	Fe	Supernatant	NA	2.10E+01	kg
241-AP-104	Fe	Total		2.10E+01	kg
241-AP-104	Free OH	Supernatant	NA	8.18E+04	kg
241-AP-104	Free OH	Total		8.18E+04	kg
241-AP-104	Hg	Supernatant	NA	5.03E-03	kg
241-AP-104	Hg	Total		5.03E-03	kg
241-AP-104	K	Supernatant	NA	8.76E+03	kg
241-AP-104	K	Total		8.76E+03	kg
241-AP-104	La	Supernatant	NA	4.17E-01	kg
241-AP-104	La	Total		4.17E-01	kg
241-AP-104	Li	Supernatant	NA	8.39E-02	kg
241-AP-104	Li	Total		8.39E-02	kg
241-AP-104	Mg	Supernatant	NA	1.16E+01	kg
241-AP-104	Mg	Total		1.16E+01	kg
241-AP-104	Mn	Supernatant	NA	4.21E+00	kg
241-AP-104	Mn	Total		4.21E+00	kg
241-AP-104	Mo	Supernatant	NA	2.62E+02	kg
241-AP-104	Mo	Total		2.62E+02	kg
241-AP-104	Na	Supernatant	NA	5.35E+05	kg
241-AP-104	Na	Total		5.35E+05	kg
241-AP-104	Nd	Supernatant	NA	1.06E+01	kg
241-AP-104	Nd	Total		1.06E+01	kg
241-AP-104	NH3	Supernatant	NA	3.53E+03	kg
241-AP-104	NH3	Total		3.53E+03	kg
241-AP-104	Ni	Supernatant	NA	1.91E+02	kg

Summary		
Ag	2.91E+00	kg
Al	6.98E+04	kg
As	7.26E+00	kg
B	2.05E+02	kg
Ba	2.52E-01	kg
Be	5.10E-01	kg
Bi	1.16E+01	kg
Ca	2.03E+02	kg
Cd	6.36E+00	kg
Ce	2.45E-01	kg
Cl	2.16E+04	kg
CN	1.09E+02	kg
Co	2.89E+00	kg
Cr	2.09E+03	kg
Cu	1.62E+01	kg
F	9.37E+02	kg
Fe	2.10E+01	kg
Free OH	8.18E+04	kg
Hg	5.03E-03	kg
K	8.76E+03	kg
La	4.17E-01	kg
Li	8.39E-02	kg
Mg	1.16E+01	kg
Mn	4.21E+00	kg
Mo	2.62E+02	kg
Na	5.35E+05	kg
Nd	1.06E+01	kg
NH3	3.53E+03	kg
Ni	1.91E+02	kg
NO2	2.66E+05	kg
NO3	4.19E+05	kg
Oxalate	3.79E+03	kg
Pb	5.81E+01	kg
Pd	7.46E+00	kg
PO4	1.90E+04	kg
Pr	7.13E-01	kg
Rb	1.18E+01	kg
Rh	2.28E+01	kg
Ru	9.00E+01	kg
Sb	1.12E-01	kg
Se	2.85E+01	kg
Si	1.51E+02	kg
SO4	1.51E+04	kg
Sr	1.12E+00	kg
Ta	1.44E-01	kg
Te	7.13E-01	kg
Th	1.06E+00	kg
Ti	1.33E+00	kg
TIC as CO3	7.21E+04	kg
Tl	2.10E-01	kg
TOC	1.73E+04	kg
UTOTAL	4.93E+01	kg
V	5.39E+00	kg
W	3.75E+02	kg
Y	1.27E+00	kg
Zn	2.23E+00	kg
Zr	2.46E+00	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-34

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AP-104	Ni	Total		1.91E+02	kg	
241-AP-104	NO2	Supernatant	NA	2.66E+05	kg	
241-AP-104	NO2	Total		2.66E+05	kg	
241-AP-104	NO3	Supernatant	NA	4.19E+05	kg	
241-AP-104	NO3	Total		4.19E+05	kg	
241-AP-104	Oxalate	Supernatant	NA	3.79E+03	kg	
241-AP-104	Oxalate	Total		3.79E+03	kg	
241-AP-104	Pb	Supernatant	NA	5.81E+01	kg	
241-AP-104	Pb	Total		5.81E+01	kg	
241-AP-104	Pd	Supernatant	NA	7.46E+00	kg	
241-AP-104	Pd	Total		7.46E+00	kg	
241-AP-104	PO4	Supernatant	NA	1.90E+04	kg	
241-AP-104	PO4	Total		1.90E+04	kg	
241-AP-104	Pr	Supernatant	NA	7.13E-01	kg	
241-AP-104	Pr	Total		7.13E-01	kg	
241-AP-104	Rb	Supernatant	NA	1.18E+01	kg	
241-AP-104	Rb	Total		1.18E+01	kg	
241-AP-104	Rh	Supernatant	NA	2.28E+01	kg	
241-AP-104	Rh	Total		2.28E+01	kg	
241-AP-104	Ru	Supernatant	NA	9.00E+01	kg	
241-AP-104	Ru	Total		9.00E+01	kg	
241-AP-104	Sb	Supernatant	NA	1.12E-01	kg	
241-AP-104	Sb	Total		1.12E-01	kg	
241-AP-104	Se	Supernatant	NA	2.85E+01	kg	
241-AP-104	Se	Total		2 85E+01	kg	
241-AP-104	Si	Supernatant	NA	1.51E+02	kg	
241-AP-104	Si	Total		1.51E+02	kg	
241-AP-104	SO4	Supernatant	NA	1.51E+04	kg	
241-AP-104	SO4	Total		1.51E+04	kg	
241-AP-104	Sr	Supernatant	NA	1.12E+00	kg	
241-AP-104	Sr	Total		1.12E+00	kg	
241-AP-104	Ta	Supernatant	NA	1.44E-01	kg	
241-AP-104	Ta	Total		1.44E-01	kg	
241-AP-104	Te	Supernatant	NA	7.13E-01	kg	
241-AP-104	Te	Total		7.13E-01	kg	
241-AP-104	Th	Supernatant	NA	1.06E+00	kg	
241-AP-104	Th	Total		1.06E+00	kg	
241-AP-104	Ti	Supernatant	NA	1.33E+00	kg	
241-AP-104	Ti	Total		1.33E+00	kg	
241-AP-104	TIC as CO3	Supernatant	NA	7.21E+04	kg	
241-AP-104	TIC as CO3	Total		7.21E+04	kg	
241-AP-104	Tl	Supernatant	NA	2.10E-01	kg	
241-AP-104	Tl	Total		2.10E-01	kg	
241-AP-104	TOC	Supernatant	NA	1.73E+04	kg	
241-AP-104	TOC	Total		1.73E+04	kg	
241-AP-104	UTOTAL	Supernatant	NA	4.93E+01	kg	
241-AP-104	UTOTAL	Total		4.93E+01	kg	
241-AP-104	V	Supernatant	NA	5.39E+00	kg	
241-AP-104	V	Total		5.39E+00	kg	
241-AP-104	W	Supernatant	NA	3.75E+02	kg	
241-AP-104	W	Total		3.75E+02	kg	
241-AP-104	Y	Supernatant	NA	1.27E+00	kg	
241-AP-104	Y	Total		1.27E+00	kg	
241-AP-104	Zn	Supernatant	NA	2.23E+00	kg	
241-AP-104	Zn	Total		2.23E+00	kg	
241-AP-104	Zr	Supernatant	NA	2.46E+00	kg	
241-AP-104	Zr	Total		2.46E+00	kg	

241-AP-105	106Ru	Salt Cake	A2-SltSlr (Solid)	9.54E-03	Ci	Summary	
241-AP-105	106Ru	Supernatant	Waste Transfer	1.81E-05	Ci	106Ru	1.81E-05 Ci
241-AP-105	106Ru	Total		9.56E-03	Ci	113mCd	7.53E+01 Ci
241-AP-105	113mCd	Salt Cake	A2-SltSlr (Solid)	5.72E+00	Ci	125Sb	2.07E+01 Ci
241-AP-105	113mCd	Supernatant	Waste Transfer	7.53E+01	Ci	126Sn	2.93E+00 Ci
241-AP-105	113mCd	Total		8.10E+01	Ci	129I	8.51E-01 Ci
241-AP-105	125Sb	Salt Cake	A2-SltSlr (Solid)	2.27E+00	Ci	134Cs	1.90E+00 Ci
241-AP-105	125Sb	Supernatant	Waste Transfer	2.07E+01	Ci	137Cs	5.39E+05 Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-35

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-105	125Sb	Total		2.30E+01	Ci
241-AP-105	126Sn	Salt Cake	A2-SltSlr (Solid)	4.65E-01	Ci
241-AP-105	126Sn	Supernatant	Waste Transfer	2.93E+00	Ci
241-AP-105	126Sn	Total		3.40E+00	Ci
241-AP-105	129I	Salt Cake	A2-SltSlr (Solid)	4.31E-02	Ci
241-AP-105	129I	Supernatant	Waste Transfer	8.51E-01	Ci
241-AP-105	129I	Total		8.94E-01	Ci
241-AP-105	134Cs	Salt Cake	A2-SltSlr (Solid)	7.50E-01	Ci
241-AP-105	134Cs	Supernatant	Waste Transfer	1.90E+00	Ci
241-AP-105	134Cs	Total		2.65E+00	Ci
241-AP-105	137Cs	Salt Cake	A2-SltSlr (Solid)	1.22E+05	Ci
241-AP-105	137Cs	Supernatant	Waste Transfer	5.39E+05	Ci
241-AP-105	137Cs	Total		6.61E+05	Ci
241-AP-105	137mBa	Salt Cake	A2-SltSlr (Solid)	1.15E+05	Ci
241-AP-105	137mBa	Supernatant	Waste Transfer	5.09E+05	Ci
241-AP-105	137mBa	Total		6.24E+05	Ci
241-AP-105	14C	Salt Cake	A2-SltSlr (Solid)	2.23E+00	Ci
241-AP-105	14C	Supernatant	Waste Transfer	2.61E+01	Ci
241-AP-105	14C	Total		2.83E+01	Ci
241-AP-105	151Sm	Salt Cake	A2-SltSlr (Solid)	3.18E+03	Ci
241-AP-105	151Sm	Supernatant	Waste Transfer	1.58E+04	Ci
241-AP-105	151Sm	Total		1.90E+04	Ci
241-AP-105	152Eu	Salt Cake	A2-SltSlr (Solid)	3.69E-01	Ci
241-AP-105	152Eu	Supernatant	Waste Transfer	3.40E+00	Ci
241-AP-105	152Eu	Total		3.77E+00	Ci
241-AP-105	154Eu	Salt Cake	A2-SltSlr (Solid)	2.55E+01	Ci
241-AP-105	154Eu	Supernatant	Waste Transfer	8.05E+01	Ci
241-AP-105	154Eu	Total		1.06E+02	Ci
241-AP-105	155Eu	Salt Cake	A2-SltSlr (Solid)	9.82E+00	Ci
241-AP-105	155Eu	Supernatant	Waste Transfer	6.18E+01	Ci
241-AP-105	155Eu	Total		7.16E+01	Ci
241-AP-105	226Ra	Salt Cake	A2-SltSlr (Solid)	9.61E-06	Ci
241-AP-105	226Ra	Supernatant	Waste Transfer	2.15E-04	Ci
241-AP-105	226Ra	Total		2.25E-04	Ci
241-AP-105	227Ac	Salt Cake	A2-SltSlr (Solid)	1.18E-03	Ci
241-AP-105	227Ac	Supernatant	Waste Transfer	2 61E-03	Ci
241-AP-105	227Ac	Total		3.79E-03	Ci
241-AP-105	228Ra	Salt Cake	A2-SltSlr (Solid)	2.73E-03	Ci
241-AP-105	228Ra	Supernatant	Waste Transfer	6.51E-02	Ci
241-AP-105	228Ra	Total		6.78E-02	Ci
241-AP-105	229Th	Salt Cake	A2-SltSlr (Solid)	4.75E-06	Ci
241-AP-105	229Th	Supernatant	Waste Transfer	3.71E-03	Ci
241-AP-105	229Th	Total		3.71E-03	Ci
241-AP-105	231Pa	Salt Cake	A2-SltSlr (Solid)	1.24E-02	Ci
241-AP-105	231Pa	Supernatant	Waste Transfer	5.90E-03	Ci
241-AP-105	231Pa	Total		1.83E-02	Ci
241-AP-105	232Th	Salt Cake	A2-SltSlr (Solid)	1.72E-05	Ci
241-AP-105	232Th	Supernatant	Waste Transfer	5.97E-03	Ci
241-AP-105	232Th	Total		5.99E-03	Ci
241-AP-105	232U	Salt Cake	A2-SltSlr (Solid)	1.13E-03	Ci
241-AP-105	232U	Supernatant	Waste Transfer	4.30E-03	Ci
241-AP-105	232U	Total		5.43E-03	Ci
241-AP-105	233U	Salt Cake	A2-SltSlr (Solid)	6.92E-02	Ci
241-AP-105	233U	Supernatant	Waste Transfer	1.81E-02	Ci
241-AP-105	233U	Total		8.73E-02	Ci
241-AP-105	234U	Salt Cake	A2-SltSlr (Solid)	4.90E-02	Ci
241-AP-105	234U	Supernatant	Waste Transfer	1.31E-02	Ci
241-AP-105	234U	Total		6.20E-02	Ci
241-AP-105	235U	Salt Cake	A2-SltSlr (Solid)	1.93E-03	Ci
241-AP-105	235U	Supernatant	Waste Transfer	5.31E-04	Ci
241-AP-105	235U	Total		2.47E-03	Ci
241-AP-105	236U	Salt Cake	A2-SltSlr (Solid)	3.31E-03	Ci
241-AP-105	236U	Supernatant	Waste Transfer	5.32E-04	Ci
241-AP-105	236U	Total		3.85E-03	Ci
241-AP-105	237Np	Salt Cake	A2-SltSlr (Solid)	7.78E-02	Ci
241-AP-105	237Np	Supernatant	Waste Transfer	1.14E+00	Ci
241-AP-105	237Np	Total		1.22E+00	Ci
241-AP-105	238Pu	Salt Cake	A2-SltSlr (Solid)	1.35E-01	Ci

Summary		
137mBa	5.09E+05	Ci
14C	2.61E+01	Ci
151Sm	1.58E+04	Ci
152Eu	3.40E+00	Ci
154Eu	8.05E+01	Ci
155Eu	6.18E+01	Ci
226Ra	2.15E-04	Ci
227Ac	2.61E-03	Ci
228Ra	6.51E-02	Ci
229Th	3.71E-03	Ci
231Pa	5.90E-03	Ci
232Th	5.97E-03	Ci
232U	4.30E-03	Ci
233U	1.81E-02	Ci
234U	1.31E-02	Ci
235U	5.31E-04	Ci
236U	5.32E-04	Ci
237Np	1.14E+00	Ci
238Pu	6.38E-02	Ci
238U	1.15E-02	Ci
239Pu	1.12E+00	Ci
240Pu	1.84E-01	Ci
241Am	2.75E+00	Ci
241Pu	1.35E+00	Ci
242Cm	5.01E-03	Ci
242Pu	1.08E-05	Ci
243Am	9.73E-05	Ci
243Cm	1.78E-03	Ci
244Cm	3.51E-02	Ci
3H	3.52E+02	Ci
59Ni	1.17E+00	Ci
60Co	1.83E+01	Ci
63Ni	1.02E+02	Ci
79Se	1.79E+00	Ci
90Sr	1.08E+03	Ci
90Y	1.08E+03	Ci
93mNb	2.06E+01	Ci
93Zr	2.37E+01	Ci
99Tc	6.11E+02	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-36

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AP-105	238Pu	Supernatant	Waste Transfer	6.38E-02	Ci		
241-AP-105	238Pu	Total		1.98E-01	Ci		
241-AP-105	238U	Salt Cake	A2-SltSlr (Solid)	3.83E-02	Ci		
241-AP-105	238U	Supernatant	Waste Transfer	1.15E-02	Ci		
241-AP-105	238U	Total		4.98E-02	Ci		
241-AP-105	239Pu	Salt Cake	A2-SltSlr (Solid)	1.86E+00	Ci		
241-AP-105	239Pu	Supernatant	Waste Transfer	1.12E+00	Ci		
241-AP-105	239Pu	Total		2.98E+00	Ci		
241-AP-105	240Pu	Salt Cake	A2-SltSlr (Solid)	4.83E-01	Ci		
241-AP-105	240Pu	Supernatant	Waste Transfer	1.84E-01	Ci		
241-AP-105	240Pu	Total		6.67E-01	Ci		
241-AP-105	241Am	Salt Cake	A2-SltSlr (Solid)	2.83E+00	Ci		
241-AP-105	241Am	Supernatant	Waste Transfer	2.75E+00	Ci		
241-AP-105	241Am	Total		5.58E+00	Ci		
241-AP-105	241Pu	Salt Cake	A2-SltSlr (Solid)	8.48E+00	Ci		
241-AP-105	241Pu	Supernatant	Waste Transfer	1.35E+00	Ci		
241-AP-105	241Pu	Total		9.83E+00	Ci		
241-AP-105	242Cm	Salt Cake	A2-SltSlr (Solid)	7.18E-04	Ci		
241-AP-105	242Cm	Supernatant	Waste Transfer	5.01E-03	Ci		
241-AP-105	242Cm	Total		5.73E-03	Ci		
241-AP-105	242Pu	Salt Cake	A2-SltSlr (Solid)	5.11E-05	Ci		
241-AP-105	242Pu	Supernatant	Waste Transfer	1.08E-05	Ci		
241-AP-105	242Pu	Total		6.19E-05	Ci		
241-AP-105	243Am	Salt Cake	A2-SltSlr (Solid)	1.84E-03	Ci		
241-AP-105	243Am	Supernatant	Waste Transfer	9.73E-05	Ci		
241-AP-105	243Am	Total		1.94E-03	Ci		
241-AP-105	243Cm	Salt Cake	A2-SltSlr (Solid)	3.96E-05	Ci		
241-AP-105	243Cm	Supernatant	Waste Transfer	1.78E-03	Ci		
241-AP-105	243Cm	Total		1 82E-03	Ci		
241-AP-105	244Cm	Salt Cake	A2-SltSlr (Solid)	9.37E-04	Ci		
241-AP-105	244Cm	Supernatant	Waste Transfer	3.51E-02	Ci		
241-AP-105	244Cm	Total		3.60E-02	Ci		
241-AP-105	3H	Salt Cake	A2-SltSlr (Solid)	2.09E+00	Ci		
241-AP-105	3H	Supernatant	Waste Transfer	3.52E+02	Ci		
241-AP-105	3H	Total		3.54E+02	Ci		
241-AP-105	59Ni	Salt Cake	A2-SltSlr (Solid)	2.03E+00	Ci		
241-AP-105	59Ni	Supernatant	Waste Transfer	1.17E+00	Ci		
241-AP-105	59Ni	Total		3.20E+00	Ci		
241-AP-105	60Co	Salt Cake	A2-SltSlr (Solid)	3.90E+00	Ci		
241-AP-105	60Co	Supernatant	Waste Transfer	1.83E+01	Ci		
241-AP-105	60Co	Total		2.22E+01	Ci		
241-AP-105	63Ni	Salt Cake	A2-SltSlr (Solid)	1.89E+02	Ci		
241-AP-105	63Ni	Supernatant	Waste Transfer	1.02E+02	Ci		
241-AP-105	63Ni	Total		2.91E+02	Ci		
241-AP-105	79Se	Salt Cake	A2-SltSlr (Solid)	1.12E-01	Ci		
241-AP-105	79Se	Supernatant	Waste Transfer	1.79E+00	Ci		
241-AP-105	79Se	Total		1.90E+00	Ci		
241-AP-105	90Sr	Salt Cake	A2-SltSlr (Solid)	9.69E+03	Ci		
241-AP-105	90Sr	Supernatant	Waste Transfer	1.08E+03	Ci		
241-AP-105	90Sr	Total		1.08E+04	Ci		
241-AP-105	90Y	Salt Cake	A2-SltSlr (Solid)	9.69E+03	Ci		
241-AP-105	90Y	Supernatant	Waste Transfer	1.08E+03	Ci		
241-AP-105	90Y	Total		1.08E+04	Ci		
241-AP-105	93mNb	Salt Cake	A2-SltSlr (Solid)	5.54E+00	Ci		
241-AP-105	93mNb	Supernatant	Waste Transfer	2.06E+01	Ci		
241-AP-105	93mNb	Total		2.61E+01	Ci		
241-AP-105	93Zr	Salt Cake	A2-SltSlr (Solid)	6.68E+00	Ci		
241-AP-105	93Zr	Supernatant	Waste Transfer	2.37E+01	Ci		
241-AP-105	93Zr	Total		3.04E+01	Ci		
241-AP-105	99Tc	Salt Cake	A2-SltSlr (Solid)	7.68E+01	Ci		
241-AP-105	99Tc	Supernatant	Waste Transfer	6.11E+02	Ci		
241-AP-105	99Tc	Total		6.88E+02	Ci		
241-AP-105	Al	Salt Cake	A2-SltSlr (Solid)	4.73E+03	kg	Summary	
241-AP-105	Al	Supernatant	Waste Transfer	7.63E+04	kg	Ag	0.00E+00 kg
241-AP-105	Al	Total		8.11E+04	kg	Al	7.63E+04 kg
241-AP-105	Bi	Salt Cake	A2-SltSlr (Solid)	6.68E+00	kg	As	0.00E+00 kg
241-AP-105	Bi	Supernatant	Waste Transfer	6.32E+01	kg	B	0.00E+00 kg
241-AP-105	Bi	Total		6 99E+01	kg	Ba	0.00E+00 kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-37

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-105	Ca	Salt Cake	A2-SltSlr (Solid)	6.67E+01	kg
241-AP-105	Ca	Supernatant	Waste Transfer	1.13E+02	kg
241-AP-105	Ca	Total		1.80E+02	kg
241-AP-105	Cl	Salt Cake	A2-SltSlr (Solid)	6.86E+02	kg
241-AP-105	Cl	Supernatant	Waste Transfer	1.71E+04	kg
241-AP-105	Cl	Total		1.77E+04	kg
241-AP-105	Cr	Salt Cake	A2-SltSlr (Solid)	8.03E+01	kg
241-AP-105	Cr	Supernatant	Waste Transfer	1.69E+04	kg
241-AP-105	Cr	Total		1.69E+04	kg
241-AP-105	F	Salt Cake	A2-SltSlr (Solid)	1.12E+04	kg
241-AP-105	F	Supernatant	Waste Transfer	7.15E+02	kg
241-AP-105	F	Total		1.19E+04	kg
241-AP-105	Fe	Salt Cake	A2-SltSlr (Solid)	2.59E+01	kg
241-AP-105	Fe	Supernatant	Waste Transfer	4.37E+01	kg
241-AP-105	Fe	Total		6.96E+01	kg
241-AP-105	Free OH	Salt Cake	A2-SltSlr (Solid)	1.84E+04	kg
241-AP-105	Free OH	Supernatant	Waste Transfer	1.03E+05	kg
241-AP-105	Free OH	Total		1.22E+05	kg
241-AP-105	Hg	Salt Cake	A2-SltSlr (Solid)	2.34E-01	kg
241-AP-105	Hg	Supernatant	Waste Transfer	7.41E-03	kg
241-AP-105	Hg	Total		2.42E-01	kg
241-AP-105	K	Salt Cake	A2-SltSlr (Solid)	1.39E+04	kg
241-AP-105	K	Supernatant	Waste Transfer	8.82E+03	kg
241-AP-105	K	Total		2.28E+04	kg
241-AP-105	La	Salt Cake	A2-SltSlr (Solid)	1.38E-04	kg
241-AP-105	La	Supernatant	Waste Transfer	3.62E+00	kg
241-AP-105	La	Total		3.62E+00	kg
241-AP-105	Mn	Salt Cake	A2-SltSlr (Solid)	2.85E+00	kg
241-AP-105	Mn	Supernatant	Waste Transfer	9.15E+00	kg
241-AP-105	Mn	Total		1.20E+01	kg
241-AP-105	Na	Salt Cake	A2-SltSlr (Solid)	1.04E+05	kg
241-AP-105	Na	Supernatant	Waste Transfer	5.31E+05	kg
241-AP-105	Na	Total		6.35E+05	kg
241-AP-105	Ni	Salt Cake	A2-SltSlr (Solid)	8.95E+00	kg
241-AP-105	Ni	Supernatant	Waste Transfer	4.39E+01	kg
241-AP-105	Ni	Total		5.29E+01	kg
241-AP-105	NO2	Salt Cake	A2-SltSlr (Solid)	1.62E+04	kg
241-AP-105	NO2	Supernatant	Waste Transfer	1.88E+05	kg
241-AP-105	NO2	Total		2.04E+05	kg
241-AP-105	NO3	Salt Cake	A2-SltSlr (Solid)	6.31E+04	kg
241-AP-105	NO3	Supernatant	Waste Transfer	4.21E+05	kg
241-AP-105	NO3	Total		4.84E+05	kg
241-AP-105	Oxalate	Salt Cake	A2-SltSlr (Solid)	3.41E+03	kg
241-AP-105	Oxalate	Supernatant	Waste Transfer	5.60E+03	kg
241-AP-105	Oxalate	Total		9.01E+03	kg
241-AP-105	Pb	Salt Cake	A2-SltSlr (Solid)	2.85E+01	kg
241-AP-105	Pb	Supernatant	Waste Transfer	9.09E+01	kg
241-AP-105	Pb	Total		1.19E+02	kg
241-AP-105	PO4	Salt Cake	A2-SltSlr (Solid)	4.92E+03	kg
241-AP-105	PO4	Supernatant	Waste Transfer	9.13E+03	kg
241-AP-105	PO4	Total		1.40E+04	kg
241-AP-105	Si	Salt Cake	A2-SltSlr (Solid)	8.19E+01	kg
241-AP-105	Si	Supernatant	Waste Transfer	8.06E+01	kg
241-AP-105	Si	Total		1.63E+02	kg
241-AP-105	SO4	Salt Cake	A2-SltSlr (Solid)	9.66E+03	kg
241-AP-105	SO4	Supernatant	Waste Transfer	1.19E+04	kg
241-AP-105	SO4	Total		2.16E+04	kg
241-AP-105	Sr	Salt Cake	A2-SltSlr (Solid)	1.10E+00	kg
241-AP-105	Sr	Supernatant	Waste Transfer	3.66E-01	kg
241-AP-105	Sr	Total		1.47E+00	kg
241-AP-105	Th	Salt Cake	A2-SltSlr (Solid)	1.56E-01	kg
241-AP-105	Th	Supernatant	Waste Transfer	5.41E+01	kg
241-AP-105	Th	Total		5.43E+01	kg
241-AP-105	TIC as CO3	Salt Cake	A2-SltSlr (Solid)	4.49E+04	kg
241-AP-105	TIC as CO3	Supernatant	Waste Transfer	6.03E+04	kg
241-AP-105	TIC as CO3	Total		1.05E+05	kg
241-AP-105	TOC	Salt Cake	A2-SltSlr (Solid)	2.94E+03	kg
241-AP-105	TOC	Supernatant	Waste Transfer	5.94E+03	kg

Summary		
Be	0.00E+00	kg
Bi	6.32E+01	kg
Ca	1.13E+02	kg
Cd	0.00E+00	kg
Ce	0.00E+00	kg
Cl	1.71E+04	kg
CN	0.00E+00	kg
Co	0.00E+00	kg
Cr	1.69E+04	kg
Cu	0.00E+00	kg
F	7.15E+02	kg
Fe	4.37E+01	kg
Free OH	1.03E+05	kg
Hg	7.41E-03	kg
K	8.82E+03	kg
La	3.62E+00	kg
Li	0.00E+00	kg
Mg	0.00E+00	kg
Mn	9.15E+00	kg
Mo	0.00E+00	kg
Na	5.31E+05	kg
Nd	0.00E+00	kg
NH3	0.00E+00	kg
Ni	4.39E+01	kg
NO2	1.88E+05	kg
NO3	4.21E+05	kg
Oxalate	5.60E+03	kg
Pb	9.09E+01	kg
Pd	0.00E+00	kg
PO4	9.13E+03	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	0.00E+00	kg
Se	0.00E+00	kg
Si	8.06E+01	kg
SO4	1.19E+04	kg
Sr	3.66E-01	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	5.41E+01	kg
Ti	0.00E+00	kg
TIC as CO3	6.03E+04	kg
Tl	0.00E+00	kg
TOC	5.94E+03	kg
UTOTAL	3.44E+01	kg
V	0.00E+00	kg
W	0.00E+00	kg
Y	0.00E+00	kg
Zn	0.00E+00	kg
Zr	8.36E+00	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-38

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AP-105	TOC	Total		8.88E+03	kg
241-AP-105	UTOTAL	Salt Cake	A2-SltSlr (Solid)	1.15E+02	kg
241-AP-105	UTOTAL	Supernatant	Waste Transfer	3.44E+01	kg
241-AP-105	UTOTAL	Total		1.49E+02	kg
241-AP-105	Zr	Salt Cake	A2-SltSlr (Solid)	5.34E+00	kg
241-AP-105	Zr	Supernatant	Waste Transfer	8.36E+00	kg
241-AP-105	Zr	Total		1.37E+01	kg

241-AW-101	106Ru	Supernatant	A2-SltSlr (Liquid)	1.63E-05	Ci
241-AW-101	106Ru	Salt Cake	A2-SltSlr (Solid)	4.21E-02	Ci
241-AW-101	106Ru	Total		4.21E-02	Ci
241-AW-101	113mCd	Supernatant	A2-SltSlr (Liquid)	7.11E+01	Ci
241-AW-101	113mCd	Salt Cake	A2-SltSlr (Solid)	2.52E+01	Ci
241-AW-101	113mCd	Total		9.64E+01	Ci
241-AW-101	125Sb	Supernatant	A2-SltSlr (Liquid)	1.01E+01	Ci
241-AW-101	125Sb	Salt Cake	A2-SltSlr (Solid)	1.00E+01	Ci
241-AW-101	125Sb	Total		2.01E+01	Ci
241-AW-101	126Sn	Supernatant	A2-SltSlr (Liquid)	2.08E+01	Ci
241-AW-101	126Sn	Salt Cake	A2-SltSlr (Solid)	2.05E+00	Ci
241-AW-101	126Sn	Total		2.29E+01	Ci
241-AW-101	129I	Supernatant	A2-SltSlr (Liquid)	4.76E-01	Ci
241-AW-101	129I	Salt Cake	A2-SltSlr (Solid)	1.90E-01	Ci
241-AW-101	129I	Total		6.67E-01	Ci
241-AW-101	134Cs	Supernatant	A2-SltSlr (Liquid)	4.95E+01	Ci
241-AW-101	134Cs	Salt Cake	A2-SltSlr (Solid)	3.31E+00	Ci
241-AW-101	134Cs	Total		5.28E+01	Ci
241-AW-101	137Cs	Supernatant	A2-SltSlr (Liquid)	1.05E+06	Ci
241-AW-101	137Cs	Salt Cake	A2-SltSlr (Solid)	4.75E+05	Ci
241-AW-101	137Cs	Total		1.52E+06	Ci
241-AW-101	137mBa	Supernatant	A2-SltSlr (Liquid)	9.87E+05	Ci
241-AW-101	137mBa	Salt Cake	A2-SltSlr (Solid)	4.48E+05	Ci
241-AW-101	137mBa	Total		1.44E+06	Ci
241-AW-101	14C	Supernatant	A2-SltSlr (Liquid)	8.36E-01	Ci
241-AW-101	14C	Salt Cake	A2-SltSlr (Solid)	9.83E+00	Ci
241-AW-101	14C	Total		1.07E+01	Ci
241-AW-101	151Sm	Supernatant	A2-SltSlr (Liquid)	1.08E+04	Ci
241-AW-101	151Sm	Salt Cake	A2-SltSlr (Solid)	1.40E+04	Ci
241-AW-101	151Sm	Total		2.49E+04	Ci
241-AW-101	152Eu	Supernatant	A2-SltSlr (Liquid)	1.20E+00	Ci
241-AW-101	152Eu	Salt Cake	A2-SltSlr (Solid)	1.63E+00	Ci
241-AW-101	152Eu	Total		2.82E+00	Ci
241-AW-101	154Eu	Supernatant	A2-SltSlr (Liquid)	6.52E+01	Ci
241-AW-101	154Eu	Salt Cake	A2-SltSlr (Solid)	1.13E+02	Ci
241-AW-101	154Eu	Total		1.78E+02	Ci
241-AW-101	155Eu	Supernatant	A2-SltSlr (Liquid)	3.18E+01	Ci
241-AW-101	155Eu	Salt Cake	A2-SltSlr (Solid)	4.33E+01	Ci
241-AW-101	155Eu	Total		7.51E+01	Ci
241-AW-101	226Ra	Supernatant	A2-SltSlr (Liquid)	1.19E-04	Ci
241-AW-101	226Ra	Salt Cake	A2-SltSlr (Solid)	4.24E-05	Ci
241-AW-101	226Ra	Total		1.62E-04	Ci
241-AW-101	227Ac	Supernatant	A2-SltSlr (Liquid)	1.47E-02	Ci
241-AW-101	227Ac	Salt Cake	A2-SltSlr (Solid)	5.22E-03	Ci
241-AW-101	227Ac	Total		1.99E-02	Ci
241-AW-101	228Ra	Supernatant	A2-SltSlr (Liquid)	3.39E-02	Ci
241-AW-101	228Ra	Salt Cake	A2-SltSlr (Solid)	1.20E-02	Ci
241-AW-101	228Ra	Total		4.60E-02	Ci
241-AW-101	229Th	Supernatant	A2-SltSlr (Liquid)	5.92E-05	Ci
241-AW-101	229Th	Salt Cake	A2-SltSlr (Solid)	2.10E-05	Ci
241-AW-101	229Th	Total		8.01E-05	Ci
241-AW-101	231Pa	Supernatant	A2-SltSlr (Liquid)	1.55E-01	Ci
241-AW-101	231Pa	Salt Cake	A2-SltSlr (Solid)	5.48E-02	Ci
241-AW-101	231Pa	Total		2.09E-01	Ci
241-AW-101	232Th	Supernatant	A2-SltSlr (Liquid)	5.24E-05	Ci
241-AW-101	232Th	Salt Cake	A2-SltSlr (Solid)	7.57E-05	Ci
241-AW-101	232Th	Total		1.28E-04	Ci
241-AW-101	232U	Supernatant	A2-SltSlr (Liquid)	7.16E-05	Ci

Summary		
106Ru	4.21E-02	Ci
113mCd	9.64E+01	Ci
125Sb	2.01E+01	Ci
126Sn	2.29E+01	Ci
129I	6.67E-01	Ci
134Cs	5.28E+01	Ci
137Cs	1.52E+06	Ci
137mBa	1.44E+06	Ci
14C	1.07E+01	Ci
151Sm	2.49E+04	Ci
152Eu	2.82E+00	Ci
154Eu	1.78E+02	Ci
155Eu	7.51E+01	Ci
226Ra	1.62E-04	Ci
227Ac	1.99E-02	Ci
228Ra	4.60E-02	Ci
229Th	8.01E-05	Ci
231Pa	2.09E-01	Ci
232Th	1.28E-04	Ci
232U	2.64E-02	Ci
233U	1.62E+00	Ci
234U	1.15E+00	Ci
235U	4.53E-02	Ci
236U	7.76E-02	Ci
237Np	3.46E-01	Ci
238Pu	7.29E+00	Ci
238U	8.98E-01	Ci
239Pu	1.00E+02	Ci
240Pu	2.61E+01	Ci
241Am	1.05E+02	Ci
241Pu	4.59E+02	Ci
242Cm	2.75E-02	Ci
242Pu	2.77E-03	Ci
243Am	6.76E-02	Ci
243Cm	7.07E-02	Ci
244Cm	1.58E+00	Ci
3H	2.88E+01	Ci
59Ni	9.71E+00	Ci
60Co	3.19E+01	Ci
63Ni	9.07E+02	Ci
79Se	6.36E-01	Ci
90Sr	8.30E+04	Ci
90Y	8.30E+04	Ci
93mNb	9.34E+01	Ci
93Zr	1.13E+02	Ci
99Tc	8.18E+02	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-39

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AW-101	232U	Salt Cake	A2-SltSlr (Solid)	2.63E-02	Ci	
241-AW-101	232U	Total		2.64E-02	Ci	
241-AW-101	233U	Supernatant	A2-SltSlr (Liquid)	4.40E-03	Ci	
241-AW-101	233U	Salt Cake	A2-SltSlr (Solid)	1.61E+00	Ci	
241-AW-101	233U	Total		1.62E+00	Ci	
241-AW-101	234U	Supernatant	A2-SltSlr (Liquid)	3.11E-03	Ci	
241-AW-101	234U	Salt Cake	A2-SltSlr (Solid)	1.14E+00	Ci	
241-AW-101	234U	Total		1.15E+00	Ci	
241-AW-101	235U	Supernatant	A2-SltSlr (Liquid)	1.23E-04	Ci	
241-AW-101	235U	Salt Cake	A2-SltSlr (Solid)	4.52E-02	Ci	
241-AW-101	235U	Total		4.53E-02	Ci	
241-AW-101	236U	Supernatant	A2-SltSlr (Liquid)	2.11E-04	Ci	
241-AW-101	236U	Salt Cake	A2-SltSlr (Solid)	7.74E-02	Ci	
241-AW-101	236U	Total		7.76E-02	Ci	
241-AW-101	237Np	Supernatant	A2-SltSlr (Liquid)	2.36E-03	Ci	
241-AW-101	237Np	Salt Cake	A2-SltSlr (Solid)	3.43E-01	Ci	
241-AW-101	237Np	Total		3.46E-01	Ci	
241-AW-101	238Pu	Supernatant	A2-SltSlr (Liquid)	8.25E-02	Ci	
241-AW-101	238Pu	Salt Cake	A2-SltSlr (Solid)	7.20E+00	Ci	
241-AW-101	238Pu	Total		7.29E+00	Ci	
241-AW-101	238U	Supernatant	A2-SltSlr (Liquid)	2.44E-03	Ci	
241-AW-101	238U	Salt Cake	A2-SltSlr (Solid)	8.95E-01	Ci	
241-AW-101	238U	Total		8.98E-01	Ci	
241-AW-101	239Pu	Supernatant	A2-SltSlr (Liquid)	1.14E+00	Ci	
241-AW-101	239Pu	Salt Cake	A2-SltSlr (Solid)	9.93E+01	Ci	
241-AW-101	239Pu	Total		1.00E+02	Ci	
241-AW-101	240Pu	Supernatant	A2-SltSlr (Liquid)	2.96E-01	Ci	
241-AW-101	240Pu	Salt Cake	A2-SltSlr (Solid)	2.58E+01	Ci	
241-AW-101	240Pu	Total		2.61E+01	Ci	
241-AW-101	241Am	Supernatant	A2-SltSlr (Liquid)	7.21E-01	Ci	
241-AW-101	241Am	Salt Cake	A2-SltSlr (Solid)	1.04E+02	Ci	
241-AW-101	241Am	Total		1.05E+02	Ci	
241-AW-101	241Pu	Supernatant	A2-SltSlr (Liquid)	5.20E+00	Ci	
241-AW-101	241Pu	Salt Cake	A2-SltSlr (Solid)	4.54E+02	Ci	
241-AW-101	241Pu	Total		4.59E+02	Ci	
241-AW-101	242Cm	Supernatant	A2-SltSlr (Liquid)	1.32E-03	Ci	
241-AW-101	242Cm	Salt Cake	A2-SltSlr (Solid)	2.62E-02	Ci	
241-AW-101	242Cm	Total		2.75E-02	Ci	
241-AW-101	242Pu	Supernatant	A2-SltSlr (Liquid)	3.13E-05	Ci	
241-AW-101	242Pu	Salt Cake	A2-SltSlr (Solid)	2.73E-03	Ci	
241-AW-101	242Pu	Total		2.77E-03	Ci	
241-AW-101	243/244Cm	Salt Cake	A2-SltSlr (Solid)	1.98E+00	Ci	
241-AW-101	243/244Cm	Total		1.98E+00	Ci	
241-AW-101	243Am	Supernatant	A2-SltSlr (Liquid)	4.43E-04	Ci	
241-AW-101	243Am	Salt Cake	A2-SltSlr (Solid)	6.71E-02	Ci	
241-AW-101	243Am	Total		6.76E-02	Ci	
241-AW-101	243Cm	Supernatant	A2-SltSlr (Liquid)	7.28E-05	Ci	
241-AW-101	243Cm	Salt Cake	A2-SltSlr (Solid)	7.06E-02	Ci	
241-AW-101	243Cm	Total		7.07E-02	Ci	
241-AW-101	244Cm	Supernatant	A2-SltSlr (Liquid)	1.72E-03	Ci	
241-AW-101	244Cm	Salt Cake	A2-SltSlr (Solid)	1.58E+00	Ci	
241-AW-101	244Cm	Total		1.58E+00	Ci	
241-AW-101	3H	Supernatant	A2-SltSlr (Liquid)	1.41E+01	Ci	
241-AW-101	3H	Salt Cake	A2-SltSlr (Solid)	1.47E+01	Ci	
241-AW-101	3H	Total		2.88E+01	Ci	
241-AW-101	59Ni	Supernatant	A2-SltSlr (Liquid)	7.59E-01	Ci	
241-AW-101	59Ni	Salt Cake	A2-SltSlr (Solid)	8.95E+00	Ci	
241-AW-101	59Ni	Total		9.71E+00	Ci	
241-AW-101	60Co	Supernatant	A2-SltSlr (Liquid)	1.47E+01	Ci	
241-AW-101	60Co	Salt Cake	A2-SltSlr (Solid)	1.72E+01	Ci	
241-AW-101	60Co	Total		3.19E+01	Ci	
241-AW-101	63Ni	Supernatant	A2-SltSlr (Liquid)	7.07E+01	Ci	
241-AW-101	63Ni	Salt Cake	A2-SltSlr (Solid)	8.36E+02	Ci	
241-AW-101	63Ni	Total		9.07E+02	Ci	
241-AW-101	79Se	Supernatant	A2-SltSlr (Liquid)	1.41E-01	Ci	
241-AW-101	79Se	Salt Cake	A2-SltSlr (Solid)	4.95E-01	Ci	
241-AW-101	79Se	Total		6.36E-01	Ci	
241-AW-101	90Sr	Supernatant	A2-SltSlr (Liquid)	1.04E+03	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-40

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AW-101	90Sr	Salt Cake	A2-SltSlr (Solid)	8.20E+04	Ci
241-AW-101	90Sr	Total		8.30E+04	Ci
241-AW-101	90Y	Supernatant	A2-SltSlr (Liquid)	1.04E+03	Ci
241-AW-101	90Y	Salt Cake	A2-SltSlr (Solid)	8.20E+04	Ci
241-AW-101	90Y	Total		8 30E+04	Ci
241-AW-101	93mNb	Supernatant	A2-SltSlr (Liquid)	6.89E+01	Ci
241-AW-101	93mNb	Salt Cake	A2-SltSlr (Solid)	2.45E+01	Ci
241-AW-101	93mNb	Total		9.34E+01	Ci
241-AW-101	93Zr	Supernatant	A2-SltSlr (Liquid)	8.31E+01	Ci
241-AW-101	93Zr	Salt Cake	A2-SltSlr (Solid)	2.95E+01	Ci
241-AW-101	93Zr	Total		1.13E+02	Ci
241-AW-101	99Tc	Supernatant	A2-SltSlr (Liquid)	4.68E+02	Ci
241-AW-101	99Tc	Salt Cake	A2-SltSlr (Solid)	3.50E+02	Ci
241-AW-101	99Tc	Total		8.18E+02	Ci
241-AW-101	Ag	Supernatant	A2-SltSlr (Liquid)	5.54E+00	kg
241-AW-101	Ag	Salt Cake	A2-SltSlr (Solid)	5.68E+01	kg
241-AW-101	Ag	Total		6.23E+01	kg
241-AW-101	Al	Supernatant	A2-SltSlr (Liquid)	8.17E+04	kg
241-AW-101	Al	Salt Cake	A2-SltSlr (Solid)	3.34E+04	kg
241-AW-101	Al	Total		1.15E+05	kg
241-AW-101	As	Supernatant	A2-SltSlr (Liquid)	1.52E+02	kg
241-AW-101	As	Salt Cake	A2-SltSlr (Solid)	8.31E+01	kg
241-AW-101	As	Total		2.35E+02	kg
241-AW-101	B	Supernatant	A2-SltSlr (Liquid)	1.26E+02	kg
241-AW-101	B	Salt Cake	A2-SltSlr (Solid)	2.44E+02	kg
241-AW-101	B	Total		3.70E+02	kg
241-AW-101	Ba	Supernatant	A2-SltSlr (Liquid)	5.77E+00	kg
241-AW-101	Ba	Salt Cake	A2-SltSlr (Solid)	1.10E+01	kg
241-AW-101	Ba	Total		1.68E+01	kg
241-AW-101	Be	Supernatant	A2-SltSlr (Liquid)	7.48E+00	kg
241-AW-101	Be	Salt Cake	A2-SltSlr (Solid)	2.45E+00	kg
241-AW-101	Be	Total		9.93E+00	kg
241-AW-101	Bi	Supernatant	A2-SltSlr (Liquid)	2.22E+01	kg
241-AW-101	Bi	Salt Cake	A2-SltSlr (Solid)	2.57E+01	kg
241-AW-101	Bi	Total		4.78E+01	kg
241-AW-101	Ca	Supernatant	A2-SltSlr (Liquid)	2.69E+01	kg
241-AW-101	Ca	Salt Cake	A2-SltSlr (Solid)	7.30E+02	kg
241-AW-101	Ca	Total		7.56E+02	kg
241-AW-101	Cd	Supernatant	A2-SltSlr (Liquid)	7.17E+00	kg
241-AW-101	Cd	Salt Cake	A2-SltSlr (Solid)	1.67E+01	kg
241-AW-101	Cd	Total		2.38E+01	kg
241-AW-101	Ce	Supernatant	A2-SltSlr (Liquid)	7.20E+00	kg
241-AW-101	Ce	Salt Cake	A2-SltSlr (Solid)	5.13E+01	kg
241-AW-101	Ce	Total		5.85E+01	kg
241-AW-101	Cl	Supernatant	A2-SltSlr (Liquid)	1.71E+04	kg
241-AW-101	Cl	Salt Cake	A2-SltSlr (Solid)	7.81E+03	kg
241-AW-101	Cl	Total		2.50E+04	kg
241-AW-101	Co	Supernatant	A2-SltSlr (Liquid)	1.11E+01	kg
241-AW-101	Co	Salt Cake	A2-SltSlr (Solid)	1.23E+01	kg
241-AW-101	Co	Total		2.33E+01	kg
241-AW-101	Cr	Supernatant	A2-SltSlr (Liquid)	2.88E+02	kg
241-AW-101	Cr	Salt Cake	A2-SltSlr (Solid)	8.76E+02	kg
241-AW-101	Cr	Total		1.16E+03	kg
241-AW-101	Cu	Supernatant	A2-SltSlr (Liquid)	7.48E+00	kg
241-AW-101	Cu	Salt Cake	A2-SltSlr (Solid)	2.44E+01	kg
241-AW-101	Cu	Total		3.18E+01	kg
241-AW-101	F	Supernatant	A2-SltSlr (Liquid)	1.94E+03	kg
241-AW-101	F	Salt Cake	A2-SltSlr (Solid)	7.47E+03	kg
241-AW-101	F	Total		9.42E+03	kg
241-AW-101	Fe	Supernatant	A2-SltSlr (Liquid)	1.45E+01	kg
241-AW-101	Fe	Salt Cake	A2-SltSlr (Solid)	8.04E+02	kg
241-AW-101	Fe	Total		8.19E+02	kg
241-AW-101	Free OH	Supernatant	A2-SltSlr (Liquid)	2.76E+05	kg
241-AW-101	Free OH	Salt Cake	A2-SltSlr (Solid)	1.17E+05	kg
241-AW-101	Free OH	Total		3.93E+05	kg
241-AW-101	Hg	Supernatant	A2-SltSlr (Liquid)	7.02E-01	kg
241-AW-101	Hg	Salt Cake	A2-SltSlr (Solid)	1.03E+00	kg
241-AW-101	Hg	Total		1.74E+00	kg

Summary		
Ag	6.23E+01	kg
Al	1.15E+05	kg
As	2.35E+02	kg
B	3.70E+02	kg
Ba	1.68E+01	kg
Be	9.93E+00	kg
Bi	4.78E+01	kg
Ca	7.56E+02	kg
Cd	2.38E+01	kg
Ce	5.85E+01	kg
Cl	2.50E+04	kg
CN	0.00E+00	kg
Co	2.33E+01	kg
Cr	1.16E+03	kg
Cu	3.18E+01	kg
F	9.42E+03	kg
Fe	8.19E+02	kg
Free OH	3.93E+05	kg
Hg	1.74E+00	kg
K	1.67E+05	kg
La	6.76E+00	kg
Li	4.37E+01	kg
Mg	1.63E+02	kg
Mn	6.36E+02	kg
Mo	2.51E+02	kg
Na	1.02E+06	kg
Nd	4.78E+01	kg
NH3	0.00E+00	kg
Ni	1.08E+02	kg
NO2	4.22E+05	kg
NO3	8.19E+05	kg
Oxalate	2.61E+04	kg
Pb	6.93E+02	kg
Pd	0.00E+00	kg
PO4	1.07E+04	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	1.41E+02	kg
Se	1.20E+02	kg
Si	1.31E+03	kg
SO4	1.23E+04	kg
Sr	1.58E+01	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	1.16E+00	kg
Ti	2.39E+01	kg
TIC as CO3	1.14E+05	kg
Tl	2.42E+02	kg
TOC	2.04E+04	kg
UTOTAL	2.69E+03	kg
V	1.28E+01	kg
W	0.00E+00	kg
Y	0.00E+00	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-41

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AW-101	K	Supernatant	A2-SltSlr (Liquid)	9.75E+04	kg	Zn	8.90E+01 kg
241-AW-101	K	Salt Cake	A2-SltSlr (Solid)	6.97E+04	kg	Zr	2.00E+02 kg
241-AW-101	K	Total		1.67E+05	kg		
241-AW-101	La	Supernatant	A2-SltSlr (Liquid)	6.76E+00	kg		
241-AW-101	La	Salt Cake	A2-SltSlr (Solid)	6.09E-04	kg		
241-AW-101	La	Total		6.76E+00	kg		
241-AW-101	Li	Supernatant	A2-SltSlr (Liquid)	1.76E+01	kg		
241-AW-101	Li	Salt Cake	A2-SltSlr (Solid)	2.62E+01	kg		
241-AW-101	Li	Total		4.37E+01	kg		
241-AW-101	Mg	Supernatant	A2-SltSlr (Liquid)	5.45E+00	kg		
241-AW-101	Mg	Salt Cake	A2-SltSlr (Solid)	1.57E+02	kg		
241-AW-101	Mg	Total		1.63E+02	kg		
241-AW-101	Mn	Supernatant	A2-SltSlr (Liquid)	1.11E+01	kg		
241-AW-101	Mn	Salt Cake	A2-SltSlr (Solid)	6.25E+02	kg		
241-AW-101	Mn	Total		6.36E+02	kg		
241-AW-101	Mo	Supernatant	A2-SltSlr (Liquid)	1.74E+02	kg		
241-AW-101	Mo	Salt Cake	A2-SltSlr (Solid)	7.63E+01	kg		
241-AW-101	Mo	Total		2.51E+02	kg		
241-AW-101	Na	Supernatant	A2-SltSlr (Liquid)	6.45E+05	kg		
241-AW-101	Na	Salt Cake.	A2-SltSlr (Solid)	3.77E+05	kg		
241-AW-101	Na	Total		1.02E+06	kg		
241-AW-101	Nd	Supernatant	A2-SltSlr (Liquid)	2.22E+01	kg		
241-AW-101	Nd	Salt Cake	A2-SltSlr (Solid)	2.57E+01	kg		
241-AW-101	Nd	Total		4.78E+01	kg		
241-AW-101	Ni	Supernatant	A2-SltSlr (Liquid)	1.65E+01	kg		
241-AW-101	Ni	Salt Cake	A2-SltSlr (Solid)	9.18E+01	kg		
241-AW-101	Ni	Total		1.08E+02	kg		
241-AW-101	NO2	Supernatant	A2-SltSlr (Liquid)	2.92E+05	kg		
241-AW-101	NO2	Salt Cake	A2-SltSlr (Solid)	1.30E+05	kg		
241-AW-101	NO2	Total		4.22E+05	kg		
241-AW-101	NO3	Supernatant	A2-SltSlr (Liquid)	4.74E+05	kg		
241-AW-101	NO3	Salt Cake	A2-SltSlr (Solid)	3.46E+05	kg		
241-AW-101	NO3	Total		8.19E+05	kg		
241-AW-101	Oxalate	Supernatant	A2-SltSlr (Liquid)	2.02E+02	kg		
241-AW-101	Oxalate	Salt Cake	A2-SltSlr (Solid)	2.59E+04	kg		
241-AW-101	Oxalate	Total		2.61E+04	kg		
241-AW-101	Pb	Supernatant	A2-SltSlr (Liquid)	1.59E+02	kg		
241-AW-101	Pb	Salt Cake	A2-SltSlr (Solid)	5.34E+02	kg		
241-AW-101	Pb	Total		6.93E+02	kg		
241-AW-101	PO4	Supernatant	A2-SltSlr (Liquid)	1.43E+03	kg		
241-AW-101	PO4	Salt Cake	A2-SltSlr (Solid)	9.26E+03	kg		
241-AW-101	PO4	Total		1.07E+04	kg		
241-AW-101	Sb	Supernatant	A2-SltSlr (Liquid)	9.14E+01	kg		
241-AW-101	Sb	Salt Cake	A2-SltSlr (Solid)	4.99E+01	kg		
241-AW-101	Sb	Total		1.41E+02	kg		
241-AW-101	Se	Supernatant	A2-SltSlr (Liquid)	5.68E+01	kg		
241-AW-101	Se	Salt Cake	A2-SltSlr (Solid)	6.36E+01	kg		
241-AW-101	Se	Total		1.20E+02	kg		
241-AW-101	Si	Supernatant	A2-SltSlr (Liquid)	4.18E+02	kg		
241-AW-101	Si	Salt Cake	A2-SltSlr (Solid)	8.95E+02	kg		
241-AW-101	Si	Total		1.31E+03	kg		
241-AW-101	SO4	Supernatant	A2-SltSlr (Liquid)	3.13E+03	kg		
241-AW-101	SO4	Salt Cake	A2-SltSlr (Solid)	9.17E+03	kg		
241-AW-101	SO4	Total		1.23E+04	kg		
241-AW-101	Sr	Supernatant	A2-SltSlr (Liquid)	7.84E+00	kg		
241-AW-101	Sr	Salt Cake	A2-SltSlr (Solid)	7.92E+00	kg		
241-AW-101	Sr	Total		1.58E+01	kg		
241-AW-101	Th	Supernatant	A2-SltSlr (Liquid)	4.76E-01	kg		
241-AW-101	Th	Salt Cake	A2-SltSlr (Solid)	6.89E-01	kg		
241-AW-101	Th	Total		1.16E+00	kg		
241-AW-101	Ti	Supernatant	A2-SltSlr (Liquid)	1.52E+01	kg		
241-AW-101	Ti	Salt Cake	A2-SltSlr (Solid)	8.67E+00	kg		
241-AW-101	Ti	Total		2.39E+01	kg		
241-AW-101	TIC as CO3	Supernatant	A2-SltSlr (Liquid)	2.01E+04	kg		
241-AW-101	TIC as CO3	Salt Cake	A2-SltSlr (Solid)	9.35E+04	kg		
241-AW-101	TIC as CO3	Total		1.14E+05	kg		
241-AW-101	Tl	Supernatant	A2-SltSlr (Liquid)	1.15E+02	kg		
241-AW-101	Tl	Salt Cake	A2-SltSlr (Solid)	1.27E+02	kg		

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-42

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AW-101	Tl	Total		2.42E+02	kg		
241-AW-101	TOC	Supernatant	A2-SltSlr (Liquid)	7.24E+03	kg		
241-AW-101	TOC	Salt Cake	A2-SltSlr (Solid)	1.32E+04	kg		
241-AW-101	TOC	Total		2.04E+04	kg		
241-AW-101	UTOTAL	Supernatant	A2-SltSlr (Liquid)	7.31E+00	kg		
241-AW-101	UTOTAL	Salt Cake	A2-SltSlr (Solid)	2.69E+03	kg		
241-AW-101	UTOTAL	Total		2.69E+03	kg		
241-AW-101	V	Supernatant	A2-SltSlr (Liquid)	5.45E-01	kg		
241-AW-101	V	Salt Cake	A2-SltSlr (Solid)	1.23E+01	kg		
241-AW-101	V	Total		1.28E+01	kg		
241-AW-101	Zn	Supernatant	A2-SltSlr (Liquid)	1.66E+01	kg		
241-AW-101	Zn	Salt Cake	A2-SltSlr (Solid)	7.24E+01	kg		
241-AW-101	Zn	Total		8.90E+01	kg		
241-AW-101	Zr	Supernatant	A2-SltSlr (Liquid)	3.21E+01	kg		
241-AW-101	Zr	Salt Cake	A2-SltSlr (Solid)	1.68E+02	kg		
241-AW-101	Zr	Total		2.00E+02	kg		
241-AZ-101	106Ru	Sludge	NA	1.07E-03	Ci	Summary	
241-AZ-101	106Ru	Supernatant	P3AZ1 (Liquid)	2.87E+01	Ci	106Ru	2.87E+01 Ci
241-AZ-101	106Ru	Sludge	P3AZ1 (Solid)	5.12E+01	Ci	113mCd	1.33E+02 Ci
241-AZ-101	106Ru	Total		7.99E+01	Ci	125Sb	1.88E+03 Ci
241-AZ-101	113mCd	Sludge	NA	6.40E-01	Ci	126Sn	7.85E+00 Ci
241-AZ-101	113mCd	Supernatant	P3AZ1 (Liquid)	1.33E+02	Ci	129I	3.24E-02 Ci
241-AZ-101	113mCd	Sludge	P3AZ1 (Solid)	3.87E+02	Ci	134Cs	1.44E+03 Ci
241-AZ-101	113mCd	Total		5.21E+02	Ci	137Cs	5.06E+06 Ci
241-AZ-101	125Sb	Sludge	NA	4.47E+02	Ci	137mBa	4.78E+06 Ci
241-AZ-101	125Sb	Supernatant	P3AZ1 (Liquid)	1.88E+03	Ci	14C	6.25E+00 Ci
241-AZ-101	125Sb	Sludge	P3AZ1 (Solid)	2.49E+03	Ci	151Sm	1.26E+04 Ci
241-AZ-101	125Sb	Total		4.82E+03	Ci	152Eu	1.52E+01 Ci
241-AZ-101	126Sn	Sludge	NA	5.20E-02	Ci	154Eu	1.55E+02 Ci
241-AZ-101	126Sn	Supernatant	P3AZ1 (Liquid)	7.85E+00	Ci	155Eu	9.11E+02 Ci
241-AZ-101	126Sn	Sludge	P3AZ1 (Solid)	4.87E-01	Ci	226Ra	2.22E-04 Ci
241-AZ-101	126Sn	Total		8.39E+00	Ci	227Ac	1.46E-03 Ci
241-AZ-101	129I	Sludge	NA	5.49E-02	Ci	228Ra	1.45E-08 Ci
241-AZ-101	129I	Supernatant	P3AZ1 (Liquid)	3.24E-02	Ci	229Th	1.90E-06 Ci
241-AZ-101	129I	Sludge	P3AZ1 (Solid)	3.06E-01	Ci	231Pa	3.18E-03 Ci
241-AZ-101	129I	Total		3.93E-01	Ci	232Th	1.86E-08 Ci
241-AZ-101	134Cs	Sludge	NA	8.40E-02	Ci	232U	1.49E-06 Ci
241-AZ-101	134Cs	Supernatant	P3AZ1 (Liquid)	1.44E+03	Ci	233U	4.92E-07 Ci
241-AZ-101	134Cs	Sludge	P3AZ1 (Solid)	4.87E+01	Ci	234U	4.42E-03 Ci
241-AZ-101	134Cs	Total		1.49E+03	Ci	235U	1.65E-04 Ci
241-AZ-101	137Cs	Sludge	NA	3.70E+04	Ci	236U	4.22E-04 Ci
241-AZ-101	137Cs	Supernatant	P3AZ1 (Liquid)	5.06E+06	Ci	237Np	1.22E-01 Ci
241-AZ-101	137Cs	Sludge	P3AZ1 (Solid)	2.06E+05	Ci	238Pu	4.70E-01 Ci
241-AZ-101	137Cs	Total		5.30E+06	Ci	238U	3.04E-03 Ci
241-AZ-101	137mBa	Sludge	NA	3.49E+04	Ci	239Pu	4.55E+00 Ci
241-AZ-101	137mBa	Supernatant	P3AZ1 (Liquid)	4.78E+06	Ci	240Pu	1.30E+00 Ci
241-AZ-101	137mBa	Sludge	P3AZ1 (Solid)	1.94E+05	Ci	241Am	4.67E-01 Ci
241-AZ-101	137mBa	Total		5.01E+06	Ci	241Pu	3.37E+01 Ci
241-AZ-101	14C	Sludge	NA	5.26E-02	Ci	242Cm	2.37E-04 Ci
241-AZ-101	14C	Supernatant	P3AZ1 (Liquid)	6.25E+00	Ci	242Pu	1.69E-04 Ci
241-AZ-101	14C	Sludge	P3AZ1 (Solid)	2.93E-01	Ci	243Am	1.06E-04 Ci
241-AZ-101	14C	Total		6.59E+00	Ci	243Cm	4.24E-03 Ci
241-AZ-101	151Sm	Sludge	NA	3.56E+02	Ci	244Cm	9.86E-02 Ci
241-AZ-101	151Sm	Supernatant	P3AZ1 (Liquid)	1.26E+04	Ci	3H	5.17E+01 Ci
241-AZ-101	151Sm	Sludge	P3AZ1 (Solid)	1.18E+05	Ci	59Ni	6.93E+00 Ci
241-AZ-101	151Sm	Total		1.31E+05	Ci	60Co	3.97E+01 Ci
241-AZ-101	152Eu	Sludge	NA	4.12E-02	Ci	63Ni	6.54E+02 Ci
241-AZ-101	152Eu	Supernatant	P3AZ1 (Liquid)	1.52E+01	Ci	79Se	3.14E+00 Ci
241-AZ-101	152Eu	Sludge	P3AZ1 (Solid)	1.42E+02	Ci	90Sr	2.81E+03 Ci
241-AZ-101	152Eu	Total		1.57E+02	Ci	90Y	2.81E+03 Ci
241-AZ-101	154Eu	Sludge	NA	1.62E+03	Ci	93mNb	1.20E+02 Ci
241-AZ-101	154Eu	Supernatant	P3AZ1 (Liquid)	1.55E+02	Ci	93Zr	1.95E+02 Ci
241-AZ-101	154Eu	Sludge	P3AZ1 (Solid)	9.00E+03	Ci	99Tc	1.06E+03 Ci
241-AZ-101	154Eu	Total		1.08E+04	Ci		
241-AZ-101	155Eu	Sludge	NA	1.72E+03	Ci		

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-43

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-101	155Eu	Supernatant	P3AZ1 (Liquid)	9.11E+02	Ci	
241-AZ-101	155Eu	Sludge	P3AZ1 (Solid)	9.56E+03	Ci	
241-AZ-101	155Eu	Total		1.22E+04	Ci	
241-AZ-101	226Ra	Sludge	NA	1.08E-06	Ci	
241-AZ-101	226Ra	Supernatant	P3AZ1 (Liquid)	2.22E-04	Ci	
241-AZ-101	226Ra	Sludge	P3AZ1 (Solid)	7.62E-05	Ci	
241-AZ-101	226Ra	Total		3.00E-04	Ci	
241-AZ-101	227Ac	Sludge	NA	1.32E-04	Ci	
241-AZ-101	227Ac	Supernatant	P3AZ1 (Liquid)	1.46E-03	Ci	
241-AZ-101	227Ac	Sludge	P3AZ1 (Solid)	1.78E-04	Ci	
241-AZ-101	227Ac	Total		1.77E-03	Ci	
241-AZ-101	228Ra	Sludge	NA	7.35E-04	Ci	
241-AZ-101	228Ra	Supernatant	P3AZ1 (Liquid)	1.45E-08	Ci	
241-AZ-101	228Ra	Sludge	P3AZ1 (Solid)	2.01E-03	Ci	
241-AZ-101	228Ra	Total		2.74E-03	Ci	
241-AZ-101	229Th	Sludge	NA	5.31E-07	Ci	
241-AZ-101	229Th	Supernatant	P3AZ1 (Liquid)	1.90E-06	Ci	
241-AZ-101	229Th	Sludge	P3AZ1 (Solid)	6.41E-08	Ci	
241-AZ-101	229Th	Total		2.49E-06	Ci	
241-AZ-101	231Pa	Sludge	NA	1.39E-03	Ci	
241-AZ-101	231Pa	Supernatant	P3AZ1 (Liquid)	3.18E-03	Ci	
241-AZ-101	231Pa	Sludge	P3AZ1 (Solid)	1.07E-04	Ci	
241-AZ-101	231Pa	Total		4.67E-03	Ci	
241-AZ-101	232Th	Sludge	NA	1.24E-03	Ci	
241-AZ-101	232Th	Supernatant	P3AZ1 (Liquid)	1.86E-08	Ci	
241-AZ-101	232Th	Sludge	P3AZ1 (Solid)	6.92E-03	Ci	
241-AZ-101	232Th	Total		8.17E-03	Ci	
241-AZ-101	232U	Sludge	NA	2.45E-03	Ci	
241-AZ-101	232U	Supernatant	P3AZ1 (Liquid)	1.49E-06	Ci	
241-AZ-101	232U	Sludge	P3AZ1 (Solid)	2.27E-04	Ci	
241-AZ-101	232U	Total		2.68E-03	Ci	
241-AZ-101	233U	Sludge	NA	1.50E-01	Ci	
241-AZ-101	233U	Supernatant	P3AZ1 (Liquid)	4.92E-07	Ci	
241-AZ-101	233U	Sludge	P3AZ1 (Solid)	7.48E-05	Ci	
241-AZ-101	233U	Total		1.50E-01	Ci	
241-AZ-101	234U	Sludge	NA	1.06E-01	Ci	
241-AZ-101	234U	Supernatant	P3AZ1 (Liquid)	4.42E-03	Ci	
241-AZ-101	234U	Sludge	P3AZ1 (Solid)	6.72E-01	Ci	
241-AZ-101	234U	Total		7.82E-01	Ci	
241-AZ-101	235U	Sludge	NA	4.20E-03	Ci	
241-AZ-101	235U	Supernatant	P3AZ1 (Liquid)	1.65E-04	Ci	
241-AZ-101	235U	Sludge	P3AZ1 (Solid)	2.52E-02	Ci	
241-AZ-101	235U	Total		2.96E-02	Ci	
241-AZ-101	236U	Sludge	NA	7.20E-03	Ci	
241-AZ-101	236U	Supernatant	P3AZ1 (Liquid)	4.22E-04	Ci	
241-AZ-101	236U	Sludge	P3AZ1 (Solid)	6.39E-02	Ci	
241-AZ-101	236U	Total		7.16E-02	Ci	
241-AZ-101	237Np	Sludge	NA	2.05E+00	Ci	
241-AZ-101	237Np	Supernatant	P3AZ1 (Liquid)	1.22E-01	Ci	
241-AZ-101	237Np	Sludge	P3AZ1 (Solid)	1.14E+01	Ci	
241-AZ-101	237Np	Total		1.36E+01	Ci	
241-AZ-101	238Pu	Sludge	NA	1.32E+01	Ci	
241-AZ-101	238Pu	Supernatant	P3AZ1 (Liquid)	4.70E-01	Ci	
241-AZ-101	238Pu	Sludge	P3AZ1 (Solid)	1.02E+02	Ci	
241-AZ-101	238Pu	Total		1.15E+02	Ci	
241-AZ-101	238U	Sludge	NA	8.33E-02	Ci	
241-AZ-101	238U	Supernatant	P3AZ1 (Liquid)	3.04E-03	Ci	
241-AZ-101	238U	Sludge	P3AZ1 (Solid)	4.65E-01	Ci	
241-AZ-101	238U	Total		5.52E-01	Ci	
241-AZ-101	239Pu	Sludge	NA	1.81E+02	Ci	
241-AZ-101	239Pu	Supernatant	P3AZ1 (Liquid)	4.55E+00	Ci	
241-AZ-101	239Pu	Sludge	P3AZ1 (Solid)	9.89E+02	Ci	
241-AZ-101	239Pu	Total		1.18E+03	Ci	
241-AZ-101	240Pu	Sludge	NA	4.72E+01	Ci	
241-AZ-101	240Pu	Supernatant	P3AZ1 (Liquid)	1.30E+00	Ci	
241-AZ-101	240Pu	Sludge	P3AZ1 (Solid)	2.84E+02	Ci	
241-AZ-101	240Pu	Total		3.32E+02	Ci	
241-AZ-101	241Am	Sludge	NA	3.89E+03	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-44

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-101	241Am	Supernatant	P3AZ1 (Liquid)	4.67E-01	Ci	
241-AZ-101	241Am	Sludge	P3AZ1 (Solid)	2.17E+04	Ci	
241-AZ-101	241Am	Total		2.56E+04	Ci	
241-AZ-101	241Pu	Sludge	NA	8.29E+02	Ci	
241-AZ-101	241Pu	Supernatant	P3AZ1 (Liquid)	3.37E+01	Ci	
241-AZ-101	241Pu	Sludge	P3AZ1 (Solid)	7.33E+03	Ci	
241-AZ-101	241Pu	Total		8.19E+03	Ci	
241-AZ-101	242Cm	Sludge	NA	1.71E+00	Ci	
241-AZ-101	242Cm	Supernatant	P3AZ1 (Liquid)	2.37E-04	Ci	
241-AZ-101	242Cm	Sludge	P3AZ1 (Solid)	9.52E+00	Ci	
241-AZ-101	242Cm	Total		1.12E+01	Ci	
241-AZ-101	242Pu	Sludge	NA	5.00E-03	Ci	
241-AZ-101	242Pu	Supernatant	P3AZ1 (Liquid)	1.69E-04	Ci	
241-AZ-101	242Pu	Sludge	P3AZ1 (Solid)	3.66E-02	Ci	
241-AZ-101	242Pu	Total		4.18E-02	Ci	
241-AZ-101	243/244Cm	Sludge	NA	4.16E+00	Ci	
241-AZ-101	243/244Cm	Supernatant	P3AZ1 (Liquid)	1.12E-01	Ci	
241-AZ-101	243/244Cm	Sludge	P3AZ1 (Solid)	2.32E+01	Ci	
241-AZ-101	243/244Cm	Total		2.74E+01	Ci	
241-AZ-101	243Am	Sludge	NA	2.58E+00	Ci	
241-AZ-101	243Am	Supernatant	P3AZ1 (Liquid)	1.06E-04	Ci	
241-AZ-101	243Am	Sludge	P3AZ1 (Solid)	6.83E+00	Ci	
241-AZ-101	243Am	Total		9.41E+00	Ci	
241-AZ-101	243Cm	Sludge	NA	1.58E-01	Ci	
241-AZ-101	243Cm	Supernatant	P3AZ1 (Liquid)	4.24E-03	Ci	
241-AZ-101	243Cm	Sludge	P3AZ1 (Solid)	8.79E-01	Ci	
241-AZ-101	243Cm	Total		1.04E+00	Ci	
241-AZ-101	244Cm	Sludge	NA	3.67E+00	Ci	
241-AZ-101	244Cm	Supernatant	P3AZ1 (Liquid)	9.86E-02	Ci	
241-AZ-101	244Cm	Sludge	P3AZ1 (Solid)	2.04E+01	Ci	
241-AZ-101	244Cm	Total		2.42E+01	Ci	
241-AZ-101	3H	Sludge	NA	3.32E-01	Ci	
241-AZ-101	3H	Supernatant	P3AZ1 (Liquid)	5.17E+01	Ci	
241-AZ-101	3H	Sludge	P3AZ1 (Solid)	1.85E+00	Ci	
241-AZ-101	3H	Total		5.39E+01	Ci	
241-AZ-101	59Ni	Sludge	NA	2.27E-01	Ci	
241-AZ-101	59Ni	Supernatant	P3AZ1 (Liquid)	6.93E+00	Ci	
241-AZ-101	59Ni	Sludge	P3AZ1 (Solid)	1.41E+01	Ci	
241-AZ-101	59Ni	Total		2.13E+01	Ci	
241-AZ-101	60Co	Sludge	NA	1.13E+02	Ci	
241-AZ-101	60Co	Supernatant	P3AZ1 (Liquid)	3.97E+01	Ci	
241-AZ-101	60Co	Sludge	P3AZ1 (Solid)	6.27E+02	Ci	
241-AZ-101	60Co	Total		7.80E+02	Ci	
241-AZ-101	63Ni	Sludge	NA	2.12E+01	Ci	
241-AZ-101	63Ni	Supernatant	P3AZ1 (Liquid)	6.54E+02	Ci	
241-AZ-101	63Ni	Sludge	P3AZ1 (Solid)	1.34E+03	Ci	
241-AZ-101	63Ni	Total		2.01E+03	Ci	
241-AZ-101	79Se	Sludge	NA	8.10E-02	Ci	
241-AZ-101	79Se	Supernatant	P3AZ1 (Liquid)	3.14E+00	Ci	
241-AZ-101	79Se	Sludge	P3AZ1 (Solid)	4.51E-01	Ci	
241-AZ-101	79Se	Total		3.68E+00	Ci	
241-AZ-101	90Sr	Sludge	NA	8.40E+05	Ci	
241-AZ-101	90Sr	Supernatant	P3AZ1 (Liquid)	2.81E+03	Ci	
241-AZ-101	90Sr	Sludge	P3AZ1 (Solid)	4.68E+06	Ci	
241-AZ-101	90Sr	Total		5.52E+06	Ci	
241-AZ-101	90Y	Sludge	NA	8.40E+05	Ci	
241-AZ-101	90Y	Supernatant	P3AZ1 (Liquid)	2.81E+03	Ci	
241-AZ-101	90Y	Sludge	P3AZ1 (Solid)	4.68E+06	Ci	
241-AZ-101	90Y	Total		5.52E+06	Ci	
241-AZ-101	93mNb	Sludge	NA	6.20E-01	Ci	
241-AZ-101	93mNb	Supernatant	P3AZ1 (Liquid)	1.20E+02	Ci	
241-AZ-101	93mNb	Sludge	P3AZ1 (Solid)	4.05E+00	Ci	
241-AZ-101	93mNb	Total		1.25E+02	Ci	
241-AZ-101	93Zr	Sludge	NA	7.48E-01	Ci	
241-AZ-101	93Zr	Supernatant	P3AZ1 (Liquid)	1.95E+02	Ci	
241-AZ-101	93Zr	Sludge	P3AZ1 (Solid)	6.59E+00	Ci	
241-AZ-101	93Zr	Total		2.02E+02	Ci	
241-AZ-101	99Tc	Sludge	NA	7.65E+00	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-45

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AZ-101	99Tc	Supernatant	P3AZ1 (Liquid)	1.06E+03	Ci
241-AZ-101	99Tc	Sludge	P3AZ1 (Solid)	4.26E+01	Ci
241-AZ-101	99Tc	Total		1.11E+03	Ci
241-AZ-101	Ag	Sludge	NA	2.43E+00	kg
241-AZ-101	Ag	Supernatant	P3AZ1 (Liquid)	2.05E+00	kg
241-AZ-101	Ag	Sludge	P3AZ1 (Solid)	1.35E+01	kg
241-AZ-101	Ag	Total		1.80E+01	kg
241-AZ-101	Al	Sludge	NA	5.99E+03	kg
241-AZ-101	Al	Supernatant	P3AZ1 (Liquid)	1.96E+04	kg
241-AZ-101	Al	Sludge	P3AZ1 (Solid)	3.34E+04	kg
241-AZ-101	Al	Total		5.90E+04	kg
241-AZ-101	As	Sludge	NA	2.06E+00	kg
241-AZ-101	As	Supernatant	P3AZ1 (Liquid)	3.21E+01	kg
241-AZ-101	As	Sludge	P3AZ1 (Solid)	1.15E+01	kg
241-AZ-101	As	Total		4.56E+01	kg
241-AZ-101	B	Sludge	NA	1.30E+00	kg
241-AZ-101	B	Supernatant	P3AZ1 (Liquid)	6.07E+01	kg
241-AZ-101	B	Sludge	P3AZ1 (Solid)	7.26E+00	kg
241-AZ-101	B	Total		6.93E+01	kg
241-AZ-101	Ba	Sludge	NA	2.15E+01	kg
241-AZ-101	Ba	Supernatant	P3AZ1 (Liquid)	2.52E-01	kg
241-AZ-101	Ba	Sludge	P3AZ1 (Solid)	1.19E+02	kg
241-AZ-101	Ba	Total		1.41E+02	kg
241-AZ-101	Be	Sludge	NA	3.96E-01	kg
241-AZ-101	Be	Supernatant	P3AZ1 (Liquid)	9.53E-01	kg
241-AZ-101	Be	Sludge	P3AZ1 (Solid)	2.21E+00	kg
241-AZ-101	Be	Total		3.55E+00	kg
241-AZ-101	Bi	Sludge	NA	7.48E-01	kg
241-AZ-101	Bi	Supernatant	P3AZ1 (Liquid)	0.00E+00	kg
241-AZ-101	Bi	Sludge	P3AZ1 (Solid)	0.00E+00	kg
241-AZ-101	Bi	Total		7.48E-01	kg
241-AZ-101	Ca	Sludge	NA	1.05E+02	kg
241-AZ-101	Ca	Supernatant	P3AZ1 (Liquid)	2.38E+01	kg
241-AZ-101	Ca	Sludge	P3AZ1 (Solid)	5.87E+02	kg
241-AZ-101	Ca	Total		7.16E+02	kg
241-AZ-101	Cd	Sludge	NA	2.05E+02	kg
241-AZ-101	Cd	Supernatant	P3AZ1 (Liquid)	2.60E+00	kg
241-AZ-101	Cd	Sludge	P3AZ1 (Solid)	1.14E+03	kg
241-AZ-101	Cd	Total		1.35E+03	kg
241-AZ-101	Ce	Sludge	NA	3.52E+01	kg
241-AZ-101	Ce	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg
241-AZ-101	Ce	Sludge	P3AZ1 (Solid)	1.96E+02	kg
241-AZ-101	Ce	Total		2.31E+02	kg
241-AZ-101	Cl	Sludge	NA	5.83E+00	kg
241-AZ-101	Cl	Supernatant	P3AZ1 (Liquid)	7.89E+02	kg
241-AZ-101	Cl	Sludge	P3AZ1 (Solid)	3.25E+01	kg
241-AZ-101	Cl	Total		8.28E+02	kg
241-AZ-101	CN	Sludge	NA	2.16E-01	kg
241-AZ-101	CN	Supernatant	P3AZ1 (Liquid)	6.62E+00	kg
241-AZ-101	CN	Sludge	P3AZ1 (Solid)	1.20E+00	kg
241-AZ-101	CN	Total		8.04E+00	kg
241-AZ-101	Co	Sludge	NA	1.38E+00	kg
241-AZ-101	Co	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg
241-AZ-101	Co	Sludge	P3AZ1 (Solid)	7.67E+00	kg
241-AZ-101	Co	Total		9.24E+00	kg
241-AZ-101	Cr	Sludge	NA	3.76E+01	kg
241-AZ-101	Cr	Supernatant	P3AZ1 (Liquid)	2.22E+03	kg
241-AZ-101	Cr	Sludge	P3AZ1 (Solid)	2.09E+02	kg
241-AZ-101	Cr	Total		2.47E+03	kg
241-AZ-101	Cu	Sludge	NA	1.04E+01	kg
241-AZ-101	Cu	Supernatant	P3AZ1 (Liquid)	2.05E+00	kg
241-AZ-101	Cu	Sludge	P3AZ1 (Solid)	5.82E+01	kg
241-AZ-101	Cu	Total		7.07E+01	kg
241-AZ-101	F	Sludge	NA	1.88E+02	kg
241-AZ-101	F	Supernatant	P3AZ1 (Liquid)	6.51E+03	kg
241-AZ-101	F	Sludge	P3AZ1 (Solid)	1.04E+03	kg
241-AZ-101	F	Total		7.74E+03	kg
241-AZ-101	Fe	Sludge	NA	2.93E+03	kg

Summary		
Summary		
Ag	2.05E+00	kg
Al	1.96E+04	kg
As	3.21E+01	kg
B	6.07E+01	kg
Ba	2.52E-01	kg
Be	9.53E-01	kg
Bi	0.00E+00	kg
Ca	2.38E+01	kg
Cd	2.60E+00	kg
Ce	1.91E-01	kg
Cl	7.89E+02	kg
CN	6.62E+00	kg
Co	1.91E-01	kg
Cr	2.22E+03	kg
Cu	2.05E+00	kg
F	6.51E+03	kg
Fe	4.87E+00	kg
Free OH	3.69E+04	kg
Hg	1.80E-01	kg
K	1.45E+04	kg
La	0.00E+00	kg
Li	2.92E+00	kg
Mg	8.43E+00	kg
Mn	0.00E+00	kg
Mo	2.88E+02	kg
Na	3.60E+05	kg
Nd	8.43E+00	kg
NH3	0.00E+00	kg
Ni	3.24E+00	kg
NO2	1.99E+05	kg
NO3	1.71E+05	kg
Oxalate	3.27E+03	kg
Pb	1.08E+01	kg
Pd	6.49E+01	kg
PO4	5.01E+03	kg
Pr	1.91E-01	kg
Rb	2.98E+01	kg
Rh	6.79E+00	kg
Ru	1.52E+00	kg
Sb	1.91E-01	kg
Se	2.10E+01	kg
Si	2.22E+02	kg
SO4	5.24E+04	kg
Sr	1.29E-01	kg
Ta	1.91E-01	kg
Te	1.91E-01	kg
Th	1.69E-04	kg
Ti	2.05E+00	kg
TIC as CO3	1.60E+05	kg
Tl	1.91E-01	kg
TOC	1.65E+03	kg
UTOTAL	9.14E+00	kg
V	4.87E+00	kg
W	1.88E+02	kg
Y	4.22E+00	kg
Zn	4.22E+00	kg
Zr	0.00E+00	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-46

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-101	Fe	Supernatant	P3AZ1 (Liquid)	4.87E+00	kg	
241-AZ-101	Fe	Sludge	P3AZ1 (Solid)	1.63E+04	kg	
241-AZ-101	Fe	Total		1.93E+04	kg	
241-AZ-101	Free OH	Sludge	NA	4.10E+01	kg	
241-AZ-101	Free OH	Supernatant	P3AZ1 (Liquid)	3.69E+04	kg	
241-AZ-101	Free OH	Sludge	P3AZ1 (Solid)	2.28E+02	kg	
241-AZ-101	Free OH	Total		3.71E+04	kg	
241-AZ-101	Hg	Sludge	NA	1.38E-01	kg	
241-AZ-101	Hg	Supernatant	P3AZ1 (Liquid)	1.80E-01	kg	
241-AZ-101	Hg	Sludge	P3AZ1 (Solid)	7.66E-01	kg	
241-AZ-101	Hg	Total		1.08E+00	kg	
241-AZ-101	K	Sludge	NA	7.62E+01	kg	
241-AZ-101	K	Supernatant	P3AZ1 (Liquid)	1.45E+04	kg	
241-AZ-101	K	Sludge	P3AZ1 (Solid)	4.24E+02	kg	
241-AZ-101	K	Total		1.50E+04	kg	
241-AZ-101	La	Sludge	NA	7.86E+01	kg	
241-AZ-101	La	Supernatant	P3AZ1 (Liquid)	0.00E+00	kg	
241-AZ-101	La	Sludge	P3AZ1 (Solid)	4.37E+02	kg	
241-AZ-101	La	Total		5.16E+02	kg	
241-AZ-101	Li	Sludge	NA	3.09E+00	kg	
241-AZ-101	Li	Supernatant	P3AZ1 (Liquid)	2.92E+00	kg	
241-AZ-101	Li	Sludge	P3AZ1 (Solid)	1.72E+01	kg	
241-AZ-101	Li	Total		2.32E+01	kg	
241-AZ-101	Mg	Sludge	NA	1.93E+01	kg	
241-AZ-101	Mg	Supernatant	P3AZ1 (Liquid)	8.43E+00	kg	
241-AZ-101	Mg	Sludge	P3AZ1 (Solid)	1.08E+02	kg	
241-AZ-101	Mg	Total		1.35E+02	kg	
241-AZ-101	Mn	Sludge	NA	6.50E+01	kg	
241-AZ-101	Mn	Supernatant	P3AZ1 (Liquid)	0.00E+00	kg	
241-AZ-101	Mn	Sludge	P3AZ1 (Solid)	3.62E+02	kg	
241-AZ-101	Mn	Total		4.27E+02	kg	
241-AZ-101	Mo	Sludge	NA	3.12E+00	kg	
241-AZ-101	Mo	Supernatant	P3AZ1 (Liquid)	2.88E+02	kg	
241-AZ-101	Mo	Sludge	P3AZ1 (Solid)	1.73E+01	kg	
241-AZ-101	Mo	Total		3.08E+02	kg	
241-AZ-101	Na	Sludge	NA	3.48E+03	kg	
241-AZ-101	Na	Supernatant	P3AZ1 (Liquid)	3.60E+05	kg	
241-AZ-101	Na	Sludge	P3AZ1 (Solid)	1.94E+04	kg	
241-AZ-101	Na	Total		3.83E+05	kg	
241-AZ-101	Nd	Sludge	NA	9.19E+01	kg	
241-AZ-101	Nd	Supernatant	P3AZ1 (Liquid)	8.43E+00	kg	
241-AZ-101	Nd	Sludge	P3AZ1 (Solid)	5.12E+02	kg	
241-AZ-101	Nd	Total		6.12E+02	kg	
241-AZ-101	Ni	Sludge	NA	1.22E+02	kg	
241-AZ-101	Ni	Supernatant	P3AZ1 (Liquid)	3.24E+00	kg	
241-AZ-101	Ni	Sludge	P3AZ1 (Solid)	6.77E+02	kg	
241-AZ-101	Ni	Total		8.02E+02	kg	
241-AZ-101	NO2	Sludge	NA	1.42E+03	kg	
241-AZ-101	NO2	Supernatant	P3AZ1 (Liquid)	1.99E+05	kg	
241-AZ-101	NO2	Sludge	P3AZ1 (Solid)	7.92E+03	kg	
241-AZ-101	NO2	Total		2.08E+05	kg	
241-AZ-101	NO3	Sludge	NA	1.19E+03	kg	
241-AZ-101	NO3	Supernatant	P3AZ1 (Liquid)	1.71E+05	kg	
241-AZ-101	NO3	Sludge	P3AZ1 (Solid)	6.65E+03	kg	
241-AZ-101	NO3	Total		1.78E+05	kg	
241-AZ-101	Oxalate	Sludge	NA	1.42E+02	kg	
241-AZ-101	Oxalate	Supernatant	P3AZ1 (Liquid)	3.27E+03	kg	
241-AZ-101	Oxalate	Sludge	P3AZ1 (Solid)	7.90E+02	kg	
241-AZ-101	Oxalate	Total		4.20E+03	kg	
241-AZ-101	Pb	Sludge	NA	2.15E+01	kg	
241-AZ-101	Pb	Supernatant	P3AZ1 (Liquid)	1.08E+01	kg	
241-AZ-101	Pb	Sludge	P3AZ1 (Solid)	1.20E+02	kg	
241-AZ-101	Pb	Total		1.52E+02	kg	
241-AZ-101	Pd	Sludge	NA	1.05E+02	kg	
241-AZ-101	Pd	Supernatant	P3AZ1 (Liquid)	6.49E+01	kg	
241-AZ-101	Pd	Sludge	P3AZ1 (Solid)	5.87E+02	kg	
241-AZ-101	Pd	Total		7.57E+02	kg	
241-AZ-101	PO4	Sludge	NA	2.46E+02	kg	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-47

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-101	PO4	Supernatant	P3AZ1 (Liquid)	5.01E+03	kg	
241-AZ-101	PO4	Sludge	P3AZ1 (Solid)	1.37E+03	kg	
241-AZ-101	PO4	Total		6.63E+03	kg	
241-AZ-101	Pr	Sludge	NA	2.17E+01	kg	
241-AZ-101	Pr	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg	
241-AZ-101	Pr	Sludge	P3AZ1 (Solid)	1.21E+02	kg	
241-AZ-101	Pr	Total		1.43E+02	kg	
241-AZ-101	Rb	Sludge	NA	1.15E+01	kg	
241-AZ-101	Rb	Supernatant	P3AZ1 (Liquid)	2.98E+01	kg	
241-AZ-101	Rb	Sludge	P3AZ1 (Solid)	6.42E+01	kg	
241-AZ-101	Rb	Total		1.06E+02	kg	
241-AZ-101	Rh	Sludge	NA	4.01E+00	kg	
241-AZ-101	Rh	Supernatant	P3AZ1 (Liquid)	6.79E+00	kg	
241-AZ-101	Rh	Sludge	P3AZ1 (Solid)	2.23E+01	kg	
241-AZ-101	Rh	Total		3.32E+01	kg	
241-AZ-101	Ru	Sludge	NA	3.16E+01	kg	
241-AZ-101	Ru	Supernatant	P3AZ1 (Liquid)	1.52E+00	kg	
241-AZ-101	Ru	Sludge	P3AZ1 (Solid)	1.76E+02	kg	
241-AZ-101	Ru	Total		2.09E+02	kg	
241-AZ-101	Sb	Sludge	NA	1.49E-01	kg	
241-AZ-101	Sb	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg	
241-AZ-101	Sb	Sludge	P3AZ1 (Solid)	8.31E-01	kg	
241-AZ-101	Sb	Total		1.17E+00	kg	
241-AZ-101	Se	Sludge	NA	6.72E-02	kg	
241-AZ-101	Se	Supernatant	P3AZ1 (Liquid)	2.10E+01	kg	
241-AZ-101	Se	Sludge	P3AZ1 (Solid)	3.74E-01	kg	
241-AZ-101	Se	Total		2.14E+01	kg	
241-AZ-101	Si	Sludge	NA	1.67E+02	kg	
241-AZ-101	Si	Supernatant	P3AZ1 (Liquid)	2.22E+02	kg	
241-AZ-101	Si	Sludge	P3AZ1 (Solid)	9.29E+02	kg	
241-AZ-101	Si	Total		1.32E+03	kg	
241-AZ-101	SO4	Sludge	NA	1.11E+03	kg	
241-AZ-101	SO4	Supernatant	P3AZ1 (Liquid)	5.24E+04	kg	
241-AZ-101	SO4	Sludge	P3AZ1 (Solid)	6.19E+03	kg	
241-AZ-101	SO4	Total		5.97E+04	kg	
241-AZ-101	Sr	Sludge	NA	1.56E+01	kg	
241-AZ-101	Sr	Supernatant	P3AZ1 (Liquid)	1.29E-01	kg	
241-AZ-101	Sr	Sludge	P3AZ1 (Solid)	8.70E+01	kg	
241-AZ-101	Sr	Total		1.03E+02	kg	
241-AZ-101	Ta	Sludge	NA	1.60E-01	kg	
241-AZ-101	Ta	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg	
241-AZ-101	Ta	Sludge	P3AZ1 (Solid)	8.92E-01	kg	
241-AZ-101	Ta	Total		1.24E+00	kg	
241-AZ-101	Te	Sludge	NA	8.74E+00	kg	
241-AZ-101	Te	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg	
241-AZ-101	Te	Sludge	P3AZ1 (Solid)	4.87E+01	kg	
241-AZ-101	Te	Total		5.76E+01	kg	
241-AZ-101	Th	Sludge	NA	1.13E+01	kg	
241-AZ-101	Th	Supernatant	P3AZ1 (Liquid)	1.69E-04	kg	
241-AZ-101	Th	Sludge	P3AZ1 (Solid)	6.29E+01	kg	
241-AZ-101	Th	Total		7.42E+01	kg	
241-AZ-101	Ti	Sludge	NA	2.82E+00	kg	
241-AZ-101	Ti	Supernatant	P3AZ1 (Liquid)	2.05E+00	kg	
241-AZ-101	Ti	Sludge	P3AZ1 (Solid)	1.57E+01	kg	
241-AZ-101	Ti	Total		2.06E+01	kg	
241-AZ-101	TIC as CO3	Sludge	NA	2.02E+03	kg	
241-AZ-101	TIC as CO3	Supernatant	P3AZ1 (Liquid)	1.60E+05	kg	
241-AZ-101	TIC as CO3	Sludge	P3AZ1 (Solid)	1.12E+04	kg	
241-AZ-101	TIC as CO3	Total		1.73E+05	kg	
241-AZ-101	Tl	Sludge	NA	6.89E-03	kg	
241-AZ-101	Tl	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg	
241-AZ-101	Tl	Sludge	P3AZ1 (Solid)	3.84E-02	kg	
241-AZ-101	Tl	Total		2.36E-01	kg	
241-AZ-101	TOC	Sludge	NA	3.95E+01	kg	
241-AZ-101	TOC	Supernatant	P3AZ1 (Liquid)	1.65E+03	kg	
241-AZ-101	TOC	Sludge	P3AZ1 (Solid)	2.20E+02	kg	
241-AZ-101	TOC	Total		1.91E+03	kg	
241-AZ-101	UTOTAL	Sludge	NA	2.50E+02	kg	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO : C-48

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AZ-101	UTOTAL	Supernatant	P3AZ1 (Liquid)	9.14E+00	kg		
241-AZ-101	UTOTAL	Sludge	P3AZ1 (Solid)	1.39E+03	kg		
241-AZ-101	UTOTAL	Total		1.65E+03	kg		
241-AZ-101	V	Sludge	NA	1.03E+00	kg		
241-AZ-101	V	Supernatant	P3AZ1 (Liquid)	4.87E+00	kg		
241-AZ-101	V	Sludge	P3AZ1 (Solid)	5.75E+00	kg		
241-AZ-101	V	Total		1.16E+01	kg		
241-AZ-101	W	Sludge	NA	1.67E+00	kg		
241-AZ-101	W	Supernatant	P3AZ1 (Liquid)	1.88E+02	kg		
241-AZ-101	W	Sludge	P3AZ1 (Solid)	9.30E+00	kg		
241-AZ-101	W	Total		1.99E+02	kg		
241-AZ-101	Y	Sludge	NA	4.97E+00	kg		
241-AZ-101	Y	Supernatant	P3AZ1 (Liquid)	4.22E+00	kg		
241-AZ-101	Y	Sludge	P3AZ1 (Solid)	2.76E+01	kg		
241-AZ-101	Y	Total		3.68E+01	kg		
241-AZ-101	Zn	Sludge	NA	3.47E+00	kg		
241-AZ-101	Zn	Supernatant	P3AZ1 (Liquid)	4.22E+00	kg		
241-AZ-101	Zn	Sludge	P3AZ1 (Solid)	1.93E+01	kg		
241-AZ-101	Zn	Total		2.70E+01	kg		
241-AZ-101	Zr	Sludge	NA	8.56E+02	kg		
241-AZ-101	Zr	Supernatant	P3AZ1 (Liquid)	0.00E+00	kg		
241-AZ-101	Zr	Sludge	P3AZ1 (Solid)	4.77E+03	kg		
241-AZ-101	Zr	Total		5.62E+03	kg		
241-AZ-102	106Ru	Sludge	NA sludge	6.81E-08	Ci	Summary	
241-AZ-102	106Ru	Supernatant	P3AZ2 (Liquid)	8.60E+01	Ci	106Ru	8.60E+01 Ci
241-AZ-102	106Ru	Sludge	P3AZ2 (Solid)	5.93E+00	Ci	113mCd	1.24E+02 Ci
241-AZ-102	106Ru	Sludge	PL2 (Solid)	1.37E-03	Ci	125Sb	1.75E+03 Ci
241-AZ-102	106Ru	Sludge	SRR (Solid)	4.72E-04	Ci	126Sn	2.11E+00 Ci
241-AZ-102	106Ru	Total		9.19E+01	Ci	129I	4.46E-02 Ci
241-AZ-102	113mCd	Sludge	NA sludge	3.39E-01	Ci	134Cs	8.71E+02 Ci
241-AZ-102	113mCd	Supernatant	P3AZ2 (Liquid)	1.24E+02	Ci	137Cs	3.13E+06 Ci
241-AZ-102	113mCd	Sludge	P3AZ2 (Solid)	1.74E+02	Ci	137mBa	2.95E+06 Ci
241-AZ-102	113mCd	Sludge	PL2 (Solid)	1.40E-04	Ci	14C	3.17E+00 Ci
241-AZ-102	113mCd	Sludge	SRR (Solid)	8.08E-01	Ci	151Sm	1.24E+04 Ci
241-AZ-102	113mCd	Total		2.99E+02	Ci	152Eu	1.33E+01 Ci
241-AZ-102	125Sb	Sludge	NA sludge	4.82E+01	Ci	154Eu	1.57E+02 Ci
241-AZ-102	125Sb	Supernatant	P3AZ2 (Liquid)	1.75E+03	Ci	155Eu	2.45E+02 Ci
241-AZ-102	125Sb	Sludge	P3AZ2 (Solid)	1.66E+03	Ci	226Ra	1.41E-04 Ci
241-AZ-102	125Sb	Sludge	PL2 (Solid)	9.04E+01	Ci	227Ac	8.24E-04 Ci
241-AZ-102	125Sb	Sludge	SRR (Solid)	5.90E+02	Ci	228Ra	9.85E-09 Ci
241-AZ-102	125Sb	Total		4.14E+03	Ci	229Th	9.38E-07 Ci
241-AZ-102	126Sn	Sludge	NA sludge	1.13E-02	Ci	231Pa	1.78E-03 Ci
241-AZ-102	126Sn	Supernatant	P3AZ2 (Liquid)	2.11E+00	Ci	232Th	1.10E-08 Ci
241-AZ-102	126Sn	Sludge	P3AZ2 (Solid)	5.20E-01	Ci	232U	3.64E-05 Ci
241-AZ-102	126Sn	Sludge	PL2 (Solid)	3.96E-06	Ci	233U	1.16E-05 Ci
241-AZ-102	126Sn	Sludge	SRR (Solid)	4.90E-02	Ci	234U	1.25E-01 Ci
241-AZ-102	126Sn	Total		2.69E+00	Ci	235U	4.97E-03 Ci
241-AZ-102	129I	Sludge	NA sludge	9.11E-04	Ci	236U	1.23E-02 Ci
241-AZ-102	129I	Supernatant	P3AZ2 (Liquid)	4.46E-02	Ci	237Np	3.57E-01 Ci
241-AZ-102	129I	Sludge	P3AZ2 (Solid)	3.07E-03	Ci	238Pu	2.34E+00 Ci
241-AZ-102	129I	Sludge	PL2 (Solid)	3.59E-04	Ci	238U	8.59E-02 Ci
241-AZ-102	129I	Sludge	SRR (Solid)	2.17E-04	Ci	239Pu	2.42E+01 Ci
241-AZ-102	129I	Total		4.91E-02	Ci	240Pu	6.61E+00 Ci
241-AZ-102	134Cs	Sludge	NA sludge	2.49E+00	Ci	241Am	2.07E+00 Ci
241-AZ-102	134Cs	Supernatant	P3AZ2 (Liquid)	8.71E+02	Ci	241Pu	1.67E+02 Ci
241-AZ-102	134Cs	Sludge	P3AZ2 (Solid)	8.54E+01	Ci	242Cm	6.57E-04 Ci
241-AZ-102	134Cs	Sludge	PL2 (Solid)	4.66E+00	Ci	242Pu	7.97E-04 Ci
241-AZ-102	134Cs	Sludge	SRR (Solid)	3.04E+01	Ci	243Am	1.85E-04 Ci
241-AZ-102	134Cs	Total		9.94E+02	Ci	243Cm	8.91E-05 Ci
241-AZ-102	137Cs	Sludge	NA sludge	7.47E+03	Ci	244Cm	2.11E-03 Ci
241-AZ-102	137Cs	Supernatant	P3AZ2 (Liquid)	3.13E+06	Ci	3H	9.77E+01 Ci
241-AZ-102	137Cs	Sludge	P3AZ2 (Solid)	2.57E+05	Ci	59Ni	2.14E+00 Ci
241-AZ-102	137Cs	Sludge	PL2 (Solid)	1.40E+04	Ci	60Co	3.94E+01 Ci
241-AZ-102	137Cs	Sludge	SRR (Solid)	9.15E+04	Ci	63Ni	2.05E+02 Ci
241-AZ-102	137Cs	Total		3.50E+06	Ci	79Se	1.43E+00 Ci

CALCULATION SHEET

PROJECT. RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-49

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary		
241-AZ-102	137mBa	Sludge	NA sludge	7.05E+03	Ci	90Sr	6.51E+03	Ci
241-AZ-102	137mBa	Supernatant	P3AZ2 (Liquid)	2.95E+06	Ci	90Y	6.51E+03	Ci
241-AZ-102	137mBa	Sludge	P3AZ2 (Solid)	2.42E+05	Ci	93mNb	6.13E+01	Ci
241-AZ-102	137mBa	Sludge	PL2 (Solid)	1.32E+04	Ci	93Zr	1.05E+02	Ci
241-AZ-102	137mBa	Sludge	SRR (Solid)	8.64E+04	Ci	99Tc	6.98E+02	Ci
241-AZ-102	137mBa	Total		3.30E+06	Ci			
241-AZ-102	14C	Sludge	NA sludge	7.97E-03	Ci			
241-AZ-102	14C	Supernatant	P3AZ2 (Liquid)	3.17E+00	Ci			
241-AZ-102	14C	Sludge	P3AZ2 (Solid)	2.74E-01	Ci			
241-AZ-102	14C	Sludge	PL2 (Solid)	1.49E-02	Ci			
241-AZ-102	14C	Sludge	SRR (Solid)	9.77E-02	Ci			
241-AZ-102	14C	Total		3.57E+00	Ci			
241-AZ-102	151Sm	Sludge	NA sludge	5.54E+01	Ci			
241-AZ-102	151Sm	Supernatant	P3AZ2 (Liquid)	1.24E+04	Ci			
241-AZ-102	151Sm	Sludge	P3AZ2 (Solid)	6.16E+04	Ci			
241-AZ-102	151Sm	Sludge	PL2 (Solid)	3.51E-02	Ci			
241-AZ-102	151Sm	Sludge	SRR (Solid)	1.43E+05	Ci			
241-AZ-102	151Sm	Total		2.17E+05	Ci			
241-AZ-102	152Eu	Sludge	NA sludge	9.99E-03	Ci			
241-AZ-102	152Eu	Supernatant	P3AZ2 (Liquid)	1.33E+01	Ci			
241-AZ-102	152Eu	Sludge	P3AZ2 (Solid)	6.64E+01	Ci			
241-AZ-102	152Eu	Sludge	PL2 (Solid)	4.05E-05	Ci			
241-AZ-102	152Eu	Sludge	SRR (Solid)	3.09E+01	Ci			
241-AZ-102	152Eu	Total		1.11E+02	Ci			
241-AZ-102	154Eu	Sludge	NA sludge	1.73E+02	Ci			
241-AZ-102	154Eu	Supernatant	P3AZ2 (Liquid)	1.57E+02	Ci			
241-AZ-102	154Eu	Sludge	P3AZ2 (Solid)	5.95E+03	Ci			
241-AZ-102	154Eu	Sludge	PL2 (Solid)	3.25E+02	Ci			
241-AZ-102	154Eu	Sludge	SRR (Solid)	2.12E+03	Ci			
241-AZ-102	154Eu	Total		8.73E+03	Ci			
241-AZ-102	155Eu	Sludge	NA sludge	2.51E+02	Ci			
241-AZ-102	155Eu	Supernatant	P3AZ2 (Liquid)	2.45E+02	Ci			
241-AZ-102	155Eu	Sludge	P3AZ2 (Solid)	8.64E+03	Ci			
241-AZ-102	155Eu	Sludge	PL2 (Solid)	4.71E+02	Ci			
241-AZ-102	155Eu	Sludge	SRR (Solid)	3.08E+03	Ci			
241-AZ-102	155Eu	Total		1.27E+04	Ci			
241-AZ-102	226Ra	Sludge	NA sludge	3.06E-07	Ci			
241-AZ-102	226Ra	Supernatant	P3AZ2 (Liquid)	1.41E-04	Ci			
241-AZ-102	226Ra	Sludge	P3AZ2 (Solid)	9.70E-06	Ci			
241-AZ-102	226Ra	Sludge	PL2 (Solid)	7.69E-11	Ci			
241-AZ-102	226Ra	Sludge	SRR (Solid)	6.20E-07	Ci			
241-AZ-102	226Ra	Total		1.52E-04	Ci			
241-AZ-102	227Ac	Sludge	NA sludge	3.27E-05	Ci			
241-AZ-102	227Ac	Supernatant	P3AZ2 (Liquid)	8.24E-04	Ci			
241-AZ-102	227Ac	Sludge	P3AZ2 (Solid)	5.67E-05	Ci			
241-AZ-102	227Ac	Sludge	PL2 (Solid)	4.32E-10	Ci			
241-AZ-102	227Ac	Sludge	SRR (Solid)	3.13E-06	Ci			
241-AZ-102	227Ac	Total		9.16E-04	Ci			
241-AZ-102	228Ra	Sludge	NA sludge	1.92E-04	Ci			
241-AZ-102	228Ra	Supernatant	P3AZ2 (Liquid)	9.85E-09	Ci			
241-AZ-102	228Ra	Sludge	P3AZ2 (Solid)	4.24E-03	Ci			
241-AZ-102	228Ra	Sludge	PL2 (Solid)	3.42E-04	Ci			
241-AZ-102	228Ra	Sludge	SRR (Solid)	1.85E-03	Ci			
241-AZ-102	228Ra	Total		6.62E-03	Ci			
241-AZ-102	229Th	Sludge	NA sludge	1.22E-07	Ci			
241-AZ-102	229Th	Supernatant	P3AZ2 (Liquid)	9.38E-07	Ci			
241-AZ-102	229Th	Sludge	P3AZ2 (Solid)	6.45E-08	Ci			
241-AZ-102	229Th	Sludge	PL2 (Solid)	5.09E-13	Ci			
241-AZ-102	229Th	Sludge	SRR (Solid)	3.69E-09	Ci			
241-AZ-102	229Th	Total		1.13E-06	Ci			
241-AZ-102	231Pa	Sludge	NA sludge	3.34E-04	Ci			
241-AZ-102	231Pa	Supernatant	P3AZ2 (Liquid)	1.78E-03	Ci			
241-AZ-102	231Pa	Sludge	P3AZ2 (Solid)	1.23E-04	Ci			
241-AZ-102	231Pa	Sludge	PL2 (Solid)	8.89E-10	Ci			
241-AZ-102	231Pa	Sludge	SRR (Solid)	4.76E-06	Ci			
241-AZ-102	231Pa	Total		2.24E-03	Ci			
241-AZ-102	232Th	Sludge	NA sludge	4.15E-04	Ci			
241-AZ-102	232Th	Supernatant	P3AZ2 (Liquid)	1.10E-08	Ci			

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-50

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	232Th	Sludge	P3AZ2 (Solid)	1.43E-02	Ci	
241-AZ-102	232Th	Sludge	PL2 (Solid)	7.79E-04	Ci	
241-AZ-102	232Th	Sludge	SRR (Solid)	5.09E-03	Ci	
241-AZ-102	232Th	Total		2.06E-02	Ci	
241-AZ-102	232U	Sludge	NA sludge	4.88E-03	Ci	
241-AZ-102	232U	Supernatant	P3AZ2 (Liquid)	3.64E-05	Ci	
241-AZ-102	232U	Sludge	P3AZ2 (Solid)	6.94E-04	Ci	
241-AZ-102	232U	Sludge	PL2 (Solid)	4.14E-05	Ci	
241-AZ-102	232U	Sludge	SRR (Solid)	5.49E-05	Ci	
241-AZ-102	232U	Total		5.71E-03	Ci	
241-AZ-102	233U	Sludge	NA sludge	3.03E-01	Ci	
241-AZ-102	233U	Supernatant	P3AZ2 (Liquid)	1.16E-05	Ci	
241-AZ-102	233U	Sludge	P3AZ2 (Solid)	2.20E-04	Ci	
241-AZ-102	233U	Sludge	PL2 (Solid)	1.35E-05	Ci	
241-AZ-102	233U	Sludge	SRR (Solid)	1.72E-04	Ci	
241-AZ-102	233U	Total		3.03E-01	Ci	
241-AZ-102	234U	Sludge	NA sludge	5.29E-02	Ci	
241-AZ-102	234U	Supernatant	P3AZ2 (Liquid)	1.25E-01	Ci	
241-AZ-102	234U	Sludge	P3AZ2 (Solid)	2.38E+00	Ci	
241-AZ-102	234U	Sludge	PL2 (Solid)	1.29E-01	Ci	
241-AZ-102	234U	Sludge	SRR (Solid)	5.99E-01	Ci	
241-AZ-102	234U	Total		3.28E+00	Ci	
241-AZ-102	235U	Sludge	NA sludge	2.15E-03	Ci	
241-AZ-102	235U	Supernatant	P3AZ2 (Liquid)	4.97E-03	Ci	
241-AZ-102	235U	Sludge	P3AZ2 (Solid)	9.46E-02	Ci	
241-AZ-102	235U	Sludge	PL2 (Solid)	4.94E-03	Ci	
241-AZ-102	235U	Sludge	SRR (Solid)	2.53E-02	Ci	
241-AZ-102	235U	Total		1.32E-01	Ci	
241-AZ-102	236U	Sludge	NA sludge	1.39E-03	Ci	
241-AZ-102	236U	Supernatant	P3AZ2 (Liquid)	1 23E-02	Ci	
241-AZ-102	236U	Sludge	P3AZ2 (Solid)	2.35E-01	Ci	
241-AZ-102	236U	Sludge	PL2 (Solid)	1.24E-02	Ci	
241-AZ-102	236U	Sludge	SRR (Solid)	1.58E-02	Ci	
241-AZ-102	236U	Total		2.76E-01	Ci	
241-AZ-102	237Np	Sludge	NA sludge	3.83E-01	Ci	
241-AZ-102	237Np	Supernatant	P3AZ2 (Liquid)	3.57E-01	Ci	
241-AZ-102	237Np	Sludge	P3AZ2 (Solid)	1.32E+01	Ci	
241-AZ-102	237Np	Sludge	PL2 (Solid)	7.19E-01	Ci	
241-AZ-102	237Np	Sludge	SRR (Solid)	4.70E+00	Ci	
241-AZ-102	237Np	Total		1.93E+01	Ci	
241-AZ-102	238Pu	Sludge	NA sludge	3.93E+00	Ci	
241-AZ-102	238Pu	Supernatant	P3AZ2 (Liquid)	2.34E+00	Ci	
241-AZ-102	238Pu	Sludge	P3AZ2 (Solid)	1.35E+02	Ci	
241-AZ-102	238Pu	Sludge	PL2 (Solid)	7.36E+00	Ci	
241-AZ-102	238Pu	Sludge	SRR (Solid)	4.81E+01	Ci	
241-AZ-102	238Pu	Total		1.97E+02	Ci	
241-AZ-102	238U	Sludge	NA sludge	4.75E-02	Ci	
241-AZ-102	238U	Supernatant	P3AZ2 (Liquid)	8.59E-02	Ci	
241-AZ-102	238U	Sludge	P3AZ2 (Solid)	1.63E+00	Ci	
241-AZ-102	238U	Sludge	PL2 (Solid)	8.89E-02	Ci	
241-AZ-102	238U	Sludge	SRR (Solid)	5.82E-01	Ci	
241-AZ-102	238U	Total		2.44E+00	Ci	
241-AZ-102	239Pu	Sludge	NA sludge	2.71E+01	Ci	
241-AZ-102	239Pu	Supernatant	P3AZ2 (Liquid)	2.42E+01	Ci	
241-AZ-102	239Pu	Sludge	P3AZ2 (Solid)	9.01E+02	Ci	
241-AZ-102	239Pu	Sludge	PL2 (Solid)	4.88E+01	Ci	
241-AZ-102	239Pu	Sludge	SRR (Solid)	3.32E+02	Ci	
241-AZ-102	239Pu	Total		1.33E+03	Ci	
241-AZ-102	240Pu	Sludge	NA sludge	6.29E+00	Ci	
241-AZ-102	240Pu	Supernatant	P3AZ2 (Liquid)	6.61E+00	Ci	
241-AZ-102	240Pu	Sludge	P3AZ2 (Solid)	2.47E+02	Ci	
241-AZ-102	240Pu	Sludge	PL2 (Solid)	1.38E+01	Ci	
241-AZ-102	240Pu	Sludge	SRR (Solid)	7.70E+01	Ci	
241-AZ-102	240Pu	Total		3.51E+02	Ci	
241-AZ-102	241Am	Sludge	NA sludge	5.72E+02	Ci	
241-AZ-102	241Am	Supernatant	P3AZ2 (Liquid)	2.07E+00	Ci	
241-AZ-102	241Am	Sludge	P3AZ2 (Solid)	1.97E+04	Ci	
241-AZ-102	241Am	Sludge	PL2 (Solid)	1.07E+03	Ci	

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-51

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	241Am	Sludge	SRR (Solid)	7.01E+03	Ci	
241-AZ-102	241Am	Total		2.84E+04	Ci	
241-AZ-102	241Pu	Sludge	NA sludge	4.89E+01	Ci	
241-AZ-102	241Pu	Supernatant	P3AZ2 (Liquid)	1.67E+02	Ci	
241-AZ-102	241Pu	Sludge	P3AZ2 (Solid)	6.21E+03	Ci	
241-AZ-102	241Pu	Sludge	PL2 (Solid)	3.53E+02	Ci	
241-AZ-102	241Pu	Sludge	SRR (Solid)	5.64E+02	Ci	
241-AZ-102	241Pu	Total		7.34E+03	Ci	
241-AZ-102	242Cm	Sludge	NA sludge	5.01E-01	Ci	
241-AZ-102	242Cm	Supernatant	P3AZ2 (Liquid)	6.57E-04	Ci	
241-AZ-102	242Cm	Sludge	P3AZ2 (Solid)	1.72E+01	Ci	
241-AZ-102	242Cm	Sludge	PL2 (Solid)	9.40E-01	Ci	
241-AZ-102	242Cm	Sludge	SRR (Solid)	6.14E+00	Ci	
241-AZ-102	242Cm	Total		2.48E+01	Ci	
241-AZ-102	242Pu	Sludge	NA sludge	4.70E-04	Ci	
241-AZ-102	242Pu	Supernatant	P3AZ2 (Liquid)	7.97E-04	Ci	
241-AZ-102	242Pu	Sludge	P3AZ2 (Solid)	2.95E-02	Ci	
241-AZ-102	242Pu	Sludge	PL2 (Solid)	1.74E-03	Ci	
241-AZ-102	242Pu	Sludge	SRR (Solid)	5.36E-03	Ci	
241-AZ-102	242Pu	Total		3.79E-02	Ci	
241-AZ-102	243/244Cm	Sludge	NA sludge	1.58E+00	Ci	
241-AZ-102	243/244Cm	Sludge	P3AZ2 (Solid)	5.45E+01	Ci	
241-AZ-102	243/244Cm	Sludge	PL2 (Solid)	2.97E+00	Ci	
241-AZ-102	243/244Cm	Sludge	SRR (Solid)	1.94E+01	Ci	
241-AZ-102	243/244Cm	Total		7.84E+01	Ci	
241-AZ-102	243Am	Sludge	NA sludge	3.55E-01	Ci	
241-AZ-102	243Am	Supernatant	P3AZ2 (Liquid)	1.85E-04	Ci	
241-AZ-102	243Am	Sludge	P3AZ2 (Solid)	4.41E+00	Ci	
241-AZ-102	243Am	Sludge	PL2 (Solid)	3.00E-01	Ci	
241-AZ-102	243Am	Sludge	SRR (Solid)	4.32E+00	Ci	
241-AZ-102	243Am	Total		9.39E+00	Ci	
241-AZ-102	243Cm	Sludge	NA sludge	5.78E-02	Ci	
241-AZ-102	243Cm	Supernatant	P3AZ2 (Liquid)	8.91E-05	Ci	
241-AZ-102	243Cm	Sludge	P3AZ2 (Solid)	1.99E+00	Ci	
241-AZ-102	243Cm	Sludge	PL2 (Solid)	1.08E-01	Ci	
241-AZ-102	243Cm	Sludge	SRR (Solid)	7.09E-01	Ci	
241-AZ-102	243Cm	Total		2.86E+00	Ci	
241-AZ-102	244Cm	Sludge	NA sludge	1.31E+00	Ci	
241-AZ-102	244Cm	Supernatant	P3AZ2 (Liquid)	2.11E-03	Ci	
241-AZ-102	244Cm	Sludge	P3AZ2 (Solid)	4.51E+01	Ci	
241-AZ-102	244Cm	Sludge	PL2 (Solid)	2.46E+00	Ci	
241-AZ-102	244Cm	Sludge	SRR (Solid)	1.61E+01	Ci	
241-AZ-102	244Cm	Total		6.50E+01	Ci	
241-AZ-102	3H	Sludge	NA sludge	3.52E-01	Ci	
241-AZ-102	3H	Supernatant	P3AZ2 (Liquid)	9.77E+01	Ci	
241-AZ-102	3H	Sludge	P3AZ2 (Solid)	1.21E+01	Ci	
241-AZ-102	3H	Sludge	PL2 (Solid)	6.59E-01	Ci	
241-AZ-102	3H	Sludge	SRR (Solid)	4.31E+00	Ci	
241-AZ-102	3H	Total		1.15E+02	Ci	
241-AZ-102	59Ni	Sludge	NA sludge	6.26E-02	Ci	
241-AZ-102	59Ni	Supernatant	P3AZ2 (Liquid)	2.14E+00	Ci	
241-AZ-102	59Ni	Sludge	P3AZ2 (Solid)	9.26E+00	Ci	
241-AZ-102	59Ni	Sludge	PL2 (Solid)	1.80E-04	Ci	
241-AZ-102	59Ni	Sludge	SRR (Solid)	4.90E-01	Ci	
241-AZ-102	59Ni	Total		1.20E+01	Ci	
241-AZ-102	60Co	Sludge	NA sludge	1.50E+01	Ci	
241-AZ-102	60Co	Supernatant	P3AZ2 (Liquid)	3.94E+01	Ci	
241-AZ-102	60Co	Sludge	P3AZ2 (Solid)	5.16E+02	Ci	
241-AZ-102	60Co	Sludge	PL2 (Solid)	2.82E+01	Ci	
241-AZ-102	60Co	Sludge	SRR (Solid)	1.84E+02	Ci	
241-AZ-102	60Co	Total		7.83E+02	Ci	
241-AZ-102	63Ni	Sludge	NA sludge	5.85E+00	Ci	
241-AZ-102	63Ni	Supernatant	P3AZ2 (Liquid)	2.05E+02	Ci	
241-AZ-102	63Ni	Sludge	P3AZ2 (Solid)	8.85E+02	Ci	
241-AZ-102	63Ni	Sludge	PL2 (Solid)	1.71E-02	Ci	
241-AZ-102	63Ni	Sludge	SRR (Solid)	4.52E+01	Ci	
241-AZ-102	63Ni	Total		1.14E+03	Ci	
241-AZ-102	79Se	Sludge	NA sludge	2.72E-03	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.. 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-52

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary		
241-AZ-102	79Se	Supernatant	P3AZ2 (Liquid)	1.43E+00	Ci			
241-AZ-102	79Se	Sludge	P3AZ2 (Solid)	1.19E-01	Ci			
241-AZ-102	79Se	Sludge	PL2 (Solid)	8.89E-07	Ci			
241-AZ-102	79Se	Sludge	SRR (Solid)	1.15E-02	Ci			
241-AZ-102	79Se	Total		1.56E+00	Ci			
241-AZ-102	90Sr	Sludge	NA sludge	7.90E+04	Ci			
241-AZ-102	90Sr	Supernatant	P3AZ2 (Liquid)	6.51E+03	Ci			
241-AZ-102	90Sr	Sludge	P3AZ2 (Solid)	2.71E+06	Ci			
241-AZ-102	90Sr	Sludge	PL2 (Solid)	1.48E+05	Ci			
241-AZ-102	90Sr	Sludge	SRR (Solid)	9.67E+05	Ci			
241-AZ-102	90Sr	Total		3.92E+06	Ci			
241-AZ-102	90Y	Sludge	NA sludge	7.90E+04	Ci			
241-AZ-102	90Y	Supernatant	P3AZ2 (Liquid)	6.51E+03	Ci			
241-AZ-102	90Y	Sludge	P3AZ2 (Solid)	2.71E+06	Ci			
241-AZ-102	90Y	Sludge	PL2 (Solid)	1.48E+05	Ci			
241-AZ-102	90Y	Sludge	SRR (Solid)	9.67E+05	Ci			
241-AZ-102	90Y	Total		3.92E+06	Ci			
241-AZ-102	93mNb	Sludge	NA sludge	1.34E-01	Ci			
241-AZ-102	93mNb	Supernatant	P3AZ2 (Liquid)	6.13E+01	Ci			
241-AZ-102	93mNb	Sludge	P3AZ2 (Solid)	4.24E+00	Ci			
241-AZ-102	93mNb	Sludge	PL2 (Solid)	3.25E-05	Ci			
241-AZ-102	93mNb	Sludge	SRR (Solid)	5.41E-01	Ci			
241-AZ-102	93mNb	Total		6.62E+01	Ci			
241-AZ-102	93Zr	Sludge	NA sludge	1.62E-01	Ci			
241-AZ-102	93Zr	Supernatant	P3AZ2 (Liquid)	1.05E+02	Ci			
241-AZ-102	93Zr	Sludge	P3AZ2 (Solid)	7.21E+00	Ci			
241-AZ-102	93Zr	Sludge	PL2 (Solid)	5.37E-05	Ci			
241-AZ-102	93Zr	Sludge	SRR (Solid)	6.83E-01	Ci			
241-AZ-102	93Zr	Total		1.13E+02	Ci			
241-AZ-102	99Tc	Sludge	NA sludge	1.75E+00	Ci			
241-AZ-102	99Tc	Supernatant	P3AZ2 (Liquid)	6.98E+02	Ci			
241-AZ-102	99Tc	Sludge	P3AZ2 (Solid)	6.02E+01	Ci			
241-AZ-102	99Tc	Sludge	PL2 (Solid)	3 28E+00	Ci			
241-AZ-102	99Tc	Sludge	SRR (Solid)	2.15E+01	Ci			
241-AZ-102	99Tc	Total		7.85E+02	Ci			
241-AZ-102	Ag	Sludge	NA sludge	2.63E+00	kg	Summary		
241-AZ-102	Ag	Supernatant	P3AZ2 (Liquid)	1.61E+00	kg	Ag	1.61E+00	kg
241-AZ-102	Ag	Sludge	P3AZ2 (Solid)	9.05E+01	kg	Al	1.13E+03	kg
241-AZ-102	Ag	Sludge	PL2 (Solid)	4.94E+00	kg	As	1.28E+01	kg
241-AZ-102	Ag	Sludge	SRR (Solid)	3.22E+01	kg	B	2.57E+01	kg
241-AZ-102	Ag	Total		1.32E+02	kg	Ba	1.57E-01	kg
241-AZ-102	Al	Sludge	NA sludge	6.11E+02	kg	Be	7.42E-02	kg
241-AZ-102	Al	Supernatant	P3AZ2 (Liquid)	1.13E+03	kg	Bi	0.00E+00	kg
241-AZ-102	Al	Sludge	P3AZ2 (Solid)	2.10E+04	kg	Ca	5.73E+00	kg
241-AZ-102	Al	Sludge	PL2 (Solid)	1.15E+03	kg	Cd	1.67E+00	kg
241-AZ-102	Al	Sludge	SRR (Solid)	7.49E+03	kg	Ce	7.61E-02	kg
241-AZ-102	Al	Total		3.14E+04	kg	Cl	2.36E+02	kg
241-AZ-102	As	Sludge	NA sludge	4.67E-01	kg	CN	2.44E+01	kg
241-AZ-102	As	Supernatant	P3AZ2 (Liquid)	1.28E+01	kg	Co	7.42E-02	kg
241-AZ-102	As	Sludge	P3AZ2 (Solid)	1.61E+01	kg	Cr	2.53E+03	kg
241-AZ-102	As	Sludge	PL2 (Solid)	8.77E-01	kg	Cu	1.30E+00	kg
241-AZ-102	As	Sludge	SRR (Solid)	5.73E+00	kg	F	3.42E+03	kg
241-AZ-102	As	Total		3.60E+01	kg	Fe	2.23E+00	kg
241-AZ-102	B	Sludge	NA sludge	6.07E-01	kg	Free OH	8.13E+03	kg
241-AZ-102	B	Supernatant	P3AZ2 (Liquid)	2.57E+01	kg	Hg	2.03E-01	kg
241-AZ-102	B	Sludge	P3AZ2 (Solid)	2.09E+01	kg	K	1.05E+04	kg
241-AZ-102	B	Sludge	PL2 (Solid)	1.14E+00	kg	La	0.00E+00	kg
241-AZ-102	B	Sludge	SRR (Solid)	7.43E+00	kg	Li	4.93E-01	kg
241-AZ-102	B	Total		5.58E+01	kg	Mg	1.71E+01	kg
241-AZ-102	Ba	Sludge	NA sludge	4.03E+00	kg	Mn	0.00E+00	kg
241-AZ-102	Ba	Supernatant	P3AZ2 (Liquid)	1.57E-01	kg	Mo	1.78E+02	kg
241-AZ-102	Ba	Sludge	P3AZ2 (Solid)	1.39E+02	kg	Na	2.04E+05	kg
241-AZ-102	Ba	Sludge	PL2 (Solid)	7.56E+00	kg	Nd	6.62E+00	kg
241-AZ-102	Ba	Sludge	SRR (Solid)	4.94E+01	kg	NH3	0.00E+00	kg
241-AZ-102	Ba	Total		2 00E+02	kg	Ni	3.81E+00	kg
241-AZ-102	Be	Sludge	NA sludge	6.46E-02	kg	NO2	1.35E+05	kg
241-AZ-102	Be	Supernatant	P3AZ2 (Liquid)	7.42E-02	kg	NO3	2.73E+04	kg
241-AZ-102	Be	Sludge	P3AZ2 (Solid)	2.22E+00	kg	Oxalate	7.37E+03	kg

CALCULATION SHEET

PROJECT. RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-53

BY:. E. Bernos
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AZ-102	Be	Sludge	PL2 (Solid)	1.21E-01	kg
241-AZ-102	Be	Sludge	SRR (Solid)	7.92E-01	kg
241-AZ-102	Be	Total		3.27E+00	kg
241-AZ-102	Bi	Sludge	NA sludge	1.83E+00	kg
241-AZ-102	Bi	Supernatant	P3AZ2 (Liquid)	0.00E+00	kg
241-AZ-102	Bi	Sludge	P3AZ2 (Solid)	6.28E+01	kg
241-AZ-102	Bi	Sludge	PL2 (Solid)	3.43E+00	kg
241-AZ-102	Bi	Sludge	SRR (Solid)	2.24E+01	kg
241-AZ-102	Bi	Total		9.05E+01	kg
241-AZ-102	Ca	Sludge	NA sludge	2.65E+01	kg
241-AZ-102	Ca	Supernatant	P3AZ2 (Liquid)	5.73E+00	kg
241-AZ-102	Ca	Sludge	P3AZ2 (Solid)	9.09E+02	kg
241-AZ-102	Ca	Sludge	PL2 (Solid)	4.96E+01	kg
241-AZ-102	Ca	Sludge	SRR (Solid)	3.24E+02	kg
241-AZ-102	Ca	Total		1.32E+03	kg
241-AZ-102	Cd	Sludge	NA sludge	9.53E+01	kg
241-AZ-102	Cd	Supernatant	P3AZ2 (Liquid)	1.67E+00	kg
241-AZ-102	Cd	Sludge	P3AZ2 (Solid)	3.28E+03	kg
241-AZ-102	Cd	Sludge	PL2 (Solid)	1.79E+02	kg
241-AZ-102	Cd	Sludge	SRR (Solid)	1.17E+03	kg
241-AZ-102	Cd	Total		4.72E+03	kg
241-AZ-102	Ce	Sludge	NA sludge	6.40E+00	kg
241-AZ-102	Ce	Supernatant	P3AZ2 (Liquid)	7.61E-02	kg
241-AZ-102	Ce	Sludge	P3AZ2 (Solid)	2.20E+02	kg
241-AZ-102	Ce	Sludge	PL2 (Solid)	1.20E+01	kg
241-AZ-102	Ce	Sludge	SRR (Solid)	7.84E+01	kg
241-AZ-102	Ce	Total		3.17E+02	kg
241-AZ-102	Cl	Sludge	NA sludge	1.55E+00	kg
241-AZ-102	Cl	Supernatant	P3AZ2 (Liquid)	2.36E+02	kg
241-AZ-102	Cl	Sludge	P3AZ2 (Solid)	5.32E+01	kg
241-AZ-102	Cl	Sludge	PL2 (Solid)	2.90E+00	kg
241-AZ-102	Cl	Sludge	SRR (Solid)	1.90E+01	kg
241-AZ-102	Cl	Total		3.13E+02	kg
241-AZ-102	CN	Sludge	NA sludge	5.97E-02	kg
241-AZ-102	CN	Supernatant	P3AZ2 (Liquid)	2.44E+01	kg
241-AZ-102	CN	Sludge	P3AZ2 (Solid)	2.05E+00	kg
241-AZ-102	CN	Sludge	PL2 (Solid)	1.12E-01	kg
241-AZ-102	CN	Sludge	SRR (Solid)	7.32E-01	kg
241-AZ-102	CN	Total		2.74E+01	kg
241-AZ-102	Co	Sludge	NA sludge	2.24E-01	kg
241-AZ-102	Co	Supernatant	P3AZ2 (Liquid)	7.42E-02	kg
241-AZ-102	Co	Sludge	P3AZ2 (Solid)	7.69E+00	kg
241-AZ-102	Co	Sludge	PL2 (Solid)	4.20E-01	kg
241-AZ-102	Co	Sludge	SRR (Solid)	2.74E+00	kg
241-AZ-102	Co	Total		1.12E+01	kg
241-AZ-102	Cr	Sludge	NA sludge	1.10E+01	kg
241-AZ-102	Cr	Supernatant	P3AZ2 (Liquid)	2.53E+03	kg
241-AZ-102	Cr	Sludge	P3AZ2 (Solid)	3.79E+02	kg
241-AZ-102	Cr	Sludge	PL2 (Solid)	2.07E+01	kg
241-AZ-102	Cr	Sludge	SRR (Solid)	1.35E+02	kg
241-AZ-102	Cr	Total		3.08E+03	kg
241-AZ-102	Cu	Sludge	NA sludge	1.06E+00	kg
241-AZ-102	Cu	Supernatant	P3AZ2 (Liquid)	1.30E+00	kg
241-AZ-102	Cu	Sludge	P3AZ2 (Solid)	3.64E+01	kg
241-AZ-102	Cu	Sludge	PL2 (Solid)	1.99E+00	kg
241-AZ-102	Cu	Sludge	SRR (Solid)	1.30E+01	kg
241-AZ-102	Cu	Total		5.38E+01	kg
241-AZ-102	F	Sludge	NA sludge	9.38E+00	kg
241-AZ-102	F	Supernatant	P3AZ2 (Liquid)	3.42E+03	kg
241-AZ-102	F	Sludge	P3AZ2 (Solid)	3.22E+02	kg
241-AZ-102	F	Sludge	PL2 (Solid)	1.76E+01	kg
241-AZ-102	F	Sludge	SRR (Solid)	1.15E+02	kg
241-AZ-102	F	Total		3.88E+03	kg
241-AZ-102	Fe	Sludge	NA sludge	7.29E+02	kg
241-AZ-102	Fe	Supernatant	P3AZ2 (Liquid)	2.23E+00	kg
241-AZ-102	Fe	Sludge	P3AZ2 (Solid)	2.51E+04	kg
241-AZ-102	Fe	Sludge	PL2 (Solid)	1.37E+03	kg
241-AZ-102	Fe	Sludge	SRR (Solid)	8.93E+03	kg

Summary		
Pb	0.00E+00	kg
Pd	0.00E+00	kg
PO4	1.49E+03	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	1.13E-01	kg
Se	2.19E+01	kg
Si	1.62E+02	kg
SO4	5.84E+04	kg
Sr	1.20E-01	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	9.99E-05	kg
Ti	5.48E-01	kg
TIC as CO3	1.07E+05	kg
Tl	0.00E+00	kg
TOC	6.61E+03	kg
UTOTAL	2.58E+02	kg
V	1.76E+00	kg
W	0.00E+00	kg
Y	7.42E-02	kg
Zn	1.11E+00	kg
Zr	1.04E+00	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-54

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	Fe	Total		3.61E+04	kg	
241-AZ-102	Free OH	Sludge	NA sludge	8.03E-01	kg	
241-AZ-102	Free OH	Supernatant	P3AZ2 (Liquid)	8.13E+03	kg	
241-AZ-102	Free OH	Sludge	P3AZ2 (Solid)	2.76E+01	kg	
241-AZ-102	Free OH	Sludge	PL2 (Solid)	1.51E+00	kg	
241-AZ-102	Free OH	Sludge	SRR (Solid)	9.83E+00	kg	
241-AZ-102	Free OH	Total		8.17E+03	kg	
241-AZ-102	Hg	Sludge	NA sludge	1.01E-01	kg	
241-AZ-102	Hg	Supernatant	P3AZ2 (Liquid)	2.03E-01	kg	
241-AZ-102	Hg	Sludge	P3AZ2 (Solid)	3.46E+00	kg	
241-AZ-102	Hg	Sludge	PL2 (Solid)	1.89E-01	kg	
241-AZ-102	Hg	Sludge	SRR (Solid)	1.23E+00	kg	
241-AZ-102	Hg	Total		5.18E+00	kg	
241-AZ-102	K	Sludge	NA sludge	3.03E+01	kg	
241-AZ-102	K	Supernatant	P3AZ2 (Liquid)	1.05E+04	kg	
241-AZ-102	K	Sludge	P3AZ2 (Solid)	1.04E+03	kg	
241-AZ-102	K	Sludge	PL2 (Solid)	5.69E+01	kg	
241-AZ-102	K	Sludge	SRR (Solid)	3.72E+02	kg	
241-AZ-102	K	Total		1.20E+04	kg	
241-AZ-102	La	Sludge	NA sludge	2.42E+01	kg	
241-AZ-102	La	Supernatant	P3AZ2 (Liquid)	0.00E+00	kg	
241-AZ-102	La	Sludge	P3AZ2 (Solid)	8.32E+02	kg	
241-AZ-102	La	Sludge	PL2 (Solid)	4.54E+01	kg	
241-AZ-102	La	Sludge	SRR (Solid)	2.97E+02	kg	
241-AZ-102	La	Total		1.20E+03	kg	
241-AZ-102	Li	Sludge	NA sludge	5.39E-01	kg	
241-AZ-102	Li	Supernatant	P3AZ2 (Liquid)	4.93E-01	kg	
241-AZ-102	Li	Sludge	P3AZ2 (Solid)	1.85E+01	kg	
241-AZ-102	Li	Sludge	PL2 (Solid)	1.01E+00	kg	
241-AZ-102	Li	Sludge	SRR (Solid)	6.60E+00	kg	
241-AZ-102	Li	Total		2.72E+01	kg	
241-AZ-102	Mg	Sludge	NA sludge	4.25E+00	kg	
241-AZ-102	Mg	Supernatant	P3AZ2 (Liquid)	1.71E+01	kg	
241-AZ-102	Mg	Sludge	P3AZ2 (Solid)	1.46E+02	kg	
241-AZ-102	Mg	Sludge	PL2 (Solid)	7.97E+00	kg	
241-AZ-102	Mg	Sludge	SRR (Solid)	5.21E+01	kg	
241-AZ-102	Mg	Total		2.27E+02	kg	
241-AZ-102	Mn	Sludge	NA sludge	1.91E+01	kg	
241-AZ-102	Mn	Supernatant	P3AZ2 (Liquid)	0.00E+00	kg	
241-AZ-102	Mn	Sludge	P3AZ2 (Solid)	6.57E+02	kg	
241-AZ-102	Mn	Sludge	PL2 (Solid)	3.58E+01	kg	
241-AZ-102	Mn	Sludge	SRR (Solid)	2.34E+02	kg	
241-AZ-102	Mn	Total		9.46E+02	kg	
241-AZ-102	Mo	Sludge	NA sludge	3.93E-01	kg	
241-AZ-102	Mo	Supernatant	P3AZ2 (Liquid)	1.78E+02	kg	
241-AZ-102	Mo	Sludge	P3AZ2 (Solid)	1.35E+01	kg	
241-AZ-102	Mo	Sludge	PL2 (Solid)	7.37E-01	kg	
241-AZ-102	Mo	Sludge	SRR (Solid)	4.81E+00	kg	
241-AZ-102	Mo	Total		1.98E+02	kg	
241-AZ-102	Na	Sludge	NA sludge	5.39E+02	kg	
241-AZ-102	Na	Supernatant	P3AZ2 (Liquid)	2.04E+05	kg	
241-AZ-102	Na	Sludge	P3AZ2 (Solid)	1.85E+04	kg	
241-AZ-102	Na	Sludge	PL2 (Solid)	1.01E+03	kg	
241-AZ-102	Na	Sludge	SRR (Solid)	6.60E+03	kg	
241-AZ-102	Na	Total		2.31E+05	kg	
241-AZ-102	Nd	Sludge	NA sludge	1.83E+01	kg	
241-AZ-102	Nd	Supernatant	P3AZ2 (Liquid)	6.62E+00	kg	
241-AZ-102	Nd	Sludge	P3AZ2 (Solid)	6.29E+02	kg	
241-AZ-102	Nd	Sludge	PL2 (Solid)	3.43E+01	kg	
241-AZ-102	Nd	Sludge	SRR (Solid)	2.24E+02	kg	
241-AZ-102	Nd	Total		9.13E+02	kg	
241-AZ-102	Ni	Sludge	NA sludge	4.92E+01	kg	
241-AZ-102	Ni	Supernatant	P3AZ2 (Liquid)	3.81E+00	kg	
241-AZ-102	Ni	Sludge	P3AZ2 (Solid)	1.69E+03	kg	
241-AZ-102	Ni	Sludge	PL2 (Solid)	9.22E+01	kg	
241-AZ-102	Ni	Sludge	SRR (Solid)	6.02E+02	kg	
241-AZ-102	Ni	Total		2.44E+03	kg	
241-AZ-102	NO2	Sludge	NA sludge	3.34E+02	kg	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-55

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	NO2	Supernatant	P3AZ2 (Liquid)	1.35E+05	kg	
241-AZ-102	NO2	Sludge	P3AZ2 (Solid)	1.15E+04	kg	
241-AZ-102	NO2	Sludge	PL2 (Solid)	6.26E+02	kg	
241-AZ-102	NO2	Sludge	SRR (Solid)	4.09E+03	kg	
241-AZ-102	NO2	Total		1.51E+05	kg	
241-AZ-102	NO3	Sludge	NA sludge	8.61E+01	kg	
241-AZ-102	NO3	Supernatant	P3AZ2 (Liquid)	2.73E+04	kg	
241-AZ-102	NO3	Sludge	P3AZ2 (Solid)	2.96E+03	kg	
241-AZ-102	NO3	Sludge	PL2 (Solid)	1.61E+02	kg	
241-AZ-102	NO3	Sludge	SRR (Solid)	1.05E+03	kg	
241-AZ-102	NO3	Total		3.16E+04	kg	
241-AZ-102	Oxalate	Sludge	NA sludge	2.10E+01	kg	
241-AZ-102	Oxalate	Supernatant	P3AZ2 (Liquid)	7.37E+03	kg	
241-AZ-102	Oxalate	Sludge	P3AZ2 (Solid)	7.20E+02	kg	
241-AZ-102	Oxalate	Sludge	PL2 (Solid)	3.93E+01	kg	
241-AZ-102	Oxalate	Sludge	SRR (Solid)	2.57E+02	kg	
241-AZ-102	Oxalate	Total		8.41E+03	kg	
241-AZ-102	Pb	Sludge	NA sludge	1.58E+01	kg	
241-AZ-102	Pb	Supernatant	P3AZ2 (Liquid)	0.00E+00	kg	
241-AZ-102	Pb	Sludge	P3AZ2 (Solid)	5.43E+02	kg	
241-AZ-102	Pb	Sludge	PL2 (Solid)	2.96E+01	kg	
241-AZ-102	Pb	Sludge	SRR (Solid)	1.94E+02	kg	
241-AZ-102	Pb	Total		7.82E+02	kg	
241-AZ-102	PO4	Sludge	NA sludge	2.31E+01	kg	
241-AZ-102	PO4	Supernatant	P3AZ2 (Liquid)	1.49E+03	kg	
241-AZ-102	PO4	Sludge	P3AZ2 (Solid)	7.94E+02	kg	
241-AZ-102	PO4	Sludge	PL2 (Solid)	4.33E+01	kg	
241-AZ-102	PO4	Sludge	SRR (Solid)	2.83E+02	kg	
241-AZ-102	PO4	Total		2.63E+03	kg	
241-AZ-102	Sb	Sludge	NA sludge	1.96E-01	kg	
241-AZ-102	Sb	Supernatant	P3AZ2 (Liquid)	1.13E-01	kg	
241-AZ-102	Sb	Sludge	P3AZ2 (Solid)	6.73E+00	kg	
241-AZ-102	Sb	Sludge	PL2 (Solid)	3.67E-01	kg	
241-AZ-102	Sb	Sludge	SRR (Solid)	2.40E+00	kg	
241-AZ-102	Sb	Total		9.81E+00	kg	
241-AZ-102	Se	Sludge	NA sludge	4.75E-01	kg	
241-AZ-102	Se	Supernatant	P3AZ2 (Liquid)	2.19E+01	kg	
241-AZ-102	Se	Sludge	P3AZ2 (Solid)	1.63E+01	kg	
241-AZ-102	Se	Sludge	PL2 (Solid)	8.90E-01	kg	
241-AZ-102	Se	Sludge	SRR (Solid)	5.82E+00	kg	
241-AZ-102	Se	Total		4.54E+01	kg	
241-AZ-102	Si	Sludge	NA sludge	3.66E+01	kg	
241-AZ-102	Si	Supernatant	P3AZ2 (Liquid)	1.62E+02	kg	
241-AZ-102	Si	Sludge	P3AZ2 (Solid)	1.26E+03	kg	
241-AZ-102	Si	Sludge	PL2 (Solid)	6.87E+01	kg	
241-AZ-102	Si	Sludge	SRR (Solid)	4.49E+02	kg	
241-AZ-102	Si	Total		1.98E+03	kg	
241-AZ-102	SO4	Sludge	NA sludge	1.31E+02	kg	
241-AZ-102	SO4	Supernatant	P3AZ2 (Liquid)	5.84E+04	kg	
241-AZ-102	SO4	Sludge	P3AZ2 (Solid)	4.51E+03	kg	
241-AZ-102	SO4	Sludge	PL2 (Solid)	2.46E+02	kg	
241-AZ-102	SO4	Sludge	SRR (Solid)	1.61E+03	kg	
241-AZ-102	SO4	Total		6.49E+04	kg	
241-AZ-102	Sr	Sludge	NA sludge	1.24E+00	kg	
241-AZ-102	Sr	Supernatant	P3AZ2 (Liquid)	1.20E-01	kg	
241-AZ-102	Sr	Sludge	P3AZ2 (Solid)	4.27E+01	kg	
241-AZ-102	Sr	Sludge	PL2 (Solid)	2.33E+00	kg	
241-AZ-102	Sr	Sludge	SRR (Solid)	1.52E+01	kg	
241-AZ-102	Sr	Total		6.16E+01	kg	
241-AZ-102	Th	Sludge	NA sludge	3.77E+00	kg	
241-AZ-102	Th	Supernatant	P3AZ2 (Liquid)	9.99E-05	kg	
241-AZ-102	Th	Sludge	P3AZ2 (Solid)	1.30E+02	kg	
241-AZ-102	Th	Sludge	PL2 (Solid)	7.08E+00	kg	
241-AZ-102	Th	Sludge	SRR (Solid)	4.62E+01	kg	
241-AZ-102	Th	Total		1.87E+02	kg	
241-AZ-102	Ti	Sludge	NA sludge	4.99E-01	kg	
241-AZ-102	Ti	Supernatant	P3AZ2 (Liquid)	5.48E-01	kg	
241-AZ-102	Ti	Sludge	P3AZ2 (Solid)	1.71E+01	kg	

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-56

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	Ti	Sludge	PL2 (Solid)	9.35E-01	kg	
241-AZ-102	Ti	Sludge	SRR (Solid)	6.11E+00	kg	
241-AZ-102	Ti	Total		2.52E+01	kg	
241-AZ-102	TIC as CO3	Sludge	NA sludge	1.59E+02	kg	
241-AZ-102	TIC as CO3	Supernatant	P3AZ2 (Liquid)	1.07E+05	kg	
241-AZ-102	TIC as CO3	Sludge	P3AZ2 (Solid)	5.47E+03	kg	
241-AZ-102	TIC as CO3	Sludge	PL2 (Solid)	2.98E+02	kg	
241-AZ-102	TIC as CO3	Sludge	SRR (Solid)	1.95E+03	kg	
241-AZ-102	TIC as CO3	Total		1.15E+05	kg	
241-AZ-102	TOC	Sludge	NA sludge	5.73E+00	kg	
241-AZ-102	TOC	Supernatant	P3AZ2 (Liquid)	6.61E+03	kg	
241-AZ-102	TOC	Sludge	P3AZ2 (Solid)	1.97E+02	kg	
241-AZ-102	TOC	Sludge	PL2 (Solid)	1.07E+01	kg	
241-AZ-102	TOC	Sludge	SRR (Solid)	7.02E+01	kg	
241-AZ-102	TOC	Total		6.90E+03	kg	
241-AZ-102	UTOTAL	Sludge	NA sludge	1.43E+02	kg	
241-AZ-102	UTOTAL	Supernatant	P3AZ2 (Liquid)	2.58E+02	kg	
241-AZ-102	UTOTAL	Sludge	P3AZ2 (Solid)	4.90E+03	kg	
241-AZ-102	UTOTAL	Sludge	PL2 (Solid)	2.67E+02	kg	
241-AZ-102	UTOTAL	Sludge	SRR (Solid)	1.75E+03	kg	
241-AZ-102	UTOTAL	Total		7.32E+03	kg	
241-AZ-102	V	Sludge	NA sludge	4.71E-02	kg	
241-AZ-102	V	Supernatant	P3AZ2 (Liquid)	1.76E+00	kg	
241-AZ-102	V	Sludge	P3AZ2 (Solid)	1.62E+00	kg	
241-AZ-102	V	Sludge	PL2 (Solid)	8.83E-02	kg	
241-AZ-102	V	Sludge	SRR (Solid)	5.77E-01	kg	
241-AZ-102	V	Total		4 09E+00	kg	
241-AZ-102	Y	Sludge	NA sludge	6.12E-01	kg	
241-AZ-102	Y	Supernatant	P3AZ2 (Liquid)	7.42E-02	kg	
241-AZ-102	Y	Sludge	P3AZ2 (Solid)	2.10E+01	kg	
241-AZ-102	Y	Sludge	PL2 (Solid)	1.15E+00	kg	
241-AZ-102	Y	Sludge	SRR (Solid)	7.49E+00	kg	
241-AZ-102	Y	Total		3.04E+01	kg	
241-AZ-102	Zn	Sludge	NA sludge	2.66E+00	kg	
241-AZ-102	Zn	Supernatant	P3AZ2 (Liquid)	1.11E+00	kg	
241-AZ-102	Zn	Sludge	P3AZ2 (Solid)	9.13E+01	kg	
241-AZ-102	Zn	Sludge	PL2 (Solid)	4.98E+00	kg	
241-AZ-102	Zn	Total		1.00E+02	kg	
241-AZ-102	Zr	Sludge	NA sludge	9.20E+01	kg	
241-AZ-102	Zr	Supernatant	P3AZ2 (Liquid)	1.04E+00	kg	
241-AZ-102	Zr	Sludge	P3AZ2 (Solid)	3.16E+03	kg	
241-AZ-102	Zr	Sludge	PL2 (Solid)	1.73E+02	kg	
241-AZ-102	Zr	Sludge	SRR (Solid)	1.13E+03	kg	
241-AZ-102	Zr	Total		4.56E+03	kg	

241-SY-101	106Ru	Supernatant	NA	9.22E-07	Ci	Summary	
241-SY-101	106Ru	Salt Cake	S2-SltSlr (Solid)	6.63E-06	Ci	106Ru	9.22E-07 Ci
241-SY-101	106Ru	Total		7.55E-06	Ci	113mCd	7.39E+00 Ci
241-SY-101	113mCd	Supernatant	NA	7.39E+00	Ci	125Sb	1.84E+00 Ci
241-SY-101	113mCd	Salt Cake	S2-SltSlr (Solid)	2.04E+01	Ci	126Sn	2.87E-01 Ci
241-SY-101	113mCd	Total		2.77E+01	Ci	129I	8.11E-02 Ci
241-SY-101	125Sb	Supernatant	NA	1.84E+00	Ci	134Cs	3.57E-02 Ci
241-SY-101	125Sb	Salt Cake	S2-SltSlr (Solid)	1.40E+00	Ci	137Cs	5.58E+04 Ci
241-SY-101	125Sb	Total		3.24E+00	Ci	137mBa	5.27E+04 Ci
241-SY-101	126Sn	Supernatant	NA	2.87E-01	Ci	14C	1.74E+00 Ci
241-SY-101	126Sn	Salt Cake	S2-SltSlr (Solid)	1.57E+00	Ci	151Sm	1.55E+03 Ci
241-SY-101	126Sn	Total		1.86E+00	Ci	152Eu	3.34E-01 Ci
241-SY-101	129I	Supernatant	NA	8.11E-02	Ci	154Eu	3.23E+00 Ci
241-SY-101	129I	Salt Cake	S2-SltSlr (Solid)	1.23E-01	Ci	155Eu	1.12E+01 Ci
241-SY-101	129I	Total		2.04E-01	Ci	226Ra	2.12E-05 Ci
241-SY-101	134Cs	Supernatant	NA	3.57E-02	Ci	227Ac	2.58E-04 Ci
241-SY-101	134Cs	Salt Cake	S2-SltSlr (Solid)	7.01E-02	Ci	228Ra	4.97E-03 Ci
241-SY-101	134Cs	Total		1.06E-01	Ci	229Th	2.79E-04 Ci
241-SY-101	137Cs	Supernatant	NA	5.58E+04	Ci	231Pa	5.86E-04 Ci
241-SY-101	137Cs	Salt Cake	S2-SltSlr (Solid)	1.91E+05	Ci	232Th	1.87E-04 Ci
241-SY-101	137Cs	Total		2.47E+05	Ci	232U	2.50E-04 Ci

CALCULATION SHEET

BY:. E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO : 24590
CALC NO.. 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-57

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-SY-101	137mBa	Supernatant	NA	5.27E+04	Ci
241-SY-101	137mBa	Salt Cake	S2-SltSlr (Solid)	1.80E+05	Ci
241-SY-101	137mBa	Total		2.33E+05	Ci
241-SY-101	14C	Supernatant	NA	1.74E+00	Ci
241-SY-101	14C	Salt Cake	S2-SltSlr (Solid)	6.53E-01	Ci
241-SY-101	14C	Total		2.40E+00	Ci
241-SY-101	151Sm	Supernatant	NA	1.55E+03	Ci
241-SY-101	151Sm	Salt Cake	S2-SltSlr (Solid)	2.86E+03	Ci
241-SY-101	151Sm	Total		4.41E+03	Ci
241-SY-101	152Eu	Supernatant	NA	3.34E-01	Ci
241-SY-101	152Eu	Salt Cake	S2-SltSlr (Solid)	3.27E+00	Ci
241-SY-101	152Eu	Total		3.60E+00	Ci
241-SY-101	154Eu	Supernatant	NA	3.23E+00	Ci
241-SY-101	154Eu	Salt Cake	S2-SltSlr (Solid)	3.60E+02	Ci
241-SY-101	154Eu	Total		3.64E+02	Ci
241-SY-101	155Eu	Supernatant	NA	1.12E+01	Ci
241-SY-101	155Eu	Salt Cake	S2-SltSlr (Solid)	8.21E+01	Ci
241-SY-101	155Eu	Total		9.34E+01	Ci
241-SY-101	226Ra	Supernatant	NA	2.12E-05	Ci
241-SY-101	226Ra	Salt Cake	S2-SltSlr (Solid)	3.45E-05	Ci
241-SY-101	226Ra	Total		5.57E-05	Ci
241-SY-101	227Ac	Supernatant	NA	2.58E-04	Ci
241-SY-101	227Ac	Salt Cake	S2-SltSlr (Solid)	1.19E-03	Ci
241-SY-101	227Ac	Total		1.45E-03	Ci
241-SY-101	228Ra	Supernatant	NA	4.97E-03	Ci
241-SY-101	228Ra	Salt Cake	S2-SltSlr (Solid)	3.05E-03	Ci
241-SY-101	228Ra	Total		8.02E-03	Ci
241-SY-101	229Th	Supernatant	NA	2.79E-04	Ci
241-SY-101	229Th	Salt Cake	S2-SltSlr (Solid)	1.04E-05	Ci
241-SY-101	229Th	Total		2.89E-04	Ci
241-SY-101	231Pa	Supernatant	NA	5.86E-04	Ci
241-SY-101	231Pa	Salt Cake	S2-SltSlr (Solid)	1.10E-02	Ci
241-SY-101	231Pa	Total		1.16E-02	Ci
241-SY-101	232Th	Supernatant	NA	1.87E-04	Ci
241-SY-101	232Th	Salt Cake	S2-SltSlr (Solid)	3.62E-05	Ci
241-SY-101	232Th	Total		2.24E-04	Ci
241-SY-101	232U	Supernatant	NA	2.50E-04	Ci
241-SY-101	232U	Salt Cake	S2-SltSlr (Solid)	3.38E-03	Ci
241-SY-101	232U	Total		3.63E-03	Ci
241-SY-101	233U	Supernatant	NA	1.06E-03	Ci
241-SY-101	233U	Salt Cake	S2-SltSlr (Solid)	2.09E-01	Ci
241-SY-101	233U	Total		2.10E-01	Ci
241-SY-101	234U	Supernatant	NA	6.29E-04	Ci
241-SY-101	234U	Salt Cake	S2-SltSlr (Solid)	1.06E-01	Ci
241-SY-101	234U	Total		1.06E-01	Ci
241-SY-101	235U	Supernatant	NA	2.61E-05	Ci
241-SY-101	235U	Salt Cake	S2-SltSlr (Solid)	4.41E-03	Ci
241-SY-101	235U	Total		4.43E-03	Ci
241-SY-101	236U	Supernatant	NA	1.72E-05	Ci
241-SY-101	236U	Salt Cake	S2-SltSlr (Solid)	2.56E-03	Ci
241-SY-101	236U	Total		2.57E-03	Ci
241-SY-101	237Np	Supernatant	NA	9.58E-02	Ci
241-SY-101	237Np	Salt Cake	S2-SltSlr (Solid)	4.77E-01	Ci
241-SY-101	237Np	Total		5.73E-01	Ci
241-SY-101	238Pu	Supernatant	NA	1.45E-03	Ci
241-SY-101	238Pu	Salt Cake	S2-SltSlr (Solid)	1.34E+00	Ci
241-SY-101	238Pu	Total		1.34E+00	Ci
241-SY-101	238U	Supernatant	NA	5.90E-04	Ci
241-SY-101	238U	Salt Cake	S2-SltSlr (Solid)	9.87E-02	Ci
241-SY-101	238U	Total		9.93E-02	Ci
241-SY-101	239Pu	Supernatant	NA	6.81E-02	Ci
241-SY-101	239Pu	Salt Cake	S2-SltSlr (Solid)	3.83E+01	Ci
241-SY-101	239Pu	Total		3.84E+01	Ci
241-SY-101	240Pu	Supernatant	NA	1.08E-02	Ci
241-SY-101	240Pu	Salt Cake	S2-SltSlr (Solid)	8.22E+00	Ci
241-SY-101	240Pu	Total		8.23E+00	Ci
241-SY-101	241Am	Supernatant	NA	2.69E-01	Ci
241-SY-101	241Am	Salt Cake	S2-SltSlr (Solid)	4.39E+02	Ci

Summary		
233U	1.06E-03	Ci
234U	6.29E-04	Ci
235U	2.61E-05	Ci
236U	1.72E-05	Ci
237Np	9.58E-02	Ci
238Pu	1.45E-03	Ci
238U	5.90E-04	Ci
239Pu	6.81E-02	Ci
240Pu	1.08E-02	Ci
241Am	2.69E-01	Ci
241Pu	6.28E-02	Ci
242Cm	5.72E-04	Ci
242Pu	5.31E-07	Ci
243Am	9.17E-06	Ci
243Cm	1.39E-04	Ci
244Cm	2.57E-03	Ci
3H	2.17E+01	Ci
59Ni	7.30E-02	Ci
60Co	1.29E+00	Ci
63Ni	6.66E+00	Ci
79Se	2.58E-01	Ci
90Sr	1.04E+03	Ci
90Y	1.04E+03	Ci
93mNb	1.37E+00	Ci
93Zr	1.55E+00	Ci
99Tc	7.20E+01	Ci

CALCULATION SHEET

BY:. E Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-58

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-SY-101	241Am	Total		4.39E+02	Ci
241-SY-101	241Pu	Supernatant	NA	6.28E-02	Ci
241-SY-101	241Pu	Salt Cake	S2-SltSlr (Solid)	5.41E+01	Ci
241-SY-101	241Pu	Total		5.42E+01	Ci
241-SY-101	242Cm	Supernatant	NA	5.72E-04	Ci
241-SY-101	242Cm	Salt Cake	S2-SltSlr (Solid)	1.14E+00	Ci
241-SY-101	242Cm	Total		1.14E+00	Ci
241-SY-101	242Pu	Supernatant	NA	5.31E-07	Ci
241-SY-101	242Pu	Salt Cake	S2-SltSlr (Solid)	5.13E-04	Ci
241-SY-101	242Pu	Total		5.14E-04	Ci
241-SY-101	243Am	Supernatant	NA	9.17E-06	Ci
241-SY-101	243Am	Salt Cake	S2-SltSlr (Solid)	2.56E-01	Ci
241-SY-101	243Am	Total		2.56E-01	Ci
241-SY-101	243Cm	Supernatant	NA	1.39E-04	Ci
241-SY-101	243Cm	Salt Cake	S2-SltSlr (Solid)	3.87E-02	Ci
241-SY-101	243Cm	Total		3.88E-02	Ci
241-SY-101	244Cm	Supernatant	NA	2.57E-03	Ci
241-SY-101	244Cm	Salt Cake	S2-SltSlr (Solid)	9.04E-01	Ci
241-SY-101	244Cm	Total		9.06E-01	Ci
241-SY-101	3H	Supernatant	NA	2.17E+01	Ci
241-SY-101	3H	Salt Cake	S2-SltSlr (Solid)	1.44E+01	Ci
241-SY-101	3H	Total		3.61E+01	Ci
241-SY-101	59Ni	Supernatant	NA	7.30E-02	Ci
241-SY-101	59Ni	Salt Cake	S2-SltSlr (Solid)	1.00E+00	Ci
241-SY-101	59Ni	Total		1.08E+00	Ci
241-SY-101	60Co	Supernatant	NA	1.29E+00	Ci
241-SY-101	60Co	Salt Cake	S2-SltSlr (Solid)	1.38E+01	Ci
241-SY-101	60Co	Total		1.51E+01	Ci
241-SY-101	63Ni	Supernatant	NA	6.66E+00	Ci
241-SY-101	63Ni	Salt Cake	S2-SltSlr (Solid)	9.39E+01	Ci
241-SY-101	63Ni	Total		1.01E+02	Ci
241-SY-101	79Se	Supernatant	NA	2.58E-01	Ci
241-SY-101	79Se	Salt Cake	S2-SltSlr (Solid)	1.90E-01	Ci
241-SY-101	79Se	Total		4.49E-01	Ci
241-SY-101	90Sr	Supernatant	NA	1.04E+03	Ci
241-SY-101	90Sr	Salt Cake	S2-SltSlr (Solid)	5.54E+04	Ci
241-SY-101	90Sr	Total		5.64E+04	Ci
241-SY-101	90Y	Supernatant	NA	1.04E+03	Ci
241-SY-101	90Y	Salt Cake	S2-SltSlr (Solid)	5.54E+04	Ci
241-SY-101	90Y	Total		5.64E+04	Ci
241-SY-101	93mNb	Supernatant	NA	1.37E+00	Ci
241-SY-101	93mNb	Salt Cake	S2-SltSlr (Solid)	4.89E+00	Ci
241-SY-101	93mNb	Total		6.25E+00	Ci
241-SY-101	93Zr	Supernatant	NA	1.55E+00	Ci
241-SY-101	93Zr	Salt Cake	S2-SltSlr (Solid)	5.84E+00	Ci
241-SY-101	93Zr	Total		7.38E+00	Ci
241-SY-101	99Tc	Supernatant	NA	7.20E+01	Ci
241-SY-101	99Tc	Salt Cake	S2-SltSlr (Solid)	2.78E+02	Ci
241-SY-101	99Tc	Total		3.50E+02	Ci
241-SY-101	Ag	Supernatant	NA	3.72E-01	kg
241-SY-101	Ag	Salt Cake	S2-SltSlr (Solid)	1.71E+01	kg
241-SY-101	Ag	Total		1.75E+01	kg
241-SY-101	Al	Supernatant	NA	4.47E+03	kg
241-SY-101	Al	Salt Cake	S2-SltSlr (Solid)	7.71E+04	kg
241-SY-101	Al	Total		8.16E+04	kg
241-SY-101	As	Supernatant	NA	3.44E+00	kg
241-SY-101	As	Salt Cake	S2-SltSlr (Solid)	6.84E+01	kg
241-SY-101	As	Total		7.19E+01	kg
241-SY-101	B	Supernatant	NA	1.29E+01	kg
241-SY-101	B	Salt Cake	S2-SltSlr (Solid)	1.73E+02	kg
241-SY-101	B	Total		1.86E+02	kg
241-SY-101	Ba	Supernatant	NA	1.36E-01	kg
241-SY-101	Ba	Salt Cake	S2-SltSlr (Solid)	3.43E+01	kg
241-SY-101	Ba	Total		3.44E+01	kg
241-SY-101	Be	Supernatant	NA	1.14E-01	kg
241-SY-101	Be	Salt Cake	S2-SltSlr (Solid)	3.43E+00	kg
241-SY-101	Be	Total		3.54E+00	kg
241-SY-101	Bi	Supernatant	NA	6.59E+00	kg

Summary		
Ag	3.72E-01	kg
Al	4.47E+03	kg
As	3.44E+00	kg
B	1.29E+01	kg
Ba	1.36E-01	kg
Be	1.14E-01	kg
Bi	6.59E+00	kg
Ca	1.37E+01	kg
Cd	3.96E-01	kg
Ce	3.32E+00	kg
Cl	1.50E+03	kg
CN	0.00E+00	kg
Co	7.57E-01	kg
Cr	2.87E+02	kg
Cu	8.20E-01	kg
F	3.71E+01	kg
Fe	1.33E+00	kg
Free OH	1.77E+04	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-59

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-SY-101	Bi	Salt Cake	S2-SltSlr (Solid)	2.72E+01	kg
241-SY-101	Bi	Total		3.38E+01	kg
241-SY-101	Ca	Supernatant	NA	1.37E+01	kg
241-SY-101	Ca	Salt Cake	S2-SltSlr (Solid)	4.16E+02	kg
241-SY-101	Ca	Total		4.30E+02	kg
241-SY-101	Cd	Supernatant	NA	3.96E-01	kg
241-SY-101	Cd	Salt Cake	S2-SltSlr (Solid)	5.39E+01	kg
241-SY-101	Cd	Total		5.43E+01	kg
241-SY-101	Ce	Supernatant	NA	3.32E+00	kg
241-SY-101	Ce	Salt Cake	S2-SltSlr (Solid)	6.84E+01	kg
241-SY-101	Ce	Total		7.18E+01	kg
241-SY-101	Cl	Supernatant	NA	1.50E+03	kg
241-SY-101	Cl	Salt Cake	S2-SltSlr (Solid)	5.69E+03	kg
241-SY-101	Cl	Total		7.19E+03	kg
241-SY-101	Co	Supernatant	NA	7.57E-01	kg
241-SY-101	Co	Salt Cake	S2-SltSlr (Solid)	1.37E+01	kg
241-SY-101	Co	Total		1.44E+01	kg
241-SY-101	Cr	Supernatant	NA	2.87E+02	kg
241-SY-101	Cr	Salt Cake	S2-SltSlr (Solid)	1.71E+04	kg
241-SY-101	Cr	Total		1.74E+04	kg
241-SY-101	Cu	Supernatant	NA	8.20E-01	kg
241-SY-101	Cu	Salt Cake	S2-SltSlr (Solid)	6.84E+00	kg
241-SY-101	Cu	Total		7.66E+00	kg
241-SY-101	F	Supernatant	NA	3.71E+01	kg
241-SY-101	F	Salt Cake	S2-SltSlr (Solid)	5.97E+02	kg
241-SY-101	F	Total		6.34E+02	kg
241-SY-101	Fe	Supernatant	NA	1.33E+00	kg
241-SY-101	Fe	Salt Cake	S2-SltSlr (Solid)	1.21E+03	kg
241-SY-101	Fe	Total		1.22E+03	kg
241-SY-101	Free OH	Supernatant	NA	1.77E+04	kg
241-SY-101	Free OH	Total		1.77E+04	kg
241-SY-101	Hg	Supernatant	NA	7.59E-04	kg
241-SY-101	Hg	Salt Cake	S2-SltSlr (Solid)	5.76E-01	kg
241-SY-101	Hg	Total		5.77E-01	kg
241-SY-101	K	Supernatant	NA	5.30E+02	kg
241-SY-101	K	Salt Cake	S2-SltSlr (Solid)	2.38E+03	kg
241-SY-101	K	Total		2.91E+03	kg
241-SY-101	La	Supernatant	NA	3.92E-01	kg
241-SY-101	La	Salt Cake	S2-SltSlr (Solid)	7.15E-04	kg
241-SY-101	La	Total		3.93E-01	kg
241-SY-101	Li	Supernatant	NA	2.16E-01	kg
241-SY-101	Li	Salt Cake	S2-SltSlr (Solid)	8.47E+00	kg
241-SY-101	Li	Total		8.69E+00	kg
241-SY-101	Mg	Supernatant	NA	3.96E+00	kg
241-SY-101	Mg	Salt Cake	S2-SltSlr (Solid)	6.84E+01	kg
241-SY-101	Mg	Total		7.24E+01	kg
241-SY-101	Mn	Supernatant	NA	3.77E-01	kg
241-SY-101	Mn	Salt Cake	S2-SltSlr (Solid)	2.88E+02	kg
241-SY-101	Mn	Total		2.89E+02	kg
241-SY-101	Mo	Supernatant	NA	1.77E+01	kg
241-SY-101	Mo	Salt Cake	S2-SltSlr (Solid)	6.79E+01	kg
241-SY-101	Mo	Total		8.56E+01	kg
241-SY-101	Na	Supernatant	NA	6.50E+04	kg
241-SY-101	Na	Salt Cake	S2-SltSlr (Solid)	2.09E+05	kg
241-SY-101	Na	Total		2.74E+05	kg
241-SY-101	Nd	Supernatant	NA	1.53E+00	kg
241-SY-101	Nd	Salt Cake	S2-SltSlr (Solid)	7.77E+01	kg
241-SY-101	Nd	Total		7.92E+01	kg
241-SY-101	Ni	Supernatant	NA	1.09E+01	kg
241-SY-101	Ni	Salt Cake	S2-SltSlr (Solid)	2.98E+02	kg
241-SY-101	Ni	Total		3.09E+02	kg
241-SY-101	NO2	Supernatant	NA	1.96E+04	kg
241-SY-101	NO2	Salt Cake	S2-SltSlr (Solid)	7.15E+04	kg
241-SY-101	NO2	Total		9.10E+04	kg
241-SY-101	NO3	Supernatant	NA	4.88E+04	kg
241-SY-101	NO3	Salt Cake	S2-SltSlr (Solid)	1.04E+05	kg
241-SY-101	NO3	Total		1.52E+05	kg
241-SY-101	Oxalate	Supernatant	NA	1.35E+02	kg

Summary		
Hg	7.59E-04	kg
K	5.30E+02	kg
La	3.92E-01	kg
Li	2.16E-01	kg
Mg	3.96E+00	kg
Mn	3.77E-01	kg
Mo	1.77E+01	kg
Na	6.50E+04	kg
Nd	1.53E+00	kg
NH3	0.00E+00	kg
Ni	1.09E+01	kg
NO2	1.96E+04	kg
NO3	4.88E+04	kg
Oxalate	1.35E+02	kg
Pb	4.07E+00	kg
Pd	0.00E+00	kg
PO4	1.65E+03	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	2.62E+00	kg
Se	5.06E+00	kg
Si	4.31E+00	kg
SO4	3.61E+03	kg
Sr	9.43E-02	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	1.70E+00	kg
Ti	9.19E-02	kg
TIC as CO3	1.19E+04	kg
Tl	3.65E+00	kg
TOC	1.09E+03	kg
UTOTAL	1.77E+00	kg
V	4.07E-01	kg
W	0.00E+00	kg
Y	0.00E+00	kg
Zn	1.80E-01	kg
Zr	2.40E-01	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: C-60

BY:. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-SY-101	Oxalate	Salt Cake	S2-SltSlr (Solid)	9.61E+04	kg	
241-SY-101	Oxalate	Total		9.62E+04	kg	
241-SY-101	Pb	Supernatant	NA	4.07E+00	kg	
241-SY-101	Pb	Salt Cake	S2-SltSlr (Solid)	2.64E+02	kg	
241-SY-101	Pb	Total		2.68E+02	kg	
241-SY-101	PO4	Supernatant	NA	1.65E+03	kg	
241-SY-101	PO4	Salt Cake	S2-SltSlr (Solid)	1.94E+04	kg	
241-SY-101	PO4	Total		2.10E+04	kg	
241-SY-101	Sb	Supernatant	NA	2.62E+00	kg	
241-SY-101	Sb	Salt Cake	S2-SltSlr (Solid)	9.61E+01	kg	
241-SY-101	Sb	Total		9.87E+01	kg	
241-SY-101	Se	Supernatant	NA	5.06E+00	kg	
241-SY-101	Se	Salt Cake	S2-SltSlr (Solid)	7.26E+01	kg	
241-SY-101	Se	Total		7.77E+01	kg	
241-SY-101	Si	Supernatant	NA	4.31E+00	kg	
241-SY-101	Si	Salt Cake	S2-SltSlr (Solid)	2.62E+02	kg	
241-SY-101	Si	Total		2.67E+02	kg	
241-SY-101	SO4	Supernatant	NA	3.61E+03	kg	
241-SY-101	SO4	Salt Cake	S2-SltSlr (Solid)	3.73E+03	kg	
241-SY-101	SO4	Total		7.34E+03	kg	
241-SY-101	Sr	Supernatant	NA	9.43E-02	kg	
241-SY-101	Sr	Salt Cake	S2-SltSlr (Solid)	7.12E-02	kg	
241-SY-101	Sr	Total		1.65E-01	kg	
241-SY-101	Th	Supernatant	NA	1.70E+00	kg	
241-SY-101	Th	Salt Cake	S2-SltSlr (Solid)	3.29E-01	kg	
241-SY-101	Th	Total		2.03E+00	kg	
241-SY-101	Ti	Supernatant	NA	9.19E-02	kg	
241-SY-101	Ti	Salt Cake	S2-SltSlr (Solid)	7.39E+00	kg	
241-SY-101	Ti	Total		7.48E+00	kg	
241-SY-101	TIC as CO3	Supernatant	NA	1.19E+04	kg	
241-SY-101	TIC as CO3	Salt Cake	S2-SltSlr (Solid)	2.84E+04	kg	
241-SY-101	TIC as CO3	Total		4.03E+04	kg	
241-SY-101	Tl	Supernatant	NA	3.65E+00	kg	
241-SY-101	Tl	Salt Cake	S2-SltSlr (Solid)	1.37E+02	kg	
241-SY-101	Tl	Total		1.40E+02	kg	
241-SY-101	TOC	Supernatant	NA	1.09E+03	kg	
241-SY-101	TOC	Salt Cake	S2-SltSlr (Solid)	2.65E+04	kg	
241-SY-101	TOC	Total		2.76E+04	kg	
241-SY-101	UTOTAL	Supernatant	NA	1.77E+00	kg	
241-SY-101	UTOTAL	Salt Cake	S2-SltSlr (Solid)	2.95E+02	kg	
241-SY-101	UTOTAL	Total		2.97E+02	kg	
241-SY-101	V	Supernatant	NA	4.07E-01	kg	
241-SY-101	V	Salt Cake	S2-SltSlr (Solid)	3.43E+01	kg	
241-SY-101	V	Total		3.47E+01	kg	
241-SY-101	Zn	Supernatant	NA	1.80E-01	kg	
241-SY-101	Zn	Salt Cake	S2-SltSlr (Solid)	3.73E+01	kg	
241-SY-101	Zn	Total		3.75E+01	kg	
241-SY-101	Zr	Supernatant	NA	2.40E-01	kg	
241-SY-101	Zr	Salt Cake	S2-SltSlr (Solid)	3.36E+01	kg	
241-SY-101	Zr	Total		3.38E+01	kg	

Attachment D HLW BBI Data

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-2

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AW-104	106Ru	Salt Cake (Liquids)	A2-SltSlr (Liquid)	6.75E-07	Ci
241-AW-104	106Ru	Salt Cake (Solids)	A2-SltSlr (Solid)	1.43E-02	Ci
241-AW-104	106Ru	Supernatant	NA	1.11E-05	Ci
241-AW-104	106Ru	Sludge (Liquids)	PL2 (Liquid)	2.13E-07	Ci
241-AW-104	106Ru	Sludge (Solids)	PL2 (Solid)	1.18E-02	Ci
241-AW-104	106Ru	Total		2.60E-02	Ci
241-AW-104	113mCd	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.94E+00	Ci
241-AW-104	113mCd	Salt Cake (Solids)	A2-SltSlr (Solid)	8.55E+00	Ci
241-AW-104	113mCd	Supernatant	NA	6.68E+01	Ci
241-AW-104	113mCd	Sludge (Liquids)	PL2 (Liquid)	9.28E-01	Ci
241-AW-104	113mCd	Sludge (Solids)	PL2 (Solid)	1.21E-03	Ci
241-AW-104	113mCd	Total		7.92E+01	Ci
241-AW-104	125Sb	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.17E-01	Ci
241-AW-104	125Sb	Salt Cake (Solids)	A2-SltSlr (Solid)	3.39E+00	Ci
241-AW-104	125Sb	Supernatant	NA	1.98E+01	Ci
241-AW-104	125Sb	Sludge (Liquids)	PL2 (Liquid)	1.31E-01	Ci
241-AW-104	125Sb	Sludge (Solids)	PL2 (Solid)	1.17E-02	Ci
241-AW-104	125Sb	Total		2.38E+01	Ci
241-AW-104	126Sn	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.62E-01	Ci
241-AW-104	126Sn	Salt Cake (Solids)	A2-SltSlr (Solid)	6.95E-01	Ci
241-AW-104	126Sn	Supernatant	NA	2.95E+00	Ci
241-AW-104	126Sn	Sludge (Liquids)	PL2 (Liquid)	2.72E-01	Ci
241-AW-104	126Sn	Sludge (Solids)	PL2 (Solid)	3.41E-05	Ci
241-AW-104	126Sn	Total		4.78E+00	Ci
241-AW-104	129I	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.22E-02	Ci
241-AW-104	129I	Salt Cake (Solids)	A2-SltSlr (Solid)	6.45E-02	Ci
241-AW-104	129I	Supernatant	NA	7.71E-01	Ci
241-AW-104	129I	Sludge (Liquids)	PL2 (Liquid)	1.01E-02	Ci
241-AW-104	129I	Sludge (Solids)	PL2 (Solid)	3.09E-03	Ci
241-AW-104	129I	Total		8.81E-01	Ci
241-AW-104	134Cs	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.87E-01	Ci
241-AW-104	134Cs	Salt Cake (Solids)	A2-SltSlr (Solid)	1.12E+00	Ci
241-AW-104	134Cs	Supernatant	NA	1.32E+00	Ci
241-AW-104	134Cs	Sludge (Liquids)	PL2 (Liquid)	1.22E-01	Ci
241-AW-104	134Cs	Sludge (Solids)	PL2 (Solid)	4.27E-03	Ci
241-AW-104	134Cs	Total		2.95E+00	Ci
241-AW-104	137Cs	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.56E+04	Ci
241-AW-104	137Cs	Salt Cake (Solids)	A2-SltSlr (Solid)	1.52E+05	Ci
241-AW-104	137Cs	Supernatant	NA	7.69E+05	Ci
241-AW-104	137Cs	Sludge (Liquids)	PL2 (Liquid)	1.44E+04	Ci
241-AW-104	137Cs	Sludge (Solids)	PL2 (Solid)	1.37E+01	Ci
241-AW-104	137Cs	Total		9.81E+05	Ci
241-AW-104	137mBa	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.30E+04	Ci
241-AW-104	137mBa	Salt Cake (Solids)	A2-SltSlr (Solid)	1.44E+05	Ci
241-AW-104	137mBa	Supernatant	NA	7.25E+05	Ci
241-AW-104	137mBa	Sludge (Liquids)	PL2 (Liquid)	1.36E+04	Ci
241-AW-104	137mBa	Sludge (Solids)	PL2 (Solid)	1.29E+01	Ci
241-AW-104	137mBa	Total		9.26E+05	Ci
241-AW-104	14C	Salt Cake (Liquids)	A2-SltSlr (Liquid)	7.63E-02	Ci
241-AW-104	14C	Salt Cake (Solids)	A2-SltSlr (Solid)	3.33E+00	Ci
241-AW-104	14C	Supernatant	NA	1.48E+00	Ci
241-AW-104	14C	Sludge (Liquids)	PL2 (Liquid)	2.40E-02	Ci
241-AW-104	14C	Sludge (Solids)	PL2 (Solid)	1.23E-03	Ci
241-AW-104	14C	Total		4.91E+00	Ci
241-AW-104	151Sm	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.47E+02	Ci
241-AW-104	151Sm	Salt Cake (Solids)	A2-SltSlr (Solid)	4.76E+03	Ci
241-AW-104	151Sm	Supernatant	NA	1.39E+04	Ci
241-AW-104	151Sm	Sludge (Liquids)	PL2 (Liquid)	1.41E+02	Ci
241-AW-104	151Sm	Sludge (Solids)	PL2 (Solid)	3.02E-01	Ci
241-AW-104	151Sm	Total		1.92E+04	Ci
241-AW-104	152Eu	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.95E-02	Ci
241-AW-104	152Eu	Salt Cake (Solids)	A2-SltSlr (Solid)	5.51E-01	Ci
241-AW-104	152Eu	Supernatant	NA	3.14E+00	Ci
241-AW-104	152Eu	Sludge (Liquids)	PL2 (Liquid)	1.56E-02	Ci
241-AW-104	152Eu	Sludge (Solids)	PL2 (Solid)	3.49E-04	Ci
241-AW-104	152Eu	Total		3.76E+00	Ci
241-AW-104	154Eu	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.34E+00	Ci
241-AW-104	154Eu	Salt Cake (Solids)	A2-SltSlr (Solid)	3.82E+01	Ci
241-AW-104	154Eu	Supernatant	NA	6.19E+01	Ci

Summary		
106Ru	1.18E-02	Ci
113mCd	9.29E-01	Ci
125Sb	1.43E-01	Ci
126Sn	2.72E-01	Ci
129I	1.32E-02	Ci
134Cs	1.26E-01	Ci
137Cs	1.44E+04	Ci
137mBa	1.36E+04	Ci
14C	2.52E-02	Ci
151Sm	1.41E+02	Ci
152Eu	1.59E-02	Ci
154Eu	1.41E+00	Ci
155Eu	4.39E-01	Ci
226Ra	1.56E-06	Ci
227Ac	1.92E-04	Ci
228Ra	4.43E-04	Ci
229Th	7.72E-07	Ci
231Pa	2.02E-03	Ci
232Th	2.79E-06	Ci
232U	2.16E-03	Ci
233U	6.76E-02	Ci
234U	3.39E+00	Ci
235U	1.30E-01	Ci
236U	3.24E-01	Ci
237Np	2.05E-03	Ci
238Pu	4.95E+01	Ci
238U	2.34E+00	Ci
239Pu	4.90E+02	Ci
240Pu	1.38E+02	Ci
241Am	1.86E+01	Ci
241Pu	3.54E+03	Ci
242Cm	5.28E-04	Ci
242Pu	1.74E-02	Ci
243Am	1.83E-04	Ci
243Cm	3.13E-05	Ci
244Cm	7.43E-04	Ci
3H	2.01E-01	Ci
59Ni	1.15E-02	Ci
60Co	2.20E-01	Ci
63Ni	1.07E+00	Ci
79Se	4.61E-02	Ci
90Sr	5.22E+01	Ci
90Y	5.22E+01	Ci
93mNb	8.99E-01	Ci
93Zr	1.08E+00	Ci
99Tc	1.07E+01	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-3

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AW-104	154Eu	Sludge (Liquids)	PL2 (Liquid)	1.37E+00	Ci	
241-AW-104	154Eu	Sludge (Solids)	PL2 (Solid)	3.85E-02	Ci	
241-AW-104	154Eu	Total		1.06E+02	Ci	
241-AW-104	155Eu	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.32E+00	Ci	
241-AW-104	155Eu	Salt Cake (Solids)	A2-SltSlr (Solid)	1.47E+01	Ci	
241-AW-104	155Eu	Supernatant	NA	4.32E+01	Ci	
241-AW-104	155Eu	Sludge (Liquids)	PL2 (Liquid)	4.15E-01	Ci	
241-AW-104	155Eu	Sludge (Solids)	PL2 (Solid)	2.42E-02	Ci	
241-AW-104	155Eu	Total		5.96E+01	Ci	
241-AW-104	226Ra	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.94E-06	Ci	
241-AW-104	226Ra	Salt Cake (Solids)	A2-SltSlr (Solid)	1.44E-05	Ci	
241-AW-104	226Ra	Supernatant	NA	1.87E-04	Ci	
241-AW-104	226Ra	Sludge (Liquids)	PL2 (Liquid)	1.56E-06	Ci	
241-AW-104	226Ra	Sludge (Solids)	PL2 (Solid)	6.62E-10	Ci	
241-AW-104	226Ra	Total		2.08E-04	Ci	
241-AW-104	227Ac	Salt Cake (Liquids)	A2-SltSlr (Liquid)	6.09E-04	Ci	
241-AW-104	227Ac	Salt Cake (Solids)	A2-SltSlr (Solid)	1.77E-03	Ci	
241-AW-104	227Ac	Supernatant	NA	3.12E-03	Ci	
241-AW-104	227Ac	Sludge (Liquids)	PL2 (Liquid)	1.92E-04	Ci	
241-AW-104	227Ac	Sludge (Solids)	PL2 (Solid)	3.72E-09	Ci	
241-AW-104	227Ac	Total		5.69E-03	Ci	
241-AW-104	228Ra	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.41E-03	Ci	
241-AW-104	228Ra	Salt Cake (Solids)	A2-SltSlr (Solid)	4.08E-03	Ci	
241-AW-104	228Ra	Supernatant	NA	1.23E-01	Ci	
241-AW-104	228Ra	Sludge (Liquids)	PL2 (Liquid)	4.43E-04	Ci	
241-AW-104	228Ra	Sludge (Solids)	PL2 (Solid)	4.16E-14	Ci	
241-AW-104	228Ra	Total		1.29E-01	Ci	
241-AW-104	229Th	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.45E-06	Ci	
241-AW-104	229Th	Salt Cake (Solids)	A2-SltSlr (Solid)	7.10E-06	Ci	
241-AW-104	229Th	Supernatant	NA	5.43E-03	Ci	
241-AW-104	229Th	Sludge (Liquids)	PL2 (Liquid)	7.72E-07	Ci	
241-AW-104	229Th	Sludge (Solids)	PL2 (Solid)	4.38E-12	Ci	
241-AW-104	229Th	Total		5.44E-03	Ci	
241-AW-104	231Pa	Salt Cake (Liquids)	A2-SltSlr (Liquid)	6.40E-03	Ci	
241-AW-104	231Pa	Salt Cake (Solids)	A2-SltSlr (Solid)	1.86E-02	Ci	
241-AW-104	231Pa	Supernatant	NA	5.06E-03	Ci	
241-AW-104	231Pa	Sludge (Liquids)	PL2 (Liquid)	2.02E-03	Ci	
241-AW-104	231Pa	Sludge (Solids)	PL2 (Solid)	7.65E-09	Ci	
241-AW-104	231Pa	Total		3.20E-02	Ci	
241-AW-104	232Th	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.85E-06	Ci	
241-AW-104	232Th	Salt Cake (Solids)	A2-SltSlr (Solid)	2.56E-05	Ci	
241-AW-104	232Th	Supernatant	NA	2.26E-02	Ci	
241-AW-104	232Th	Sludge (Liquids)	PL2 (Liquid)	2.79E-06	Ci	
241-AW-104	232Th	Sludge (Solids)	PL2 (Solid)	4.57E-14	Ci	
241-AW-104	232Th	Total		2.26E-02	Ci	
241-AW-104	232U	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.78E-06	Ci	
241-AW-104	232U	Salt Cake (Solids)	A2-SltSlr (Solid)	2.09E-03	Ci	
241-AW-104	232U	Supernatant	NA	7.62E-03	Ci	
241-AW-104	232U	Sludge (Liquids)	PL2 (Liquid)	1.09E-03	Ci	
241-AW-104	232U	Sludge (Solids)	PL2 (Solid)	1.07E-03	Ci	
241-AW-104	232U	Total		1.19E-02	Ci	
241-AW-104	233U	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.71E-04	Ci	
241-AW-104	233U	Salt Cake (Solids)	A2-SltSlr (Solid)	1.28E-01	Ci	
241-AW-104	233U	Supernatant	NA	3.22E-02	Ci	
241-AW-104	233U	Sludge (Liquids)	PL2 (Liquid)	6.72E-02	Ci	
241-AW-104	233U	Sludge (Solids)	PL2 (Solid)	3.50E-04	Ci	
241-AW-104	233U	Total		2.28E-01	Ci	
241-AW-104	234U	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.21E-04	Ci	
241-AW-104	234U	Salt Cake (Solids)	A2-SltSlr (Solid)	9.09E-02	Ci	
241-AW-104	234U	Supernatant	NA	7.35E-03	Ci	
241-AW-104	234U	Sludge (Liquids)	PL2 (Liquid)	4.75E-02	Ci	
241-AW-104	234U	Sludge (Solids)	PL2 (Solid)	3.34E+00	Ci	
241-AW-104	234U	Total		3.49E+00	Ci	
241-AW-104	235U	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.77E-06	Ci	
241-AW-104	235U	Salt Cake (Solids)	A2-SltSlr (Solid)	3.59E-03	Ci	
241-AW-104	235U	Supernatant	NA	2.88E-04	Ci	
241-AW-104	235U	Sludge (Liquids)	PL2 (Liquid)	1.88E-03	Ci	
241-AW-104	235U	Sludge (Solids)	PL2 (Solid)	1.28E-01	Ci	
241-AW-104	235U	Total		1.33E-01	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-4

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AW-104	236U	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E-06	Ci	
241-AW-104	236U	Salt Cake (Solids)	A2-SltSlr (Solid)	6.15E-03	Ci	
241-AW-104	236U	Supernatant	NA	3.04E-04	Ci	
241-AW-104	236U	Sludge (Liquids)	PL2 (Liquid)	3.22E-03	Ci	
241-AW-104	236U	Sludge (Solids)	PL2 (Solid)	3.21E-01	Ci	
241-AW-104	236U	Total		3.31E-01	Ci	
241-AW-104	237Np	Salt Cake (Liquids)	A2-SltSlr (Liquid)	6.36E-03	Ci	
241-AW-104	237Np	Salt Cake (Solids)	A2-SltSlr (Solid)	1.16E-01	Ci	
241-AW-104	237Np	Supernatant	NA	7.05E-01	Ci	
241-AW-104	237Np	Sludge (Liquids)	PL2 (Liquid)	2.01E-03	Ci	
241-AW-104	237Np	Sludge (Solids)	PL2 (Solid)	4.43E-05	Ci	
241-AW-104	237Np	Total		8.30E-01	Ci	
241-AW-104	238Pu	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.21E-03	Ci	
241-AW-104	238Pu	Salt Cake (Solids)	A2-SltSlr (Solid)	2.04E+00	Ci	
241-AW-104	238Pu	Supernatant	NA	1.46E-02	Ci	
241-AW-104	238Pu	Sludge (Liquids)	PL2 (Liquid)	7.81E-04	Ci	
241-AW-104	238Pu	Sludge (Solids)	PL2 (Solid)	4.95E+01	Ci	
241-AW-104	238Pu	Total		5.16E+01	Ci	
241-AW-104	238U	Salt Cake (Liquids)	A2-SltSlr (Liquid)	9.44E-05	Ci	
241-AW-104	238U	Salt Cake (Solids)	A2-SltSlr (Solid)	7.12E-02	Ci	
241-AW-104	238U	Supernatant	NA	6.22E-03	Ci	
241-AW-104	238U	Sludge (Liquids)	PL2 (Liquid)	3.72E-02	Ci	
241-AW-104	238U	Sludge (Solids)	PL2 (Solid)	2.30E+00	Ci	
241-AW-104	238U	Total		2.41E+00	Ci	
241-AW-104	239Pu	Salt Cake (Liquids)	A2-SltSlr (Liquid)	5.80E-02	Ci	
241-AW-104	239Pu	Salt Cake (Solids)	A2-SltSlr (Solid)	2.81E+01	Ci	
241-AW-104	239Pu	Supernatant	NA	4.58E-01	Ci	
241-AW-104	239Pu	Sludge (Liquids)	PL2 (Liquid)	1.08E-02	Ci	
241-AW-104	239Pu	Sludge (Solids)	PL2 (Solid)	4.90E+02	Ci	
241-AW-104	239Pu	Total		5.18E+02	Ci	
241-AW-104	240Pu	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.51E-02	Ci	
241-AW-104	240Pu	Salt Cake (Solids)	A2-SltSlr (Solid)	7.32E+00	Ci	
241-AW-104	240Pu	Supernatant	NA	8.17E-02	Ci	
241-AW-104	240Pu	Sludge (Liquids)	PL2 (Liquid)	2.80E-03	Ci	
241-AW-104	240Pu	Sludge (Solids)	PL2 (Solid)	1.38E+02	Ci	
241-AW-104	240Pu	Total		1.46E+02	Ci	
241-AW-104	241Am	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.38E+00	Ci	
241-AW-104	241Am	Salt Cake (Solids)	A2-SltSlr (Solid)	4.29E+01	Ci	
241-AW-104	241Am	Supernatant	NA	5.05E+00	Ci	
241-AW-104	241Am	Sludge (Liquids)	PL2 (Liquid)	2.57E-01	Ci	
241-AW-104	241Am	Sludge (Solids)	PL2 (Solid)	1.83E+01	Ci	
241-AW-104	241Am	Total		6.78E+01	Ci	
241-AW-104	241Pu	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.65E-01	Ci	
241-AW-104	241Pu	Salt Cake (Solids)	A2-SltSlr (Solid)	1.28E+02	Ci	
241-AW-104	241Pu	Supernatant	NA	7.61E-01	Ci	
241-AW-104	241Pu	Sludge (Liquids)	PL2 (Liquid)	4.92E-02	Ci	
241-AW-104	241Pu	Sludge (Solids)	PL2 (Solid)	3.54E+03	Ci	
241-AW-104	241Pu	Total		3.67E+03	Ci	
241-AW-104	242Cm	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.71E-03	Ci	
241-AW-104	242Cm	Salt Cake (Solids)	A2-SltSlr (Solid)	1.09E-02	Ci	
241-AW-104	242Cm	Supernatant	NA	3.15E-02	Ci	
241-AW-104	242Cm	Sludge (Liquids)	PL2 (Liquid)	5.03E-04	Ci	
241-AW-104	242Cm	Sludge (Solids)	PL2 (Solid)	2.46E-05	Ci	
241-AW-104	242Cm	Total		4.56E-02	Ci	
241-AW-104	242Pu	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.60E-06	Ci	
241-AW-104	242Pu	Salt Cake (Solids)	A2-SltSlr (Solid)	7.74E-04	Ci	
241-AW-104	242Pu	Supernatant	NA	5.96E-06	Ci	
241-AW-104	242Pu	Sludge (Liquids)	PL2 (Liquid)	2.97E-07	Ci	
241-AW-104	242Pu	Sludge (Solids)	PL2 (Solid)	1.74E-02	Ci	
241-AW-104	242Pu	Total		1.82E-02	Ci	
241-AW-104	243Am	Salt Cake (Liquids)	A2-SltSlr (Liquid)	9.09E-04	Ci	
241-AW-104	243Am	Salt Cake (Solids)	A2-SltSlr (Solid)	2.79E-02	Ci	
241-AW-104	243Am	Supernatant	NA	1.84E-04	Ci	
241-AW-104	243Am	Sludge (Liquids)	PL2 (Liquid)	1.69E-04	Ci	
241-AW-104	243Am	Sludge (Solids)	PL2 (Solid)	1.35E-05	Ci	
241-AW-104	243Am	Total		2.92E-02	Ci	
241-AW-104	243Cm	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.50E-04	Ci	
241-AW-104	243Cm	Salt Cake (Solids)	A2-SltSlr (Solid)	6.00E-04	Ci	
241-AW-104	243Cm	Supernatant	NA	6.38E-03	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-5

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AW-104	243Cm	Sludge (Liquids)	PL2 (Liquid)	2.78E-05	Ci	
241-AW-104	243Cm	Sludge (Solids)	PL2 (Solid)	3.50E-06	Ci	
241-AW-104	243Cm	Total		7.16E-03	Ci	
241-AW-104	244Cm	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.54E-03	Ci	
241-AW-104	244Cm	Salt Cake (Solids)	A2-SltSlr (Solid)	1.42E-02	Ci	
241-AW-104	244Cm	Supernatant	NA	1.26E-01	Ci	
241-AW-104	244Cm	Sludge (Liquids)	PL2 (Liquid)	6.57E-04	Ci	
241-AW-104	244Cm	Sludge (Solids)	PL2 (Solid)	8.59E-05	Ci	
241-AW-104	244Cm	Total		1.44E-01	Ci	
241-AW-104	3H	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.40E-01	Ci	
241-AW-104	3H	Salt Cake (Solids)	A2-SltSlr (Solid)	3.12E+00	Ci	
241-AW-104	3H	Supernatant	NA	2.42E+00	Ci	
241-AW-104	3H	Sludge (Liquids)	PL2 (Liquid)	4.40E-02	Ci	
241-AW-104	3H	Sludge (Solids)	PL2 (Solid)	1.57E-01	Ci	
241-AW-104	3H	Total		5.89E+00	Ci	
241-AW-104	59Ni	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.14E-02	Ci	
241-AW-104	59Ni	Salt Cake (Solids)	A2-SltSlr (Solid)	3.03E+00	Ci	
241-AW-104	59Ni	Supernatant	NA	1.03E+00	Ci	
241-AW-104	59Ni	Sludge (Liquids)	PL2 (Liquid)	9.90E-03	Ci	
241-AW-104	59Ni	Sludge (Solids)	PL2 (Solid)	1.55E-03	Ci	
241-AW-104	59Ni	Total		4.10E+00	Ci	
241-AW-104	60Co	Salt Cake (Liquids)	A2-SltSlr (Liquid)	6.77E-01	Ci	
241-AW-104	60Co	Salt Cake (Solids)	A2-SltSlr (Solid)	5.83E+00	Ci	
241-AW-104	60Co	Supernatant	NA	1.31E+01	Ci	
241-AW-104	60Co	Sludge (Liquids)	PL2 (Liquid)	2.13E-01	Ci	
241-AW-104	60Co	Sludge (Solids)	PL2 (Solid)	7.40E-03	Ci	
241-AW-104	60Co	Total		1.98E+01	Ci	
241-AW-104	63Ni	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.93E+00	Ci	
241-AW-104	63Ni	Salt Cake (Solids)	A2-SltSlr (Solid)	2.83E+02	Ci	
241-AW-104	63Ni	Supernatant	NA	9.83E+01	Ci	
241-AW-104	63Ni	Sludge (Liquids)	PL2 (Liquid)	9.22E-01	Ci	
241-AW-104	63Ni	Sludge (Solids)	PL2 (Solid)	1.47E-01	Ci	
241-AW-104	63Ni	Total		3.86E+02	Ci	
241-AW-104	79Se	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.46E-01	Ci	
241-AW-104	79Se	Salt Cake (Solids)	A2-SltSlr (Solid)	1.68E-01	Ci	
241-AW-104	79Se	Supernatant	NA	2.81E+00	Ci	
241-AW-104	79Se	Sludge (Liquids)	PL2 (Liquid)	4.61E-02	Ci	
241-AW-104	79Se	Sludge (Solids)	PL2 (Solid)	7.66E-06	Ci	
241-AW-104	79Se	Total		3.17E+00	Ci	
241-AW-104	90Sr	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.28E+02	Ci	
241-AW-104	90Sr	Salt Cake (Solids)	A2-SltSlr (Solid)	5.56E+02	Ci	
241-AW-104	90Sr	Supernatant	NA	5.24E+03	Ci	
241-AW-104	90Sr	Sludge (Liquids)	PL2 (Liquid)	4.02E+01	Ci	
241-AW-104	90Sr	Sludge (Solids)	PL2 (Solid)	1.20E+01	Ci	
241-AW-104	90Sr	Total		5.98E+03	Ci	
241-AW-104	90Y	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.28E+02	Ci	
241-AW-104	90Y	Salt Cake (Solids)	A2-SltSlr (Solid)	5.56E+02	Ci	
241-AW-104	90Y	Supernatant	NA	5.24E+03	Ci	
241-AW-104	90Y	Sludge (Liquids)	PL2 (Liquid)	4.02E+01	Ci	
241-AW-104	90Y	Sludge (Solids)	PL2 (Solid)	1.20E+01	Ci	
241-AW-104	90Y	Total		5.98E+03	Ci	
241-AW-104	93mNb	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.85E+00	Ci	
241-AW-104	93mNb	Salt Cake (Solids)	A2-SltSlr (Solid)	8.28E+00	Ci	
241-AW-104	93mNb	Supernatant	NA	2.11E+01	Ci	
241-AW-104	93mNb	Sludge (Liquids)	PL2 (Liquid)	8.99E-01	Ci	
241-AW-104	93mNb	Sludge (Solids)	PL2 (Solid)	2.80E-04	Ci	
241-AW-104	93mNb	Total		3.31E+01	Ci	
241-AW-104	93Zr	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.44E+00	Ci	
241-AW-104	93Zr	Salt Cake (Solids)	A2-SltSlr (Solid)	9.99E+00	Ci	
241-AW-104	93Zr	Supernatant	NA	1.88E+01	Ci	
241-AW-104	93Zr	Sludge (Liquids)	PL2 (Liquid)	1.08E+00	Ci	
241-AW-104	93Zr	Sludge (Solids)	PL2 (Solid)	4.62E-04	Ci	
241-AW-104	93Zr	Total		3.33E+01	Ci	
241-AW-104	99Tc	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.39E+01	Ci	
241-AW-104	99Tc	Salt Cake (Solids)	A2-SltSlr (Solid)	1.39E+02	Ci	
241-AW-104	99Tc	Supernatant	NA	5.89E+02	Ci	
241-AW-104	99Tc	Sludge (Liquids)	PL2 (Liquid)	1.07E+01	Ci	
241-AW-104	99Tc	Sludge (Solids)	PL2 (Solid)	3.14E-03	Ci	
241-AW-104	99Tc	Total		7.73E+02	Ci	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-6

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AW-104	Ag	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E-01	kg
241-AW-104	Ag	Salt Cake (Solids)	A2-SltSlr (Solid)	5.65E+00	kg
241-AW-104	Ag	Supernatant	NA	5.97E+00	kg
241-AW-104	Ag	Sludge (Liquids)	PL2 (Liquid)	3.79E-01	kg
241-AW-104	Ag	Sludge (Solids)	PL2 (Solid)	2.42E+01	kg
241-AW-104	Ag	Total		3.71E+01	kg
241-AW-104	Al	Salt Cake (Liquids)	A2-SltSlr (Liquid)	5.67E+03	kg
241-AW-104	Al	Salt Cake (Solids)	A2-SltSlr (Solid)	1.46E+04	kg
241-AW-104	Al	Supernatant	NA	8.19E+04	kg
241-AW-104	Al	Sludge (Liquids)	PL2 (Liquid)	8.37E+02	kg
241-AW-104	Al	Sludge (Solids)	PL2 (Solid)	2.57E+03	kg
241-AW-104	Al	Total		1.06E+05	kg
241-AW-104	As	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E+00	kg
241-AW-104	As	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+01	kg
241-AW-104	As	Supernatant	NA	2.87E+01	kg
241-AW-104	As	Sludge (Liquids)	PL2 (Liquid)	3.73E+00	kg
241-AW-104	As	Sludge (Solids)	PL2 (Solid)	1.13E+01	kg
241-AW-104	As	Total		9.09E+01	kg
241-AW-104	B	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.69E+00	kg
241-AW-104	B	Salt Cake (Solids)	A2-SltSlr (Solid)	2.22E+01	kg
241-AW-104	B	Supernatant	NA	1.41E+02	kg
241-AW-104	B	Sludge (Liquids)	PL2 (Liquid)	2.03E+00	kg
241-AW-104	B	Sludge (Solids)	PL2 (Solid)	6.01E+00	kg
241-AW-104	B	Total		1.80E+02	kg
241-AW-104	Ba	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.09E+00	kg
241-AW-104	Ba	Salt Cake (Solids)	A2-SltSlr (Solid)	1.95E+01	kg
241-AW-104	Ba	Supernatant	NA	1.13E+00	kg
241-AW-104	Ba	Sludge (Liquids)	PL2 (Liquid)	1.87E+00	kg
241-AW-104	Ba	Sludge (Solids)	PL2 (Solid)	6.40E+00	kg
241-AW-104	Ba	Total		3.30E+01	kg
241-AW-104	Be	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.08E-01	kg
241-AW-104	Be	Salt Cake (Solids)	A2-SltSlr (Solid)	1.95E+00	kg
241-AW-104	Be	Supernatant	NA	9.60E-01	kg
241-AW-104	Be	Sludge (Liquids)	PL2 (Liquid)	1.86E-01	kg
241-AW-104	Be	Sludge (Solids)	PL2 (Solid)	9.25E-01	kg
241-AW-104	Be	Total		4.43E+00	kg
241-AW-104	Bi	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.18E+00	kg
241-AW-104	Bi	Salt Cake (Solids)	A2-SltSlr (Solid)	9.99E+00	kg
241-AW-104	Bi	Supernatant	NA	5.50E+01	kg
241-AW-104	Bi	Sludge (Liquids)	PL2 (Liquid)	1.32E+00	kg
241-AW-104	Bi	Sludge (Solids)	PL2 (Solid)	0.00E+00	kg
241-AW-104	Bi	Total		7.05E+01	kg
241-AW-104	Ca	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E+00	kg
241-AW-104	Ca	Salt Cake (Solids)	A2-SltSlr (Solid)	3.01E+02	kg
241-AW-104	Ca	Supernatant	NA	1.90E+02	kg
241-AW-104	Ca	Sludge (Liquids)	PL2 (Liquid)	1.30E+01	kg
241-AW-104	Ca	Sludge (Solids)	PL2 (Solid)	9.05E+02	kg
241-AW-104	Ca	Total		1.42E+03	kg
241-AW-104	Ce	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E+00	kg
241-AW-104	Ce	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+01	kg
241-AW-104	Ce	Supernatant	NA	2.77E+01	kg
241-AW-104	Ce	Sludge (Liquids)	PL2 (Liquid)	3.73E+00	kg
241-AW-104	Ce	Sludge (Solids)	PL2 (Solid)	1.13E+01	kg
241-AW-104	Ce	Total		8.99E+01	kg
241-AW-104	Cl	Salt Cake (Liquids)	A2-SltSlr (Liquid)	7.74E+02	kg
241-AW-104	Cl	Salt Cake (Solids)	A2-SltSlr (Solid)	2.30E+03	kg
241-AW-104	Cl	Supernatant	NA	1.51E+04	kg
241-AW-104	Cl	Sludge (Liquids)	PL2 (Liquid)	1.47E+02	kg
241-AW-104	Cl	Sludge (Solids)	PL2 (Solid)	3.18E+02	kg
241-AW-104	Cl	Total		1.87E+04	kg
241-AW-104	Co	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.63E+00	kg
241-AW-104	Co	Salt Cake (Solids)	A2-SltSlr (Solid)	7.82E+00	kg
241-AW-104	Co	Supernatant	NA	7.58E+00	kg
241-AW-104	Co	Sludge (Liquids)	PL2 (Liquid)	7.44E-01	kg
241-AW-104	Co	Sludge (Solids)	PL2 (Solid)	2.26E+00	kg
241-AW-104	Co	Total		2.00E+01	kg
241-AW-104	Cr	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.51E+01	kg
241-AW-104	Cr	Salt Cake (Solids)	A2-SltSlr (Solid)	2.37E+03	kg
241-AW-104	Cr	Supernatant	NA	9.75E+02	kg

Summary		
Summary		
Ag	2.46E+01	kg
Al	3.41E+03	kg
As	1.50E+01	kg
B	8.04E+00	kg
Ba	8.27E+00	kg
Be	1.11E+00	kg
Bi	1.32E+00	kg
Ca	9.18E+02	kg
Cd	0.00E+00	kg
Ce	1.50E+01	kg
Cl	4.65E+02	kg
CN	0.00E+00	kg
Co	3.00E+00	kg
Cr	1.62E+02	kg
Cu	1.49E+01	kg
F	8.53E+02	kg
Fe	2.31E+03	kg
OH	1.27E+03	kg
Hg	1.03E-02	kg
K	1.79E+03	kg
La	2.00E+01	kg
Li	3.11E+00	kg
Mg	2.00E+02	kg
Mn	7.92E+02	kg
Mo	1.31E+01	kg
Na	3.48E+04	kg
Nd	1.50E+01	kg
NH3	0.00E+00	kg
Ni	6.32E+01	kg
NO2	8.54E+03	kg
NO3	1.46E+04	kg
Oxalate	8.85E+02	kg
Pb	8.20E+01	kg
Pd	0.00E+00	kg
PO4	3.02E+02	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	9.03E+00	kg
Se	1.53E+01	kg
Si	4.79E+02	kg
SO4	8.42E+02	kg
Sr	4.94E+00	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	2.53E-02	kg
Ti	1.60E+01	kg
TIC as CO3	1.68E+04	kg
Tl	0.00E+00	kg
TOC	3.00E+03	kg
UTOTAL	7.02E+03	kg
V	7.53E+00	kg
W	0.00E+00	kg
Y	1.50E+00	kg
Zn	2.80E+01	kg
Zr	2.11E+03	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-7

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AW-104	Cr	Sludge (Liquids)	PL2 (Liquid)	4.87E+00	kg	
241-AW-104	Cr	Sludge (Solids)	PL2 (Solid)	1.57E+02	kg	
241-AW-104	Cr	Total		3.52E+03	kg	
241-AW-104	Cu	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E-01	kg	
241-AW-104	Cu	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+00	kg	
241-AW-104	Cu	Supernatant	NA	1.94E+01	kg	
241-AW-104	Cu	Sludge (Liquids)	PL2 (Liquid)	3.73E-01	kg	
241-AW-104	Cu	Sludge (Solids)	PL2 (Solid)	1.45E+01	kg	
241-AW-104	Cu	Total		3.90E+01	kg	
241-AW-104	F	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.66E+01	kg	
241-AW-104	F	Salt Cake (Solids)	A2-SltSlr (Solid)	3.19E+04	kg	
241-AW-104	F	Supernatant	NA	5.98E+02	kg	
241-AW-104	F	Sludge (Liquids)	PL2 (Liquid)	1.36E+02	kg	
241-AW-104	F	Sludge (Solids)	PL2 (Solid)	7.17E+02	kg	
241-AW-104	F	Total		3.33E+04	kg	
241-AW-104	Fe	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.31E+00	kg	
241-AW-104	Fe	Salt Cake (Solids)	A2-SltSlr (Solid)	2.72E+02	kg	
241-AW-104	Fe	Supernatant	NA	1.92E+01	kg	
241-AW-104	Fe	Sludge (Liquids)	PL2 (Liquid)	3.14E+01	kg	
241-AW-104	Fe	Sludge (Solids)	PL2 (Solid)	2.28E+03	kg	
241-AW-104	Fe	Total		2.61E+03	kg	
241-AW-104	Free OH	Salt Cake (Liquids)	A2-SltSlr (Liquid)	6.67E+03	kg	
241-AW-104	Free OH	Supernatant	NA	8.15E+04	kg	
241-AW-104	Free OH	Sludge (Liquids)	PL2 (Liquid)	1.27E+03	kg	
241-AW-104	Free OH	Total		8.95E+04	kg	
241-AW-104	Hg	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.28E-02	kg	
241-AW-104	Hg	Salt Cake (Solids)	A2-SltSlr (Solid)	3.50E-01	kg	
241-AW-104	Hg	Supernatant	NA	0.00E+00	kg	
241-AW-104	Hg	Sludge (Liquids)	PL2 (Liquid)	1.03E-02	kg	
241-AW-104	Hg	Sludge (Solids)	PL2 (Solid)	0.00E+00	kg	
241-AW-104	Hg	Total		3.93E-01	kg	
241-AW-104	K	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.34E+03	kg	
241-AW-104	K	Salt Cake (Solids)	A2-SltSlr (Solid)	5.93E+03	kg	
241-AW-104	K	Supernatant	NA	1.81E+04	kg	
241-AW-104	K	Sludge (Liquids)	PL2 (Liquid)	6.20E+02	kg	
241-AW-104	K	Sludge (Solids)	PL2 (Solid)	1.17E+03	kg	
241-AW-104	K	Total		2.82E+04	kg	
241-AW-104	La	Salt Cake (Liquids)	A2-SltSlr (Liquid)	9.02E-05	kg	
241-AW-104	La	Salt Cake (Solids)	A2-SltSlr (Solid)	2.06E-04	kg	
241-AW-104	La	Supernatant	NA	3.30E+00	kg	
241-AW-104	La	Sludge (Liquids)	PL2 (Liquid)	2.84E-05	kg	
241-AW-104	La	Sludge (Solids)	PL2 (Solid)	2.00E+01	kg	
241-AW-104	La	Total		2.33E+01	kg	
241-AW-104	Li	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E-01	kg	
241-AW-104	Li	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+00	kg	
241-AW-104	Li	Supernatant	NA	1.80E+00	kg	
241-AW-104	Li	Sludge (Liquids)	PL2 (Liquid)	3.73E-01	kg	
241-AW-104	Li	Sludge (Solids)	PL2 (Solid)	2.74E+00	kg	
241-AW-104	Li	Total		9.62E+00	kg	
241-AW-104	Mg	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E+00	kg	
241-AW-104	Mg	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+01	kg	
241-AW-104	Mg	Supernatant	NA	3.30E+01	kg	
241-AW-104	Mg	Sludge (Liquids)	PL2 (Liquid)	3.73E+00	kg	
241-AW-104	Mg	Sludge (Solids)	PL2 (Solid)	1.96E+02	kg	
241-AW-104	Mg	Total		2.80E+02	kg	
241-AW-104	Mn	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E-01	kg	
241-AW-104	Mn	Salt Cake (Solids)	A2-SltSlr (Solid)	3.41E+02	kg	
241-AW-104	Mn	Supernatant	NA	7.29E+00	kg	
241-AW-104	Mn	Sludge (Liquids)	PL2 (Liquid)	5.44E+00	kg	
241-AW-104	Mn	Sludge (Solids)	PL2 (Solid)	7.87E+02	kg	
241-AW-104	Mn	Total		1.14E+03	kg	
241-AW-104	Mo	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.18E+01	kg	
241-AW-104	Mo	Salt Cake (Solids)	A2-SltSlr (Solid)	3.33E+01	kg	
241-AW-104	Mo	Supernatant	NA	2.51E+02	kg	
241-AW-104	Mo	Sludge (Liquids)	PL2 (Liquid)	3.12E+00	kg	
241-AW-104	Mo	Sludge (Solids)	PL2 (Solid)	1.00E+01	kg	
241-AW-104	Mo	Total		3.09E+02	kg	
241-AW-104	Na	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.50E+04	kg	
241-AW-104	Na	Salt Cake (Solids)	A2-SltSlr (Solid)	1.65E+05	kg	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-8

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AW-104	Na	Supernatant	NA	5.47E+05	kg	
241-AW-104	Na	Sludge (Liquids)	PL2 (Liquid)	1.17E+04	kg	
241-AW-104	Na	Sludge (Solids)	PL2 (Solid)	2.31E+04	kg	
241-AW-104	Na	Total		7.82E+05	kg	
241-AW-104	Nd	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E+00	kg	
241-AW-104	Nd	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+01	kg	
241-AW-104	Nd	Supernatant	NA	1.28E+01	kg	
241-AW-104	Nd	Sludge (Liquids)	PL2 (Liquid)	3.73E+00	kg	
241-AW-104	Nd	Sludge (Solids)	PL2 (Solid)	1.13E+01	kg	
241-AW-104	Nd	Total		7.50E+01	kg	
241-AW-104	Ni	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.00E+00	kg	
241-AW-104	Ni	Salt Cake (Solids)	A2-SltSlr (Solid)	2.38E+01	kg	
241-AW-104	Ni	Supernatant	NA	1.03E+02	kg	
241-AW-104	Ni	Sludge (Liquids)	PL2 (Liquid)	1.02E+00	kg	
241-AW-104	Ni	Sludge (Solids)	PL2 (Solid)	6.22E+01	kg	
241-AW-104	Ni	Total		1.92E+02	kg	
241-AW-104	NO2	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.32E+04	kg	
241-AW-104	NO2	Salt Cake (Solids)	A2-SltSlr (Solid)	4.17E+04	kg	
241-AW-104	NO2	Supernatant	NA	2.40E+05	kg	
241-AW-104	NO2	Sludge (Liquids)	PL2 (Liquid)	2.72E+03	kg	
241-AW-104	NO2	Sludge (Solids)	PL2 (Solid)	5.82E+03	kg	
241-AW-104	NO2	Total		3.03E+05	kg	
241-AW-104	NO3	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.89E+04	kg	
241-AW-104	NO3	Salt Cake (Solids)	A2-SltSlr (Solid)	5.97E+04	kg	
241-AW-104	NO3	Supernatant	NA	3.62E+05	kg	
241-AW-104	NO3	Sludge (Liquids)	PL2 (Liquid)	4.38E+03	kg	
241-AW-104	NO3	Sludge (Solids)	PL2 (Solid)	1.02E+04	kg	
241-AW-104	NO3	Total		4.56E+05	kg	
241-AW-104	Oxalate	Salt Cake (Liquids)	A2-SltSlr (Liquid)	6.64E+01	kg	
241-AW-104	Oxalate	Salt Cake (Solids)	A2-SltSlr (Solid)	8.19E+03	kg	
241-AW-104	Oxalate	Supernatant	NA	9.21E+01	kg	
241-AW-104	Oxalate	Sludge (Liquids)	PL2 (Liquid)	2.71E+02	kg	
241-AW-104	Oxalate	Sludge (Solids)	PL2 (Solid)	6.14E+02	kg	
241-AW-104	Oxalate	Total		9.23E+03	kg	
241-AW-104	Pb	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E+00	kg	
241-AW-104	Pb	Salt Cake (Solids)	A2-SltSlr (Solid)	4.20E+01	kg	
241-AW-104	Pb	Supernatant	NA	8.19E+01	kg	
241-AW-104	Pb	Sludge (Liquids)	PL2 (Liquid)	3.73E-01	kg	
241-AW-104	Pb	Sludge (Solids)	PL2 (Solid)	8.16E+01	kg	
241-AW-104	Pb	Total		2.14E+02	kg	
241-AW-104	PO4	Salt Cake (Liquids)	A2-SltSlr (Liquid)	1.95E+02	kg	
241-AW-104	PO4	Salt Cake (Solids)	A2-SltSlr (Solid)	2.78E+03	kg	
241-AW-104	PO4	Supernatant	NA	9.08E+03	kg	
241-AW-104	PO4	Sludge (Liquids)	PL2 (Liquid)	1.56E+02	kg	
241-AW-104	PO4	Sludge (Solids)	PL2 (Solid)	1.46E+02	kg	
241-AW-104	PO4	Total		1.24E+04	kg	
241-AW-104	Sb	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.91E+00	kg	
241-AW-104	Sb	Salt Cake (Solids)	A2-SltSlr (Solid)	2.34E+01	kg	
241-AW-104	Sb	Supernatant	NA	2.19E+01	kg	
241-AW-104	Sb	Sludge (Liquids)	PL2 (Liquid)	2.24E+00	kg	
241-AW-104	Sb	Sludge (Solids)	PL2 (Solid)	6.79E+00	kg	
241-AW-104	Sb	Total		5.92E+01	kg	
241-AW-104	Se	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E+00	kg	
241-AW-104	Se	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+01	kg	
241-AW-104	Se	Supernatant	NA	4.23E+01	kg	
241-AW-104	Se	Sludge (Liquids)	PL2 (Liquid)	4.01E+00	kg	
241-AW-104	Se	Sludge (Solids)	PL2 (Solid)	1.13E+01	kg	
241-AW-104	Se	Total		1.05E+02	kg	
241-AW-104	Si	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.31E+01	kg	
241-AW-104	Si	Salt Cake (Solids)	A2-SltSlr (Solid)	9.29E+02	kg	
241-AW-104	Si	Supernatant	NA	1.24E+02	kg	
241-AW-104	Si	Sludge (Liquids)	PL2 (Liquid)	7.32E+00	kg	
241-AW-104	Si	Sludge (Solids)	PL2 (Solid)	4.72E+02	kg	
241-AW-104	Si	Total		1.55E+03	kg	
241-AW-104	SO4	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.52E+02	kg	
241-AW-104	SO4	Salt Cake (Solids)	A2-SltSlr (Solid)	1.80E+04	kg	
241-AW-104	SO4	Supernatant	NA	1.02E+04	kg	
241-AW-104	SO4	Sludge (Liquids)	PL2 (Liquid)	3.01E+02	kg	
241-AW-104	SO4	Sludge (Solids)	PL2 (Solid)	5.41E+02	kg	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-9

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AW-104	SO4	Total		2.94E+04	kg	
241-AW-104	Sr	Salt Cake (Liquids)	A2-SltSlr (Liquid)	3.12E-03	kg	
241-AW-104	Sr	Salt Cake (Solids)	A2-SltSlr (Solid)	1.65E+00	kg	
241-AW-104	Sr	Supernatant	NA	2.90E-01	kg	
241-AW-104	Sr	Sludge (Liquids)	PL2 (Liquid)	1.86E-03	kg	
241-AW-104	Sr	Sludge (Solids)	PL2 (Solid)	4.94E+00	kg	
241-AW-104	Sr	Total		6.88E+00	kg	
241-AW-104	Th	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.04E-02	kg	
241-AW-104	Th	Salt Cake (Solids)	A2-SltSlr (Solid)	2.33E-01	kg	
241-AW-104	Th	Supernatant	NA	2.05E+02	kg	
241-AW-104	Th	Sludge (Liquids)	PL2 (Liquid)	2.53E-02	kg	
241-AW-104	Th	Sludge (Solids)	PL2 (Solid)	4.14E-10	kg	
241-AW-104	Th	Total		2.06E+02	kg	
241-AW-104	Ti	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E-01	kg	
241-AW-104	Ti	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+00	kg	
241-AW-104	Ti	Supernatant	NA	9.12E-01	kg	
241-AW-104	Ti	Sludge (Liquids)	PL2 (Liquid)	3.73E-01	kg	
241-AW-104	Ti	Sludge (Solids)	PL2 (Solid)	1.56E+01	kg	
241-AW-104	Ti	Total		2.16E+01	kg	
241-AW-104	TIC as CO	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.09E+03	kg	
241-AW-104	TIC as CO	Salt Cake (Solids)	A2-SltSlr (Solid)	3.48E+04	kg	
241-AW-104	TIC as CO	Supernatant	NA	5.54E+04	kg	
241-AW-104	TIC as CO	Sludge (Liquids)	PL2 (Liquid)	4.59E+03	kg	
241-AW-104	TIC as CO	Sludge (Solids)	PL2 (Solid)	1.22E+04	kg	
241-AW-104	TIC as CO	Total		1.09E+05	kg	
241-AW-104	TOC	Salt Cake (Liquids)	A2-SltSlr (Liquid)	5.14E+02	kg	
241-AW-104	TOC	Salt Cake (Solids)	A2-SltSlr (Solid)	4.51E+03	kg	
241-AW-104	TOC	Supernatant	NA	1.39E+04	kg	
241-AW-104	TOC	Sludge (Liquids)	PL2 (Liquid)	1.63E+02	kg	
241-AW-104	TOC	Sludge (Solids)	PL2 (Solid)	2.84E+03	kg	
241-AW-104	TOC	Total		2.19E+04	kg	
241-AW-104	UTOTAL	Salt Cake (Liquids)	A2-SltSlr (Liquid)	2.83E-01	kg	
241-AW-104	UTOTAL	Salt Cake (Solids)	A2-SltSlr (Solid)	2.14E+02	kg	
241-AW-104	UTOTAL	Supernatant	NA	1.86E+01	kg	
241-AW-104	UTOTAL	Sludge (Liquids)	PL2 (Liquid)	1.12E+02	kg	
241-AW-104	UTOTAL	Sludge (Solids)	PL2 (Solid)	6.91E+03	kg	
241-AW-104	UTOTAL	Total		7.25E+03	kg	
241-AW-104	V	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.09E+00	kg	
241-AW-104	V	Salt Cake (Solids)	A2-SltSlr (Solid)	1.95E+01	kg	
241-AW-104	V	Supernatant	NA	3.40E+00	kg	
241-AW-104	V	Sludge (Liquids)	PL2 (Liquid)	1.87E+00	kg	
241-AW-104	V	Sludge (Solids)	PL2 (Solid)	5.66E+00	kg	
241-AW-104	V	Total		3.45E+01	kg	
241-AW-104	Y	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E-01	kg	
241-AW-104	Y	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+00	kg	
241-AW-104	Y	Supernatant	NA	3.50E-01	kg	
241-AW-104	Y	Sludge (Liquids)	PL2 (Liquid)	3.73E-01	kg	
241-AW-104	Y	Sludge (Solids)	PL2 (Solid)	1.13E+00	kg	
241-AW-104	Y	Total		6.57E+00	kg	
241-AW-104	Zn	Salt Cake (Liquids)	A2-SltSlr (Liquid)	8.17E-01	kg	
241-AW-104	Zn	Salt Cake (Solids)	A2-SltSlr (Solid)	3.90E+00	kg	
241-AW-104	Zn	Supernatant	NA	1.50E+00	kg	
241-AW-104	Zn	Sludge (Liquids)	PL2 (Liquid)	3.73E-01	kg	
241-AW-104	Zn	Sludge (Solids)	PL2 (Solid)	2.76E+01	kg	
241-AW-104	Zn	Total		3.42E+01	kg	
241-AW-104	Zr	Salt Cake (Liquids)	A2-SltSlr (Liquid)	4.16E+00	kg	
241-AW-104	Zr	Salt Cake (Solids)	A2-SltSlr (Solid)	3.04E+02	kg	
241-AW-104	Zr	Supernatant	NA	6.48E+00	kg	
241-AW-104	Zr	Sludge (Liquids)	PL2 (Liquid)	5.57E+00	kg	
241-AW-104	Zr	Sludge (Solids)	PL2 (Solid)	2.10E+03	kg	
241-AW-104	Zr	Total		2.42E+03	kg	

241-AY-101	106Ru	Supernatant	NA	4.37E-07	Ci	Summary	
241-AY-101	106Ru	Sludge (Liquids)	NA	1.75E-06	Ci	106Ru	2.98E-02 Ci
241-AY-101	106Ru	Sludge (Solids)	NA	2.98E-02	Ci	113mCd	1.87E+01 Ci
241-AY-101	106Ru	Total		2.98E-02	Ci	125Sb	2.46E+02 Ci
241-AY-101	113mCd	Sludge (Liquids)	NA	9.79E-01	Ci	126Sn	1.38E+00 Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-10

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AY-101	113mCd	Sludge (Solids)	NA	1.77E+01	Ci
241-AY-101	113mCd	Supernatant	NA	3.10E+00	Ci
241-AY-101	113mCd	Total		2.18E+01	Ci
241-AY-101	125Sb	Sludge (Liquids)	NA	2.78E-01	Ci
241-AY-101	125Sb	Sludge (Solids)	NA	2.46E+02	Ci
241-AY-101	125Sb	Supernatant	NA	8.81E+00	Ci
241-AY-101	125Sb	Total		2.55E+02	Ci
241-AY-101	126Sn	Sludge (Solids)	NA	1.32E+00	Ci
241-AY-101	126Sn	Supernatant	NA	4.16E-02	Ci
241-AY-101	126Sn	Sludge (Liquids)	NA	6.22E-02	Ci
241-AY-101	126Sn	Total		1.42E+00	Ci
241-AY-101	129I	Sludge (Solids)	NA	8.26E-02	Ci
241-AY-101	129I	Sludge (Liquids)	NA	1.42E-03	Ci
241-AY-101	129I	Supernatant	NA	9.43E-04	Ci
241-AY-101	129I	Total		8.49E-02	Ci
241-AY-101	134Cs	Supernatant	NA	1.26E-02	Ci
241-AY-101	134Cs	Sludge (Liquids)	NA	1.32E-02	Ci
241-AY-101	134Cs	Sludge (Solids)	NA	1.25E+00	Ci
241-AY-101	134Cs	Total		1.28E+00	Ci
241-AY-101	137Cs	Sludge (Liquids)	NA	4.82E+03	Ci
241-AY-101	137Cs	Sludge (Solids)	NA	6.02E+04	Ci
241-AY-101	137Cs	Supernatant	NA	1.51E+04	Ci
241-AY-101	137Cs	Total		8.01E+04	Ci
241-AY-101	137mBa	Sludge (Liquids)	NA	4.55E+03	Ci
241-AY-101	137mBa	Sludge (Solids)	NA	5.68E+04	Ci
241-AY-101	137mBa	Supernatant	NA	1.42E+04	Ci
241-AY-101	137mBa	Total		7.56E+04	Ci
241-AY-101	14C	Sludge (Liquids)	NA	4.77E-02	Ci
241-AY-101	14C	Sludge (Solids)	NA	1.16E+00	Ci
241-AY-101	14C	Supernatant	NA	5.57E-02	Ci
241-AY-101	14C	Total		1.27E+00	Ci
241-AY-101	151Sm	Sludge (Liquids)	NA	1.89E+02	Ci
241-AY-101	151Sm	Sludge (Solids)	NA	2.45E+05	Ci
241-AY-101	151Sm	Supernatant	NA	5.61E+02	Ci
241-AY-101	151Sm	Total		2.46E+05	Ci
241-AY-101	152Eu	Sludge (Liquids)	NA	4.45E-02	Ci
241-AY-101	152Eu	Sludge (Solids)	NA	3.60E+02	Ci
241-AY-101	152Eu	Supernatant	NA	1.93E-01	Ci
241-AY-101	152Eu	Total		3.61E+02	Ci
241-AY-101	154Eu	Sludge (Liquids)	NA	3.89E+00	Ci
241-AY-101	154Eu	Sludge (Solids)	NA	5.62E+03	Ci
241-AY-101	154Eu	Supernatant	NA	3.12E+00	Ci
241-AY-101	154Eu	Total		5.63E+03	Ci
241-AY-101	155Eu	Sludge (Liquids)	NA	1.56E+00	Ci
241-AY-101	155Eu	Sludge (Solids)	NA	2.27E+03	Ci
241-AY-101	155Eu	Supernatant	NA	4.03E+00	Ci
241-AY-101	155Eu	Total		2.27E+03	Ci
241-AY-101	226Ra	Sludge (Liquids)	NA	7.87E-07	Ci
241-AY-101	226Ra	Sludge (Solids)	NA	2.22E-05	Ci
241-AY-101	226Ra	Supernatant	NA	5.78E-06	Ci
241-AY-101	226Ra	Total		2.88E-05	Ci
241-AY-101	227Ac	Sludge (Liquids)	NA	5.21E-06	Ci
241-AY-101	227Ac	Sludge (Solids)	NA	1.88E-03	Ci
241-AY-101	227Ac	Supernatant	NA	7.51E-05	Ci
241-AY-101	227Ac	Total		1.96E-03	Ci
241-AY-101	228Ra	Sludge (Liquids)	NA	2.30E-04	Ci
241-AY-101	228Ra	Sludge (Solids)	NA	7.18E-02	Ci
241-AY-101	228Ra	Supernatant	NA	2.32E-03	Ci
241-AY-101	228Ra	Total		7.44E-02	Ci
241-AY-101	229Th	Sludge (Liquids)	NA	3.71E-07	Ci
241-AY-101	229Th	Sludge (Solids)	NA	8.33E-06	Ci
241-AY-101	229Th	Supernatant	NA	1.18E-04	Ci
241-AY-101	229Th	Total		1.27E-04	Ci
241-AY-101	231Pa	Sludge (Liquids)	NA	5.48E-04	Ci
241-AY-101	231Pa	Sludge (Solids)	NA	1.94E-02	Ci
241-AY-101	231Pa	Supernatant	NA	1.82E-04	Ci
241-AY-101	231Pa	Total		2.02E-02	Ci
241-AY-101	232Th	Sludge (Liquids)	NA	6.18E-04	Ci
241-AY-101	232Th	Sludge (Solids)	NA	5.68E-02	Ci

Summary		
129I	8.40E-02	Ci
134Cs	1.26E+00	Ci
137Cs	6.50E+04	Ci
137mBa	6.14E+04	Ci
14C	1.21E+00	Ci
151Sm	2.45E+05	Ci
152Eu	3.60E+02	Ci
154Eu	5.62E+03	Ci
155Eu	2.27E+03	Ci
226Ra	2.30E-05	Ci
227Ac	1.89E-03	Ci
228Ra	7.20E-02	Ci
229Th	8.70E-06	Ci
231Pa	1.99E-02	Ci
232Th	5.74E-02	Ci
232U	8.04E-04	Ci
233U	4.70E-02	Ci
234U	2.08E-01	Ci
235U	8.86E-03	Ci
236U	8.14E-03	Ci
237Np	2.65E+00	Ci
238Pu	5.92E+01	Ci
238U	1.77E-01	Ci
239Pu	6.93E+02	Ci
240Pu	2.13E+02	Ci
241Am	1.32E+04	Ci
241Pu	2.97E+03	Ci
242Cm	1.96E+01	Ci
242Pu	3.04E-02	Ci
243Am	1.18E+01	Ci
243Cm	1.93E+00	Ci
244Cm	4.52E+01	Ci
3H	2.21E+00	Ci
59Ni	3.01E+01	Ci
60Co	4.51E+02	Ci
63Ni	2.81E+03	Ci
79Se	3.40E-01	Ci
90Sr	1.94E+06	Ci
90Y	1.94E+06	Ci
93mNb	1.13E+02	Ci
93Zr	2.09E+02	Ci
99Tc	1.44E+01	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-11

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AY-101	232Th	Supernatant	NA	1.44E-03	Ci	
241-AY-101	232Th	Total		5.88E-02	Ci	
241-AY-101	232U	Supernatant	NA	4.27E-04	Ci	
241-AY-101	232U	Sludge (Liquids)	NA	6.10E-04	Ci	
241-AY-101	232U	Sludge (Solids)	NA	1.94E-04	Ci	
241-AY-101	232U	Total		1.23E-03	Ci	
241-AY-101	233U	Supernatant	NA	2.68E-02	Ci	
241-AY-101	233U	Sludge (Liquids)	NA	3.71E-02	Ci	
241-AY-101	233U	Sludge (Solids)	NA	9.88E-03	Ci	
241-AY-101	233U	Total		7.38E-02	Ci	
241-AY-101	234U	Sludge (Liquids)	NA	1.78E-02	Ci	
241-AY-101	234U	Sludge (Solids)	NA	1.90E-01	Ci	
241-AY-101	234U	Supernatant	NA	1.17E-02	Ci	
241-AY-101	234U	Total		2.19E-01	Ci	
241-AY-101	235U	Sludge (Liquids)	NA	7.41E-04	Ci	
241-AY-101	235U	Sludge (Solids)	NA	8.12E-03	Ci	
241-AY-101	235U	Supernatant	NA	4.83E-04	Ci	
241-AY-101	235U	Total		9.35E-03	Ci	
241-AY-101	236U	Sludge (Solids)	NA	7.66E-03	Ci	
241-AY-101	236U	Supernatant	NA	3.14E-04	Ci	
241-AY-101	236U	Sludge (Liquids)	NA	4.81E-04	Ci	
241-AY-101	236U	Total		8.45E-03	Ci	
241-AY-101	237Np	Sludge (Liquids)	NA	1.51E-02	Ci	
241-AY-101	237Np	Sludge (Solids)	NA	2.63E+00	Ci	
241-AY-101	237Np	Supernatant	NA	4.85E-02	Ci	
241-AY-101	237Np	Total		2.70E+00	Ci	
241-AY-101	238Pu	Sludge (Liquids)	NA	8.75E-01	Ci	
241-AY-101	238Pu	Sludge (Solids)	NA	5.83E+01	Ci	
241-AY-101	238Pu	Supernatant	NA	2.32E-01	Ci	
241-AY-101	238Pu	Total		5.94E+01	Ci	
241-AY-101	238U	Sludge (Liquids)	NA	1.67E-02	Ci	
241-AY-101	238U	Sludge (Solids)	NA	1.60E-01	Ci	
241-AY-101	238U	Supernatant	NA	1.09E-02	Ci	
241-AY-101	238U	Total		1.87E-01	Ci	
241-AY-101	239Pu	Sludge (Liquids)	NA	2.05E+01	Ci	
241-AY-101	239Pu	Sludge (Solids)	NA	6.72E+02	Ci	
241-AY-101	239Pu	Supernatant	NA	5.57E+00	Ci	
241-AY-101	239Pu	Total		6.98E+02	Ci	
241-AY-101	240Pu	Sludge (Liquids)	NA	4.79E+00	Ci	
241-AY-101	240Pu	Sludge (Solids)	NA	2.08E+02	Ci	
241-AY-101	240Pu	Supernatant	NA	1.30E+00	Ci	
241-AY-101	240Pu	Total		2.14E+02	Ci	
241-AY-101	241Am	Sludge (Liquids)	NA	2.82E+00	Ci	
241-AY-101	241Am	Sludge (Solids)	NA	1.32E+04	Ci	
241-AY-101	241Am	Supernatant	NA	8.57E-01	Ci	
241-AY-101	241Am	Total		1.32E+04	Ci	
241-AY-101	241Pu	Sludge (Liquids)	NA	4.13E+01	Ci	
241-AY-101	241Pu	Sludge (Solids)	NA	2.93E+03	Ci	
241-AY-101	241Pu	Supernatant	NA	9.73E+00	Ci	
241-AY-101	241Pu	Total		2.98E+03	Ci	
241-AY-101	242Cm	Sludge (Liquids)	NA	4.27E-03	Ci	
241-AY-101	242Cm	Sludge (Solids)	NA	1.96E+01	Ci	
241-AY-101	242Cm	Supernatant	NA	1.38E-03	Ci	
241-AY-101	242Cm	Total		1.96E+01	Ci	
241-AY-101	242Pu	Supernatant	NA	9.25E-05	Ci	
241-AY-101	242Pu	Sludge (Liquids)	NA	3.40E-04	Ci	
241-AY-101	242Pu	Sludge (Solids)	NA	3.01E-02	Ci	
241-AY-101	242Pu	Total		3.06E-02	Ci	
241-AY-101	243Am	Sludge (Liquids)	NA	1.63E-03	Ci	
241-AY-101	243Am	Sludge (Solids)	NA	1.18E+01	Ci	
241-AY-101	243Am	Supernatant	NA	5.07E-04	Ci	
241-AY-101	243Am	Total		1.18E+01	Ci	
241-AY-101	243Cm	Sludge (Liquids)	NA	1.65E-04	Ci	
241-AY-101	243Cm	Sludge (Solids)	NA	1.93E+00	Ci	
241-AY-101	243Cm	Supernatant	NA	5.00E-05	Ci	
241-AY-101	243Cm	Total		1.93E+00	Ci	
241-AY-101	244Cm	Sludge (Liquids)	NA	4.09E-03	Ci	
241-AY-101	244Cm	Sludge (Solids)	NA	4.52E+01	Ci	
241-AY-101	244Cm	Supernatant	NA	1.18E-03	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-12

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AY-101	244Cm	Total		4.52E+01	Ci		
241-AY-101	3H	Supernatant	NA	1.18E+00	Ci		
241-AY-101	3H	Sludge (Solids)	NA	1.78E+00	Ci		
241-AY-101	3H	Sludge (Liquids)	NA	4.26E-01	Ci		
241-AY-101	3H	Total		3.38E+00	Ci		
241-AY-101	59Ni	Sludge (Liquids)	NA	1.05E-01	Ci		
241-AY-101	59Ni	Sludge (Solids)	NA	3.00E+01	Ci		
241-AY-101	59Ni	Supernatant	NA	9.11E-02	Ci		
241-AY-101	59Ni	Total		3.02E+01	Ci		
241-AY-101	60Co	Sludge (Liquids)	NA	1.32E+00	Ci		
241-AY-101	60Co	Sludge (Solids)	NA	4.50E+02	Ci		
241-AY-101	60Co	Supernatant	NA	2.21E+00	Ci		
241-AY-101	60Co	Total		4.53E+02	Ci		
241-AY-101	63Ni	Sludge (Liquids)	NA	9.97E+00	Ci		
241-AY-101	63Ni	Sludge (Solids)	NA	2.80E+03	Ci		
241-AY-101	63Ni	Supernatant	NA	8.37E+00	Ci		
241-AY-101	63Ni	Total		2.82E+03	Ci		
241-AY-101	79Se	Sludge (Liquids)	NA	2.50E-02	Ci		
241-AY-101	79Se	Sludge (Solids)	NA	3.15E-01	Ci		
241-AY-101	79Se	Supernatant	NA	6.83E-02	Ci		
241-AY-101	79Se	Total		4.08E-01	Ci		
241-AY-101	90Sr	Sludge (Liquids)	NA	4.24E+01	Ci		
241-AY-101	90Sr	Sludge (Solids)	NA	1.94E+06	Ci		
241-AY-101	90Sr	Supernatant	NA	3.02E+02	Ci		
241-AY-101	90Sr	Total		1.94E+06	Ci		
241-AY-101	90Y	Sludge (Solids)	NA	1.94E+06	Ci		
241-AY-101	90Y	Supernatant	NA	3.02E+02	Ci		
241-AY-101	90Y	Sludge (Liquids)	NA	4.24E+01	Ci		
241-AY-101	90Y	Total		1.94E+06	Ci		
241-AY-101	93mNb	Sludge (Liquids)	NA	7.13E-01	Ci		
241-AY-101	93mNb	Sludge (Solids)	NA	1.12E+02	Ci		
241-AY-101	93mNb	Supernatant	NA	7.04E-01	Ci		
241-AY-101	93mNb	Total		1.14E+02	Ci		
241-AY-101	93Zr	Sludge (Liquids)	NA	8.89E-01	Ci		
241-AY-101	93Zr	Sludge (Solids)	NA	2.08E+02	Ci		
241-AY-101	93Zr	Supernatant	NA	8.60E-01	Ci		
241-AY-101	93Zr	Total		2.10E+02	Ci		
241-AY-101	99Tc	Sludge (Liquids)	NA	2.33E+00	Ci		
241-AY-101	99Tc	Sludge (Solids)	NA	1.21E+01	Ci		
241-AY-101	99Tc	Supernatant	NA	6.07E+00	Ci		
241-AY-101	99Tc	Total		2.05E+01	Ci		
241-AY-101	Ag	Sludge (Liquids)	NA	2.15E+00	kg	Summary	
241-AY-101	Ag	Sludge (Solids)	NA	2.01E+02	kg	Ag	2.03E+02 kg
241-AY-101	Ag	Supernatant	NA	1.31E+00	kg	Al	3.49E+04 kg
241-AY-101	Ag	Total		2.04E+02	kg	As	1.36E+01 kg
241-AY-101	Al	Sludge (Liquids)	NA	2.91E+01	kg	B	2.17E+01 kg
241-AY-101	Al	Sludge (Solids)	NA	3.49E+04	kg	Ba	2.81E+02 kg
241-AY-101	Al	Supernatant	NA	1.54E+03	kg	Be	3.33E+00 kg
241-AY-101	Al	Total		3.65E+04	kg	Bi	1.07E+01 kg
241-AY-101	As	Sludge (Liquids)	NA	3.46E-01	kg	Ca	1.27E+03 kg
241-AY-101	As	Sludge (Solids)	NA	1.33E+01	kg	Cd	8.28E+01 kg
241-AY-101	As	Supernatant	NA	1.27E+00	kg	Ce	3.34E+02 kg
241-AY-101	As	Total		1.49E+01	kg	Cl	1.53E+02 kg
241-AY-101	B	Sludge (Liquids)	NA	2.18E+00	kg	CN	0.00E+00 kg
241-AY-101	B	Sludge (Solids)	NA	1.95E+01	kg	Co	1.74E+01 kg
241-AY-101	B	Supernatant	NA	5.31E+00	kg	Cr	1.34E+03 kg
241-AY-101	B	Total		2.70E+01	kg	Cu	1.35E+02 kg
241-AY-101	Ba	Sludge (Liquids)	NA	2.59E-02	kg	F	1.08E+03 kg
241-AY-101	Ba	Sludge (Solids)	NA	2.81E+02	kg	Fe	4.12E+04 kg
241-AY-101	Ba	Supernatant	NA	9.48E-02	kg	OH	4.92E-02 kg
241-AY-101	Ba	Total		2.81E+02	kg	Hg	1.63E+01 kg
241-AY-101	Be	Sludge (Liquids)	NA	2.59E-02	kg	K	2.25E+02 kg
241-AY-101	Be	Sludge (Solids)	NA	3.30E+00	kg	La	1.05E+03 kg
241-AY-101	Be	Supernatant	NA	9.48E-02	kg	Li	2.91E+00 kg
241-AY-101	Be	Total		3.42E+00	kg	Mg	4.39E+02 kg
241-AY-101	Bi	Sludge (Liquids)	NA	1.05E-01	kg	Mn	1.83E+03 kg
241-AY-101	Bi	Sludge (Solids)	NA	1.06E+01	kg	Mo	1.12E+01 kg
241-AY-101	Bi	Supernatant	NA	4.39E+00	kg	Na	6.62E+04 kg
241-AY-101	Bi	Total		1.51E+01	kg	Nd	7.73E+02 kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.. D-13

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AY-101	Ca	Sludge (Liquids)	NA	3.81E+00	kg
241-AY-101	Ca	Sludge (Solids)	NA	1.27E+03	kg
241-AY-101	Ca	Supernatant	NA	5.25E+00	kg
241-AY-101	Ca	Total		1.27E+03	kg
241-AY-101	Cd	Sludge (Liquids)	NA	1.26E-01	kg
241-AY-101	Cd	Sludge (Solids)	NA	8.27E+01	kg
241-AY-101	Cd	Supernatant	NA	6.54E-01	kg
241-AY-101	Cd	Total		8.35E+01	kg
241-AY-101	Ce	Supernatant	NA	4.39E+00	kg
241-AY-101	Ce	Sludge (Liquids)	NA	3.76E+00	kg
241-AY-101	Ce	Sludge (Solids)	NA	3.30E+02	kg
241-AY-101	Ce	Total		3.39E+02	kg
241-AY-101	Cl	Sludge (Liquids)	NA	3.48E+01	kg
241-AY-101	Cl	Sludge (Solids)	NA	1.18E+02	kg
241-AY-101	Cl	Supernatant	NA	1.19E+02	kg
241-AY-101	Cl	Total		2.72E+02	kg
241-AY-101	Co	Sludge (Liquids)	NA	4.82E-02	kg
241-AY-101	Co	Sludge (Solids)	NA	1.74E+01	kg
241-AY-101	Co	Supernatant	NA	1.76E-01	kg
241-AY-101	Co	Total		1.76E+01	kg
241-AY-101	Cr	Sludge (Liquids)	NA	2.15E+01	kg
241-AY-101	Cr	Sludge (Solids)	NA	1.32E+03	kg
241-AY-101	Cr	Supernatant	NA	5.42E+01	kg
241-AY-101	Cr	Total		1.39E+03	kg
241-AY-101	Cu	Sludge (Liquids)	NA	1.03E+00	kg
241-AY-101	Cu	Sludge (Solids)	NA	1.34E+02	kg
241-AY-101	Cu	Supernatant	NA	5.25E-01	kg
241-AY-101	Cu	Total		1.35E+02	kg
241-AY-101	F	Sludge (Liquids)	NA	1.84E+01	kg
241-AY-101	F	Sludge (Solids)	NA	1.06E+03	kg
241-AY-101	F	Supernatant	NA	1.38E+02	kg
241-AY-101	F	Total		1.22E+03	kg
241-AY-101	Fe	Sludge (Liquids)	NA	2.29E+01	kg
241-AY-101	Fe	Sludge (Solids)	NA	4.12E+04	kg
241-AY-101	Fe	Supernatant	NA	2.20E+00	kg
241-AY-101	Fe	Total		4.12E+04	kg
241-AY-101	Free OH	Sludge (Liquids)	NA	4.92E-02	kg
241-AY-101	Free OH	Supernatant	NA	1.12E+04	kg
241-AY-101	Free OH	Total		1.12E+04	kg
241-AY-101	Hg	Sludge (Liquids)	NA	8.46E-01	kg
241-AY-101	Hg	Sludge (Solids)	NA	1.55E+01	kg
241-AY-101	Hg	Supernatant	NA	0.00E+00	kg
241-AY-101	Hg	Total		1.64E+01	kg
241-AY-101	K	Sludge (Solids)	NA	1.93E+02	kg
241-AY-101	K	Supernatant	NA	1.16E+02	kg
241-AY-101	K	Sludge (Liquids)	NA	3.17E+01	kg
241-AY-101	K	Total		3.40E+02	kg
241-AY-101	La	Sludge (Liquids)	NA	1.52E-02	kg
241-AY-101	La	Sludge (Solids)	NA	1.05E+03	kg
241-AY-101	La	Supernatant	NA	5.57E-02	kg
241-AY-101	La	Total		1.05E+03	kg
241-AY-101	Li	Sludge (Liquids)	NA	2.20E-01	kg
241-AY-101	Li	Sludge (Solids)	NA	2.69E+00	kg
241-AY-101	Li	Supernatant	NA	4.87E-01	kg
241-AY-101	Li	Total		3.40E+00	kg
241-AY-101	Mg	Sludge (Liquids)	NA	1.22E+00	kg
241-AY-101	Mg	Sludge (Solids)	NA	4.38E+02	kg
241-AY-101	Mg	Supernatant	NA	4.39E+00	kg
241-AY-101	Mg	Total		4.44E+02	kg
241-AY-101	Mn	Sludge (Liquids)	NA	1.20E+00	kg
241-AY-101	Mn	Sludge (Solids)	NA	1.83E+03	kg
241-AY-101	Mn	Supernatant	NA	4.39E-01	kg
241-AY-101	Mn	Total		1.83E+03	kg
241-AY-101	Mo	Sludge (Liquids)	NA	1.32E+00	kg
241-AY-101	Mo	Sludge (Solids)	NA	9.90E+00	kg
241-AY-101	Mo	Supernatant	NA	2.46E+00	kg
241-AY-101	Mo	Total		1.37E+01	kg
241-AY-101	Na	Sludge (Liquids)	NA	4.29E+03	kg
241-AY-101	Na	Sludge (Solids)	NA	6.19E+04	kg

Summary		
NH3	0.00E+00	kg
Ni	1.69E+03	kg
NO2	1.60E+04	kg
NO3	2.08E+03	kg
Oxalate	2.68E+04	kg
Pb	9.33E+02	kg
Pd	0.00E+00	kg
PO4	2.53E+03	kg
Pr	0.00E+00	kg
Rb	7.85E-01	kg
Rh	1.06E+01	kg
Ru	0.00E+00	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Sb	2.01E+00	kg
Se	2.80E+00	kg
Si	4.50E+02	kg
SO4	3.48E+03	kg
Sr	6.61E+01	kg
Th	5.22E+02	kg
Ti	3.97E+01	kg
TIC as CO3	1.10E+05	kg
Tl	8.02E-01	kg
TOC	7.42E+03	kg
UTOTAL	5.29E+02	kg
V	1.19E+01	kg
W	0.00E+00	kg
Y	9.06E+01	kg
Zn	5.39E+01	kg
Zr	5.88E+02	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-14

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AY-101	Na	Supernatant	NA	3.77E+04	kg	
241-AY-101	Na	Total		1.04E+05	kg	
241-AY-101	Nd	Sludge (Liquids)	NA	1.22E+00	kg	
241-AY-101	Nd	Sludge (Solids)	NA	7.72E+02	kg	
241-AY-101	Nd	Supernatant	NA	4.39E+00	kg	
241-AY-101	Nd	Total		7.77E+02	kg	
241-AY-101	Ni	Sludge (Liquids)	NA	4.44E+00	kg	
241-AY-101	Ni	Sludge (Solids)	NA	1.69E+03	kg	
241-AY-101	Ni	Supernatant	NA	2.76E+00	kg	
241-AY-101	Ni	Total		1.70E+03	kg	
241-AY-101	NO2	Sludge (Liquids)	NA	3.59E+03	kg	
241-AY-101	NO2	Sludge (Solids)	NA	1.24E+04	kg	
241-AY-101	NO2	Supernatant	NA	1.09E+04	kg	
241-AY-101	NO2	Total		2.69E+04	kg	
241-AY-101	NO3	Sludge (Liquids)	NA	3.71E+02	kg	
241-AY-101	NO3	Sludge (Solids)	NA	1.71E+03	kg	
241-AY-101	NO3	Supernatant	NA	1.51E+03	kg	
241-AY-101	NO3	Total		3.59E+03	kg	
241-AY-101	Oxalate	Sludge (Liquids)	NA	1.57E+02	kg	
241-AY-101	Oxalate	Sludge (Solids)	NA	2.66E+04	kg	
241-AY-101	Oxalate	Supernatant	NA	4.46E+02	kg	
241-AY-101	Oxalate	Total		2.72E+04	kg	
241-AY-101	Pb	Sludge (Liquids)	NA	1.22E+00	kg	
241-AY-101	Pb	Sludge (Solids)	NA	9.32E+02	kg	
241-AY-101	Pb	Supernatant	NA	4.39E+00	kg	
241-AY-101	Pb	Total		9.37E+02	kg	
241-AY-101	PO4	Sludge (Liquids)	NA	4.70E+01	kg	
241-AY-101	PO4	Sludge (Solids)	NA	2.48E+03	kg	
241-AY-101	PO4	Supernatant	NA	7.91E+02	kg	
241-AY-101	PO4	Total		3.32E+03	kg	
241-AY-101	Rb	Sludge (Liquids)	NA	5.14E-02	kg	
241-AY-101	Rb	Sludge (Solids)	NA	7.34E-01	kg	
241-AY-101	Rb	Supernatant	NA	1.88E-01	kg	
241-AY-101	Rb	Total		9.74E-01	kg	
241-AY-101	Rh	Sludge (Liquids)	NA	8.42E-02	kg	
241-AY-101	Rh	Sludge (Solids)	NA	1.05E+01	kg	
241-AY-101	Rh	Supernatant	NA	3.08E-01	kg	
241-AY-101	Rh	Total		1.09E+01	kg	
241-AY-101	Sb	Sludge (Liquids)	NA	8.64E-03	kg	
241-AY-101	Sb	Sludge (Solids)	NA	2.00E+00	kg	
241-AY-101	Sb	Supernatant	NA	2.16E-04	kg	
241-AY-101	Sb	Total		2.01E+00	kg	
241-AY-101	Se	Sludge (Liquids)	NA	2.58E-04	kg	
241-AY-101	Se	Sludge (Solids)	NA	2.80E+00	kg	
241-AY-101	Se	Supernatant	NA	3.18E+01	kg	
241-AY-101	Se	Total		3.46E+01	kg	
241-AY-101	Si	Sludge (Liquids)	NA	2.31E+00	kg	
241-AY-101	Si	Sludge (Solids)	NA	4.48E+02	kg	
241-AY-101	Si	Supernatant	NA	2.04E+01	kg	
241-AY-101	Si	Total		4.70E+02	kg	
241-AY-101	SO4	Sludge (Liquids)	NA	7.87E+02	kg	
241-AY-101	SO4	Sludge (Solids)	NA	2.69E+03	kg	
241-AY-101	SO4	Supernatant	NA	1.92E+03	kg	
241-AY-101	SO4	Total		5.40E+03	kg	
241-AY-101	Sr	Sludge (Liquids)	NA	6.35E-03	kg	
241-AY-101	Sr	Sludge (Solids)	NA	6.61E+01	kg	
241-AY-101	Sr	Supernatant	NA	4.39E-01	kg	
241-AY-101	Sr	Total		6.65E+01	kg	
241-AY-101	Th	Sludge (Liquids)	NA	5.61E+00	kg	
241-AY-101	Th	Sludge (Solids)	NA	5.16E+02	kg	
241-AY-101	Th	Supernatant	NA	1.31E+01	kg	
241-AY-101	Th	Total		5.35E+02	kg	
241-AY-101	Ti	Sludge (Liquids)	NA	1.22E-01	kg	
241-AY-101	Ti	Sludge (Solids)	NA	3.96E+01	kg	
241-AY-101	Ti	Supernatant	NA	4.39E-01	kg	
241-AY-101	Ti	Total		4.01E+01	kg	
241-AY-101	TIC as CO	Sludge (Liquids)	NA	5.89E+03	kg	
241-AY-101	TIC as CO	Sludge (Solids)	NA	1.04E+05	kg	
241-AY-101	TIC as CO	Supernatant	NA	1.68E+04	kg	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-15

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AY-101	TIC as CO	Total		1.27E+05	kg		
241-AY-101	Tl	Sludge (Solids)	NA	7.80E-01	kg		
241-AY-101	Tl	Supernatant	NA	7.92E-02	kg		
241-AY-101	Tl	Sludge (Liquids)	NA	2.16E-02	kg		
241-AY-101	Tl	Total		8.81E-01	kg		
241-AY-101	TOC	Sludge (Liquids)	NA	1.62E+02	kg		
241-AY-101	TOC	Sludge (Solids)	NA	7.26E+03	kg		
241-AY-101	TOC	Supernatant	NA	4.39E+02	kg		
241-AY-101	TOC	Total		7.86E+03	kg		
241-AY-101	UTOTAL	Sludge (Liquids)	NA	5.01E+01	kg		
241-AY-101	UTOTAL	Sludge (Solids)	NA	4.79E+02	kg		
241-AY-101	UTOTAL	Supernatant	NA	3.27E+01	kg		
241-AY-101	UTOTAL	Total		5.62E+02	kg		
241-AY-101	V	Sludge (Liquids)	NA	1.30E-01	kg		
241-AY-101	V	Sludge (Solids)	NA	1.18E+01	kg		
241-AY-101	V	Supernatant	NA	4.75E-01	kg		
241-AY-101	V	Total		1.24E+01	kg		
241-AY-101	Y	Sludge (Liquids)	NA	2.20E-01	kg		
241-AY-101	Y	Sludge (Solids)	NA	9.04E+01	kg		
241-AY-101	Y	Supernatant	NA	1.31E+00	kg		
241-AY-101	Y	Total		9.19E+01	kg		
241-AY-101	Zn	Sludge (Liquids)	NA	1.70E-01	kg		
241-AY-101	Zn	Sludge (Solids)	NA	5.37E+01	kg		
241-AY-101	Zn	Supernatant	NA	4.39E-01	kg		
241-AY-101	Zn	Total		5.43E+01	kg		
241-AY-101	Zr	Sludge (Liquids)	NA	2.67E+01	kg		
241-AY-101	Zr	Sludge (Solids)	NA	5.61E+02	kg		
241-AY-101	Zr	Supernatant	NA	1.31E+00	kg		
241-AY-101	Zr	Total		5.89E+02	kg		
241-AY-102	106Ru	Sludge (Liquids)	BL (Liquid)	4.58E-07	Ci	Summary	
241-AY-102	106Ru	Sludge (Solids)	BL (Solid)	2.02E-04	Ci	106Ru	5.02E-04 Ci
241-AY-102	106Ru	Sludge (Solids)	NA	3.00E-04	Ci	113mCd	2.97E+00 Ci
241-AY-102	106Ru	Supernatant	NA	1.16E-05	Ci	125Sb	2.70E+01 Ci
241-AY-102	106Ru	Total		5.14E-04	Ci	126Sn	1.34E+01 Ci
241-AY-102	113mCd	Sludge (Liquids)	BL (Liquid)	1.68E-01	Ci	129I	5.84E-02 Ci
241-AY-102	113mCd	Sludge (Solids)	BL (Solid)	1.09E-01	Ci	134Cs	1.67E-02 Ci
241-AY-102	113mCd	Sludge (Solids)	NA	2.69E+00	Ci	137Cs	2.50E+05 Ci
241-AY-102	113mCd	Supernatant	NA	2.34E+01	Ci	137mBa	2.36E+05 Ci
241-AY-102	113mCd	Total		2.63E+01	Ci	14C	2.15E-01 Ci
241-AY-102	125Sb	Sludge (Liquids)	BL (Liquid)	7.45E-03	Ci	151Sm	7.37E+04 Ci
241-AY-102	125Sb	Sludge (Solids)	BL (Solid)	4.50E+00	Ci	152Eu	6.34E+01 Ci
241-AY-102	125Sb	Sludge (Solids)	NA	2.25E+01	Ci	154Eu	6.49E+03 Ci
241-AY-102	125Sb	Supernatant	NA	4.36E+00	Ci	155Eu	2.60E+03 Ci
241-AY-102	125Sb	Total		3.14E+01	Ci	226Ra	2.76E-06 Ci
241-AY-102	126Sn	Sludge (Liquids)	BL (Liquid)	6.56E-02	Ci	227Ac	1.78E-05 Ci
241-AY-102	126Sn	Sludge (Solids)	BL (Solid)	2.21E+00	Ci	228Ra	2.25E-02 Ci
241-AY-102	126Sn	Supernatant	NA	1.55E+00	Ci	229Th	7.30E-07 Ci
241-AY-102	126Sn	Sludge (Solids)	NA	1.11E+01	Ci	231Pa	2.98E-05 Ci
241-AY-102	126Sn	Total		1.49E+01	Ci	232Th	6.99E-02 Ci
241-AY-102	129I	Sludge (Liquids)	BL (Liquid)	4.29E-05	Ci	232U	8.23E-04 Ci
241-AY-102	129I	Sludge (Solids)	BL (Solid)	2.80E-05	Ci	233U	4.95E-02 Ci
241-AY-102	129I	Sludge (Solids)	NA	5.83E-02	Ci	234U	5.90E-01 Ci
241-AY-102	129I	Supernatant	NA	4.75E-02	Ci	235U	2.52E-02 Ci
241-AY-102	129I	Total		1.06E-01	Ci	236U	1.50E-02 Ci
241-AY-102	134Cs	Sludge (Liquids)	BL (Liquid)	0.00E+00	Ci	237Np	3.73E+00 Ci
241-AY-102	134Cs	Sludge (Solids)	BL (Solid)	0.00E+00	Ci	238Pu	6.10E+01 Ci
241-AY-102	134Cs	Sludge (Solids)	NA	1.67E-02	Ci	238U	5.78E-01 Ci
241-AY-102	134Cs	Supernatant	NA	8.03E+00	Ci	239Pu	1.59E+03 Ci
241-AY-102	134Cs	Total		8.04E+00	Ci	240Pu	3.67E+02 Ci
241-AY-102	137Cs	Sludge (Liquids)	BL (Liquid)	3.70E+03	Ci	241Am	4 98E+03 Ci
241-AY-102	137Cs	Sludge (Solids)	BL (Solid)	4.09E+04	Ci	241Pu	2.60E+03 Ci
241-AY-102	137Cs	Supernatant	NA	5.73E+04	Ci	242Cm	5.60E+00 Ci
241-AY-102	137Cs	Sludge (Solids)	NA	2.05E+05	Ci	242Pu	2.46E-02 Ci
241-AY-102	137Cs	Total		3.07E+05	Ci	243Am	2.72E+00 Ci
241-AY-102	137mBa	Sludge (Liquids)	BL (Liquid)	3.49E+03	Ci	243Cm	2.12E+00 Ci
241-AY-102	137mBa	Sludge (Solids)	BL (Solid)	3.86E+04	Ci	244Cm	5.01E+01 Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.. 24590-WTP-M4C-FRP-00001
SHEET REV. 0D
SHEET NO.: D-16

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AY-102	137mBa	Sludge (Solids)	NA	1.94E+05	Ci
241-AY-102	137mBa	Supernatant	NA	5.41E+04	Ci
241-AY-102	137mBa	Total		2.90E+05	Ci
241-AY-102	14C	Sludge (Liquids)	BL (Liquid)	3.15E-02	Ci
241-AY-102	14C	Sludge (Solids)	BL (Solid)	3.05E-02	Ci
241-AY-102	14C	Sludge (Solids)	NA	1.53E-01	Ci
241-AY-102	14C	Supernatant	NA	4.87E-01	Ci
241-AY-102	14C	Total		7.02E-01	Ci
241-AY-102	151Sm	Sludge (Liquids)	BL (Liquid)	3.08E+02	Ci
241-AY-102	151Sm	Sludge (Solids)	BL (Solid)	1.22E+04	Ci
241-AY-102	151Sm	Sludge (Solids)	NA	6.12E+04	Ci
241-AY-102	151Sm	Supernatant	NA	8.28E+03	Ci
241-AY-102	151Sm	Total		8.20E+04	Ci
241-AY-102	152Eu	Sludge (Liquids)	BL (Liquid)	8.47E-02	Ci
241-AY-102	152Eu	Sludge (Solids)	BL (Solid)	1.05E+01	Ci
241-AY-102	152Eu	Sludge (Solids)	NA	5.28E+01	Ci
241-AY-102	152Eu	Supernatant	NA	1.36E+00	Ci
241-AY-102	152Eu	Total		6.48E+01	Ci
241-AY-102	154Eu	Sludge (Liquids)	BL (Liquid)	2.71E-02	Ci
241-AY-102	154Eu	Sludge (Solids)	BL (Solid)	1.08E+03	Ci
241-AY-102	154Eu	Sludge (Solids)	NA	5.41E+03	Ci
241-AY-102	154Eu	Supernatant	NA	2.50E+01	Ci
241-AY-102	154Eu	Total		6.51E+03	Ci
241-AY-102	155Eu	Sludge (Liquids)	BL (Liquid)	1.72E-02	Ci
241-AY-102	155Eu	Sludge (Solids)	BL (Solid)	4.32E+02	Ci
241-AY-102	155Eu	Sludge (Solids)	NA	2.17E+03	Ci
241-AY-102	155Eu	Supernatant	NA	7.26E+00	Ci
241-AY-102	155Eu	Total		2.61E+03	Ci
241-AY-102	226Ra	Sludge (Liquids)	BL (Liquid)	1.28E-07	Ci
241-AY-102	226Ra	Sludge (Solids)	BL (Solid)	8.35E-08	Ci
241-AY-102	226Ra	Sludge (Solids)	NA	2.55E-06	Ci
241-AY-102	226Ra	Supernatant	NA	2.23E-01	Ci
241-AY-102	226Ra	Total		2.23E-01	Ci
241-AY-102	227Ac	Sludge (Liquids)	BL (Liquid)	6.52E-07	Ci
241-AY-102	227Ac	Sludge (Solids)	BL (Solid)	4.26E-07	Ci
241-AY-102	227Ac	Sludge (Solids)	NA	1.67E-05	Ci
241-AY-102	227Ac	Supernatant	NA	1.17E-03	Ci
241-AY-102	227Ac	Total		1.18E-03	Ci
241-AY-102	228Ra	Sludge (Liquids)	BL (Liquid)	1.82E-07	Ci
241-AY-102	228Ra	Sludge (Solids)	BL (Solid)	3.63E-03	Ci
241-AY-102	228Ra	Sludge (Solids)	NA	1.89E-02	Ci
241-AY-102	228Ra	Supernatant	NA	1.37E-09	Ci
241-AY-102	228Ra	Total		2.25E-02	Ci
241-AY-102	229Th	Sludge (Liquids)	BL (Liquid)	6.64E-10	Ci
241-AY-102	229Th	Sludge (Solids)	BL (Solid)	4.33E-10	Ci
241-AY-102	229Th	Sludge (Solids)	NA	7.29E-07	Ci
241-AY-102	229Th	Supernatant	NA	1.76E-07	Ci
241-AY-102	229Th	Total		9.07E-07	Ci
241-AY-102	231Pa	Sludge (Liquids)	BL (Liquid)	9.96E-07	Ci
241-AY-102	231Pa	Sludge (Solids)	BL (Solid)	6.52E-07	Ci
241-AY-102	231Pa	Sludge (Solids)	NA	2.82E-05	Ci
241-AY-102	231Pa	Supernatant	NA	2.18E-03	Ci
241-AY-102	231Pa	Total		2.21E-03	Ci
241-AY-102	232Th	Sludge (Liquids)	BL (Liquid)	8.78E-07	Ci
241-AY-102	232Th	Sludge (Solids)	BL (Solid)	1.16E-02	Ci
241-AY-102	232Th	Sludge (Solids)	NA	5.83E-02	Ci
241-AY-102	232Th	Supernatant	NA	1.46E-09	Ci
241-AY-102	232Th	Total		6.99E-02	Ci
241-AY-102	232U	Sludge (Liquids)	BL (Liquid)	1.01E-05	Ci
241-AY-102	232U	Sludge (Solids)	BL (Solid)	1.09E-05	Ci
241-AY-102	232U	Sludge (Solids)	NA	8.02E-04	Ci
241-AY-102	232U	Supernatant	NA	2.01E-03	Ci
241-AY-102	232U	Total		2.83E-03	Ci
241-AY-102	233U	Sludge (Liquids)	BL (Liquid)	2.13E-05	Ci
241-AY-102	233U	Sludge (Solids)	BL (Solid)	2.30E-05	Ci
241-AY-102	233U	Sludge (Solids)	NA	4.95E-02	Ci
241-AY-102	233U	Supernatant	NA	8.45E-03	Ci
241-AY-102	233U	Total		5.80E-02	Ci
241-AY-102	234U	Sludge (Liquids)	BL (Liquid)	8.21E-02	Ci

Summary		
3H	3.47E+00	Ci
59Ni	2.43E+01	Ci
60Co	7.22E+01	Ci
63Ni	2.20E+03	Ci
79Se	5.41E-02	Ci
90Sr	4.63E+06	Ci
90Y	4.63E+06	Ci
93mNb	2.43E+00	Ci
93Zr	2.93E+00	Ci
99Tc	2.45E+01	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-17

BY: E. Bernos
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AY-102	234U	Sludge (Solids)	BL (Solid)	8.88E-02	Ci	
241-AY-102	234U	Supernatant	NA	9.16E-02	Ci	
241-AY-102	234U	Sludge (Solids)	NA	4.19E-01	Ci	
241-AY-102	234U	Total		6.81E-01	Ci	
241-AY-102	235U	Sludge (Liquids)	BL (Liquid)	3.49E-03	Ci	
241-AY-102	235U	Sludge (Solids)	BL (Solid)	3.77E-03	Ci	
241-AY-102	235U	Sludge (Solids)	NA	1.79E-02	Ci	
241-AY-102	235U	Supernatant	NA	3.57E-03	Ci	
241-AY-102	235U	Total		2.87E-02	Ci	
241-AY-102	236U	Sludge (Liquids)	BL (Liquid)	2.48E-03	Ci	
241-AY-102	236U	Sludge (Solids)	BL (Solid)	2.68E-03	Ci	
241-AY-102	236U	Sludge (Solids)	NA	9.80E-03	Ci	
241-AY-102	236U	Supernatant	NA	6.34E-03	Ci	
241-AY-102	236U	Total		2.13E-02	Ci	
241-AY-102	237Np	Sludge (Liquids)	BL (Liquid)	6.22E-02	Ci	
241-AY-102	237Np	Sludge (Solids)	BL (Solid)	6.11E-01	Ci	
241-AY-102	237Np	Sludge (Solids)	NA	3.06E+00	Ci	
241-AY-102	237Np	Supernatant	NA	9.63E-01	Ci	
241-AY-102	237Np	Total		4.70E+00	Ci	
241-AY-102	238Pu	Sludge (Liquids)	BL (Liquid)	1.54E-02	Ci	
241-AY-102	238Pu	Sludge (Solids)	BL (Solid)	1.42E+01	Ci	
241-AY-102	238Pu	Sludge (Solids)	NA	4.68E+01	Ci	
241-AY-102	238Pu	Supernatant	NA	7.24E-01	Ci	
241-AY-102	238Pu	Total		6.18E+01	Ci	
241-AY-102	238U	Sludge (Liquids)	BL (Liquid)	7.69E-02	Ci	
241-AY-102	238U	Sludge (Solids)	BL (Solid)	8.34E-02	Ci	
241-AY-102	238U	Sludge (Solids)	NA	4.18E-01	Ci	
241-AY-102	238U	Supernatant	NA	7.21E-02	Ci	
241-AY-102	238U	Total		6.51E-01	Ci	
241-AY-102	239Pu	Sludge (Liquids)	BL (Liquid)	2.82E-01	Ci	
241-AY-102	239Pu	Sludge (Solids)	BL (Solid)	2.59E+02	Ci	
241-AY-102	239Pu	Sludge (Solids)	NA	1.33E+03	Ci	
241-AY-102	239Pu	Supernatant	NA	4.51E+00	Ci	
241-AY-102	239Pu	Total		1.59E+03	Ci	
241-AY-102	240Pu	Sludge (Liquids)	BL (Liquid)	7.20E-02	Ci	
241-AY-102	240Pu	Sludge (Solids)	BL (Solid)	6.61E+01	Ci	
241-AY-102	240Pu	Sludge (Solids)	NA	3.01E+02	Ci	
241-AY-102	240Pu	Supernatant	NA	9.78E-01	Ci	
241-AY-102	240Pu	Total		3.68E+02	Ci	
241-AY-102	241Am	Sludge (Liquids)	BL (Liquid)	3.81E-02	Ci	
241-AY-102	241Am	Sludge (Solids)	BL (Solid)	8.29E+02	Ci	
241-AY-102	241Am	Sludge (Solids)	NA	4.15E+03	Ci	
241-AY-102	241Am	Supernatant	NA	6.02E-01	Ci	
241-AY-102	241Am	Total		4.97E+03	Ci	
241-AY-102	241Pu	Sludge (Liquids)	BL (Liquid)	6.98E-01	Ci	
241-AY-102	241Pu	Sludge (Solids)	BL (Solid)	6.45E+02	Ci	
241-AY-102	241Pu	Sludge (Solids)	NA	1.95E+03	Ci	
241-AY-102	241Pu	Supernatant	NA	1.11E+01	Ci	
241-AY-102	241Pu	Total		2.60E+03	Ci	
241-AY-102	242Cm	Sludge (Liquids)	BL (Liquid)	3.67E-06	Ci	
241-AY-102	242Cm	Sludge (Solids)	BL (Solid)	9.32E-01	Ci	
241-AY-102	242Cm	Sludge (Solids)	NA	4.67E+00	Ci	
241-AY-102	242Cm	Supernatant	NA	9.25E-04	Ci	
241-AY-102	242Cm	Total		5.61E+00	Ci	
241-AY-102	242Pu	Sludge (Liquids)	BL (Liquid)	6.92E-06	Ci	
241-AY-102	242Pu	Sludge (Solids)	BL (Solid)	6.39E-03	Ci	
241-AY-102	242Pu	Sludge (Solids)	NA	1.82E-02	Ci	
241-AY-102	242Pu	Supernatant	NA	1.17E-04	Ci	
241-AY-102	242Pu	Total		2.47E-02	Ci	
241-AY-102	243Am	Sludge (Liquids)	BL (Liquid)	2.46E-05	Ci	
241-AY-102	243Am	Sludge (Solids)	BL (Solid)	6.54E-01	Ci	
241-AY-102	243Am	Supernatant	NA	4.00E-05	Ci	
241-AY-102	243Am	Sludge (Solids)	NA	2.07E+00	Ci	
241-AY-102	243Am	Total		2.72E+00	Ci	
241-AY-102	243Cm	Sludge (Liquids)	BL (Liquid)	3.23E-07	Ci	
241-AY-102	243Cm	Sludge (Solids)	BL (Solid)	3.53E-01	Ci	
241-AY-102	243Cm	Sludge (Solids)	NA	1.77E+00	Ci	
241-AY-102	243Cm	Supernatant	NA	8.05E-05	Ci	
241-AY-102	243Cm	Total		2.12E+00	Ci	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-18

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AY-102	244Cm	Sludge (Liquids)	BL (Liquid)	7.54E-06	Ci		
241-AY-102	244Cm	Sludge (Solids)	BL (Solid)	8.34E+00	Ci		
241-AY-102	244Cm	Sludge (Solids)	NA	4.18E+01	Ci		
241-AY-102	244Cm	Supernatant	NA	1.22E-03	Ci		
241-AY-102	244Cm	Total		5.02E+01	Ci		
241-AY-102	3H	Sludge (Liquids)	BL (Liquid)	7.62E-01	Ci		
241-AY-102	3H	Sludge (Solids)	BL (Solid)	4.51E-01	Ci		
241-AY-102	3H	Sludge (Solids)	NA	2.26E+00	Ci		
241-AY-102	3H	Supernatant	NA	1.18E+01	Ci		
241-AY-102	3H	Total		1.53E+01	Ci		
241-AY-102	59Ni	Sludge (Liquids)	BL (Liquid)	4.51E-02	Ci		
241-AY-102	59Ni	Sludge (Solids)	BL (Solid)	4.03E+00	Ci		
241-AY-102	59Ni	Sludge (Solids)	NA	2.02E+01	Ci		
241-AY-102	59Ni	Supernatant	NA	6.17E-01	Ci		
241-AY-102	59Ni	Total		2.49E+01	Ci		
241-AY-102	60Co	Sludge (Liquids)	BL (Liquid)	4.99E-01	Ci		
241-AY-102	60Co	Sludge (Solids)	BL (Solid)	1.19E+01	Ci		
241-AY-102	60Co	Supernatant	NA	7.73E+00	Ci		
241-AY-102	60Co	Sludge (Solids)	NA	5.98E+01	Ci		
241-AY-102	60Co	Total		8.00E+01	Ci		
241-AY-102	63Ni	Sludge (Liquids)	BL (Liquid)	4.19E+00	Ci		
241-AY-102	63Ni	Sludge (Solids)	BL (Solid)	3.65E+02	Ci		
241-AY-102	63Ni	Supernatant	NA	5.66E+01	Ci		
241-AY-102	63Ni	Sludge (Solids)	NA	1.83E+03	Ci		
241-AY-102	63Ni	Total		2.26E+03	Ci		
241-AY-102	79Se	Sludge (Liquids)	BL (Liquid)	7.02E-03	Ci		
241-AY-102	79Se	Sludge (Solids)	BL (Solid)	1.48E-03	Ci		
241-AY-102	79Se	Sludge (Solids)	NA	4.56E-02	Ci		
241-AY-102	79Se	Supernatant	NA	1.09E-01	Ci		
241-AY-102	79Se	Total		1.63E-01	Ci		
241-AY-102	90Sr	Sludge (Liquids)	BL (Liquid)	2.05E+02	Ci		
241-AY-102	90Sr	Sludge (Solids)	BL (Solid)	7.71E+05	Ci		
241-AY-102	90Sr	Sludge (Solids)	NA	3.86E+06	Ci		
241-AY-102	90Sr	Supernatant	NA	3.24E+03	Ci		
241-AY-102	90Sr	Total		4.64E+06	Ci		
241-AY-102	90Y	Sludge (Liquids)	BL (Liquid)	2.05E+02	Ci		
241-AY-102	90Y	Sludge (Solids)	BL (Solid)	7.71E+05	Ci		
241-AY-102	90Y	Sludge (Solids)	NA	3.86E+06	Ci		
241-AY-102	90Y	Supernatant	NA	3.24E+03	Ci		
241-AY-102	90Y	Total		4.64E+06	Ci		
241-AY-102	93mNb	Sludge (Liquids)	BL (Liquid)	1.06E-01	Ci		
241-AY-102	93mNb	Sludge (Solids)	BL (Solid)	6.93E-02	Ci		
241-AY-102	93mNb	Sludge (Solids)	NA	2.25E+00	Ci		
241-AY-102	93mNb	Supernatant	NA	9.74E+00	Ci		
241-AY-102	93mNb	Total		1.22E+01	Ci		
241-AY-102	93Zr	Sludge (Liquids)	BL (Liquid)	1.35E-01	Ci		
241-AY-102	93Zr	Sludge (Solids)	BL (Solid)	8.82E-02	Ci		
241-AY-102	93Zr	Sludge (Solids)	NA	2.71E+00	Ci		
241-AY-102	93Zr	Supernatant	NA	1.11E+01	Ci		
241-AY-102	93Zr	Total		1.40E+01	Ci		
241-AY-102	99Tc	Sludge (Liquids)	BL (Liquid)	1.54E+00	Ci		
241-AY-102	99Tc	Sludge (Solids)	BL (Solid)	3.81E+00	Ci		
241-AY-102	99Tc	Sludge (Solids)	NA	1.91E+01	Ci		
241-AY-102	99Tc	Supernatant	NA	2.39E+01	Ci		
241-AY-102	99Tc	Total		4.84E+01	Ci		
241-AY-102	Ag	Sludge (Liquids)	BL (Liquid)	6.81E-02	kg	Summary	
241-AY-102	Ag	Sludge (Solids)	BL (Solid)	7.76E+01	kg	Ag	4.67E+02 kg
241-AY-102	Ag	Sludge (Solids)	NA	3.89E+02	kg	Al	5.16E+04 kg
241-AY-102	Ag	Supernatant	NA	6.06E-01	kg	As	1.40E+01 kg
241-AY-102	Ag	Total		4.67E+02	kg	B	1.81E+01 kg
241-AY-102	Al	Sludge (Liquids)	BL (Liquid)	2.82E+01	kg	Ba	5.00E+02 kg
241-AY-102	Al	Sludge (Solids)	BL (Solid)	8.58E+03	kg	Be	7.10E-01 kg
241-AY-102	Al	Sludge (Solids)	NA	4.30E+04	kg	Bi	1.73E+01 kg
241-AY-102	Al	Supernatant	NA	3.30E+03	kg	Ca	3.47E+03 kg
241-AY-102	Al	Total		5.49E+04	kg	Cd	9.01E+01 kg
241-AY-102	As	Sludge (Liquids)	BL (Liquid)	1.20E-01	kg	Ce	7.59E+02 kg
241-AY-102	As	Sludge (Solids)	BL (Solid)	2.32E+00	kg	Cl	5.67E+01 kg
241-AY-102	As	Sludge (Solids)	NA	1.16E+01	kg	CN	1.03E+01 kg
241-AY-102	As	Supernatant	NA	5.61E+00	kg	Co	2.69E+01 kg

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-19

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AY-102	As	Total		1.97E+01	kg
241-AY-102	B	Sludge (Liquids)	BL (Liquid)	1.56E+00	kg
241-AY-102	B	Sludge (Solids)	BL (Solid)	2.76E+00	kg
241-AY-102	B	Sludge (Solids)	NA	1.38E+01	kg
241-AY-102	B	Supernatant	NA	1.35E+01	kg
241-AY-102	B	Total		3.17E+01	kg
241-AY-102	Ba	Sludge (Liquids)	BL (Liquid)	1.72E-02	kg
241-AY-102	Ba	Sludge (Solids)	BL (Solid)	8.31E+01	kg
241-AY-102	Ba	Sludge (Solids)	NA	4.17E+02	kg
241-AY-102	Ba	Supernatant	NA	2.50E-01	kg
241-AY-102	Ba	Total		5.00E+02	kg
241-AY-102	Be	Sludge (Liquids)	BL (Liquid)	1.19E-02	kg
241-AY-102	Be	Sludge (Solids)	BL (Solid)	1.16E-01	kg
241-AY-102	Be	Sludge (Solids)	NA	5.82E-01	kg
241-AY-102	Be	Supernatant	NA	1.86E-01	kg
241-AY-102	Be	Total		8.96E-01	kg
241-AY-102	Bi	Sludge (Liquids)	BL (Liquid)	0.00E+00	kg
241-AY-102	Bi	Sludge (Solids)	BL (Solid)	2.86E+00	kg
241-AY-102	Bi	Sludge (Solids)	NA	1.44E+01	kg
241-AY-102	Bi	Supernatant	NA	5.04E-02	kg
241-AY-102	Bi	Total		1.73E+01	kg
241-AY-102	Ca	Sludge (Liquids)	BL (Liquid)	4.13E-01	kg
241-AY-102	Ca	Sludge (Solids)	BL (Solid)	5.77E+02	kg
241-AY-102	Ca	Sludge (Solids)	NA	2.89E+03	kg
241-AY-102	Ca	Supernatant	NA	9.04E+00	kg
241-AY-102	Ca	Total		3.48E+03	kg
241-AY-102	Cd	Sludge (Liquids)	BL (Liquid)	1.16E-01	kg
241-AY-102	Cd	Sludge (Solids)	BL (Solid)	1.50E+01	kg
241-AY-102	Cd	Sludge (Solids)	NA	7.50E+01	kg
241-AY-102	Cd	Supernatant	NA	6.10E-01	kg
241-AY-102	Cd	Total		9.06E+01	kg
241-AY-102	Ce	Sludge (Liquids)	BL (Liquid)	1.05E-02	kg
241-AY-102	Ce	Sludge (Solids)	BL (Solid)	1.26E+02	kg
241-AY-102	Ce	Sludge (Solids)	NA	6.33E+02	kg
241-AY-102	Ce	Supernatant	NA	1.90E-01	kg
241-AY-102	Ce	Total		7.59E+02	kg
241-AY-102	Cl	Sludge (Liquids)	BL (Liquid)	1.55E+01	kg
241-AY-102	Cl	Sludge (Solids)	BL (Solid)	6.85E+00	kg
241-AY-102	Cl	Sludge (Solids)	NA	3.43E+01	kg
241-AY-102	Cl	Supernatant	NA	2.89E+02	kg
241-AY-102	Cl	Total		3.46E+02	kg
241-AY-102	CN	Sludge (Liquids)	BL (Liquid)	2.46E+00	kg
241-AY-102	CN	Sludge (Solids)	BL (Solid)	1.30E+00	kg
241-AY-102	CN	Sludge (Solids)	NA	6.53E+00	kg
241-AY-102	CN	Supernatant	NA	3.81E+01	kg
241-AY-102	CN	Total		4.84E+01	kg
241-AY-102	Co	Sludge (Liquids)	BL (Liquid)	8.61E-02	kg
241-AY-102	Co	Sludge (Solids)	BL (Solid)	4.46E+00	kg
241-AY-102	Co	Sludge (Solids)	NA	2.24E+01	kg
241-AY-102	Co	Supernatant	NA	2.37E+00	kg
241-AY-102	Co	Total		2.93E+01	kg
241-AY-102	Cr	Sludge (Liquids)	BL (Liquid)	2.02E-01	kg
241-AY-102	Cr	Sludge (Solids)	BL (Solid)	2.56E+02	kg
241-AY-102	Cr	Sludge (Solids)	NA	1.29E+03	kg
241-AY-102	Cr	Supernatant	NA	1.50E+01	kg
241-AY-102	Cr	Total		1.56E+03	kg
241-AY-102	Cu	Sludge (Liquids)	BL (Liquid)	2.26E-01	kg
241-AY-102	Cu	Sludge (Solids)	BL (Solid)	3.65E+01	kg
241-AY-102	Cu	Sludge (Solids)	NA	1.83E+02	kg
241-AY-102	Cu	Supernatant	NA	1.94E+00	kg
241-AY-102	Cu	Total		2.22E+02	kg
241-AY-102	F	Sludge (Liquids)	BL (Liquid)	8.67E+00	kg
241-AY-102	F	Sludge (Solids)	BL (Solid)	6.15E+00	kg
241-AY-102	F	Supernatant	NA	1.30E+02	kg
241-AY-102	F	Sludge (Solids)	NA	3.08E+01	kg
241-AY-102	F	Total		1.76E+02	kg
241-AY-102	Fe	Sludge (Liquids)	BL (Liquid)	1.21E+00	kg
241-AY-102	Fe	Sludge (Solids)	BL (Solid)	1.49E+04	kg
241-AY-102	Fe	Sludge (Solids)	NA	7.49E+04	kg

Summary		
Cr	1.55E+03	kg
Cu	2.20E+02	kg
F	4.56E+01	kg
Fe	8.98E+04	kg
OH	4.43E+01	kg
Hg	1.56E+02	kg
K	5.24E+02	kg
La	6.15E+02	kg
Li	3.64E+01	kg
Mg	7.98E+02	kg
Mn	1.27E+04	kg
Mo	9.71E+00	kg
Na	7.17E+04	kg
Nd	9.88E+02	kg
NH3	0.00E+00	kg
Ni	2.34E+03	kg
NO2	3.14E+03	kg
NO3	2.08E+02	kg
Oxalate	1.38E+03	kg
Pb	4.24E+03	kg
Pd	8.69E+00	kg
PO4	8.64E+03	kg
Pr	2.80E+02	kg
Rb	2.11E+00	kg
Rh	2.02E+01	kg
Ru	4.12E+02	kg
Sb	2.51E+00	kg
Se	5.87E-01	kg
Si	8.56E+03	kg
SO4	1.78E+03	kg
Sr	1.62E+02	kg
Ta	1.96E+00	kg
Te	8.84E+01	kg
Th	6.37E+02	kg
Ti	1.33E+02	kg
TIC as CO3	6.82E+04	kg
Tl	2.81E+00	kg
TOC	4.11E+03	kg
UTOTAL	1.73E+03	kg
V	8.80E+00	kg
W	0.00E+00	kg
Y	1.05E+02	kg
Zn	1.49E+02	kg
Zr	1.97E+02	kg

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-20

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AY-102	Fe	Supernatant	NA	3.51E+00	kg	
241-AY-102	Fe	Total		8.98E+04	kg	
241-AY-102	Free OH	Sludge (Liquids)	BL (Liquid)	4.43E+01	kg	
241-AY-102	Free OH	Supernatant	NA	2.22E+04	kg	
241-AY-102	Free OH	Total		2.22E+04	kg	
241-AY-102	Hg	Sludge (Liquids)	BL (Liquid)	4.21E-02	kg	
241-AY-102	Hg	Sludge (Solids)	BL (Solid)	2.60E+01	kg	
241-AY-102	Hg	Sludge (Solids)	NA	1.30E+02	kg	
241-AY-102	Hg	Supernatant	NA	6.83E-01	kg	
241-AY-102	Hg	Total		1.57E+02	kg	
241-AY-102	K	Sludge (Liquids)	BL (Liquid)	5.28E+01	kg	
241-AY-102	K	Sludge (Solids)	BL (Solid)	7.84E+01	kg	
241-AY-102	K	Sludge (Solids)	NA	3.93E+02	kg	
241-AY-102	K	Supernatant	NA	7.60E+02	kg	
241-AY-102	K	Total		1.28E+03	kg	
241-AY-102	La	Sludge (Liquids)	BL (Liquid)	4.28E-02	kg	
241-AY-102	La	Sludge (Solids)	BL (Solid)	1.02E+02	kg	
241-AY-102	La	Supernatant	NA	4.45E-03	kg	
241-AY-102	La	Sludge (Solids)	NA	5.13E+02	kg	
241-AY-102	La	Total		6.15E+02	kg	
241-AY-102	Li	Sludge (Liquids)	BL (Liquid)	2.23E+00	kg	
241-AY-102	Li	Sludge (Solids)	BL (Solid)	5.68E+00	kg	
241-AY-102	Li	Sludge (Solids)	NA	2.85E+01	kg	
241-AY-102	Li	Supernatant	NA	2.09E-01	kg	
241-AY-102	Li	Total		3.66E+01	kg	
241-AY-102	Mg	Sludge (Liquids)	BL (Liquid)	1.20E-01	kg	
241-AY-102	Mg	Sludge (Solids)	BL (Solid)	1.33E+02	kg	
241-AY-102	Mg	Sludge (Solids)	NA	6.65E+02	kg	
241-AY-102	Mg	Supernatant	NA	1.11E+01	kg	
241-AY-102	Mg	Total		8.09E+02	kg	
241-AY-102	Mn	Sludge (Liquids)	BL (Liquid)	2.94E-01	kg	
241-AY-102	Mn	Sludge (Solids)	BL (Solid)	2.11E+03	kg	
241-AY-102	Mn	Sludge (Solids)	NA	1.06E+04	kg	
241-AY-102	Mn	Supernatant	NA	5.36E-01	kg	
241-AY-102	Mn	Total		1.27E+04	kg	
241-AY-102	Mo	Sludge (Liquids)	BL (Liquid)	5.87E-01	kg	
241-AY-102	Mo	Sludge (Solids)	BL (Solid)	1.52E+00	kg	
241-AY-102	Mo	Sludge (Solids)	NA	7.60E+00	kg	
241-AY-102	Mo	Supernatant	NA	9.59E+00	kg	
241-AY-102	Mo	Total		1.93E+01	kg	
241-AY-102	Na	Sludge (Liquids)	BL (Liquid)	8.26E+03	kg	
241-AY-102	Na	Sludge (Solids)	BL (Solid)	1.05E+04	kg	
241-AY-102	Na	Sludge (Solids)	NA	5.29E+04	kg	
241-AY-102	Na	Supernatant	NA	1.63E+05	kg	
241-AY-102	Na	Total		2.35E+05	kg	
241-AY-102	Nd	Sludge (Liquids)	BL (Liquid)	1.60E-01	kg	
241-AY-102	Nd	Sludge (Solids)	BL (Solid)	1.64E+02	kg	
241-AY-102	Nd	Sludge (Solids)	NA	8.24E+02	kg	
241-AY-102	Nd	Supernatant	NA	2.50E+00	kg	
241-AY-102	Nd	Total		9.91E+02	kg	
241-AY-102	Ni	Sludge (Liquids)	BL (Liquid)	1.35E-01	kg	
241-AY-102	Ni	Sludge (Solids)	BL (Solid)	3.89E+02	kg	
241-AY-102	Ni	Sludge (Solids)	NA	1.95E+03	kg	
241-AY-102	Ni	Supernatant	NA	2.56E+00	kg	
241-AY-102	Ni	Total		2.34E+03	kg	
241-AY-102	NO2	Sludge (Liquids)	BL (Liquid)	8.85E+02	kg	
241-AY-102	NO2	Sludge (Solids)	BL (Solid)	3.75E+02	kg	
241-AY-102	NO2	Sludge (Solids)	NA	1.88E+03	kg	
241-AY-102	NO2	Supernatant	NA	8.58E+04	kg	
241-AY-102	NO2	Total		8.89E+04	kg	
241-AY-102	NO3	Sludge (Liquids)	BL (Liquid)	4.36E+01	kg	
241-AY-102	NO3	Sludge (Solids)	BL (Solid)	2.73E+01	kg	
241-AY-102	NO3	Sludge (Solids)	NA	1.37E+02	kg	
241-AY-102	NO3	Supernatant	NA	1.12E+03	kg	
241-AY-102	NO3	Total		1.33E+03	kg	
241-AY-102	Oxalate	Sludge (Liquids)	BL (Liquid)	3.45E+02	kg	
241-AY-102	Oxalate	Sludge (Solids)	BL (Solid)	1.72E+02	kg	
241-AY-102	Oxalate	Sludge (Solids)	NA	8.61E+02	kg	
241-AY-102	Oxalate	Supernatant	NA	4.67E+03	kg	

CALCULATION SHEET

BY E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-21

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AY-102	Oxalate	Total		6.05E+03	kg	
241-AY-102	Pb	Sludge (Liquids)	BL (Liquid)	0.00E+00	kg	
241-AY-102	Pb	Sludge (Solids)	BL (Solid)	7.05E+02	kg	
241-AY-102	Pb	Sludge (Solids)	NA	3.53E+03	kg	
241-AY-102	Pb	Supernatant	NA	3.11E-02	kg	
241-AY-102	Pb	Total		4.24E+03	kg	
241-AY-102	Pd	Sludge (Liquids)	BL (Liquid)	1.02E-01	kg	
241-AY-102	Pd	Sludge (Solids)	BL (Solid)	1.43E+00	kg	
241-AY-102	Pd	Sludge (Solids)	NA	7.16E+00	kg	
241-AY-102	Pd	Supernatant	NA	1.58E+00	kg	
241-AY-102	Pd	Total		1.03E+01	kg	
241-AY-102	PO4	Sludge (Liquids)	BL (Liquid)	6.84E+02	kg	
241-AY-102	PO4	Sludge (Solids)	BL (Solid)	1.32E+03	kg	
241-AY-102	PO4	Sludge (Solids)	NA	6.64E+03	kg	
241-AY-102	PO4	Supernatant	NA	6.99E+03	kg	
241-AY-102	PO4	Total		1.56E+04	kg	
241-AY-102	Pr	Sludge (Liquids)	BL (Liquid)	1.01E-02	kg	
241-AY-102	Pr	Sludge (Solids)	BL (Solid)	4.65E+01	kg	
241-AY-102	Pr	Sludge (Solids)	NA	2.33E+02	kg	
241-AY-102	Pr	Supernatant	NA	1.56E-01	kg	
241-AY-102	Pr	Total		2.80E+02	kg	
241-AY-102	Rb	Sludge (Liquids)	BL (Liquid)	9.98E-02	kg	
241-AY-102	Rb	Sludge (Solids)	BL (Solid)	3.34E-01	kg	
241-AY-102	Rb	Sludge (Solids)	NA	1.68E+00	kg	
241-AY-102	Rb	Supernatant	NA	1.85E-02	kg	
241-AY-102	Rb	Total		2.13E+00	kg	
241-AY-102	Rh	Sludge (Liquids)	BL (Liquid)	4.42E-01	kg	
241-AY-102	Rh	Sludge (Solids)	BL (Solid)	3 29E+00	kg	
241-AY-102	Rh	Sludge (Solids)	NA	1.65E+01	kg	
241-AY-102	Rh	Supernatant	NA	6.84E+00	kg	
241-AY-102	Rh	Total		2.71E+01	kg	
241-AY-102	Ru	Sludge (Liquids)	BL (Liquid)	6.28E+00	kg	
241-AY-102	Ru	Sludge (Solids)	BL (Solid)	6.75E+01	kg	
241-AY-102	Ru	Sludge (Solids)	NA	3.38E+02	kg	
241-AY-102	Ru	Supernatant	NA	9.71E+01	kg	
241-AY-102	Ru	Total		5.09E+02	kg	
241-AY-102	Sb	Sludge (Liquids)	BL (Liquid)	3.02E-01	kg	
241-AY-102	Sb	Sludge (Solids)	BL (Solid)	3.67E-01	kg	
241-AY-102	Sb	Sludge (Solids)	NA	1.84E+00	kg	
241-AY-102	Sb	Supernatant	NA	3.31E-01	kg	
241-AY-102	Sb	Total		2.84E+00	kg	
241-AY-102	Se	Sludge (Liquids)	BL (Liquid)	1.20E-01	kg	
241-AY-102	Se	Sludge (Solids)	BL (Solid)	7.77E-02	kg	
241-AY-102	Se	Sludge (Solids)	NA	3.89E-01	kg	
241-AY-102	Se	Supernatant	NA	8.26E+00	kg	
241-AY-102	Se	Total		8.84E+00	kg	
241-AY-102	Si	Sludge (Liquids)	BL (Liquid)	9.73E-01	kg	
241-AY-102	Si	Sludge (Solids)	BL (Solid)	1.42E+03	kg	
241-AY-102	Si	Sludge (Solids)	NA	7.14E+03	kg	
241-AY-102	Si	Supernatant	NA	1.89E+02	kg	
241-AY-102	Si	Total		8.76E+03	kg	
241-AY-102	SO4	Sludge (Liquids)	BL (Liquid)	1.82E+02	kg	
241-AY-102	SO4	Sludge (Solids)	BL (Solid)	2.66E+02	kg	
241-AY-102	SO4	Sludge (Solids)	NA	1.33E+03	kg	
241-AY-102	SO4	Supernatant	NA	3.96E+03	kg	
241-AY-102	SO4	Total		5.74E+03	kg	
241-AY-102	Sr	Sludge (Liquids)	BL (Liquid)	3.17E-03	kg	
241-AY-102	Sr	Sludge (Solids)	BL (Solid)	2.69E+01	kg	
241-AY-102	Sr	Sludge (Solids)	NA	1.35E+02	kg	
241-AY-102	Sr	Supernatant	NA	1.40E-01	kg	
241-AY-102	Sr	Total		1.62E+02	kg	
241-AY-102	Ta	Sludge (Liquids)	BL (Liquid)	2.01E-02	kg	
241-AY-102	Ta	Sludge (Solids)	BL (Solid)	3.24E-01	kg	
241-AY-102	Ta	Sludge (Solids)	NA	1.62E+00	kg	
241-AY-102	Ta	Supernatant	NA	3.11E-01	kg	
241-AY-102	Ta	Total		2.28E+00	kg	
241-AY-102	Te	Sludge (Liquids)	BL (Liquid)	1.71E-01	kg	
241-AY-102	Te	Sludge (Solids)	BL (Solid)	1.47E+01	kg	
241-AY-102	Te	Supernatant	NA	2.64E+00	kg	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-22

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AY-102	Te	Sludge (Solids)	NA	7.35E+01	kg	
241-AY-102	Te	Total		9.10E+01	kg	
241-AY-102	Th	Sludge (Liquids)	BL (Liquid)	8.00E-03	kg	
241-AY-102	Th	Sludge (Solids)	BL (Solid)	1.06E+02	kg	
241-AY-102	Th	Sludge (Solids)	NA	5.31E+02	kg	
241-AY-102	Th	Supernatant	NA	1.33E-05	kg	
241-AY-102	Th	Total		6.37E+02	kg	
241-AY-102	Ti	Sludge (Liquids)	BL (Liquid)	9.58E-03	kg	
241-AY-102	Ti	Sludge (Solids)	BL (Solid)	2.21E+01	kg	
241-AY-102	Ti	Sludge (Solids)	NA .	1.11E+02	kg	
241-AY-102	Ti	Supernatant	NA	1.50E-01	kg	
241-AY-102	Ti	Total		1.33E+02	kg	
241-AY-102	TIC as CO	Sludge (Liquids)	BL (Liquid)	9.30E+03	kg	
241-AY-102	TIC as CO	Sludge (Solids)	BL (Solid)	9.80E+03	kg	
241-AY-102	TIC as CO	Sludge (Solids)	NA	4.91E+04	kg	
241-AY-102	TIC as CO	Supernatant	NA	1.22E+05	kg	
241-AY-102	TIC as CO	Total		1.91E+05	kg	
241-AY-102	Tl	Sludge (Liquids)	BL (Liquid)	5.02E-02	kg	
241-AY-102	Tl	Sludge (Solids)	BL (Solid)	4.58E-01	kg	
241-AY-102	Tl	Sludge (Solids)	NA	2.30E+00	kg	
241-AY-102	Tl	Supernatant	NA	8.05E-01	kg	
241-AY-102	Tl	Total		3.61E+00	kg	
241-AY-102	TOC	Sludge (Liquids)	BL (Liquid)	1.96E+02	kg	
241-AY-102	TOC	Sludge (Solids)	BL (Solid)	6.50E+02	kg	
241-AY-102	TOC	Sludge (Solids)	NA	3.26E+03	kg	
241-AY-102	TOC	Supernatant	NA	2.34E+03	kg	
241-AY-102	TOC	Total		6.45E+03	kg	
241-AY-102	UTOTAL	Sludge (Liquids)	BL (Liquid)	2.31E+02	kg	
241-AY-102	UTOTAL	Sludge (Solids)	BL (Solid)	2.50E+02	kg	
241-AY-102	UTOTAL	Sludge (Solids)	NA	1.25E+03	kg	
241-AY-102	UTOTAL	Supernatant	NA	2.16E+02	kg	
241-AY-102	UTOTAL	Total		1.95E+03	kg	
241-AY-102	V	Sludge (Liquids)	BL (Liquid)	4.25E-02	kg	
241-AY-102	V	Sludge (Solids)	BL (Solid)	1.46E+00	kg	
241-AY-102	V	Sludge (Solids)	NA	7.30E+00	kg	
241-AY-102	V	Supernatant	NA	1.05E+00	kg	
241-AY-102	V	Total		9.84E+00	kg	
241-AY-102	Y	Sludge (Liquids)	BL (Liquid)	7.65E-03	kg	
241-AY-102	Y	Sludge (Solids)	BL (Solid)	1.74E+01	kg	
241-AY-102	Y	Sludge (Solids)	NA	8.74E+01	kg	
241-AY-102	Y	Supernatant	NA	1.20E-01	kg	
241-AY-102	Y	Total		1.05E+02	kg	
241-AY-102	Zn	Sludge (Liquids)	BL (Liquid)	1.87E-02	kg	
241-AY-102	Zn	Sludge (Solids)	BL (Solid)	2.47E+01	kg	
241-AY-102	Zn	Sludge (Solids)	NA	1.24E+02	kg	
241-AY-102	Zn	Supernatant	NA	3.54E-01	kg	
241-AY-102	Zn	Total		1.49E+02	kg	
241-AY-102	Zr	Sludge (Liquids)	BL (Liquid)	0.00E+00	kg	
241-AY-102	Zr	Sludge (Solids)	BL (Solid)	3.26E+01	kg	
241-AY-102	Zr	Sludge (Solids)	NA	1.64E+02	kg	
241-AY-102	Zr	Supernatant	NA	2.00E+00	kg	
241-AY-102	Zr	Total		1.98E+02	kg	

241-AZ-101	106Ru	Sludge	NA	1.07E-03	Ci	Summary	
241-AZ-101	106Ru	Supernatant	P3AZ1 (Liquid)	2.87E+01	Ci	106Ru	5.12E+01 Ci
241-AZ-101	106Ru	Sludge	P3AZ1 (Solid)	5.12E+01	Ci	113mCd	3.88E+02 Ci
241-AZ-101	106Ru	Total		7.99E+01	Ci	125Sb	2.94E+03 Ci
241-AZ-101	113mCd	Sludge	NA	6.40E-01	Ci	126Sn	5.39E-01 Ci
241-AZ-101	113mCd	Supernatant	P3AZ1 (Liquid)	1.33E+02	Ci	129I	3.61E-01 Ci
241-AZ-101	113mCd	Sludge	P3AZ1 (Solid)	3.87E+02	Ci	134Cs	4.88E+01 Ci
241-AZ-101	113mCd	Total		5.21E+02	Ci	137Cs	2.43E+05 Ci
241-AZ-101	125Sb	Sludge	NA	4.47E+02	Ci	137mBa	2.29E+05 Ci
241-AZ-101	125Sb	Supernatant	P3AZ1 (Liquid)	1.88E+03	Ci	14C	3.46E-01 Ci
241-AZ-101	125Sb	Sludge	P3AZ1 (Solid)	2.49E+03	Ci	151Sm	1.18E+05 Ci
241-AZ-101	125Sb	Total		4.82E+03	Ci	152Eu	1.42E+02 Ci
241-AZ-101	126Sn	Sludge	NA	5.20E-02	Ci	154Eu	1.06E+04 Ci
241-AZ-101	126Sn	Supernatant	P3AZ1 (Liquid)	7.85E+00	Ci	155Eu	1.13E+04 Ci

CALCULATION SHEET

BY: E Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-23

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AZ-101	126Sn	Sludge	P3AZ1 (Solid)	4.87E-01	Ci
241-AZ-101	126Sn	Total		8.39E+00	Ci
241-AZ-101	129I	Sludge	NA	5.49E-02	Ci
241-AZ-101	129I	Supernatant	P3AZ1 (Liquid)	3.24E-02	Ci
241-AZ-101	129I	Sludge	P3AZ1 (Solid)	3.06E-01	Ci
241-AZ-101	129I	Total		3.93E-01	Ci
241-AZ-101	134Cs	Sludge	NA	8.40E-02	Ci
241-AZ-101	134Cs	Supernatant	P3AZ1 (Liquid)	1.44E+03	Ci
241-AZ-101	134Cs	Sludge	P3AZ1 (Solid)	4.87E+01	Ci
241-AZ-101	134Cs	Total		1.49E+03	Ci
241-AZ-101	137Cs	Sludge	NA	3.70E+04	Ci
241-AZ-101	137Cs	Supernatant	P3AZ1 (Liquid)	5.06E+06	Ci
241-AZ-101	137Cs	Sludge	P3AZ1 (Solid)	2.06E+05	Ci
241-AZ-101	137Cs	Total		5.30E+06	Ci
241-AZ-101	137mBa	Sludge	NA	3.49E+04	Ci
241-AZ-101	137mBa	Supernatant	P3AZ1 (Liquid)	4.78E+06	Ci
241-AZ-101	137mBa	Sludge	P3AZ1 (Solid)	1.94E+05	Ci
241-AZ-101	137mBa	Total		5.01E+06	Ci
241-AZ-101	14C	Sludge	NA	5.26E-02	Ci
241-AZ-101	14C	Supernatant	P3AZ1 (Liquid)	6.25E+00	Ci
241-AZ-101	14C	Sludge	P3AZ1 (Solid)	2.93E-01	Ci
241-AZ-101	14C	Total		6.59E+00	Ci
241-AZ-101	151Sm	Sludge	NA	3.56E+02	Ci
241-AZ-101	151Sm	Supernatant	P3AZ1 (Liquid)	1.26E+04	Ci
241-AZ-101	151Sm	Sludge	P3AZ1 (Solid)	1.18E+05	Ci
241-AZ-101	151Sm	Total		1.31E+05	Ci
241-AZ-101	152Eu	Sludge	NA	4.12E-02	Ci
241-AZ-101	152Eu	Supernatant	P3AZ1 (Liquid)	1.52E+01	Ci
241-AZ-101	152Eu	Sludge	P3AZ1 (Solid)	1.42E+02	Ci
241-AZ-101	152Eu	Total		1.57E+02	Ci
241-AZ-101	154Eu	Sludge	NA	1.62E+03	Ci
241-AZ-101	154Eu	Supernatant	P3AZ1 (Liquid)	1.55E+02	Ci
241-AZ-101	154Eu	Sludge	P3AZ1 (Solid)	9.00E+03	Ci
241-AZ-101	154Eu	Total		1.08E+04	Ci
241-AZ-101	155Eu	Sludge	NA	1.72E+03	Ci
241-AZ-101	155Eu	Supernatant	P3AZ1 (Liquid)	9.11E+02	Ci
241-AZ-101	155Eu	Sludge	P3AZ1 (Solid)	9.56E+03	Ci
241-AZ-101	155Eu	Total		1.22E+04	Ci
241-AZ-101	226Ra	Sludge	NA	1.08E-06	Ci
241-AZ-101	226Ra	Supernatant	P3AZ1 (Liquid)	2.22E-04	Ci
241-AZ-101	226Ra	Sludge	P3AZ1 (Solid)	7.62E-05	Ci
241-AZ-101	226Ra	Total		3.00E-04	Ci
241-AZ-101	227Ac	Sludge	NA	1.32E-04	Ci
241-AZ-101	227Ac	Supernatant	P3AZ1 (Liquid)	1.46E-03	Ci
241-AZ-101	227Ac	Sludge	P3AZ1 (Solid)	1.78E-04	Ci
241-AZ-101	227Ac	Total		1.77E-03	Ci
241-AZ-101	228Ra	Sludge	NA	7.35E-04	Ci
241-AZ-101	228Ra	Supernatant	P3AZ1 (Liquid)	1.45E-08	Ci
241-AZ-101	228Ra	Sludge	P3AZ1 (Solid)	2.01E-03	Ci
241-AZ-101	228Ra	Total		2.74E-03	Ci
241-AZ-101	229Th	Sludge	NA	5.31E-07	Ci
241-AZ-101	229Th	Supernatant	P3AZ1 (Liquid)	1.90E-06	Ci
241-AZ-101	229Th	Sludge	P3AZ1 (Solid)	6.41E-08	Ci
241-AZ-101	229Th	Total		2.49E-06	Ci
241-AZ-101	231Pa	Sludge	NA	1.39E-03	Ci
241-AZ-101	231Pa	Supernatant	P3AZ1 (Liquid)	3.18E-03	Ci
241-AZ-101	231Pa	Sludge	P3AZ1 (Solid)	1.07E-04	Ci
241-AZ-101	231Pa	Total		4.67E-03	Ci
241-AZ-101	232Th	Sludge	NA	1.24E-03	Ci
241-AZ-101	232Th	Supernatant	P3AZ1 (Liquid)	1.86E-08	Ci
241-AZ-101	232Th	Sludge	P3AZ1 (Solid)	6.92E-03	Ci
241-AZ-101	232Th	Total		8.17E-03	Ci
241-AZ-101	232U	Sludge	NA	2.45E-03	Ci
241-AZ-101	232U	Supernatant	P3AZ1 (Liquid)	1.49E-06	Ci
241-AZ-101	232U	Sludge	P3AZ1 (Solid)	2.27E-04	Ci
241-AZ-101	232U	Total		2.68E-03	Ci
241-AZ-101	233U	Sludge	NA	1.50E-01	Ci
241-AZ-101	233U	Supernatant	P3AZ1 (Liquid)	4 92E-07	Ci
241-AZ-101	233U	Sludge	P3AZ1 (Solid)	7.48E-05	Ci

Summary		
226Ra	7.73E-05	Ci
227Ac	3.10E-04	Ci
228Ra	2.75E-03	Ci
229Th	5.95E-07	Ci
231Pa	1.50E-03	Ci
232Th	8.16E-03	Ci
232U	2.68E-03	Ci
233U	1.50E-01	Ci
234U	7.78E-01	Ci
235U	2.94E-02	Ci
236U	7.11E-02	Ci
237Np	1.35E+01	Ci
238Pu	1.15E+02	Ci
238U	5.48E-01	Ci
239Pu	1.17E+03	Ci
240Pu	3.31E+02	Ci
241Am	2.56E+04	Ci
241Pu	8.16E+03	Ci
242Cm	1.12E+01	Ci
242Pu	4.16E-02	Ci
243Am	9.41E+00	Ci
243Cm	1.04E+00	Ci
244Cm	2.41E+01	Ci
3H	2.18E+00	Ci
59Ni	1.43E+01	Ci
60Co	7.40E+02	Ci
63Ni	1.36E+03	Ci
79Se	5.32E-01	Ci
90Sr	5.52E+06	Ci
90Y	5.52E+06	Ci
93mNb	4.67E+00	Ci
93Zr	7.34E+00	Ci
99Tc	5.03E+01	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.. D-24

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-101	233U	Total		1.50E-01	Ci	
241-AZ-101	234U	Sludge	NA	1.06E-01	Ci	
241-AZ-101	234U	Supernatant	P3AZ1 (Liquid)	4.42E-03	Ci	
241-AZ-101	234U	Sludge	P3AZ1 (Solid)	6.72E-01	Ci	
241-AZ-101	234U	Total		7.82E-01	Ci	
241-AZ-101	235U	Sludge	NA	4.20E-03	Ci	
241-AZ-101	235U	Supernatant	P3AZ1 (Liquid)	1.65E-04	Ci	
241-AZ-101	235U	Sludge	P3AZ1 (Solid)	2.52E-02	Ci	
241-AZ-101	235U	Total		2.96E-02	Ci	
241-AZ-101	236U	Sludge	NA	7.20E-03	Ci	
241-AZ-101	236U	Supernatant	P3AZ1 (Liquid)	4.22E-04	Ci	
241-AZ-101	236U	Sludge	P3AZ1 (Solid)	6.39E-02	Ci	
241-AZ-101	236U	Total		7.16E-02	Ci	
241-AZ-101	237Np	Sludge	NA	2.05E+00	Ci	
241-AZ-101	237Np	Supernatant	P3AZ1 (Liquid)	1.22E-01	Ci	
241-AZ-101	237Np	Sludge	P3AZ1 (Solid)	1.14E+01	Ci	
241-AZ-101	237Np	Total		1.36E+01	Ci	
241-AZ-101	238Pu	Sludge	NA	1.32E+01	Ci	
241-AZ-101	238Pu	Supernatant	P3AZ1 (Liquid)	4.70E-01	Ci	
241-AZ-101	238Pu	Sludge	P3AZ1 (Solid)	1.02E+02	Ci	
241-AZ-101	238Pu	Total		1.15E+02	Ci	
241-AZ-101	238U	Sludge	NA	8.33E-02	Ci	
241-AZ-101	238U	Supernatant	P3AZ1 (Liquid)	3.04E-03	Ci	
241-AZ-101	238U	Sludge	P3AZ1 (Solid)	4.65E-01	Ci	
241-AZ-101	238U	Total		5.52E-01	Ci	
241-AZ-101	239Pu	Sludge	NA	1.81E+02	Ci	
241-AZ-101	239Pu	Supernatant	P3AZ1 (Liquid)	4.55E+00	Ci	
241-AZ-101	239Pu	Sludge	P3AZ1 (Solid)	9.89E+02	Ci	
241-AZ-101	239Pu	Total		1.18E+03	Ci	
241-AZ-101	240Pu	Sludge	NA	4.72E+01	Ci	
241-AZ-101	240Pu	Supernatant	P3AZ1 (Liquid)	1.30E+00	Ci	
241-AZ-101	240Pu	Sludge	P3AZ1 (Solid)	2.84E+02	Ci	
241-AZ-101	240Pu	Total		3.32E+02	Ci	
241-AZ-101	241Am	Sludge	NA	3.89E+03	Ci	
241-AZ-101	241Am	Supernatant	P3AZ1 (Liquid)	4.67E-01	Ci	
241-AZ-101	241Am	Sludge	P3AZ1 (Solid)	2.17E+04	Ci	
241-AZ-101	241Am	Total		2.56E+04	Ci	
241-AZ-101	241Pu	Sludge	NA	8.29E+02	Ci	
241-AZ-101	241Pu	Supernatant	P3AZ1 (Liquid)	3.37E+01	Ci	
241-AZ-101	241Pu	Sludge	P3AZ1 (Solid)	7.33E+03	Ci	
241-AZ-101	241Pu	Total		8.19E+03	Ci	
241-AZ-101	242Cm	Sludge	NA	1.71E+00	Ci	
241-AZ-101	242Cm	Supernatant	P3AZ1 (Liquid)	2.37E-04	Ci	
241-AZ-101	242Cm	Sludge	P3AZ1 (Solid)	9.52E+00	Ci	
241-AZ-101	242Cm	Total		1.12E+01	Ci	
241-AZ-101	242Pu	Sludge	NA	5.00E-03	Ci	
241-AZ-101	242Pu	Supernatant	P3AZ1 (Liquid)	1.69E-04	Ci	
241-AZ-101	242Pu	Sludge	P3AZ1 (Solid)	3.66E-02	Ci	
241-AZ-101	242Pu	Total		4.18E-02	Ci	
241-AZ-101	243Am	Sludge	NA	2.58E+00	Ci	
241-AZ-101	243Am	Supernatant	P3AZ1 (Liquid)	1.06E-04	Ci	
241-AZ-101	243Am	Sludge	P3AZ1 (Solid)	6.83E+00	Ci	
241-AZ-101	243Am	Total		9.41E+00	Ci	
241-AZ-101	243Cm	Sludge	NA	1.58E-01	Ci	
241-AZ-101	243Cm	Supernatant	P3AZ1 (Liquid)	4.24E-03	Ci	
241-AZ-101	243Cm	Sludge	P3AZ1 (Solid)	8.79E-01	Ci	
241-AZ-101	243Cm	Total		1.04E+00	Ci	
241-AZ-101	244Cm	Sludge	NA	3.67E+00	Ci	
241-AZ-101	244Cm	Supernatant	P3AZ1 (Liquid)	9.86E-02	Ci	
241-AZ-101	244Cm	Sludge	P3AZ1 (Solid)	2.04E+01	Ci	
241-AZ-101	244Cm	Total		2.42E+01	Ci	
241-AZ-101	3H	Sludge	NA	3.32E-01	Ci	
241-AZ-101	3H	Supernatant	P3AZ1 (Liquid)	5.17E+01	Ci	
241-AZ-101	3H	Sludge	P3AZ1 (Solid)	1.85E+00	Ci	
241-AZ-101	3H	Total		5.39E+01	Ci	
241-AZ-101	59Ni	Sludge	NA	2.27E-01	Ci	
241-AZ-101	59Ni	Supernatant	P3AZ1 (Liquid)	6.93E+00	Ci	
241-AZ-101	59Ni	Sludge	P3AZ1 (Solid)	1.41E+01	Ci	
241-AZ-101	59Ni	Total		2.13E+01	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO : 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-25

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary		
241-AZ-101	60Co	Sludge	NA	1.13E+02	Ci			
241-AZ-101	60Co	Supernatant	P3AZ1 (Liquid)	3.97E+01	Ci			
241-AZ-101	60Co	Sludge	P3AZ1 (Solid)	6.27E+02	Ci			
241-AZ-101	60Co	Total		7.80E+02	Ci			
241-AZ-101	63Ni	Sludge	NA	2.12E+01	Ci			
241-AZ-101	63Ni	Supernatant	P3AZ1 (Liquid)	6.54E+02	Ci			
241-AZ-101	63Ni	Sludge	P3AZ1 (Solid)	1.34E+03	Ci			
241-AZ-101	63Ni	Total		2.01E+03	Ci			
241-AZ-101	79Se	Sludge	NA	8.10E-02	Ci			
241-AZ-101	79Se	Supernatant	P3AZ1 (Liquid)	3.14E+00	Ci			
241-AZ-101	79Se	Sludge	P3AZ1 (Solid)	4.51E-01	Ci			
241-AZ-101	79Se	Total		3.68E+00	Ci			
241-AZ-101	90Sr	Sludge	NA	8.40E+05	Ci			
241-AZ-101	90Sr	Supernatant	P3AZ1 (Liquid)	2.81E+03	Ci			
241-AZ-101	90Sr	Sludge	P3AZ1 (Solid)	4.68E+06	Ci			
241-AZ-101	90Sr	Total		5.52E+06	Ci			
241-AZ-101	90Y	Sludge	NA	8.40E+05	Ci			
241-AZ-101	90Y	Supernatant	P3AZ1 (Liquid)	2.81E+03	Ci			
241-AZ-101	90Y	Sludge	P3AZ1 (Solid)	4.68E+06	Ci			
241-AZ-101	90Y	Total		5.52E+06	Ci			
241-AZ-101	93mNb	Sludge	NA	6.20E-01	Ci			
241-AZ-101	93mNb	Supernatant	P3AZ1 (Liquid)	1.20E+02	Ci			
241-AZ-101	93mNb	Sludge	P3AZ1 (Solid)	4.05E+00	Ci			
241-AZ-101	93mNb	Total		1.25E+02	Ci			
241-AZ-101	93Zr	Sludge	NA	7.48E-01	Ci			
241-AZ-101	93Zr	Supernatant	P3AZ1 (Liquid)	1.95E+02	Ci			
241-AZ-101	93Zr	Sludge	P3AZ1 (Solid)	6.59E+00	Ci			
241-AZ-101	93Zr	Total		2.02E+02	Ci			
241-AZ-101	99Tc	Sludge	NA	7.65E+00	Ci			
241-AZ-101	99Tc	Supernatant	P3AZ1 (Liquid)	1.06E+03	Ci			
241-AZ-101	99Tc	Sludge	P3AZ1 (Solid)	4.26E+01	Ci			
241-AZ-101	99Tc	Total		1.11E+03	Ci			
241-AZ-101	Ag	Sludge	NA	2.43E+00	kg	Summary		
241-AZ-101	Ag	Supernatant	P3AZ1 (Liquid)	2.05E+00	kg	Ag	1.59E+01	kg
241-AZ-101	Ag	Sludge	P3AZ1 (Solid)	1.35E+01	kg	Al	3.94E+04	kg
241-AZ-101	Ag	Total		1.80E+01	kg	As	1.36E+01	kg
241-AZ-101	Al	Sludge	NA	5.99E+03	kg	B	8.56E+00	kg
241-AZ-101	Al	Supernatant	P3AZ1 (Liquid)	1.96E+04	kg	Ba	1.41E+02	kg
241-AZ-101	Al	Sludge	P3AZ1 (Solid)	3.34E+04	kg	Be	2.61E+00	kg
241-AZ-101	Al	Total		5.90E+04	kg	Bi	7.48E-01	kg
241-AZ-101	As	Sludge	NA	2.06E+00	kg	Ca	6.92E+02	kg
241-AZ-101	As	Supernatant	P3AZ1 (Liquid)	3.21E+01	kg	Cd	1.35E+03	kg
241-AZ-101	As	Sludge	P3AZ1 (Solid)	1.15E+01	kg	Ce	2.31E+02	kg
241-AZ-101	As	Total		4.56E+01	kg	Cl	3.83E+01	kg
241-AZ-101	B	Sludge	NA	1.30E+00	kg	CN	1.42E+00	kg
241-AZ-101	B	Supernatant	P3AZ1 (Liquid)	6.07E+01	kg	Co	9.05E+00	kg
241-AZ-101	B	Sludge	P3AZ1 (Solid)	7.26E+00	kg	Cr	2.47E+02	kg
241-AZ-101	B	Total		6.93E+01	kg	Cu	6.86E+01	kg
241-AZ-101	Ba	Sludge	NA	2.15E+01	kg	F	1.23E+03	kg
241-AZ-101	Ba	Supernatant	P3AZ1 (Liquid)	2.52E-01	kg	Fe	1.92E+04	kg
241-AZ-101	Ba	Sludge	P3AZ1 (Solid)	1.19E+02	kg	OH	2.69E+02	kg
241-AZ-101	Ba	Total		1.41E+02	kg	Hg	9.04E-01	kg
241-AZ-101	Be	Sludge	NA	3.96E-01	kg	K	5.00E+02	kg
241-AZ-101	Be	Supernatant	P3AZ1 (Liquid)	9.53E-01	kg	La	5.16E+02	kg
241-AZ-101	Be	Sludge	P3AZ1 (Solid)	2.21E+00	kg	Li	2.03E+01	kg
241-AZ-101	Be	Total		3.55E+00	kg	Mg	1.27E+02	kg
241-AZ-101	Bi	Sludge	NA	7.48E-01	kg	Mn	4.27E+02	kg
241-AZ-101	Bi	Supernatant	P3AZ1 (Liquid)	0.00E+00	kg	Mo	2.04E+01	kg
241-AZ-101	Bi	Sludge	P3AZ1 (Solid)	0.00E+00	kg	Na	2.29E+04	kg
241-AZ-101	Bi	Total		7.48E-01	kg	Nd	6.04E+02	kg
241-AZ-101	Ca	Sludge	NA	1.05E+02	kg	NH3	0.00E+00	kg
241-AZ-101	Ca	Supernatant	P3AZ1 (Liquid)	2.38E+01	kg	Ni	7.99E+02	kg
241-AZ-101	Ca	Sludge	P3AZ1 (Solid)	5.87E+02	kg	NO2	9.34E+03	kg
241-AZ-101	Ca	Total		7.16E+02	kg	NO3	7.84E+03	kg
241-AZ-101	Cd	Sludge	NA	2.05E+02	kg	Oxalate	9.32E+02	kg
241-AZ-101	Cd	Supernatant	P3AZ1 (Liquid)	2.60E+00	kg	Pb	1.42E+02	kg
241-AZ-101	Cd	Sludge	P3AZ1 (Solid)	1.14E+03	kg	Pd	6.92E+02	kg
241-AZ-101	Cd	Total		1.35E+03	kg	PO4	1.62E+03	kg
241-AZ-101	Ce	Sludge	NA	3.52E+01	kg	Pr	1.43E+02	kg

CALCULATION SHEET

PROJECT. RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-26

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AZ-101	Ce	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg
241-AZ-101	Ce	Sludge	P3AZ1 (Solid)	1.96E+02	kg
241-AZ-101	Ce	Total		2.31E+02	kg
241-AZ-101	Cl	Sludge	NA	5.83E+00	kg
241-AZ-101	Cl	Supernatant	P3AZ1 (Liquid)	7.89E+02	kg
241-AZ-101	Cl	Sludge	P3AZ1 (Solid)	3.25E+01	kg
241-AZ-101	Cl	Total		8.28E+02	kg
241-AZ-101	CN	Sludge	NA	2.16E-01	kg
241-AZ-101	CN	Supernatant	P3AZ1 (Liquid)	6.62E+00	kg
241-AZ-101	CN	Sludge	P3AZ1 (Solid)	1.20E+00	kg
241-AZ-101	CN	Total		8.04E+00	kg
241-AZ-101	Co	Sludge	NA	1.38E+00	kg
241-AZ-101	Co	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg
241-AZ-101	Co	Sludge	P3AZ1 (Solid)	7.67E+00	kg
241-AZ-101	Co	Total		9.24E+00	kg
241-AZ-101	Cr	Sludge	NA	3.76E+01	kg
241-AZ-101	Cr	Supernatant	P3AZ1 (Liquid)	2.22E+03	kg
241-AZ-101	Cr	Sludge	P3AZ1 (Solid)	2.09E+02	kg
241-AZ-101	Cr	Total		2.47E+03	kg
241-AZ-101	Cu	Sludge	NA	1.04E+01	kg
241-AZ-101	Cu	Supernatant	P3AZ1 (Liquid)	2.05E+00	kg
241-AZ-101	Cu	Sludge	P3AZ1 (Solid)	5.82E+01	kg
241-AZ-101	Cu	Total		7.07E+01	kg
241-AZ-101	F	Sludge	NA	1.88E+02	kg
241-AZ-101	F	Supernatant	P3AZ1 (Liquid)	6.51E+03	kg
241-AZ-101	F	Sludge	P3AZ1 (Solid)	1.04E+03	kg
241-AZ-101	F	Total		7.74E+03	kg
241-AZ-101	Fe	Sludge	NA	2.93E+03	kg
241-AZ-101	Fe	Supernatant	P3AZ1 (Liquid)	4.87E+00	kg
241-AZ-101	Fe	Sludge	P3AZ1 (Solid)	1.63E+04	kg
241-AZ-101	Fe	Total		1.93E+04	kg
241-AZ-101	Free OH	Sludge	NA	4.10E+01	kg
241-AZ-101	Free OH	Supernatant	P3AZ1 (Liquid)	3.69E+04	kg
241-AZ-101	Free OH	Sludge	P3AZ1 (Solid)	2.28E+02	kg
241-AZ-101	Free OH	Total		3.71E+04	kg
241-AZ-101	Hg	Sludge	NA	1.38E-01	kg
241-AZ-101	Hg	Supernatant	P3AZ1 (Liquid)	1.80E-01	kg
241-AZ-101	Hg	Sludge	P3AZ1 (Solid)	7.66E-01	kg
241-AZ-101	Hg	Total		1.08E+00	kg
241-AZ-101	K	Sludge	NA	7.62E+01	kg
241-AZ-101	K	Supernatant	P3AZ1 (Liquid)	1.45E+04	kg
241-AZ-101	K	Sludge	P3AZ1 (Solid)	4.24E+02	kg
241-AZ-101	K	Total		1.50E+04	kg
241-AZ-101	La	Sludge	NA	7.86E+01	kg
241-AZ-101	La	Supernatant	P3AZ1 (Liquid)	0.00E+00	kg
241-AZ-101	La	Sludge	P3AZ1 (Solid)	4.37E+02	kg
241-AZ-101	La	Total		5.16E+02	kg
241-AZ-101	Li	Sludge	NA	3.09E+00	kg
241-AZ-101	Li	Supernatant	P3AZ1 (Liquid)	2.92E+00	kg
241-AZ-101	Li	Sludge	P3AZ1 (Solid)	1.72E+01	kg
241-AZ-101	Li	Total		2.32E+01	kg
241-AZ-101	Mg	Sludge	NA	1.93E+01	kg
241-AZ-101	Mg	Supernatant	P3AZ1 (Liquid)	8.43E+00	kg
241-AZ-101	Mg	Sludge	P3AZ1 (Solid)	1.08E+02	kg
241-AZ-101	Mg	Total		1.35E+02	kg
241-AZ-101	Mn	Sludge	NA	6.50E+01	kg
241-AZ-101	Mn	Supernatant	P3AZ1 (Liquid)	0.00E+00	kg
241-AZ-101	Mn	Sludge	P3AZ1 (Solid)	3.62E+02	kg
241-AZ-101	Mn	Total		4.27E+02	kg
241-AZ-101	Mo	Sludge	NA	3.12E+00	kg
241-AZ-101	Mo	Supernatant	P3AZ1 (Liquid)	2.88E+02	kg
241-AZ-101	Mo	Sludge	P3AZ1 (Solid)	1.73E+01	kg
241-AZ-101	Mo	Total		3.08E+02	kg
241-AZ-101	Na	Sludge	NA	3.48E+03	kg
241-AZ-101	Na	Supernatant	P3AZ1 (Liquid)	3.60E+05	kg
241-AZ-101	Na	Sludge	P3AZ1 (Solid)	1.94E+04	kg
241-AZ-101	Na	Total		3.83E+05	kg
241-AZ-101	Nd	Sludge	NA	9.19E+01	kg
241-AZ-101	Nd	Supernatant	P3AZ1 (Liquid)	8.43E+00	kg

Summary		
Rb	7.57E+01	kg
Rh	2.63E+01	kg
Ru	2.08E+02	kg
Sb	9.80E-01	kg
Se	4.41E-01	kg
Si	1.10E+03	kg
SO4	7.30E+03	kg
Sr	1.03E+02	kg
Ta	1.05E+00	kg
Te	5.74E+01	kg
Th	7.42E+01	kg
Ti	1.85E+01	kg
TIC as CO3	1.32E+04	kg
Tl	4.53E-02	kg
TOC	2.60E+02	kg
UTOTAL	1.64E+03	kg
V	6.78E+00	kg
W	1.10E+01	kg
Y	3.26E+01	kg
Zn	2.28E+01	kg
Zr	5.63E+03	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-27

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-101	Nd	Sludge	P3AZ1 (Solid)	5.12E+02	kg	
241-AZ-101	Nd	Total		6.12E+02	kg	
241-AZ-101	Ni	Sludge	NA	1.22E+02	kg	
241-AZ-101	Ni	Supernatant	P3AZ1 (Liquid)	3.24E+00	kg	
241-AZ-101	Ni	Sludge	P3AZ1 (Solid)	6.77E+02	kg	
241-AZ-101	Ni	Total		8.02E+02	kg	
241-AZ-101	NO2	Sludge	NA	1 42E+03	kg	
241-AZ-101	NO2	Supernatant	P3AZ1 (Liquid)	1.99E+05	kg	
241-AZ-101	NO2	Sludge	P3AZ1 (Solid)	7.92E+03	kg	
241-AZ-101	NO2	Total		2.08E+05	kg	
241-AZ-101	NO3	Sludge	NA	1.19E+03	kg	
241-AZ-101	NO3	Supernatant	P3AZ1 (Liquid)	1.71E+05	kg	
241-AZ-101	NO3	Sludge	P3AZ1 (Solid)	6.65E+03	kg	
241-AZ-101	NO3	Total		1.78E+05	kg	
241-AZ-101	Oxalate	Sludge	NA	1.42E+02	kg	
241-AZ-101	Oxalate	Supernatant	P3AZ1 (Liquid)	3.27E+03	kg	
241-AZ-101	Oxalate	Sludge	P3AZ1 (Solid)	7.90E+02	kg	
241-AZ-101	Oxalate	Total		4.20E+03	kg	
241-AZ-101	Pb	Sludge	NA	2.15E+01	kg	
241-AZ-101	Pb	Supernatant	P3AZ1 (Liquid)	1.08E+01	kg	
241-AZ-101	Pb	Sludge	P3AZ1 (Solid)	1.20E+02	kg	
241-AZ-101	Pb	Total		1.52E+02	kg	
241-AZ-101	Pd	Sludge	NA	1.05E+02	kg	
241-AZ-101	Pd	Supernatant	P3AZ1 (Liquid)	6.49E+01	kg	
241-AZ-101	Pd	Sludge	P3AZ1 (Solid)	5.87E+02	kg	
241-AZ-101	Pd	Total		7.57E+02	kg	
241-AZ-101	PO4	Sludge	NA	2.46E+02	kg	
241-AZ-101	PO4	Supernatant	P3AZ1 (Liquid)	5.01E+03	kg	
241-AZ-101	PO4	Sludge	P3AZ1 (Solid)	1.37E+03	kg	
241-AZ-101	PO4	Total		6.63E+03	kg	
241-AZ-101	Pr	Sludge	NA	2.17E+01	kg	
241-AZ-101	Pr	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg	
241-AZ-101	Pr	Sludge	P3AZ1 (Solid)	1.21E+02	kg	
241-AZ-101	Pr	Total		1.43E+02	kg	
241-AZ-101	Rb	Sludge	NA	1.15E+01	kg	
241-AZ-101	Rb	Supernatant	P3AZ1 (Liquid)	2.98E+01	kg	
241-AZ-101	Rb	Sludge	P3AZ1 (Solid)	6.42E+01	kg	
241-AZ-101	Rb	Total		1.06E+02	kg	
241-AZ-101	Rh	Sludge	NA	4.01E+00	kg	
241-AZ-101	Rh	Supernatant	P3AZ1 (Liquid)	6.79E+00	kg	
241-AZ-101	Rh	Sludge	P3AZ1 (Solid)	2.23E+01	kg	
241-AZ-101	Rh	Total		3.32E+01	kg	
241-AZ-101	Ru	Sludge	NA	3.16E+01	kg	
241-AZ-101	Ru	Supernatant	P3AZ1 (Liquid)	1.52E+00	kg	
241-AZ-101	Ru	Sludge	P3AZ1 (Solid)	1.76E+02	kg	
241-AZ-101	Ru	Total		2.09E+02	kg	
241-AZ-101	Sb	Sludge	NA	1.49E-01	kg	
241-AZ-101	Sb	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg	
241-AZ-101	Sb	Sludge	P3AZ1 (Solid)	8.31E-01	kg	
241-AZ-101	Sb	Total		1.17E+00	kg	
241-AZ-101	Se	Sludge	NA	6.72E-02	kg	
241-AZ-101	Se	Supernatant	P3AZ1 (Liquid)	2.10E+01	kg	
241-AZ-101	Se	Sludge	P3AZ1 (Solid)	3.74E-01	kg	
241-AZ-101	Se	Total		2.14E+01	kg	
241-AZ-101	Si	Sludge	NA	1.67E+02	kg	
241-AZ-101	Si	Supernatant	P3AZ1 (Liquid)	2.22E+02	kg	
241-AZ-101	Si	Sludge	P3AZ1 (Solid)	9.29E+02	kg	
241-AZ-101	Si	Total		1.32E+03	kg	
241-AZ-101	SO4	Sludge	NA	1.11E+03	kg	
241-AZ-101	SO4	Supernatant	P3AZ1 (Liquid)	5.24E+04	kg	
241-AZ-101	SO4	Sludge	P3AZ1 (Solid)	6.19E+03	kg	
241-AZ-101	SO4	Total		5.97E+04	kg	
241-AZ-101	Sr	Sludge	NA	1.56E+01	kg	
241-AZ-101	Sr	Supernatant	P3AZ1 (Liquid)	1.29E-01	kg	
241-AZ-101	Sr	Sludge	P3AZ1 (Solid)	8.70E+01	kg	
241-AZ-101	Sr	Total		1.03E+02	kg	
241-AZ-101	Ta	Sludge	NA	1.60E-01	kg	
241-AZ-101	Ta	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg	
241-AZ-101	Ta	Sludge	P3AZ1 (Solid)	8.92E-01	kg	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-28

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AZ-101	Ta	Total		1.24E+00	kg		
241-AZ-101	Te	Sludge	NA	8.74E+00	kg		
241-AZ-101	Te	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg		
241-AZ-101	Te	Sludge	P3AZ1 (Solid)	4.87E+01	kg		
241-AZ-101	Te	Total		5.76E+01	kg		
241-AZ-101	Th	Sludge	NA	1.13E+01	kg		
241-AZ-101	Th	Supernatant	P3AZ1 (Liquid)	1.69E-04	kg		
241-AZ-101	Th	Sludge	P3AZ1 (Solid)	6.29E+01	kg		
241-AZ-101	Th	Total		7.42E+01	kg		
241-AZ-101	Ti	Sludge	NA	2.82E+00	kg		
241-AZ-101	Ti	Supernatant	P3AZ1 (Liquid)	2.05E+00	kg		
241-AZ-101	Ti	Sludge	P3AZ1 (Solid)	1.57E+01	kg		
241-AZ-101	Ti	Total		2.06E+01	kg		
241-AZ-101	TIC as CO	Sludge	NA	2.02E+03	kg		
241-AZ-101	TIC as CO	Supernatant	P3AZ1 (Liquid)	1.60E+05	kg		
241-AZ-101	TIC as CO	Sludge	P3AZ1 (Solid)	1.12E+04	kg		
241-AZ-101	TIC as CO	Total		1.73E+05	kg		
241-AZ-101	Tl	Sludge	NA	6.89E-03	kg		
241-AZ-101	Tl	Supernatant	P3AZ1 (Liquid)	1.91E-01	kg		
241-AZ-101	Tl	Sludge	P3AZ1 (Solid)	3.84E-02	kg		
241-AZ-101	Tl	Total		2.36E-01	kg		
241-AZ-101	TOC	Sludge	NA	3.95E+01	kg		
241-AZ-101	TOC	Supernatant	P3AZ1 (Liquid)	1.65E+03	kg		
241-AZ-101	TOC	Sludge	P3AZ1 (Solid)	2.20E+02	kg		
241-AZ-101	TOC	Total		1.91E+03	kg		
241-AZ-101	UTOTAL	Sludge	NA	2.50E+02	kg		
241-AZ-101	UTOTAL	Supernatant	P3AZ1 (Liquid)	9.14E+00	kg		
241-AZ-101	UTOTAL	Sludge	P3AZ1 (Solid)	1.39E+03	kg		
241-AZ-101	UTOTAL	Total		1.65E+03	kg		
241-AZ-101	V	Sludge	NA	1.03E+00	kg		
241-AZ-101	V	Supernatant	P3AZ1 (Liquid)	4.87E+00	kg		
241-AZ-101	V	Sludge	P3AZ1 (Solid)	5.75E+00	kg		
241-AZ-101	V	Total		1.16E+01	kg		
241-AZ-101	W	Sludge	NA	1.67E+00	kg		
241-AZ-101	W	Supernatant	P3AZ1 (Liquid)	1.88E+02	kg		
241-AZ-101	W	Sludge	P3AZ1 (Solid)	9.30E+00	kg		
241-AZ-101	W	Total		1.99E+02	kg		
241-AZ-101	Y	Sludge	NA	4.97E+00	kg		
241-AZ-101	Y	Supernatant	P3AZ1 (Liquid)	4.22E+00	kg		
241-AZ-101	Y	Sludge	P3AZ1 (Solid)	2.76E+01	kg		
241-AZ-101	Y	Total		3.68E+01	kg		
241-AZ-101	Zn	Sludge	NA	3.47E+00	kg		
241-AZ-101	Zn	Supernatant	P3AZ1 (Liquid)	4 22E+00	kg		
241-AZ-101	Zn	Sludge	P3AZ1 (Solid)	1.93E+01	kg		
241-AZ-101	Zn	Total		2.70E+01	kg		
241-AZ-101	Zr	Sludge	NA	8.56E+02	kg		
241-AZ-101	Zr	Supernatant	P3AZ1 (Liquid)	0.00E+00	kg		
241-AZ-101	Zr	Sludge	P3AZ1 (Solid)	4.77E+03	kg		
241-AZ-101	Zr	Total		5.62E+03	kg		

241-AZ-102	106Ru	Sludge	NA sludge	6.81E-08	Ci	Summary	
241-AZ-102	106Ru	Supernatant	P3AZ2 (Liquid)	8.60E+01	Ci	106Ru	5.90E+00 Ci
241-AZ-102	106Ru	Sludge	P3AZ2 (Solid)	5.93E+00	Ci	113mCd	1.75E+02 Ci
241-AZ-102	106Ru	Sludge	PL2 (Solid)	1.37E-03	Ci	125Sb	2.39E+03 Ci
241-AZ-102	106Ru	Sludge	SRR (Solid)	4.72E-04	Ci	126Sn	5.80E-01 Ci
241-AZ-102	106Ru	Total		9.19E+01	Ci	129I	4.50E-03 Ci
241-AZ-102	113mCd	Sludge	NA sludge	3.39E-01	Ci	134Cs	1.23E+02 Ci
241-AZ-102	113mCd	Supernatant	P3AZ2 (Liquid)	1.24E+02	Ci	137Cs	3.70E+05 Ci
241-AZ-102	113mCd	Sludge	P3AZ2 (Solid)	1.74E+02	Ci	137mBa	3.50E+05 Ci
241-AZ-102	113mCd	Sludge	PL2 (Solid)	1.40E-04	Ci	14C	4.00E-01 Ci
241-AZ-102	113mCd	Sludge	SRR (Solid)	8.08E-01	Ci	151Sm	2.05E+05 Ci
241-AZ-102	113mCd	Total		2.99E+02	Ci	152Eu	9.77E+01 Ci
241-AZ-102	125Sb	Sludge	NA sludge	4.82E+01	Ci	154Eu	8.57E+03 Ci
241-AZ-102	125Sb	Supernatant	P3AZ2 (Liquid)	1.75E+03	Ci	155Eu	1.25E+04 Ci
241-AZ-102	125Sb	Sludge	P3AZ2 (Solid)	1.66E+03	Ci	226Ra	1.10E-05 Ci
241-AZ-102	125Sb	Sludge	PL2 (Solid)	9.04E+01	Ci	227Ac	9.20E-05 Ci
241-AZ-102	125Sb	Sludge	SRR (Solid)	5.90E+02	Ci	228Ra	6.62E-03 Ci

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO : D-29

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AZ-102	125Sb	Total		4.14E+03	Ci
241-AZ-102	126Sn	Sludge	NA sludge	1.13E-02	Ci
241-AZ-102	126Sn	Supernatant	P3AZ2 (Liquid)	2.11E+00	Ci
241-AZ-102	126Sn	Sludge	P3AZ2 (Solid)	5.20E-01	Ci
241-AZ-102	126Sn	Sludge	PL2 (Solid)	3.96E-06	Ci
241-AZ-102	126Sn	Sludge	SRR (Solid)	4.90E-02	Ci
241-AZ-102	126Sn	Total		2.69E+00	Ci
241-AZ-102	129I	Sludge	NA sludge	9.11E-04	Ci
241-AZ-102	129I	Supernatant	P3AZ2 (Liquid)	4.46E-02	Ci
241-AZ-102	129I	Sludge	P3AZ2 (Solid)	3.07E-03	Ci
241-AZ-102	129I	Sludge	PL2 (Solid)	3.59E-04	Ci
241-AZ-102	129I	Sludge	SRR (Solid)	2.17E-04	Ci
241-AZ-102	129I	Total		4.91E-02	Ci
241-AZ-102	134Cs	Sludge	NA sludge	2.49E+00	Ci
241-AZ-102	134Cs	Supernatant	P3AZ2 (Liquid)	8.71E+02	Ci
241-AZ-102	134Cs	Sludge	P3AZ2 (Solid)	8.54E+01	Ci
241-AZ-102	134Cs	Sludge	PL2 (Solid)	4.66E+00	Ci
241-AZ-102	134Cs	Sludge	SRR (Solid)	3.04E+01	Ci
241-AZ-102	134Cs	Total		9.94E+02	Ci
241-AZ-102	137Cs	Sludge	NA sludge	7.47E+03	Ci
241-AZ-102	137Cs	Supernatant	P3AZ2 (Liquid)	3.13E+06	Ci
241-AZ-102	137Cs	Sludge	P3AZ2 (Solid)	2.57E+05	Ci
241-AZ-102	137Cs	Sludge	PL2 (Solid)	1.40E+04	Ci
241-AZ-102	137Cs	Sludge	SRR (Solid)	9.15E+04	Ci
241-AZ-102	137Cs	Total		3.50E+06	Ci
241-AZ-102	137mBa	Sludge	NA sludge	7.05E+03	Ci
241-AZ-102	137mBa	Supernatant	P3AZ2 (Liquid)	2.95E+06	Ci
241-AZ-102	137mBa	Sludge	P3AZ2 (Solid)	2.42E+05	Ci
241-AZ-102	137mBa	Sludge	PL2 (Solid)	1.32E+04	Ci
241-AZ-102	137mBa	Sludge	SRR (Solid)	8.64E+04	Ci
241-AZ-102	137mBa	Total		3.30E+06	Ci
241-AZ-102	14C	Sludge	NA sludge	7.97E-03	Ci
241-AZ-102	14C	Supernatant	P3AZ2 (Liquid)	3.17E+00	Ci
241-AZ-102	14C	Sludge	P3AZ2 (Solid)	2.74E-01	Ci
241-AZ-102	14C	Sludge	PL2 (Solid)	1.49E-02	Ci
241-AZ-102	14C	Sludge	SRR (Solid)	9.77E-02	Ci
241-AZ-102	14C	Total		3.57E+00	Ci
241-AZ-102	151Sm	Sludge	NA sludge	5.54E+01	Ci
241-AZ-102	151Sm	Supernatant	P3AZ2 (Liquid)	1.24E+04	Ci
241-AZ-102	151Sm	Sludge	P3AZ2 (Solid)	6.16E+04	Ci
241-AZ-102	151Sm	Sludge	PL2 (Solid)	3.51E-02	Ci
241-AZ-102	151Sm	Sludge	SRR (Solid)	1.43E+05	Ci
241-AZ-102	151Sm	Total		2.17E+05	Ci
241-AZ-102	152Eu	Sludge	NA sludge	9.99E-03	Ci
241-AZ-102	152Eu	Supernatant	P3AZ2 (Liquid)	1.33E+01	Ci
241-AZ-102	152Eu	Sludge	P3AZ2 (Solid)	6.64E+01	Ci
241-AZ-102	152Eu	Sludge	PL2 (Solid)	4.05E-05	Ci
241-AZ-102	152Eu	Sludge	SRR (Solid)	3.09E+01	Ci
241-AZ-102	152Eu	Total		1.11E+02	Ci
241-AZ-102	154Eu	Sludge	NA sludge	1.73E+02	Ci
241-AZ-102	154Eu	Supernatant	P3AZ2 (Liquid)	1.57E+02	Ci
241-AZ-102	154Eu	Sludge	P3AZ2 (Solid)	5.95E+03	Ci
241-AZ-102	154Eu	Sludge	PL2 (Solid)	3.25E+02	Ci
241-AZ-102	154Eu	Sludge	SRR (Solid)	2.12E+03	Ci
241-AZ-102	154Eu	Total		8.73E+03	Ci
241-AZ-102	155Eu	Sludge	NA sludge	2.51E+02	Ci
241-AZ-102	155Eu	Supernatant	P3AZ2 (Liquid)	2.45E+02	Ci
241-AZ-102	155Eu	Sludge	P3AZ2 (Solid)	8.64E+03	Ci
241-AZ-102	155Eu	Sludge	PL2 (Solid)	4.71E+02	Ci
241-AZ-102	155Eu	Sludge	SRR (Solid)	3.08E+03	Ci
241-AZ-102	155Eu	Total		1.27E+04	Ci
241-AZ-102	226Ra	Sludge	NA sludge	3.06E-07	Ci
241-AZ-102	226Ra	Supernatant	P3AZ2 (Liquid)	1.41E-04	Ci
241-AZ-102	226Ra	Sludge	P3AZ2 (Solid)	9.70E-06	Ci
241-AZ-102	226Ra	Sludge	PL2 (Solid)	7.69E-11	Ci
241-AZ-102	226Ra	Sludge	SRR (Solid)	6.20E-07	Ci
241-AZ-102	226Ra	Total		1.52E-04	Ci
241-AZ-102	227Ac	Sludge	NA sludge	3.27E-05	Ci
241-AZ-102	227Ac	Supernatant	P3AZ2 (Liquid)	8.24E-04	Ci

Summary		
229Th	1.92E-07	Ci
231Pa	4.60E-04	Ci
232Th	2.06E-02	Ci
232U	5.67E-03	Ci
233U	3.03E-01	Ci
234U	3.16E+00	Ci
235U	1.27E-01	Ci
236U	2.64E-01	Ci
237Np	1.89E+01	Ci
238Pu	1.95E+02	Ci
238U	2.35E+00	Ci
239Pu	1.31E+03	Ci
240Pu	3.44E+02	Ci
241Am	2.84E+04	Ci
241Pu	7.17E+03	Ci
242Cm	2.48E+01	Ci
242Pu	3.71E-02	Ci
243Am	9.39E+00	Ci
243Cm	2.86E+00	Ci
244Cm	6.50E+01	Ci
3H	1.73E+01	Ci
59Ni	9.86E+00	Ci
60Co	7.44E+02	Ci
63Ni	9.35E+02	Ci
79Se	1.30E-01	Ci
90Sr	3.91E+06	Ci
90Y	3.91E+06	Ci
93mNb	4.90E+00	Ci
93Zr	8.00E+00	Ci
99Tc	8.70E+01	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-30

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	227Ac	Sludge	P3AZ2 (Solid)	5.67E-05	Ci	
241-AZ-102	227Ac	Sludge	PL2 (Solid)	4.32E-10	Ci	
241-AZ-102	227Ac	Sludge	SRR (Solid)	3.13E-06	Ci	
241-AZ-102	227Ac	Total		9.16E-04	Ci	
241-AZ-102	228Ra	Sludge	NA sludge	1.92E-04	Ci	
241-AZ-102	228Ra	Supernatant	P3AZ2 (Liquid)	9.85E-09	Ci	
241-AZ-102	228Ra	Sludge	P3AZ2 (Solid)	4.24E-03	Ci	
241-AZ-102	228Ra	Sludge	PL2 (Solid)	3.42E-04	Ci	
241-AZ-102	228Ra	Sludge	SRR (Solid)	1.85E-03	Ci	
241-AZ-102	228Ra	Total		6.62E-03	Ci	
241-AZ-102	229Th	Sludge	NA sludge	1.22E-07	Ci	
241-AZ-102	229Th	Supernatant	P3AZ2 (Liquid)	9.38E-07	Ci	
241-AZ-102	229Th	Sludge	P3AZ2 (Solid)	6.45E-08	Ci	
241-AZ-102	229Th	Sludge	PL2 (Solid)	5.09E-13	Ci	
241-AZ-102	229Th	Sludge	SRR (Solid)	3.69E-09	Ci	
241-AZ-102	229Th	Total		1.13E-06	Ci	
241-AZ-102	231Pa	Sludge	NA sludge	3.34E-04	Ci	
241-AZ-102	231Pa	Supernatant	P3AZ2 (Liquid)	1.78E-03	Ci	
241-AZ-102	231Pa	Sludge	P3AZ2 (Solid)	1.23E-04	Ci	
241-AZ-102	231Pa	Sludge	PL2 (Solid)	8.89E-10	Ci	
241-AZ-102	231Pa	Sludge	SRR (Solid)	4.76E-06	Ci	
241-AZ-102	231Pa	Total		2.24E-03	Ci	
241-AZ-102	232Th	Sludge	NA sludge	4.15E-04	Ci	
241-AZ-102	232Th	Supernatant	P3AZ2 (Liquid)	1.10E-08	Ci	
241-AZ-102	232Th	Sludge	P3AZ2 (Solid)	1.43E-02	Ci	
241-AZ-102	232Th	Sludge	PL2 (Solid)	7.79E-04	Ci	
241-AZ-102	232Th	Sludge	SRR (Solid)	5.09E-03	Ci	
241-AZ-102	232Th	Total		2.06E-02	Ci	
241-AZ-102	232U	Sludge	NA sludge	4.88E-03	Ci	
241-AZ-102	232U	Supernatant	P3AZ2 (Liquid)	3.64E-05	Ci	
241-AZ-102	232U	Sludge	P3AZ2 (Solid)	6.94E-04	Ci	
241-AZ-102	232U	Sludge	PL2 (Solid)	4.14E-05	Ci	
241-AZ-102	232U	Sludge	SRR (Solid)	5.49E-05	Ci	
241-AZ-102	232U	Total		5.71E-03	Ci	
241-AZ-102	233U	Sludge	NA sludge	3.03E-01	Ci	
241-AZ-102	233U	Supernatant	P3AZ2 (Liquid)	1.16E-05	Ci	
241-AZ-102	233U	Sludge	P3AZ2 (Solid)	2.20E-04	Ci	
241-AZ-102	233U	Sludge	PL2 (Solid)	1.35E-05	Ci	
241-AZ-102	233U	Sludge	SRR (Solid)	1.72E-04	Ci	
241-AZ-102	233U	Total		3.03E-01	Ci	
241-AZ-102	234U	Sludge	NA sludge	5.29E-02	Ci	
241-AZ-102	234U	Supernatant	P3AZ2 (Liquid)	1.25E-01	Ci	
241-AZ-102	234U	Sludge	P3AZ2 (Solid)	2.38E+00	Ci	
241-AZ-102	234U	Sludge	PL2 (Solid)	1.29E-01	Ci	
241-AZ-102	234U	Sludge	SRR (Solid)	5.99E-01	Ci	
241-AZ-102	234U	Total		3.28E+00	Ci	
241-AZ-102	235U	Sludge	NA sludge	2.15E-03	Ci	
241-AZ-102	235U	Supernatant	P3AZ2 (Liquid)	4.97E-03	Ci	
241-AZ-102	235U	Sludge	P3AZ2 (Solid)	9.46E-02	Ci	
241-AZ-102	235U	Sludge	PL2 (Solid)	4.94E-03	Ci	
241-AZ-102	235U	Sludge	SRR (Solid)	2.53E-02	Ci	
241-AZ-102	235U	Total		1.32E-01	Ci	
241-AZ-102	236U	Sludge	NA sludge	1.39E-03	Ci	
241-AZ-102	236U	Supernatant	P3AZ2 (Liquid)	1.23E-02	Ci	
241-AZ-102	236U	Sludge	P3AZ2 (Solid)	2.35E-01	Ci	
241-AZ-102	236U	Sludge	PL2 (Solid)	1.24E-02	Ci	
241-AZ-102	236U	Sludge	SRR (Solid)	1.58E-02	Ci	
241-AZ-102	236U	Total		2.76E-01	Ci	
241-AZ-102	237Np	Sludge	NA sludge	3.83E-01	Ci	
241-AZ-102	237Np	Supernatant	P3AZ2 (Liquid)	3.57E-01	Ci	
241-AZ-102	237Np	Sludge	P3AZ2 (Solid)	1.32E+01	Ci	
241-AZ-102	237Np	Sludge	PL2 (Solid)	7.19E-01	Ci	
241-AZ-102	237Np	Sludge	SRR (Solid)	4.70E+00	Ci	
241-AZ-102	237Np	Total		1.93E+01	Ci	
241-AZ-102	238Pu	Sludge	NA sludge	3.93E+00	Ci	
241-AZ-102	238Pu	Supernatant	P3AZ2 (Liquid)	2.34E+00	Ci	
241-AZ-102	238Pu	Sludge	P3AZ2 (Solid)	1.35E+02	Ci	
241-AZ-102	238Pu	Sludge	PL2 (Solid)	7.36E+00	Ci	
241-AZ-102	238Pu	Sludge	SRR (Solid)	4.81E+01	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-31

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	238Pu	Total		1.97E+02	Ci	
241-AZ-102	238U	Sludge	NA sludge	4.75E-02	Ci	
241-AZ-102	238U	Supernatant	P3AZ2 (Liquid)	8.59E-02	Ci	
241-AZ-102	238U	Sludge	P3AZ2 (Solid)	1.63E+00	Ci	
241-AZ-102	238U	Sludge	PL2 (Solid)	8.89E-02	Ci	
241-AZ-102	238U	Sludge	SRR (Solid)	5.82E-01	Ci	
241-AZ-102	238U	Total		2.44E+00	Ci	
241-AZ-102	239Pu	Sludge	NA sludge	2.71E+01	Ci	
241-AZ-102	239Pu	Supernatant	P3AZ2 (Liquid)	2.42E+01	Ci	
241-AZ-102	239Pu	Sludge	P3AZ2 (Solid)	9.01E+02	Ci	
241-AZ-102	239Pu	Sludge	PL2 (Solid)	4.88E+01	Ci	
241-AZ-102	239Pu	Sludge	SRR (Solid)	3.32E+02	Ci	
241-AZ-102	239Pu	Total		1.33E+03	Ci	
241-AZ-102	240Pu	Sludge	NA sludge	6.29E+00	Ci	
241-AZ-102	240Pu	Supernatant	P3AZ2 (Liquid)	6.61E+00	Ci	
241-AZ-102	240Pu	Sludge	P3AZ2 (Solid)	2.47E+02	Ci	
241-AZ-102	240Pu	Sludge	PL2 (Solid)	1.38E+01	Ci	
241-AZ-102	240Pu	Sludge	SRR (Solid)	7.70E+01	Ci	
241-AZ-102	240Pu	Total		3.51E+02	Ci	
241-AZ-102	241Am	Sludge	NA sludge	5.72E+02	Ci	
241-AZ-102	241Am	Supernatant	P3AZ2 (Liquid)	2.07E+00	Ci	
241-AZ-102	241Am	Sludge	P3AZ2 (Solid)	1.97E+04	Ci	
241-AZ-102	241Am	Sludge	PL2 (Solid)	1.07E+03	Ci	
241-AZ-102	241Am	Sludge	SRR (Solid)	7.01E+03	Ci	
241-AZ-102	241Am	Total		2.84E+04	Ci	
241-AZ-102	241Pu	Sludge	NA sludge	4.89E+01	Ci	
241-AZ-102	241Pu	Supernatant	P3AZ2 (Liquid)	1.67E+02	Ci	
241-AZ-102	241Pu	Sludge	P3AZ2 (Solid)	6.21E+03	Ci	
241-AZ-102	241Pu	Sludge	PL2 (Solid)	3.53E+02	Ci	
241-AZ-102	241Pu	Sludge	SRR (Solid)	5.64E+02	Ci	
241-AZ-102	241Pu	Total		7.34E+03	Ci	
241-AZ-102	242Cm	Sludge	NA sludge	5.01E-01	Ci	
241-AZ-102	242Cm	Supernatant	P3AZ2 (Liquid)	6.57E-04	Ci	
241-AZ-102	242Cm	Sludge	P3AZ2 (Solid)	1.72E+01	Ci	
241-AZ-102	242Cm	Sludge	PL2 (Solid)	9.40E-01	Ci	
241-AZ-102	242Cm	Sludge	SRR (Solid)	6.14E+00	Ci	
241-AZ-102	242Cm	Total		2.48E+01	Ci	
241-AZ-102	242Pu	Sludge	NA sludge	4.70E-04	Ci	
241-AZ-102	242Pu	Supernatant	P3AZ2 (Liquid)	7.97E-04	Ci	
241-AZ-102	242Pu	Sludge	P3AZ2 (Solid)	2.95E-02	Ci	
241-AZ-102	242Pu	Sludge	PL2 (Solid)	1.74E-03	Ci	
241-AZ-102	242Pu	Sludge	SRR (Solid)	5.36E-03	Ci	
241-AZ-102	242Pu	Total		3.79E-02	Ci	
241-AZ-102	243Am	Sludge	NA sludge	3.55E-01	Ci	
241-AZ-102	243Am	Supernatant	P3AZ2 (Liquid)	1.85E-04	Ci	
241-AZ-102	243Am	Sludge	P3AZ2 (Solid)	4.41E+00	Ci	
241-AZ-102	243Am	Sludge	PL2 (Solid)	3.00E-01	Ci	
241-AZ-102	243Am	Sludge	SRR (Solid)	4.32E+00	Ci	
241-AZ-102	243Am	Total		9.39E+00	Ci	
241-AZ-102	243Cm	Sludge	NA sludge	5.78E-02	Ci	
241-AZ-102	243Cm	Supernatant	P3AZ2 (Liquid)	8.91E-05	Ci	
241-AZ-102	243Cm	Sludge	P3AZ2 (Solid)	1.99E+00	Ci	
241-AZ-102	243Cm	Sludge	PL2 (Solid)	1.08E-01	Ci	
241-AZ-102	243Cm	Sludge	SRR (Solid)	7.09E-01	Ci	
241-AZ-102	243Cm	Total		2.86E+00	Ci	
241-AZ-102	244Cm	Sludge	NA sludge	1.31E+00	Ci	
241-AZ-102	244Cm	Supernatant	P3AZ2 (Liquid)	2.11E-03	Ci	
241-AZ-102	244Cm	Sludge	P3AZ2 (Solid)	4.51E+01	Ci	
241-AZ-102	244Cm	Sludge	PL2 (Solid)	2.46E+00	Ci	
241-AZ-102	244Cm	Sludge	SRR (Solid)	1.61E+01	Ci	
241-AZ-102	244Cm	Total		6.50E+01	Ci	
241-AZ-102	3H	Sludge	NA sludge	3.52E-01	Ci	
241-AZ-102	3H	Supernatant	P3AZ2 (Liquid)	9.77E+01	Ci	
241-AZ-102	3H	Sludge	P3AZ2 (Solid)	1.21E+01	Ci	
241-AZ-102	3H	Sludge	PL2 (Solid)	6.59E-01	Ci	
241-AZ-102	3H	Sludge	SRR (Solid)	4.31E+00	Ci	
241-AZ-102	3H	Total		1.15E+02	Ci	
241-AZ-102	59Ni	Sludge	NA sludge	6.26E-02	Ci	
241-AZ-102	59Ni	Supernatant	P3AZ2 (Liquid)	2.14E+00	Ci	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-32

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-AZ-102	59Ni	Sludge	P3AZ2 (Solid)	9.26E+00	Ci		
241-AZ-102	59Ni	Sludge	PL2 (Solid)	1.80E-04	Ci		
241-AZ-102	59Ni	Sludge	SRR (Solid)	4.90E-01	Ci		
241-AZ-102	59Ni	Total		1.20E+01	Ci		
241-AZ-102	60Co	Sludge	NA sludge	1.50E+01	Ci		
241-AZ-102	60Co	Supernatant	P3AZ2 (Liquid)	3.94E+01	Ci		
241-AZ-102	60Co	Sludge	P3AZ2 (Solid)	5.16E+02	Ci		
241-AZ-102	60Co	Sludge	PL2 (Solid)	2.82E+01	Ci		
241-AZ-102	60Co	Sludge	SRR (Solid)	1.84E+02	Ci		
241-AZ-102	60Co	Total		7.83E+02	Ci		
241-AZ-102	63Ni	Sludge	NA sludge	5.85E+00	Ci		
241-AZ-102	63Ni	Supernatant	P3AZ2 (Liquid)	2.05E+02	Ci		
241-AZ-102	63Ni	Sludge	P3AZ2 (Solid)	8.85E+02	Ci		
241-AZ-102	63Ni	Sludge	PL2 (Solid)	1.71E-02	Ci		
241-AZ-102	63Ni	Sludge	SRR (Solid)	4.52E+01	Ci		
241-AZ-102	63Ni	Total		1.14E+03	Ci		
241-AZ-102	79Se	Sludge	NA sludge	2.72E-03	Ci		
241-AZ-102	79Se	Supernatant	P3AZ2 (Liquid)	1.43E+00	Ci		
241-AZ-102	79Se	Sludge	P3AZ2 (Solid)	1.19E-01	Ci		
241-AZ-102	79Se	Sludge	PL2 (Solid)	8.89E-07	Ci		
241-AZ-102	79Se	Sludge	SRR (Solid)	1.15E-02	Ci		
241-AZ-102	79Se	Total		1.56E+00	Ci		
241-AZ-102	90Sr	Sludge	NA sludge	7.90E+04	Ci		
241-AZ-102	90Sr	Supernatant	P3AZ2 (Liquid)	6.51E+03	Ci		
241-AZ-102	90Sr	Sludge	P3AZ2 (Solid)	2.71E+06	Ci		
241-AZ-102	90Sr	Sludge	PL2 (Solid)	1.48E+05	Ci		
241-AZ-102	90Sr	Sludge	SRR (Solid)	9.67E+05	Ci		
241-AZ-102	90Sr	Total		3.92E+06	Ci		
241-AZ-102	90Y	Sludge	NA sludge	7.90E+04	Ci		
241-AZ-102	90Y	Supernatant	P3AZ2 (Liquid)	6.51E+03	Ci		
241-AZ-102	90Y	Sludge	P3AZ2 (Solid)	2.71E+06	Ci		
241-AZ-102	90Y	Sludge	PL2 (Solid)	1.48E+05	Ci		
241-AZ-102	90Y	Sludge	SRR (Solid)	9.67E+05	Ci		
241-AZ-102	90Y	Total		3.92E+06	Ci		
241-AZ-102	93mNb	Sludge	NA sludge	1.34E-01	Ci		
241-AZ-102	93mNb	Supernatant	P3AZ2 (Liquid)	6.13E+01	Ci		
241-AZ-102	93mNb	Sludge	P3AZ2 (Solid)	4.24E+00	Ci		
241-AZ-102	93mNb	Sludge	PL2 (Solid)	3.25E-05	Ci		
241-AZ-102	93mNb	Sludge	SRR (Solid)	5.41E-01	Ci		
241-AZ-102	93mNb	Total		6.62E+01	Ci		
241-AZ-102	93Zr	Sludge	NA sludge	1.62E-01	Ci		
241-AZ-102	93Zr	Supernatant	P3AZ2 (Liquid)	1.05E+02	Ci		
241-AZ-102	93Zr	Sludge	P3AZ2 (Solid)	7.21E+00	Ci		
241-AZ-102	93Zr	Sludge	PL2 (Solid)	5.37E-05	Ci		
241-AZ-102	93Zr	Sludge	SRR (Solid)	6.83E-01	Ci		
241-AZ-102	93Zr	Total		1.13E+02	Ci		
241-AZ-102	99Tc	Sludge	NA sludge	1.75E+00	Ci		
241-AZ-102	99Tc	Supernatant	P3AZ2 (Liquid)	6.98E+02	Ci		
241-AZ-102	99Tc	Sludge	P3AZ2 (Solid)	6.02E+01	Ci		
241-AZ-102	99Tc	Sludge	PL2 (Solid)	3.28E+00	Ci		
241-AZ-102	99Tc	Sludge	SRR (Solid)	2.15E+01	Ci		
241-AZ-102	99Tc	Total		7.85E+02	Ci		
241-AZ-102	Ag	Sludge	NA sludge	2.63E+00	kg	Summary	
241-AZ-102	Ag	Supernatant	P3AZ2 (Liquid)	1.61E+00	kg	Ag	1.30E+02 kg
241-AZ-102	Ag	Sludge	P3AZ2 (Solid)	9.05E+01	kg	Al	3.03E+04 kg
241-AZ-102	Ag	Sludge	PL2 (Solid)	4.94E+00	kg	As	2.32E+01 kg
241-AZ-102	Ag	Sludge	SRR (Solid)	3.22E+01	kg	B	3.01E+01 kg
241-AZ-102	Ag	Total		1.32E+02	kg	Ba	2.00E+02 kg
241-AZ-102	Al	Sludge	NA sludge	6.11E+02	kg	Be	3.20E+00 kg
241-AZ-102	Al	Supernatant	P3AZ2 (Liquid)	1.13E+03	kg	Bi	9.05E+01 kg
241-AZ-102	Al	Sludge	P3AZ2 (Solid)	2.10E+04	kg	Ca	1.31E+03 kg
241-AZ-102	Al	Sludge	PL2 (Solid)	1.15E+03	kg	Cd	4.72E+03 kg
241-AZ-102	Al	Sludge	SRR (Solid)	7.49E+03	kg	Ce	3.17E+02 kg
241-AZ-102	Al	Total		3.14E+04	kg	Cl	7.70E+01 kg
241-AZ-102	As	Sludge	NA sludge	4.67E-01	kg	CN	3.00E+00 kg
241-AZ-102	As	Supernatant	P3AZ2 (Liquid)	1.28E+01	kg	Co	1.11E+01 kg
241-AZ-102	As	Sludge	P3AZ2 (Solid)	1.61E+01	kg	Cr	5.50E+02 kg
241-AZ-102	As	Sludge	PL2 (Solid)	8.77E-01	kg	Cu	5.25E+01 kg
241-AZ-102	As	Sludge	SRR (Solid)	5.73E+00	kg	F	4.60E+02 kg

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-33

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-AZ-102	As	Total		3.60E+01	kg
241-AZ-102	B	Sludge	NA sludge	6.07E-01	kg
241-AZ-102	B	Supernatant	P3AZ2 (Liquid)	2.57E+01	kg
241-AZ-102	B	Sludge	P3AZ2 (Solid)	2.09E+01	kg
241-AZ-102	B	Sludge	PL2 (Solid)	1.14E+00	kg
241-AZ-102	B	Sludge	SRR (Solid)	7.43E+00	kg
241-AZ-102	B	Total		5.58E+01	kg
241-AZ-102	Ba	Sludge	NA sludge	4.03E+00	kg
241-AZ-102	Ba	Supernatant	P3AZ2 (Liquid)	1.57E-01	kg
241-AZ-102	Ba	Sludge	P3AZ2 (Solid)	1.39E+02	kg
241-AZ-102	Ba	Sludge	PL2 (Solid)	7.56E+00	kg
241-AZ-102	Ba	Sludge	SRR (Solid)	4.94E+01	kg
241-AZ-102	Ba	Total		2.00E+02	kg
241-AZ-102	Be	Sludge	NA sludge	6.46E-02	kg
241-AZ-102	Be	Supernatant	P3AZ2 (Liquid)	7.42E-02	kg
241-AZ-102	Be	Sludge	P3AZ2 (Solid)	2.22E+00	kg
241-AZ-102	Be	Sludge	PL2 (Solid)	1.21E-01	kg
241-AZ-102	Be	Sludge	SRR (Solid)	7.92E-01	kg
241-AZ-102	Be	Total		3.27E+00	kg
241-AZ-102	Bi	Sludge	NA sludge	1.83E+00	kg
241-AZ-102	Bi	Supernatant	P3AZ2 (Liquid)	0.00E+00	kg
241-AZ-102	Bi	Sludge	P3AZ2 (Solid)	6.28E+01	kg
241-AZ-102	Bi	Sludge	PL2 (Solid)	3.43E+00	kg
241-AZ-102	Bi	Sludge	SRR (Solid)	2.24E+01	kg
241-AZ-102	Bi	Total		9.05E+01	kg
241-AZ-102	Ca	Sludge	NA sludge	2.65E+01	kg
241-AZ-102	Ca	Supernatant	P3AZ2 (Liquid)	5.73E+00	kg
241-AZ-102	Ca	Sludge	P3AZ2 (Solid)	9.09E+02	kg
241-AZ-102	Ca	Sludge	PL2 (Solid)	4.96E+01	kg
241-AZ-102	Ca	Sludge	SRR (Solid)	3.24E+02	kg
241-AZ-102	Ca	Total		1.32E+03	kg
241-AZ-102	Cd	Sludge	NA sludge	9.53E+01	kg
241-AZ-102	Cd	Supernatant	P3AZ2 (Liquid)	1.67E+00	kg
241-AZ-102	Cd	Sludge	P3AZ2 (Solid)	3.28E+03	kg
241-AZ-102	Cd	Sludge	PL2 (Solid)	1.79E+02	kg
241-AZ-102	Cd	Sludge	SRR (Solid)	1.17E+03	kg
241-AZ-102	Cd	Total		4.72E+03	kg
241-AZ-102	Ce	Sludge	NA sludge	6.40E+00	kg
241-AZ-102	Ce	Supernatant	P3AZ2 (Liquid)	7.61E-02	kg
241-AZ-102	Ce	Sludge	P3AZ2 (Solid)	2.20E+02	kg
241-AZ-102	Ce	Sludge	PL2 (Solid)	1.20E+01	kg
241-AZ-102	Ce	Sludge	SRR (Solid)	7.84E+01	kg
241-AZ-102	Ce	Total		3.17E+02	kg
241-AZ-102	Cl	Sludge	NA sludge	1.55E+00	kg
241-AZ-102	Cl	Supernatant	P3AZ2 (Liquid)	2.36E+02	kg
241-AZ-102	Cl	Sludge	P3AZ2 (Solid)	5.32E+01	kg
241-AZ-102	Cl	Sludge	PL2 (Solid)	2.90E+00	kg
241-AZ-102	Cl	Sludge	SRR (Solid)	1.90E+01	kg
241-AZ-102	Cl	Total		3.13E+02	kg
241-AZ-102	CN	Sludge	NA sludge	5.97E-02	kg
241-AZ-102	CN	Supernatant	P3AZ2 (Liquid)	2.44E+01	kg
241-AZ-102	CN	Sludge	P3AZ2 (Solid)	2.05E+00	kg
241-AZ-102	CN	Sludge	PL2 (Solid)	1.12E-01	kg
241-AZ-102	CN	Sludge	SRR (Solid)	7.32E-01	kg
241-AZ-102	CN	Total		2.74E+01	kg
241-AZ-102	Co	Sludge	NA sludge	2.24E-01	kg
241-AZ-102	Co	Supernatant	P3AZ2 (Liquid)	7.42E-02	kg
241-AZ-102	Co	Sludge	P3AZ2 (Solid)	7.69E+00	kg
241-AZ-102	Co	Sludge	PL2 (Solid)	4.20E-01	kg
241-AZ-102	Co	Sludge	SRR (Solid)	2.74E+00	kg
241-AZ-102	Co	Total		1.12E+01	kg
241-AZ-102	Cr	Sludge	NA sludge	1.10E+01	kg
241-AZ-102	Cr	Supernatant	P3AZ2 (Liquid)	2.53E+03	kg
241-AZ-102	Cr	Sludge	P3AZ2 (Solid)	3.79E+02	kg
241-AZ-102	Cr	Sludge	PL2 (Solid)	2.07E+01	kg
241-AZ-102	Cr	Sludge	SRR (Solid)	1.35E+02	kg
241-AZ-102	Cr	Total		3.08E+03	kg
241-AZ-102	Cu	Sludge	NA sludge	1.06E+00	kg
241-AZ-102	Cu	Supernatant	P3AZ2 (Liquid)	1.30E+00	kg

Summary		
Fe	3.61E+04	kg
OH	4.00E+01	kg
Hg	4.98E+00	kg
K	1.50E+03	kg
La	1.20E+03	kg
Li	2.67E+01	kg
Mg	2.10E+02	kg
Mn	9.46E+02	kg
Mo	2.00E+01	kg
Na	2.70E+04	kg
Nd	9.06E+02	kg
NH3	0.00E+00	kg
Ni	2.44E+03	kg
NO2	1.60E+04	kg
NO3	4.30E+03	kg
Oxalate	1.04E+03	kg
Pb	7.82E+02	kg
Pd	0.00E+00	kg
PO4	1.14E+03	kg
Pr	0.00E+00	kg
Rb	0.00E+00	kg
Rh	0.00E+00	kg
Ru	0.00E+00	kg
Sb	9.70E+00	kg
Se	2.35E+01	kg
Si	1.82E+03	kg
SO4	6.50E+03	kg
Sr	6.15E+01	kg
Ta	0.00E+00	kg
Te	0.00E+00	kg
Th	1.87E+02	kg
Ti	2.47E+01	kg
TIC as CO3	8.00E+03	kg
Tl	0.00E+00	kg
TOC	2.90E+02	kg
UTOTAL	7.06E+03	kg
V	2.33E+00	kg
W	0.00E+00	kg
Y	3.03E+01	kg
Zn	9.89E+01	kg
Zr	4.56E+03	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-34

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	Cu	Sludge	P3AZ2 (Solid)	3.64E+01	kg	
241-AZ-102	Cu	Sludge	PL2 (Solid)	1.99E+00	kg	
241-AZ-102	Cu	Sludge	SRR (Solid)	1.30E+01	kg	
241-AZ-102	Cu	Total		5.38E+01	kg	
241-AZ-102	F	Sludge	NA sludge	9.38E+00	kg	
241-AZ-102	F	Supernatant	P3AZ2 (Liquid)	3.42E+03	kg	
241-AZ-102	F	Sludge	P3AZ2 (Solid)	3.22E+02	kg	
241-AZ-102	F	Sludge	PL2 (Solid)	1.76E+01	kg	
241-AZ-102	F	Sludge	SRR (Solid)	1.15E+02	kg	
241-AZ-102	F	Total		3.88E+03	kg	
241-AZ-102	Fe	Sludge	NA sludge	7.29E+02	kg	
241-AZ-102	Fe	Supernatant	P3AZ2 (Liquid)	2.23E+00	kg	
241-AZ-102	Fe	Sludge	P3AZ2 (Solid)	2.51E+04	kg	
241-AZ-102	Fe	Sludge	PL2 (Solid)	1.37E+03	kg	
241-AZ-102	Fe	Sludge	SRR (Solid)	8.93E+03	kg	
241-AZ-102	Fe	Total		3.61E+04	kg	
241-AZ-102	Free OH	Sludge	NA sludge	8.03E-01	kg	
241-AZ-102	Free OH	Supernatant	P3AZ2 (Liquid)	8.13E+03	kg	
241-AZ-102	Free OH	Sludge	P3AZ2 (Solid)	2.76E+01	kg	
241-AZ-102	Free OH	Sludge	PL2 (Solid)	1.51E+00	kg	
241-AZ-102	Free OH	Sludge	SRR (Solid)	9.83E+00	kg	
241-AZ-102	Free OH	Total		8.17E+03	kg	
241-AZ-102	Hg	Sludge	NA sludge	1.01E-01	kg	
241-AZ-102	Hg	Supernatant	P3AZ2 (Liquid)	2.03E-01	kg	
241-AZ-102	Hg	Sludge	P3AZ2 (Solid)	3.46E+00	kg	
241-AZ-102	Hg	Sludge	PL2 (Solid)	1.89E-01	kg	
241-AZ-102	Hg	Sludge	SRR (Solid)	1.23E+00	kg	
241-AZ-102	Hg	Total		5.18E+00	kg	
241-AZ-102	K	Sludge	NA sludge	3.03E+01	kg	
241-AZ-102	K	Supernatant	P3AZ2 (Liquid)	1.05E+04	kg	
241-AZ-102	K	Sludge	P3AZ2 (Solid)	1.04E+03	kg	
241-AZ-102	K	Sludge	PL2 (Solid)	5.69E+01	kg	
241-AZ-102	K	Sludge	SRR (Solid)	3.72E+02	kg	
241-AZ-102	K	Total		1.20E+04	kg	
241-AZ-102	La	Sludge	NA sludge	2.42E+01	kg	
241-AZ-102	La	Supernatant	P3AZ2 (Liquid)	0.00E+00	kg	
241-AZ-102	La	Sludge	P3AZ2 (Solid)	8.32E+02	kg	
241-AZ-102	La	Sludge	PL2 (Solid)	4.54E+01	kg	
241-AZ-102	La	Sludge	SRR (Solid)	2.97E+02	kg	
241-AZ-102	La	Total		1.20E+03	kg	
241-AZ-102	Li	Sludge	NA sludge	5.39E-01	kg	
241-AZ-102	Li	Supernatant	P3AZ2 (Liquid)	4.93E-01	kg	
241-AZ-102	Li	Sludge	P3AZ2 (Solid)	1.85E+01	kg	
241-AZ-102	Li	Sludge	PL2 (Solid)	1.01E+00	kg	
241-AZ-102	Li	Sludge	SRR (Solid)	6.60E+00	kg	
241-AZ-102	Li	Total		2.72E+01	kg	
241-AZ-102	Mg	Sludge	NA sludge	4.25E+00	kg	
241-AZ-102	Mg	Supernatant	P3AZ2 (Liquid)	1.71E+01	kg	
241-AZ-102	Mg	Sludge	P3AZ2 (Solid)	1.46E+02	kg	
241-AZ-102	Mg	Sludge	PL2 (Solid)	7.97E+00	kg	
241-AZ-102	Mg	Sludge	SRR (Solid)	5.21E+01	kg	
241-AZ-102	Mg	Total		2.27E+02	kg	
241-AZ-102	Mn	Sludge	NA sludge	1.91E+01	kg	
241-AZ-102	Mn	Supernatant	P3AZ2 (Liquid)	0.00E+00	kg	
241-AZ-102	Mn	Sludge	P3AZ2 (Solid)	6.57E+02	kg	
241-AZ-102	Mn	Sludge	PL2 (Solid)	3.58E+01	kg	
241-AZ-102	Mn	Sludge	SRR (Solid)	2.34E+02	kg	
241-AZ-102	Mn	Total		9.46E+02	kg	
241-AZ-102	Mo	Sludge	NA sludge	3.93E-01	kg	
241-AZ-102	Mo	Supernatant	P3AZ2 (Liquid)	1.78E+02	kg	
241-AZ-102	Mo	Sludge	P3AZ2 (Solid)	1.35E+01	kg	
241-AZ-102	Mo	Sludge	PL2 (Solid)	7.37E-01	kg	
241-AZ-102	Mo	Sludge	SRR (Solid)	4.81E+00	kg	
241-AZ-102	Mo	Total		1.98E+02	kg	
241-AZ-102	Na	Sludge	NA sludge	5.39E+02	kg	
241-AZ-102	Na	Supernatant	P3AZ2 (Liquid)	2.04E+05	kg	
241-AZ-102	Na	Sludge	P3AZ2 (Solid)	1.85E+04	kg	
241-AZ-102	Na	Sludge	PL2 (Solid)	1.01E+03	kg	
241-AZ-102	Na	Sludge	SRR (Solid)	6.60E+03	kg	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-35

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	Na	Total		2.31E+05	kg	
241-AZ-102	Nd	Sludge	NA sludge	1.83E+01	kg	
241-AZ-102	Nd	Supernatant	P3AZ2 (Liquid)	6.62E+00	kg	
241-AZ-102	Nd	Sludge	P3AZ2 (Solid)	6.29E+02	kg	
241-AZ-102	Nd	Sludge	PL2 (Solid)	3.43E+01	kg	
241-AZ-102	Nd	Sludge	SRR (Solid)	2.24E+02	kg	
241-AZ-102	Nd	Total		9.13E+02	kg	
241-AZ-102	Ni	Sludge	NA sludge	4.92E+01	kg	
241-AZ-102	Ni	Supernatant	P3AZ2 (Liquid)	3.81E+00	kg	
241-AZ-102	Ni	Sludge	P3AZ2 (Solid)	1.69E+03	kg	
241-AZ-102	Ni	Sludge	PL2 (Solid)	9.22E+01	kg	
241-AZ-102	Ni	Sludge	SRR (Solid)	6.02E+02	kg	
241-AZ-102	Ni	Total		2.44E+03	kg	
241-AZ-102	NO2	Sludge	NA sludge	3.34E+02	kg	
241-AZ-102	NO2	Supernatant	P3AZ2 (Liquid)	1.35E+05	kg	
241-AZ-102	NO2	Sludge	P3AZ2 (Solid)	1.15E+04	kg	
241-AZ-102	NO2	Sludge	PL2 (Solid)	6.26E+02	kg	
241-AZ-102	NO2	Sludge	SRR (Solid)	4.09E+03	kg	
241-AZ-102	NO2	Total		1.51E+05	kg	
241-AZ-102	NO3	Sludge	NA sludge	8.61E+01	kg	
241-AZ-102	NO3	Supernatant	P3AZ2 (Liquid)	2.73E+04	kg	
241-AZ-102	NO3	Sludge	P3AZ2 (Solid)	2.96E+03	kg	
241-AZ-102	NO3	Sludge	PL2 (Solid)	1.61E+02	kg	
241-AZ-102	NO3	Sludge	SRR (Solid)	1.05E+03	kg	
241-AZ-102	NO3	Total		3.16E+04	kg	
241-AZ-102	Oxalate	Sludge	NA sludge	2.10E+01	kg	
241-AZ-102	Oxalate	Supernatant	P3AZ2 (Liquid)	7.37E+03	kg	
241-AZ-102	Oxalate	Sludge	P3AZ2 (Solid)	7.20E+02	kg	
241-AZ-102	Oxalate	Sludge	PL2 (Solid)	3.93E+01	kg	
241-AZ-102	Oxalate	Sludge	SRR (Solid)	2.57E+02	kg	
241-AZ-102	Oxalate	Total		8.41E+03	kg	
241-AZ-102	Pb	Sludge	NA sludge	1.58E+01	kg	
241-AZ-102	Pb	Supernatant	P3AZ2 (Liquid)	0.00E+00	kg	
241-AZ-102	Pb	Sludge	P3AZ2 (Solid)	5.43E+02	kg	
241-AZ-102	Pb	Sludge	PL2 (Solid)	2.96E+01	kg	
241-AZ-102	Pb	Sludge	SRR (Solid)	1.94E+02	kg	
241-AZ-102	Pb	Total		7.82E+02	kg	
241-AZ-102	PO4	Sludge	NA sludge	2.31E+01	kg	
241-AZ-102	PO4	Supernatant	P3AZ2 (Liquid)	1.49E+03	kg	
241-AZ-102	PO4	Sludge	P3AZ2 (Solid)	7.94E+02	kg	
241-AZ-102	PO4	Sludge	PL2 (Solid)	4.33E+01	kg	
241-AZ-102	PO4	Sludge	SRR (Solid)	2.83E+02	kg	
241-AZ-102	PO4	Total		2 63E+03	kg	
241-AZ-102	Sb	Sludge	NA sludge	1.96E-01	kg	
241-AZ-102	Sb	Supernatant	P3AZ2 (Liquid)	1.13E-01	kg	
241-AZ-102	Sb	Sludge	P3AZ2 (Solid)	6.73E+00	kg	
241-AZ-102	Sb	Sludge	PL2 (Solid)	3.67E-01	kg	
241-AZ-102	Sb	Sludge	SRR (Solid)	2.40E+00	kg	
241-AZ-102	Sb	Total		9.81E+00	kg	
241-AZ-102	Se	Sludge	NA sludge	4.75E-01	kg	
241-AZ-102	Se	Supernatant	P3AZ2 (Liquid)	2.19E+01	kg	
241-AZ-102	Se	Sludge	P3AZ2 (Solid)	1.63E+01	kg	
241-AZ-102	Se	Sludge	PL2 (Solid)	8.90E-01	kg	
241-AZ-102	Se	Sludge	SRR (Solid)	5.82E+00	kg	
241-AZ-102	Se	Total		4.54E+01	kg	
241-AZ-102	Si	Sludge	NA sludge	3.66E+01	kg	
241-AZ-102	Si	Supernatant	P3AZ2 (Liquid)	1.62E+02	kg	
241-AZ-102	Si	Sludge	P3AZ2 (Solid)	1.26E+03	kg	
241-AZ-102	Si	Sludge	PL2 (Solid)	6.87E+01	kg	
241-AZ-102	Si	Sludge	SRR (Solid)	4.49E+02	kg	
241-AZ-102	Si	Total		1.98E+03	kg	
241-AZ-102	SO4	Sludge	NA sludge	1.31E+02	kg	
241-AZ-102	SO4	Supernatant	P3AZ2 (Liquid)	5.84E+04	kg	
241-AZ-102	SO4	Sludge	P3AZ2 (Solid)	4.51E+03	kg	
241-AZ-102	SO4	Sludge	PL2 (Solid)	2.46E+02	kg	
241-AZ-102	SO4	Sludge	SRR (Solid)	1.61E+03	kg	
241-AZ-102	SO4	Total		6.49E+04	kg	
241-AZ-102	Sr	Sludge	NA sludge	1.24E+00	kg	
241-AZ-102	Sr	Supernatant	P3AZ2 (Liquid)	1.20E-01	kg	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-36

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-AZ-102	Sr	Sludge	P3AZ2 (Solid)	4.27E+01	kg	
241-AZ-102	Sr	Sludge	PL2 (Solid)	2.33E+00	kg	
241-AZ-102	Sr	Sludge	SRR (Solid)	1.52E+01	kg	
241-AZ-102	Sr	Total		6.16E+01	kg	
241-AZ-102	Th	Sludge	NA sludge	3.77E+00	kg	
241-AZ-102	Th	Supernatant	P3AZ2 (Liquid)	9.99E-05	kg	
241-AZ-102	Th	Sludge	P3AZ2 (Solid)	1.30E+02	kg	
241-AZ-102	Th	Sludge	PL2 (Solid)	7.08E+00	kg	
241-AZ-102	Th	Sludge	SRR (Solid)	4.62E+01	kg	
241-AZ-102	Th	Total		1.87E+02	kg	
241-AZ-102	Ti	Sludge	NA sludge	4.99E-01	kg	
241-AZ-102	Ti	Supernatant	P3AZ2 (Liquid)	5.48E-01	kg	
241-AZ-102	Ti	Sludge	P3AZ2 (Solid)	1.71E+01	kg	
241-AZ-102	Ti	Sludge	PL2 (Solid)	9.35E-01	kg	
241-AZ-102	Ti	Sludge	SRR (Solid)	6.11E+00	kg	
241-AZ-102	Ti	Total		2.52E+01	kg	
241-AZ-102	TIC as CO	Sludge	NA sludge	1.59E+02	kg	
241-AZ-102	TIC as CO	Supernatant	P3AZ2 (Liquid)	1.07E+05	kg	
241-AZ-102	TIC as CO	Sludge	P3AZ2 (Solid)	5.47E+03	kg	
241-AZ-102	TIC as CO	Sludge	PL2 (Solid)	2.98E+02	kg	
241-AZ-102	TIC as CO	Sludge	SRR (Solid)	1.95E+03	kg	
241-AZ-102	TIC as CO	Total		1.15E+05	kg	
241-AZ-102	TOC	Sludge	NA sludge	5.73E+00	kg	
241-AZ-102	TOC	Supernatant	P3AZ2 (Liquid)	6.61E+03	kg	
241-AZ-102	TOC	Sludge	P3AZ2 (Solid)	1.97E+02	kg	
241-AZ-102	TOC	Sludge	PL2 (Solid)	1.07E+01	kg	
241-AZ-102	TOC	Sludge	SRR (Solid)	7.02E+01	kg	
241-AZ-102	TOC	Total		6.90E+03	kg	
241-AZ-102	UTOTAL	Sludge	NA sludge	1.43E+02	kg	
241-AZ-102	UTOTAL	Supernatant	P3AZ2 (Liquid)	2.58E+02	kg	
241-AZ-102	UTOTAL	Sludge	P3AZ2 (Solid)	4.90E+03	kg	
241-AZ-102	UTOTAL	Sludge	PL2 (Solid)	2.67E+02	kg	
241-AZ-102	UTOTAL	Sludge	SRR (Solid)	1.75E+03	kg	
241-AZ-102	UTOTAL	Total		7.32E+03	kg	
241-AZ-102	V	Sludge	NA sludge	4.71E-02	kg	
241-AZ-102	V	Supernatant	P3AZ2 (Liquid)	1.76E+00	kg	
241-AZ-102	V	Sludge	P3AZ2 (Solid)	1.62E+00	kg	
241-AZ-102	V	Sludge	PL2 (Solid)	8.83E-02	kg	
241-AZ-102	V	Sludge	SRR (Solid)	5.77E-01	kg	
241-AZ-102	V	Total		4.09E+00	kg	
241-AZ-102	Y	Sludge	NA sludge	6.12E-01	kg	
241-AZ-102	Y	Supernatant	P3AZ2 (Liquid)	7.42E-02	kg	
241-AZ-102	Y	Sludge	P3AZ2 (Solid)	2.10E+01	kg	
241-AZ-102	Y	Sludge	PL2 (Solid)	1.15E+00	kg	
241-AZ-102	Y	Sludge	SRR (Solid)	7.49E+00	kg	
241-AZ-102	Y	Total		3.04E+01	kg	
241-AZ-102	Zn	Sludge	NA sludge	2.66E+00	kg	
241-AZ-102	Zn	Supernatant	P3AZ2 (Liquid)	1.11E+00	kg	
241-AZ-102	Zn	Sludge	P3AZ2 (Solid)	9.13E+01	kg	
241-AZ-102	Zn	Sludge	PL2 (Solid)	4.98E+00	kg	
241-AZ-102	Zn	Total		1.00E+02	kg	
241-AZ-102	Zr	Sludge	NA sludge	9.20E+01	kg	
241-AZ-102	Zr	Supernatant	P3AZ2 (Liquid)	1.04E+00	kg	
241-AZ-102	Zr	Sludge	P3AZ2 (Solid)	3.16E+03	kg	
241-AZ-102	Zr	Sludge	PL2 (Solid)	1.73E+02	kg	
241-AZ-102	Zr	Sludge	SRR (Solid)	1.13E+03	kg	
241-AZ-102	Zr	Total		4.56E+03	kg	

241-C-104	106Ru	Sludge	CWP1 (Solid)	2.05E-10	Ci	Summary	
241-C-104	106Ru	Sludge	CWP2 (Solid)	2.05E-08	Ci	106Ru	1.80E-04 Ci
241-C-104	106Ru	Sludge	CWZr1 (Solid)	3.82E-07	Ci	113mCd	3.10E+00 Ci
241-C-104	106Ru	Sludge	NA	1.80E-04	Ci	125Sb	7.68E+01 Ci
241-C-104	106Ru	Sludge	OWW3 (Solid)	2.49E-09	Ci	126Sn	8.29E-02 Ci
241-C-104	106Ru	Sludge	TH2 (Solid)	9.31E-08	Ci	129I	6.66E-01 Ci
241-C-104	106Ru	Total		1.80E-04	Ci	134Cs	5.41E-02 Ci
241-C-104	113mCd	Sludge	CWP1 (Solid)	7.35E-01	Ci	137Cs	8.86E+04 Ci
241-C-104	113mCd	Sludge	CWP2 (Solid)	3.89E-01	Ci	137mBa	8.36E+04 Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO : 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-37

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-C-104	113mCd	Sludge	CWZr1 (Solid)	5.76E-02	Ci
241-C-104	113mCd	Sludge	NA	1.79E+00	Ci
241-C-104	113mCd	Sludge	OWW3 (Solid)	2.22E-04	Ci
241-C-104	113mCd	Sludge	TH2 (Solid)	1.30E-01	Ci
241-C-104	113mCd	Total		3.10E+00	Ci
241-C-104	125Sb	Sludge	CWP1 (Solid)	2.56E+01	Ci
241-C-104	125Sb	Sludge	CWP2 (Solid)	1.80E+01	Ci
241-C-104	125Sb	Sludge	CWZr1 (Solid)	7.06E+00	Ci
241-C-104	125Sb	Sludge	NA	1.19E+01	Ci
241-C-104	125Sb	Sludge	OWW3 (Solid)	8.07E+00	Ci
241-C-104	125Sb	Sludge	TH2 (Solid)	6.27E+00	Ci
241-C-104	125Sb	Total		7.68E+01	Ci
241-C-104	126Sn	Sludge	CWP1 (Solid)	1.09E-03	Ci
241-C-104	126Sn	Sludge	CWP2 (Solid)	4.45E-04	Ci
241-C-104	126Sn	Sludge	CWZr1 (Solid)	3.25E-03	Ci
241-C-104	126Sn	Sludge	NA	7.01E-02	Ci
241-C-104	126Sn	Sludge	OWW3 (Solid)	1.26E-05	Ci
241-C-104	126Sn	Sludge	TH2 (Solid)	8.06E-03	Ci
241-C-104	126Sn	Total		8.29E-02	Ci
241-C-104	129I	Sludge	CWP1 (Solid)	2.22E-01	Ci
241-C-104	129I	Sludge	CWP2 (Solid)	1.56E-01	Ci
241-C-104	129I	Sludge	CWZr1 (Solid)	6.12E-02	Ci
241-C-104	129I	Sludge	NA	1.03E-01	Ci
241-C-104	129I	Sludge	OWW3 (Solid)	7.00E-02	Ci
241-C-104	129I	Sludge	TH2 (Solid)	5.44E-02	Ci
241-C-104	129I	Total		6.66E-01	Ci
241-C-104	134Cs	Sludge	CWP1 (Solid)	1.83E-05	Ci
241-C-104	134Cs	Sludge	CWP2 (Solid)	1.11E-04	Ci
241-C-104	134Cs	Sludge	CWZr1 (Solid)	2.75E-02	Ci
241-C-104	134Cs	Sludge	NA	2.46E-02	Ci
241-C-104	134Cs	Sludge	OWW3 (Solid)	1.17E-05	Ci
241-C-104	134Cs	Sludge	TH2 (Solid)	1.90E-03	Ci
241-C-104	134Cs	Total		5.41E-02	Ci
241-C-104	137Cs	Sludge	CWP1 (Solid)	2.95E+04	Ci
241-C-104	137Cs	Sludge	CWP2 (Solid)	2.07E+04	Ci
241-C-104	137Cs	Sludge	CWZr1 (Solid)	8.14E+03	Ci
241-C-104	137Cs	Sludge	NA	1.37E+04	Ci
241-C-104	137Cs	Sludge	OWW3 (Solid)	9.31E+03	Ci
241-C-104	137Cs	Sludge	TH2 (Solid)	7.23E+03	Ci
241-C-104	137Cs	Total		8.86E+04	Ci
241-C-104	137mBa	Sludge	CWP1 (Solid)	2.78E+04	Ci
241-C-104	137mBa	Sludge	CWP2 (Solid)	1.95E+04	Ci
241-C-104	137mBa	Sludge	CWZr1 (Solid)	7.68E+03	Ci
241-C-104	137mBa	Sludge	NA	1.30E+04	Ci
241-C-104	137mBa	Sludge	OWW3 (Solid)	8.79E+03	Ci
241-C-104	137mBa	Sludge	TH2 (Solid)	6.83E+03	Ci
241-C-104	137mBa	Total		8.36E+04	Ci
241-C-104	14C	Sludge	CWP1 (Solid)	6.04E-01	Ci
241-C-104	14C	Sludge	CWP2 (Solid)	4.24E-01	Ci
241-C-104	14C	Sludge	CWZr1 (Solid)	1.67E-01	Ci
241-C-104	14C	Sludge	NA	2.82E-01	Ci
241-C-104	14C	Sludge	OWW3 (Solid)	1.91E-01	Ci
241-C-104	14C	Sludge	TH2 (Solid)	1.48E-01	Ci
241-C-104	14C	Total		1.82E+00	Ci
241-C-104	151Sm	Sludge	CWP1 (Solid)	1.10E+01	Ci
241-C-104	151Sm	Sludge	CWP2 (Solid)	4.34E+00	Ci
241-C-104	151Sm	Sludge	CWZr1 (Solid)	1.97E+01	Ci
241-C-104	151Sm	Sludge	NA	5.72E+04	Ci
241-C-104	151Sm	Sludge	OWW3 (Solid)	1.11E-01	Ci
241-C-104	151Sm	Sludge	TH2 (Solid)	2.80E+01	Ci
241-C-104	151Sm	Total		5.73E+04	Ci
241-C-104	152Eu	Sludge	CWP1 (Solid)	1.31E-03	Ci
241-C-104	152Eu	Sludge	CWP2 (Solid)	9.81E-04	Ci
241-C-104	152Eu	Sludge	CWZr1 (Solid)	2.51E-02	Ci
241-C-104	152Eu	Sludge	NA	1.53E+01	Ci
241-C-104	152Eu	Sludge	OWW3 (Solid)	6.25E-05	Ci
241-C-104	152Eu	Sludge	TH2 (Solid)	7.93E-03	Ci
241-C-104	152Eu	Total		1.53E+01	Ci
241-C-104	154Eu	Sludge	CWP1 (Solid)	2.84E+02	Ci

Summary		
14C	1.82E+00	Ci
151Sm	5.73E+04	Ci
152Eu	1.53E+01	Ci
154Eu	8.54E+02	Ci
155Eu	4.38E+02	Ci
226Ra	1.31E-04	Ci
227Ac	2.02E+00	Ci
228Ra	1.48E+00	Ci
229Th	5.53E-01	Ci
231Pa	1.70E-01	Ci
232Th	3.97E+00	Ci
232U	2.26E+00	Ci
233U	3.37E+02	Ci
234U	1.69E+01	Ci
235U	4.38E-01	Ci
236U	5.58E-01	Ci
237Np	3.59E+00	Ci
238Pu	2.29E+02	Ci
238U	9.56E+00	Ci
239Pu	5.18E+03	Ci
240Pu	1.33E+03	Ci
241Am	6.34E+03	Ci
241Pu	1.25E+04	Ci
242Cm	2.07E+00	Ci
242Pu	1.24E-01	Ci
243Am	1.38E+00	Ci
243Cm	1.84E-01	Ci
244Cm	4.11E+00	Ci
3H	4.00E+01	Ci
59Ni	5.68E+00	Ci
60Co	1.82E+02	Ci
63Ni	5.28E+02	Ci
79Se	5.24E+00	Ci
90Sr	4.47E+05	Ci
90Y	4.47E+05	Ci
93mNb	1.45E+00	Ci
93Zr	1.79E+00	Ci
99Tc	5.76E+01	Ci

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-38

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-104	154Eu	Sludge	CWP2 (Solid)	2.00E+02	Ci	
241-C-104	154Eu	Sludge	CWZr1 (Solid)	7.85E+01	Ci	
241-C-104	154Eu	Sludge	NA	1.33E+02	Ci	
241-C-104	154Eu	Sludge	OWW3 (Solid)	8.98E+01	Ci	
241-C-104	154Eu	Sludge	TH2 (Solid)	6.97E+01	Ci	
241-C-104	154Eu	Total		8.54E+02	Ci	
241-C-104	155Eu	Sludge	CWP1 (Solid)	1.46E+02	Ci	
241-C-104	155Eu	Sludge	CWP2 (Solid)	1.02E+02	Ci	
241-C-104	155Eu	Sludge	CWZr1 (Solid)	4.02E+01	Ci	
241-C-104	155Eu	Sludge	NA	6.79E+01	Ci	
241-C-104	155Eu	Sludge	OWW3 (Solid)	4.60E+01	Ci	
241-C-104	155Eu	Sludge	TH2 (Solid)	3.57E+01	Ci	
241-C-104	155Eu	Total		4.38E+02	Ci	
241-C-104	226Ra	Sludge	CWP1 (Solid)	3.49E-07	Ci	
241-C-104	226Ra	Sludge	CWP2 (Solid)	5.12E-07	Ci	
241-C-104	226Ra	Sludge	CWZr1 (Solid)	2.11E-07	Ci	
241-C-104	226Ra	Sludge	NA	5.21E-06	Ci	
241-C-104	226Ra	Sludge	OWW3 (Solid)	2.50E-10	Ci	
241-C-104	226Ra	Sludge	TH2 (Solid)	1.25E-04	Ci	
241-C-104	226Ra	Total		1.31E-04	Ci	
241-C-104	227Ac	Sludge	CWP1 (Solid)	1.89E-06	Ci	
241-C-104	227Ac	Sludge	CWP2 (Solid)	7.75E-03	Ci	
241-C-104	227Ac	Sludge	CWZr1 (Solid)	1.45E-06	Ci	
241-C-104	227Ac	Sludge	NA	1.33E-04	Ci	
241-C-104	227Ac	Sludge	OWW3 (Solid)	7.05E-07	Ci	
241-C-104	227Ac	Sludge	TH2 (Solid)	2.01E+00	Ci	
241-C-104	227Ac	Total		2.02E+00	Ci	
241-C-104	228Ra	Sludge	CWP1 (Solid)	3.13E-01	Ci	
241-C-104	228Ra	Sludge	CWP2 (Solid)	2.50E-01	Ci	
241-C-104	228Ra	Sludge	CWZr1 (Solid)	1.66E-01	Ci	
241-C-104	228Ra	Sludge	NA	1.96E-01	Ci	
241-C-104	228Ra	Sludge	OWW3 (Solid)	1.48E-01	Ci	
241-C-104	228Ra	Sludge	TH2 (Solid)	4.07E-01	Ci	
241-C-104	228Ra	Total		1.48E+00	Ci	
241-C-104	229Th	Sludge	CWP1 (Solid)	5.87E-10	Ci	
241-C-104	229Th	Sludge	CWP2 (Solid)	4.00E-02	Ci	
241-C-104	229Th	Sludge	CWZr1 (Solid)	9.40E-10	Ci	
241-C-104	229Th	Sludge	NA	1.37E-06	Ci	
241-C-104	229Th	Sludge	OWW3 (Solid)	1.57E-07	Ci	
241-C-104	229Th	Sludge	TH2 (Solid)	5.13E-01	Ci	
241-C-104	229Th	Total		5.53E-01	Ci	
241-C-104	231Pa	Sludge	CWP1 (Solid)	3.74E-06	Ci	
241-C-104	231Pa	Sludge	CWP2 (Solid)	4.04E-04	Ci	
241-C-104	231Pa	Sludge	CWZr1 (Solid)	3.25E-06	Ci	
241-C-104	231Pa	Sludge	NA	1.19E-03	Ci	
241-C-104	231Pa	Sludge	OWW3 (Solid)	1.04E-06	Ci	
241-C-104	231Pa	Sludge	TH2 (Solid)	1.68E-01	Ci	
241-C-104	231Pa	Total		1.70E-01	Ci	
241-C-104	232Th	Sludge	CWP1 (Solid)	1.32E+00	Ci	
241-C-104	232Th	Sludge	CWP2 (Solid)	9.27E-01	Ci	
241-C-104	232Th	Sludge	CWZr1 (Solid)	3.64E-01	Ci	
241-C-104	232Th	Sludge	NA	6.15E-01	Ci	
241-C-104	232Th	Sludge	OWW3 (Solid)	4.17E-01	Ci	
241-C-104	232Th	Sludge	TH2 (Solid)	3.24E-01	Ci	
241-C-104	232Th	Total		3.97E+00	Ci	
241-C-104	232U	Sludge	CWP1 (Solid)	1.34E-04	Ci	
241-C-104	232U	Sludge	CWP2 (Solid)	6.39E-02	Ci	
241-C-104	232U	Sludge	CWZr1 (Solid)	1.31E-04	Ci	
241-C-104	232U	Sludge	NA	5.92E-01	Ci	
241-C-104	232U	Sludge	OWW3 (Solid)	1.62E-01	Ci	
241-C-104	232U	Sludge	TH2 (Solid)	1.45E+00	Ci	
241-C-104	232U	Total		2.26E+00	Ci	
241-C-104	233U	Sludge	CWP1 (Solid)	1.12E+02	Ci	
241-C-104	233U	Sludge	CWP2 (Solid)	7.87E+01	Ci	
241-C-104	233U	Sludge	CWZr1 (Solid)	3.09E+01	Ci	
241-C-104	233U	Sludge	NA	5.23E+01	Ci	
241-C-104	233U	Sludge	OWW3 (Solid)	3.54E+01	Ci	
241-C-104	233U	Sludge	TH2 (Solid)	2.75E+01	Ci	
241-C-104	233U	Total		3.37E+02	Ci	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-39

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-104	234U	Sludge	CWP1 (Solid)	5.64E+00	Ci	
241-C-104	234U	Sludge	CWP2 (Solid)	3.96E+00	Ci	
241-C-104	234U	Sludge	CWZr1 (Solid)	1.56E+00	Ci	
241-C-104	234U	Sludge	NA	2.63E+00	Ci	
241-C-104	234U	Sludge	OWW3 (Solid)	1.78E+00	Ci	
241-C-104	234U	Sludge	TH2 (Solid)	1.38E+00	Ci	
241-C-104	234U	Total		1.69E+01	Ci	
241-C-104	235U	Sludge	CWP1 (Solid)	1.46E-01	Ci	
241-C-104	235U	Sludge	CWP2 (Solid)	1.02E-01	Ci	
241-C-104	235U	Sludge	CWZr1 (Solid)	4.02E-02	Ci	
241-C-104	235U	Sludge	NA	6.80E-02	Ci	
241-C-104	235U	Sludge	OWW3 (Solid)	4.61E-02	Ci	
241-C-104	235U	Sludge	TH2 (Solid)	3.58E-02	Ci	
241-C-104	235U	Total		4.38E-01	Ci	
241-C-104	236U	Sludge	CWP1 (Solid)	1.86E-01	Ci	
241-C-104	236U	Sludge	CWP2 (Solid)	1.30E-01	Ci	
241-C-104	236U	Sludge	CWZr1 (Solid)	5.12E-02	Ci	
241-C-104	236U	Sludge	NA	8.65E-02	Ci	
241-C-104	236U	Sludge	OWW3 (Solid)	5.86E-02	Ci	
241-C-104	236U	Sludge	TH2 (Solid)	4.55E-02	Ci	
241-C-104	236U	Total		5.58E-01	Ci	
241-C-104	237Np	Sludge	CWP1 (Solid)	1.19E+00	Ci	
241-C-104	237Np	Sludge	CWP2 (Solid)	8.38E-01	Ci	
241-C-104	237Np	Sludge	CWZr1 (Solid)	3.29E-01	Ci	
241-C-104	237Np	Sludge	NA	5.56E-01	Ci	
241-C-104	237Np	Sludge	OWW3 (Solid)	3.77E-01	Ci	
241-C-104	237Np	Sludge	TH2 (Solid)	2.93E-01	Ci	
241-C-104	237Np	Total		3.59E+00	Ci	
241-C-104	238Pu	Sludge	CWP1 (Solid)	3.09E+01	Ci	
241-C-104	238Pu	Sludge	CWP2 (Solid)	2.90E+01	Ci	
241-C-104	238Pu	Sludge	CWZr1 (Solid)	4.28E+01	Ci	
241-C-104	238Pu	Sludge	NA	6.28E+01	Ci	
241-C-104	238Pu	Sludge	OWW3 (Solid)	5.59E+01	Ci	
241-C-104	238Pu	Sludge	TH2 (Solid)	7.59E+00	Ci	
241-C-104	238Pu	Total		2.29E+02	Ci	
241-C-104	238U	Sludge	CWP1 (Solid)	3.18E+00	Ci	
241-C-104	238U	Sludge	CWP2 (Solid)	2.23E+00	Ci	
241-C-104	238U	Sludge	CWZr1 (Solid)	8.78E-01	Ci	
241-C-104	238U	Sludge	NA	1.48E+00	Ci	
241-C-104	238U	Sludge	OWW3 (Solid)	1.00E+00	Ci	
241-C-104	238U	Sludge	TH2 (Solid)	7.80E-01	Ci	
241-C-104	238U	Total		9.56E+00	Ci	
241-C-104	239Pu	Sludge	CWP1 (Solid)	1.79E+03	Ci	
241-C-104	239Pu	Sludge	CWP2 (Solid)	1.23E+03	Ci	
241-C-104	239Pu	Sludge	CWZr1 (Solid)	4.31E+02	Ci	
241-C-104	239Pu	Sludge	NA	7.76E+02	Ci	
241-C-104	239Pu	Sludge	OWW3 (Solid)	5.07E+02	Ci	
241-C-104	239Pu	Sludge	TH2 (Solid)	4.40E+02	Ci	
241-C-104	239Pu	Total		5.18E+03	Ci	
241-C-104	240Pu	Sludge	CWP1 (Solid)	3.73E+02	Ci	
241-C-104	240Pu	Sludge	CWP2 (Solid)	2.91E+02	Ci	
241-C-104	240Pu	Sludge	CWZr1 (Solid)	1.67E+02	Ci	
241-C-104	240Pu	Sludge	NA	2.34E+02	Ci	
241-C-104	240Pu	Sludge	OWW3 (Solid)	1.77E+02	Ci	
241-C-104	240Pu	Sludge	TH2 (Solid)	9.15E+01	Ci	
241-C-104	240Pu	Total		1.33E+03	Ci	
241-C-104	241Am	Sludge	CWP1 (Solid)	2.07E+03	Ci	
241-C-104	241Am	Sludge	CWP2 (Solid)	1.47E+03	Ci	
241-C-104	241Am	Sludge	CWZr1 (Solid)	6.07E+02	Ci	
241-C-104	241Am	Sludge	NA	1.00E+03	Ci	
241-C-104	241Am	Sludge	OWW3 (Solid)	6.88E+02	Ci	
241-C-104	241Am	Sludge	TH2 (Solid)	5.09E+02	Ci	
241-C-104	241Am	Total		6.34E+03	Ci	
241-C-104	241Pu	Sludge	CWP1 (Solid)	1.40E+03	Ci	
241-C-104	241Pu	Sludge	CWP2 (Solid)	1.82E+03	Ci	
241-C-104	241Pu	Sludge	CWZr1 (Solid)	2.94E+03	Ci	
241-C-104	241Pu	Sludge	NA	3.14E+03	Ci	
241-C-104	241Pu	Sludge	OWW3 (Solid)	2.90E+03	Ci	
241-C-104	241Pu	Sludge	TH2 (Solid)	3.43E+02	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-40

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-104	241Pu	Total		1.25E+04	Ci	
241-C-104	242Cm	Sludge	CWP1 (Solid)	6.90E-02	Ci	
241-C-104	242Cm	Sludge	CWP2 (Solid)	6.70E-02	Ci	
241-C-104	242Cm	Sludge	CWZr1 (Solid)	9.60E-02	Ci	
241-C-104	242Cm	Sludge	NA	8.09E-01	Ci	
241-C-104	242Cm	Sludge	OWW3 (Solid)	1.01E+00	Ci	
241-C-104	242Cm	Sludge	TH2 (Solid)	1.69E-02	Ci	
241-C-104	242Cm	Total		2.07E+00	Ci	
241-C-104	242Pu	Sludge	CWP1 (Solid)	1.16E-02	Ci	
241-C-104	242Pu	Sludge	CWP2 (Solid)	1.48E-02	Ci	
241-C-104	242Pu	Sludge	CWZr1 (Solid)	3.22E-02	Ci	
241-C-104	242Pu	Sludge	NA	3.21E-02	Ci	
241-C-104	242Pu	Sludge	OWW3 (Solid)	3.03E-02	Ci	
241-C-104	242Pu	Sludge	TH2 (Solid)	2.85E-03	Ci	
241-C-104	242Pu	Total		1.24E-01	Ci	
241-C-104	243Am	Sludge	CWP1 (Solid)	4.11E-02	Ci	
241-C-104	243Am	Sludge	CWP2 (Solid)	4.35E-02	Ci	
241-C-104	243Am	Sludge	CWZr1 (Solid)	6.34E-02	Ci	
241-C-104	243Am	Sludge	NA	5.91E-01	Ci	
241-C-104	243Am	Sludge	OWW3 (Solid)	6.26E-01	Ci	
241-C-104	243Am	Sludge	TH2 (Solid)	1.01E-02	Ci	
241-C-104	243Am	Total		1.38E+00	Ci	
241-C-104	243Cm	Sludge	CWP1 (Solid)	1.22E-03	Ci	
241-C-104	243Cm	Sludge	CWP2 (Solid)	3.31E-03	Ci	
241-C-104	243Cm	Sludge	CWZr1 (Solid)	2.55E-02	Ci	
241-C-104	243Cm	Sludge	NA	5.82E-02	Ci	
241-C-104	243Cm	Sludge	OWW3 (Solid)	9.52E-02	Ci	
241-C-104	243Cm	Sludge	TH2 (Solid)	2.99E-04	Ci	
241-C-104	243Cm	Total		1.84E-01	Ci	
241-C-104	244Cm	Sludge	CWP1 (Solid)	3.05E-02	Ci	
241-C-104	244Cm	Sludge	CWP2 (Solid)	9.81E-02	Ci	
241-C-104	244Cm	Sludge	CWZr1 (Solid)	5.25E-01	Ci	
241-C-104	244Cm	Sludge	NA	1.34E+00	Ci	
241-C-104	244Cm	Sludge	OWW3 (Solid)	2.10E+00	Ci	
241-C-104	244Cm	Sludge	TH2 (Solid)	7.48E-03	Ci	
241-C-104	244Cm	Total		4.11E+00	Ci	
241-C-104	3H	Sludge	CWP1 (Solid)	1.33E+01	Ci	
241-C-104	3H	Sludge	CWP2 (Solid)	9.34E+00	Ci	
241-C-104	3H	Sludge	CWZr1 (Solid)	3.67E+00	Ci	
241-C-104	3H	Sludge	NA	6.20E+00	Ci	
241-C-104	3H	Sludge	OWW3 (Solid)	4.20E+00	Ci	
241-C-104	3H	Sludge	TH2 (Solid)	3.26E+00	Ci	
241-C-104	3H	Total		4.00E+01	Ci	
241-C-104	59Ni	Sludge	CWP1 (Solid)	2.52E+00	Ci	
241-C-104	59Ni	Sludge	CWP2 (Solid)	1.75E+00	Ci	
241-C-104	59Ni	Sludge	CWZr1 (Solid)	2.64E-02	Ci	
241-C-104	59Ni	Sludge	NA	1.38E+00	Ci	
241-C-104	59Ni	Sludge	OWW3 (Solid)	9.83E-04	Ci	
241-C-104	59Ni	Sludge	TH2 (Solid)	7.15E-03	Ci	
241-C-104	59Ni	Total		5.68E+00	Ci	
241-C-104	60Co	Sludge	CWP1 (Solid)	6.05E+01	Ci	
241-C-104	60Co	Sludge	CWP2 (Solid)	4.25E+01	Ci	
241-C-104	60Co	Sludge	CWZr1 (Solid)	1.67E+01	Ci	
241-C-104	60Co	Sludge	NA	2.82E+01	Ci	
241-C-104	60Co	Sludge	OWW3 (Solid)	1.91E+01	Ci	
241-C-104	60Co	Sludge	TH2 (Solid)	1.48E+01	Ci	
241-C-104	60Co	Total		1.82E+02	Ci	
241-C-104	63Ni	Sludge	CWP1 (Solid)	2.31E+02	Ci	
241-C-104	63Ni	Sludge	CWP2 (Solid)	1.65E+02	Ci	
241-C-104	63Ni	Sludge	CWZr1 (Solid)	2.25E+00	Ci	
241-C-104	63Ni	Sludge	NA	1.29E+02	Ci	
241-C-104	63Ni	Sludge	OWW3 (Solid)	9.27E-02	Ci	
241-C-104	63Ni	Sludge	TH2 (Solid)	6.10E-01	Ci	
241-C-104	63Ni	Total		5.28E+02	Ci	
241-C-104	79Se	Sludge	CWP1 (Solid)	1.74E+00	Ci	
241-C-104	79Se	Sludge	CWP2 (Solid)	1.22E+00	Ci	
241-C-104	79Se	Sludge	CWZr1 (Solid)	4.81E-01	Ci	
241-C-104	79Se	Sludge	NA	8.13E-01	Ci	
241-C-104	79Se	Sludge	OWW3 (Solid)	5.51E-01	Ci	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO : 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-41

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-C-104	79Se	Sludge	TH2 (Solid)	4.28E-01	Ci		
241-C-104	79Se	Total		5.24E+00	Ci		
241-C-104	90Sr	Sludge	CWP1 (Solid)	1.49E+05	Ci		
241-C-104	90Sr	Sludge	CWP2 (Solid)	1.04E+05	Ci		
241-C-104	90Sr	Sludge	CWZr1 (Solid)	4.11E+04	Ci		
241-C-104	90Sr	Sludge	NA	6.93E+04	Ci		
241-C-104	90Sr	Sludge	OWW3 (Solid)	4.70E+04	Ci		
241-C-104	90Sr	Sludge	TH2 (Solid)	3.65E+04	Ci		
241-C-104	90Sr	Total		4.47E+05	Ci		
241-C-104	90Y	Sludge	CWP1 (Solid)	1.49E+05	Ci		
241-C-104	90Y	Sludge	CWP2 (Solid)	1.04E+05	Ci		
241-C-104	90Y	Sludge	CWZr1 (Solid)	4.11E+04	Ci		
241-C-104	90Y	Sludge	NA	6.93E+04	Ci		
241-C-104	90Y	Sludge	OWW3 (Solid)	4.70E+04	Ci		
241-C-104	90Y	Sludge	TH2 (Solid)	3.65E+04	Ci		
241-C-104	90Y	Total		4.47E+05	Ci		
241-C-104	93mNb	Sludge	CWP1 (Solid)	1.36E-02	Ci		
241-C-104	93mNb	Sludge	CWP2 (Solid)	5.05E-03	Ci		
241-C-104	93mNb	Sludge	CWZr1 (Solid)	5.65E-01	Ci		
241-C-104	93mNb	Sludge	NA	8.14E-01	Ci		
241-C-104	93mNb	Sludge	OWW3 (Solid)	1.35E-04	Ci		
241-C-104	93mNb	Sludge	TH2 (Solid)	5.12E-02	Ci		
241-C-104	93mNb	Total		1.45E+00	Ci		
241-C-104	93Zr	Sludge	CWP1 (Solid)	1.58E-02	Ci		
241-C-104	93Zr	Sludge	CWP2 (Solid)	6.21E-03	Ci		
241-C-104	93Zr	Sludge	CWZr1 (Solid)	7.07E-01	Ci		
241-C-104	93Zr	Sludge	NA	9.95E-01	Ci		
241-C-104	93Zr	Sludge	OWW3 (Solid)	1.73E-04	Ci		
241-C-104	93Zr	Sludge	TH2 (Solid)	6.54E-02	Ci		
241-C-104	93Zr	Total		1.79E+00	Ci		
241-C-104	99Tc	Sludge	CWP1 (Solid)	1.92E+01	Ci		
241-C-104	99Tc	Sludge	CWP2 (Solid)	1.35E+01	Ci		
241-C-104	99Tc	Sludge	CWZr1 (Solid)	5.29E+00	Ci		
241-C-104	99Tc	Sludge	NA	8.94E+00	Ci		
241-C-104	99Tc	Sludge	OWW3 (Solid)	6.06E+00	Ci		
241-C-104	99Tc	Sludge	TH2 (Solid)	4.70E+00	Ci		
241-C-104	99Tc	Total		5.76E+01	Ci		
241-C-104	Ag	Sludge	CWP1 (Solid)	3.49E+02	kg	Summary	
241-C-104	Ag	Sludge	CWP2 (Solid)	2.45E+02	kg	Ag	1.05E+03 kg
241-C-104	Ag	Sludge	CWZr1 (Solid)	9.64E+01	kg	Al	8.96E+04 kg
241-C-104	Ag	Sludge	NA	1.63E+02	kg	As	4.84E+01 kg
241-C-104	Ag	Sludge	OWW3 (Solid)	1.10E+02	kg	B	1.78E+03 kg
241-C-104	Ag	Sludge	TH2 (Solid)	8.56E+01	kg	Ba	1.46E+02 kg
241-C-104	Ag	Total		1.05E+03	kg	Be	3.79E+01 kg
241-C-104	Al	Sludge	CWP1 (Solid)	2.98E+04	kg	Bi	7.01E-01 kg
241-C-104	Al	Sludge	CWP2 (Solid)	2.09E+04	kg	Ca	2.97E+03 kg
241-C-104	Al	Sludge	CWZr1 (Solid)	8.23E+03	kg	Cd	1.02E+03 kg
241-C-104	Al	Sludge	NA	1.39E+04	kg	Ce	7.05E+01 kg
241-C-104	Al	Sludge	OWW3 (Solid)	9.42E+03	kg	Cl	7.95E+02 kg
241-C-104	Al	Sludge	TH2 (Solid)	7.31E+03	kg	CN	1.90E+01 kg
241-C-104	Al	Total		8.96E+04	kg	Co	9.69E+00 kg
241-C-104	As	Sludge	CWP1 (Solid)	1.61E+01	kg	Cr	1.45E+03 kg
241-C-104	As	Sludge	CWP2 (Solid)	1.13E+01	kg	Cu	1.33E+02 kg
241-C-104	As	Sludge	CWZr1 (Solid)	4.45E+00	kg	F	3.44E+04 kg
241-C-104	As	Sludge	NA	7.51E+00	kg	Fe	2.74E+04 kg
241-C-104	As	Sludge	OWW3 (Solid)	5.09E+00	kg	OH	0.00E+00 kg
241-C-104	As	Sludge	TH2 (Solid)	3.95E+00	kg	Hg	5.50E+01 kg
241-C-104	As	Total		4.84E+01	kg	K	1.32E+03 kg
241-C-104	B	Sludge	CWP1 (Solid)	5.92E+02	kg	La	4.84E+01 kg
241-C-104	B	Sludge	CWP2 (Solid)	4.16E+02	kg	Li	6.01E+00 kg
241-C-104	B	Sludge	CWZr1 (Solid)	1.63E+02	kg	Mg	2.05E+02 kg
241-C-104	B	Sludge	NA	2.76E+02	kg	Mn	6.97E+03 kg
241-C-104	B	Sludge	OWW3 (Solid)	1.87E+02	kg	Mo	2.17E+01 kg
241-C-104	B	Sludge	TH2 (Solid)	1.45E+02	kg	Na	1.77E+05 kg
241-C-104	B	Total		1.78E+03	kg	Nd	1.06E+02 kg
241-C-104	Ba	Sludge	CWP1 (Solid)	4.87E+01	kg	NH3	0.00E+00 kg
241-C-104	Ba	Sludge	CWP2 (Solid)	3.42E+01	kg	Ni	2.62E+03 kg
241-C-104	Ba	Sludge	CWZr1 (Solid)	1.34E+01	kg	NO2	3.63E+04 kg
241-C-104	Ba	Sludge	NA	2.27E+01	kg	NO3	1.95E+04 kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-42

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-C-104	Ba	Sludge	OWW3 (Solid)	1 54E+01	kg
241-C-104	Ba	Sludge	TH2 (Solid)	1.19E+01	kg
241-C-104	Ba	Total		1.46E+02	kg
241-C-104	Be	Sludge	CWP1 (Solid)	1.26E+01	kg
241-C-104	Be	Sludge	CWP2 (Solid)	8.86E+00	kg
241-C-104	Be	Sludge	CWZr1 (Solid)	3.48E+00	kg
241-C-104	Be	Sludge	NA	5.88E+00	kg
241-C-104	Be	Sludge	OWW3 (Solid)	3.98E+00	kg
241-C-104	Be	Sludge	TH2 (Solid)	3.09E+00	kg
241-C-104	Be	Total		3.79E+01	kg
241-C-104	Bi	Sludge	CWP1 (Solid)	0.00E+00	kg
241-C-104	Bi	Sludge	CWP2 (Solid)	0.00E+00	kg
241-C-104	Bi	Sludge	CWZr1 (Solid)	0.00E+00	kg
241-C-104	Bi	Sludge	NA	7.01E-01	kg
241-C-104	Bi	Sludge	OWW3 (Solid)	0.00E+00	kg
241-C-104	Bi	Sludge	TH2 (Solid)	0.00E+00	kg
241-C-104	Bi	Total		7.01E-01	kg
241-C-104	Ca	Sludge	CWP1 (Solid)	9.87E+02	kg
241-C-104	Ca	Sludge	CWP2 (Solid)	6.93E+02	kg
241-C-104	Ca	Sludge	CWZr1 (Solid)	2.73E+02	kg
241-C-104	Ca	Sludge	NA	4.60E+02	kg
241-C-104	Ca	Sludge	OWW3 (Solid)	3.12E+02	kg
241-C-104	Ca	Sludge	TH2 (Solid)	2.42E+02	kg
241-C-104	Ca	Total		2.97E+03	kg
241-C-104	Cd	Sludge	CWP1 (Solid)	3.39E+02	kg
241-C-104	Cd	Sludge	CWP2 (Solid)	2.38E+02	kg
241-C-104	Cd	Sludge	CWZr1 (Solid)	9.37E+01	kg
241-C-104	Cd	Sludge	NA	1.58E+02	kg
241-C-104	Cd	Sludge	OWW3 (Solid)	1.07E+02	kg
241-C-104	Cd	Sludge	TH2 (Solid)	8.33E+01	kg
241-C-104	Cd	Total		1.02E+03	kg
241-C-104	Ce	Sludge	CWP1 (Solid)	2.35E+01	kg
241-C-104	Ce	Sludge	CWP2 (Solid)	1.65E+01	kg
241-C-104	Ce	Sludge	CWZr1 (Solid)	6.48E+00	kg
241-C-104	Ce	Sludge	NA	1.09E+01	kg
241-C-104	Ce	Sludge	OWW3 (Solid)	7.41E+00	kg
241-C-104	Ce	Sludge	TH2 (Solid)	5.76E+00	kg
241-C-104	Ce	Total		7.05E+01	kg
241-C-104	Cl	Sludge	CWP1 (Solid)	2.65E+02	kg
241-C-104	Cl	Sludge	CWP2 (Solid)	1.86E+02	kg
241-C-104	Cl	Sludge	CWZr1 (Solid)	7.30E+01	kg
241-C-104	Cl	Sludge	NA	1.23E+02	kg
241-C-104	Cl	Sludge	OWW3 (Solid)	8.36E+01	kg
241-C-104	Cl	Sludge	TH2 (Solid)	6.49E+01	kg
241-C-104	Cl	Total		7.95E+02	kg
241-C-104	CN	Sludge	CWP1 (Solid)	6.33E+00	kg
241-C-104	CN	Sludge	CWP2 (Solid)	4.45E+00	kg
241-C-104	CN	Sludge	CWZr1 (Solid)	1.75E+00	kg
241-C-104	CN	Sludge	NA	2.95E+00	kg
241-C-104	CN	Sludge	OWW3 (Solid)	2.00E+00	kg
241-C-104	CN	Sludge	TH2 (Solid)	1.55E+00	kg
241-C-104	CN	Total		1.90E+01	kg
241-C-104	Co	Sludge	CWP1 (Solid)	3.22E+00	kg
241-C-104	Co	Sludge	CWP2 (Solid)	2.27E+00	kg
241-C-104	Co	Sludge	CWZr1 (Solid)	8.90E-01	kg
241-C-104	Co	Sludge	NA	1.50E+00	kg
241-C-104	Co	Sludge	OWW3 (Solid)	1.02E+00	kg
241-C-104	Co	Sludge	TH2 (Solid)	7.91E-01	kg
241-C-104	Co	Total		9.69E+00	kg
241-C-104	Cr	Sludge	CWP1 (Solid)	4.83E+02	kg
241-C-104	Cr	Sludge	CWP2 (Solid)	3.39E+02	kg
241-C-104	Cr	Sludge	CWZr1 (Solid)	1.33E+02	kg
241-C-104	Cr	Sludge	NA	2.25E+02	kg
241-C-104	Cr	Sludge	OWW3 (Solid)	1.53E+02	kg
241-C-104	Cr	Sludge	TH2 (Solid)	1.19E+02	kg
241-C-104	Cr	Total		1.45E+03	kg
241-C-104	Cu	Sludge	CWP1 (Solid)	4.42E+01	kg
241-C-104	Cu	Sludge	CWP2 (Solid)	3.11E+01	kg
241-C-104	Cu	Sludge	CWZr1 (Solid)	1.22E+01	kg

Summary		
Oxalate	5.58E+03	kg
Pb	8.32E+02	kg
Pd	0.00E+00	kg
PO4	3.19E+03	kg
Pr	5.71E+01	kg
Rb	2.18E+02	kg
Rh	1.21E+02	kg
Ru	0.00E+00	kg
Sb	2.91E+01	kg
Se	4.84E+01	kg
Si	1.02E+04	kg
SO4	3.40E+03	kg
Sr	8.69E+01	kg
Ta	1.43E+00	kg
Te	0.00E+00	kg
Th	3.61E+04	kg
Ti	9.74E+01	kg
TIC as CO3	4.82E+04	kg
Tl	9.69E+01	kg
TOC	1.41E+04	kg
UTOTAL	2.87E+04	kg
V	2.70E+01	kg
W	0.00E+00	kg
Y	2.36E+01	kg
Zn	6.05E+02	kg
Zr	6.45E+04	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-43

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-104	Cu	Sludge	NA	2.06E+01	kg	
241-C-104	Cu	Sludge	OWW3 (Solid)	1.40E+01	kg	
241-C-104	Cu	Sludge	TH2 (Solid)	1.09E+01	kg	
241-C-104	Cu	Total		1.33E+02	kg	
241-C-104	F	Sludge	CWP1 (Solid)	1.14E+04	kg	
241-C-104	F	Sludge	CWP2 (Solid)	8.04E+03	kg	
241-C-104	F	Sludge	CWZr1 (Solid)	3.16E+03	kg	
241-C-104	F	Sludge	NA	5.33E+03	kg	
241-C-104	F	Sludge	OWW3 (Solid)	3.61E+03	kg	
241-C-104	F	Sludge	TH2 (Solid)	2.81E+03	kg	
241-C-104	F	Total		3.44E+04	kg	
241-C-104	Fe	Sludge	CWP1 (Solid)	9.12E+03	kg	
241-C-104	Fe	Sludge	CWP2 (Solid)	6.41E+03	kg	
241-C-104	Fe	Sludge	CWZr1 (Solid)	2.52E+03	kg	
241-C-104	Fe	Sludge	NA	4.25E+03	kg	
241-C-104	Fe	Sludge	OWW3 (Solid)	2.88E+03	kg	
241-C-104	Fe	Sludge	TH2 (Solid)	2.24E+03	kg	
241-C-104	Fe	Total		2.74E+04	kg	
241-C-104	Hg	Sludge	CWP1 (Solid)	1.83E+01	kg	
241-C-104	Hg	Sludge	CWP2 (Solid)	1.29E+01	kg	
241-C-104	Hg	Sludge	CWZr1 (Solid)	5.06E+00	kg	
241-C-104	Hg	Sludge	NA	8.54E+00	kg	
241-C-104	Hg	Sludge	OWW3 (Solid)	5.79E+00	kg	
241-C-104	Hg	Sludge	TH2 (Solid)	4.49E+00	kg	
241-C-104	Hg	Total		5.50E+01	kg	
241-C-104	K	Sludge	CWP1 (Solid)	4.40E+02	kg	
241-C-104	K	Sludge	CWP2 (Solid)	3.09E+02	kg	
241-C-104	K	Sludge	CWZr1 (Solid)	1.22E+02	kg	
241-C-104	K	Sludge	NA	2.05E+02	kg	
241-C-104	K	Sludge	OWW3 (Solid)	1.39E+02	kg	
241-C-104	K	Sludge	TH2 (Solid)	1.08E+02	kg	
241-C-104	K	Total		1.32E+03	kg	
241-C-104	La	Sludge	CWP1 (Solid)	1.61E+01	kg	
241-C-104	La	Sludge	CWP2 (Solid)	1.13E+01	kg	
241-C-104	La	Sludge	CWZr1 (Solid)	4.44E+00	kg	
241-C-104	La	Sludge	NA	7.50E+00	kg	
241-C-104	La	Sludge	OWW3 (Solid)	5.08E+00	kg	
241-C-104	La	Sludge	TH2 (Solid)	3.95E+00	kg	
241-C-104	La	Total		4.84E+01	kg	
241-C-104	Li	Sludge	CWP1 (Solid)	2.00E+00	kg	
241-C-104	Li	Sludge	CWP2 (Solid)	1.40E+00	kg	
241-C-104	Li	Sludge	CWZr1 (Solid)	5.52E-01	kg	
241-C-104	Li	Sludge	NA	9.32E-01	kg	
241-C-104	Li	Sludge	OWW3 (Solid)	6.32E-01	kg	
241-C-104	Li	Sludge	TH2 (Solid)	4.91E-01	kg	
241-C-104	Li	Total		6.01E+00	kg	
241-C-104	Mg	Sludge	CWP1 (Solid)	6.81E+01	kg	
241-C-104	Mg	Sludge	CWP2 (Solid)	4.79E+01	kg	
241-C-104	Mg	Sludge	CWZr1 (Solid)	1.88E+01	kg	
241-C-104	Mg	Sludge	NA	3.18E+01	kg	
241-C-104	Mg	Sludge	OWW3 (Solid)	2.15E+01	kg	
241-C-104	Mg	Sludge	TH2 (Solid)	1.67E+01	kg	
241-C-104	Mg	Total		2.05E+02	kg	
241-C-104	Mn	Sludge	CWP1 (Solid)	2.32E+03	kg	
241-C-104	Mn	Sludge	CWP2 (Solid)	1.63E+03	kg	
241-C-104	Mn	Sludge	CWZr1 (Solid)	6.40E+02	kg	
241-C-104	Mn	Sludge	NA	1.08E+03	kg	
241-C-104	Mn	Sludge	OWW3 (Solid)	7.33E+02	kg	
241-C-104	Mn	Sludge	TH2 (Solid)	5.69E+02	kg	
241-C-104	Mn	Total		6.97E+03	kg	
241-C-104	Mo	Sludge	CWP1 (Solid)	7.22E+00	kg	
241-C-104	Mo	Sludge	CWP2 (Solid)	5.07E+00	kg	
241-C-104	Mo	Sludge	CWZr1 (Solid)	1.99E+00	kg	
241-C-104	Mo	Sludge	NA	3.37E+00	kg	
241-C-104	Mo	Sludge	OWW3 (Solid)	2.28E+00	kg	
241-C-104	Mo	Sludge	TH2 (Solid)	1.77E+00	kg	
241-C-104	Mo	Total		2.17E+01	kg	
241-C-104	Na	Sludge	CWP1 (Solid)	5.89E+04	kg	
241-C-104	Na	Sludge	CWP2 (Solid)	4.14E+04	kg	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-44

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-104	Na	Sludge	CWZr1 (Solid)	1.63E+04	kg	
241-C-104	Na	Sludge	NA	2.75E+04	kg	
241-C-104	Na	Sludge	OWW3 (Solid)	1.86E+04	kg	
241-C-104	Na	Sludge	TH2 (Solid)	1.44E+04	kg	
241-C-104	Na	Total		1.77E+05	kg	
241-C-104	Nd	Sludge	CWP1 (Solid)	3.53E+01	kg	
241-C-104	Nd	Sludge	CWP2 (Solid)	2.48E+01	kg	
241-C-104	Nd	Sludge	CWZr1 (Solid)	9.76E+00	kg	
241-C-104	Nd	Sludge	NA	1.65E+01	kg	
241-C-104	Nd	Sludge	OWW3 (Solid)	1.12E+01	kg	
241-C-104	Nd	Sludge	TH2 (Solid)	8.67E+00	kg	
241-C-104	Nd	Total		1.06E+02	kg	
241-C-104	Ni	Sludge	CWP1 (Solid)	8.71E+02	kg	
241-C-104	Ni	Sludge	CWP2 (Solid)	6.12E+02	kg	
241-C-104	Ni	Sludge	CWZr1 (Solid)	2.40E+02	kg	
241-C-104	Ni	Sludge	NA	4.06E+02	kg	
241-C-104	Ni	Sludge	OWW3 (Solid)	2.75E+02	kg	
241-C-104	Ni	Sludge	TH2 (Solid)	2.14E+02	kg	
241-C-104	Ni	Total		2.62E+03	kg	
241-C-104	NO2	Sludge	CWP1 (Solid)	1.21E+04	kg	
241-C-104	NO2	Sludge	CWP2 (Solid)	8.48E+03	kg	
241-C-104	NO2	Sludge	CWZr1 (Solid)	3.33E+03	kg	
241-C-104	NO2	Sludge	NA	5.63E+03	kg	
241-C-104	NO2	Sludge	OWW3 (Solid)	3.81E+03	kg	
241-C-104	NO2	Sludge	TH2 (Solid)	2.96E+03	kg	
241-C-104	NO2	Total		3.63E+04	kg	
241-C-104	NO3	Sludge	CWP1 (Solid)	6.47E+03	kg	
241-C-104	NO3	Sludge	CWP2 (Solid)	4.55E+03	kg	
241-C-104	NO3	Sludge	CWZr1 (Solid)	1.79E+03	kg	
241-C-104	NO3	Sludge	NA	3.02E+03	kg	
241-C-104	NO3	Sludge	OWW3 (Solid)	2.04E+03	kg	
241-C-104	NO3	Sludge	TH2 (Solid)	1.59E+03	kg	
241-C-104	NO3	Total		1.95E+04	kg	
241-C-104	Oxalate	Sludge	CWP1 (Solid)	1.86E+03	kg	
241-C-104	Oxalate	Sludge	CWP2 (Solid)	1.30E+03	kg	
241-C-104	Oxalate	Sludge	CWZr1 (Solid)	5.12E+02	kg	
241-C-104	Oxalate	Sludge	NA	8.65E+02	kg	
241-C-104	Oxalate	Sludge	OWW3 (Solid)	5.86E+02	kg	
241-C-104	Oxalate	Sludge	TH2 (Solid)	4.55E+02	kg	
241-C-104	Oxalate	Total		5.58E+03	kg	
241-C-104	Pb	Sludge	CWP1 (Solid)	2.77E+02	kg	
241-C-104	Pb	Sludge	CWP2 (Solid)	1.94E+02	kg	
241-C-104	Pb	Sludge	CWZr1 (Solid)	7 64E+01	kg	
241-C-104	Pb	Sludge	NA	1.29E+02	kg	
241-C-104	Pb	Sludge	OWW3 (Solid)	8.74E+01	kg	
241-C-104	Pb	Sludge	TH2 (Solid)	6.79E+01	kg	
241-C-104	Pb	Total		8.32E+02	kg	
241-C-104	PO4	Sludge	CWP1 (Solid)	1.06E+03	kg	
241-C-104	PO4	Sludge	CWP2 (Solid)	7.45E+02	kg	
241-C-104	PO4	Sludge	CWZr1 (Solid)	2.93E+02	kg	
241-C-104	PO4	Sludge	NA	4.94E+02	kg	
241-C-104	PO4	Sludge	OWW3 (Solid)	3.35E+02	kg	
241-C-104	PO4	Sludge	TH2 (Solid)	2.60E+02	kg	
241-C-104	PO4	Total		3.19E+03	kg	
241-C-104	Pr	Sludge	CWP1 (Solid)	1.90E+01	kg	
241-C-104	Pr	Sludge	CWP2 (Solid)	1.33E+01	kg	
241-C-104	Pr	Sludge	CWZr1 (Solid)	5.25E+00	kg	
241-C-104	Pr	Sludge	NA	8.86E+00	kg	
241-C-104	Pr	Sludge	OWW3 (Solid)	6.00E+00	kg	
241-C-104	Pr	Sludge	TH2 (Solid)	4.66E+00	kg	
241-C-104	Pr	Total		5.71E+01	kg	
241-C-104	Rb	Sludge	CWP1 (Solid)	7.24E+01	kg	
241-C-104	Rb	Sludge	CWP2 (Solid)	5.08E+01	kg	
241-C-104	Rb	Sludge	CWZr1 (Solid)	2.00E+01	kg	
241-C-104	Rb	Sludge	NA	3.37E+01	kg	
241-C-104	Rb	Sludge	OWW3 (Solid)	2.29E+01	kg	
241-C-104	Rb	Sludge	TH2 (Solid)	1.78E+01	kg	
241-C-104	Rb	Total		2.18E+02	kg	
241-C-104	Rh	Sludge	CWP1 (Solid)	4.03E+01	kg	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-45

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-104	Rh	Sludge	CWP2 (Solid)	2.83E+01	kg	
241-C-104	Rh	Sludge	CWZr1 (Solid)	1.11E+01	kg	
241-C-104	Rh	Sludge	NA	1.88E+01	kg	
241-C-104	Rh	Sludge	OWW3 (Solid)	1.27E+01	kg	
241-C-104	Rh	Sludge	TH2 (Solid)	9.90E+00	kg	
241-C-104	Rh	Total		1.21E+02	kg	
241-C-104	Sb	Sludge	CWP1 (Solid)	9.68E+00	kg	
241-C-104	Sb	Sludge	CWP2 (Solid)	6.80E+00	kg	
241-C-104	Sb	Sludge	CWZr1 (Solid)	2.67E+00	kg	
241-C-104	Sb	Sludge	NA	4.51E+00	kg	
241-C-104	Sb	Sludge	OWW3 (Solid)	3.06E+00	kg	
241-C-104	Sb	Sludge	TH2 (Solid)	2.38E+00	kg	
241-C-104	Sb	Total		2.91E+01	kg	
241-C-104	Se	Sludge	CWP1 (Solid)	1.61E+01	kg	
241-C-104	Se	Sludge	CWP2 (Solid)	1.13E+01	kg	
241-C-104	Se	Sludge	CWZr1 (Solid)	4.45E+00	kg	
241-C-104	Se	Sludge	NA	7.51E+00	kg	
241-C-104	Se	Sludge	OWW3 (Solid)	5.09E+00	kg	
241-C-104	Se	Sludge	TH2 (Solid)	3.95E+00	kg	
241-C-104	Se	Total		4.84E+01	kg	
241-C-104	Si	Sludge	CWP1 (Solid)	3.38E+03	kg	
241-C-104	Si	Sludge	CWP2 (Solid)	2.38E+03	kg	
241-C-104	Si	Sludge	CWZr1 (Solid)	9.34E+02	kg	
241-C-104	Si	Sludge	NA	1.58E+03	kg	
241-C-104	Si	Sludge	OWW3 (Solid)	1.07E+03	kg	
241-C-104	Si	Sludge	TH2 (Solid)	8.30E+02	kg	
241-C-104	Si	Total		1.02E+04	kg	
241-C-104	SO4	Sludge	CWP1 (Solid)	1.13E+03	kg	
241-C-104	SO4	Sludge	CWP2 (Solid)	7.94E+02	kg	
241-C-104	SO4	Sludge	CWZr1 (Solid)	3.12E+02	kg	
241-C-104	SO4	Sludge	NA	5.27E+02	kg	
241-C-104	SO4	Sludge	OWW3 (Solid)	3.57E+02	kg	
241-C-104	SO4	Sludge	TH2 (Solid)	2.77E+02	kg	
241-C-104	SO4	Total		3.40E+03	kg	
241-C-104	Sr	Sludge	CWP1 (Solid)	2.89E+01	kg	
241-C-104	Sr	Sludge	CWP2 (Solid)	2.03E+01	kg	
241-C-104	Sr	Sludge	CWZr1 (Solid)	7.98E+00	kg	
241-C-104	Sr	Sludge	NA	1.35E+01	kg	
241-C-104	Sr	Sludge	OWW3 (Solid)	9.14E+00	kg	
241-C-104	Sr	Sludge	TH2 (Solid)	7.10E+00	kg	
241-C-104	Sr	Total		8.69E+01	kg	
241-C-104	Ta	Sludge	CWP1 (Solid)	4.74E-01	kg	
241-C-104	Ta	Sludge	CWP2 (Solid)	3.33E-01	kg	
241-C-104	Ta	Sludge	CWZr1 (Solid)	1.31E-01	kg	
241-C-104	Ta	Sludge	NA	2.21E-01	kg	
241-C-104	Ta	Sludge	OWW3 (Solid)	1.50E-01	kg	
241-C-104	Ta	Sludge	TH2 (Solid)	1.16E-01	kg	
241-C-104	Ta	Total		1.43E+00	kg	
241-C-104	Th	Sludge	CWP1 (Solid)	1.20E+04	kg	
241-C-104	Th	Sludge	CWP2 (Solid)	8.43E+03	kg	
241-C-104	Th	Sludge	CWZr1 (Solid)	3.31E+03	kg	
241-C-104	Th	Sludge	NA	5.59E+03	kg	
241-C-104	Th	Sludge	OWW3 (Solid)	3.79E+03	kg	
241-C-104	Th	Sludge	TH2 (Solid)	2.94E+03	kg	
241-C-104	Th	Total		3.61E+04	kg	
241-C-104	Ti	Sludge	CWP1 (Solid)	3.24E+01	kg	
241-C-104	Ti	Sludge	CWP2 (Solid)	2.28E+01	kg	
241-C-104	Ti	Sludge	CWZr1 (Solid)	8.94E+00	kg	
241-C-104	Ti	Sludge	NA	1.51E+01	kg	
241-C-104	Ti	Sludge	OWW3 (Solid)	1.02E+01	kg	
241-C-104	Ti	Sludge	TH2 (Solid)	7.95E+00	kg	
241-C-104	Ti	Total		9.74E+01	kg	
241-C-104	TIC as CO	Sludge	CWP1 (Solid)	1.60E+04	kg	
241-C-104	TIC as CO	Sludge	CWP2 (Solid)	1.13E+04	kg	
241-C-104	TIC as CO	Sludge	CWZr1 (Solid)	4.43E+03	kg	
241-C-104	TIC as CO	Sludge	NA	7.48E+03	kg	
241-C-104	TIC as CO	Sludge	OWW3 (Solid)	5.07E+03	kg	
241-C-104	TIC as CO	Sludge	TH2 (Solid)	3.94E+03	kg	
241-C-104	TIC as CO	Total		4.82E+04	kg	

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-46

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-104	Tl	Sludge	CWP1 (Solid)	3.22E+01	kg	
241-C-104	Tl	Sludge	CWP2 (Solid)	2.27E+01	kg	
241-C-104	Tl	Sludge	CWZr1 (Solid)	8.90E+00	kg	
241-C-104	Tl	Sludge	NA	1.50E+01	kg	
241-C-104	Tl	Sludge	OWW3 (Solid)	1.02E+01	kg	
241-C-104	Tl	Sludge	TH2 (Solid)	7.91E+00	kg	
241-C-104	Tl	Total		9.69E+01	kg	
241-C-104	TOC	Sludge	CWP1 (Solid)	4.68E+03	kg	
241-C-104	TOC	Sludge	CWP2 (Solid)	3.29E+03	kg	
241-C-104	TOC	Sludge	CWZr1 (Solid)	1.29E+03	kg	
241-C-104	TOC	Sludge	NA	2.18E+03	kg	
241-C-104	TOC	Sludge	OWW3 (Solid)	1.48E+03	kg	
241-C-104	TOC	Sludge	TH2 (Solid)	1.15E+03	kg	
241-C-104	TOC	Total		1.41E+04	kg	
241-C-104	UTOTAL	Sludge	CWP1 (Solid)	9.53E+03	kg	
241-C-104	UTOTAL	Sludge	CWP2 (Solid)	6.70E+03	kg	
241-C-104	UTOTAL	Sludge	CWZr1 (Solid)	2.63E+03	kg	
241-C-104	UTOTAL	Sludge	NA	4.44E+03	kg	
241-C-104	UTOTAL	Sludge	OWW3 (Solid)	3.01E+03	kg	
241-C-104	UTOTAL	Sludge	TH2 (Solid)	2.34E+03	kg	
241-C-104	UTOTAL	Total		2.87E+04	kg	
241-C-104	V	Sludge	CWP1 (Solid)	9.00E+00	kg	
241-C-104	V	Sludge	CWP2 (Solid)	6.32E+00	kg	
241-C-104	V	Sludge	CWZr1 (Solid)	2.48E+00	kg	
241-C-104	V	Sludge	NA	4.19E+00	kg	
241-C-104	V	Sludge	OWW3 (Solid)	2.84E+00	kg	
241-C-104	V	Sludge	TH2 (Solid)	2.21E+00	kg	
241-C-104	V	Total		2.70E+01	kg	
241-C-104	Y	Sludge	CWP1 (Solid)	7.85E+00	kg	
241-C-104	Y	Sludge	CWP2 (Solid)	5.51E+00	kg	
241-C-104	Y	Sludge	CWZr1 (Solid)	2.17E+00	kg	
241-C-104	Y	Sludge	NA	3.66E+00	kg	
241-C-104	Y	Sludge	OWW3 (Solid)	2.48E+00	kg	
241-C-104	Y	Sludge	TH2 (Solid)	1 93E+00	kg	
241-C-104	Y	Total		2.36E+01	kg	
241-C-104	Zn	Sludge	CWP1 (Solid)	2.01E+02	kg	
241-C-104	Zn	Sludge	CWP2 (Solid)	1.41E+02	kg	
241-C-104	Zn	Sludge	CWZr1 (Solid)	5.55E+01	kg	
241-C-104	Zn	Sludge	NA	9.38E+01	kg	
241-C-104	Zn	Sludge	OWW3 (Solid)	6.35E+01	kg	
241-C-104	Zn	Sludge	TH2 (Solid)	4.93E+01	kg	
241-C-104	Zn	Total		6.05E+02	kg	
241-C-104	Zr	Sludge	CWP1 (Solid)	2.15E+04	kg	
241-C-104	Zr	Sludge	CWP2 (Solid)	1.51E+04	kg	
241-C-104	Zr	Sludge	CWZr1 (Solid)	5.92E+03	kg	
241-C-104	Zr	Sludge	NA	1.00E+04	kg	
241-C-104	Zr	Sludge	OWW3 (Solid)	6.78E+03	kg	
241-C-104	Zr	Sludge	TH2 (Solid)	5.27E+03	kg	
241-C-104	Zr	Total		6.45E+04	kg	

241-C-106	106Ru	Sludge	NA	4.52E-05	Ci	Summary	
241-C-106	106Ru	Supernatant	NA	0.00E+00	Ci	106Ru	4.52E-05 Ci
241-C-106	106Ru	Total		4.52E-05	Ci	113mCd	4.68E+00 Ci
241-C-106	113mCd	Sludge	NA	4.68E+00	Ci	125Sb	2.02E-01 Ci
241-C-106	113mCd	Supernatant	NA	0.00E+00	Ci	126Sn	1.62E+00 Ci
241-C-106	113mCd	Total		4.68E+00	Ci	129I	6.30E-04 Ci
241-C-106	125Sb	Sludge	NA	2.02E-01	Ci	134Cs	3.28E-03 Ci
241-C-106	125Sb	Supernatant	NA	2.14E-04	Ci	137Cs	1.45E+03 Ci
241-C-106	125Sb	Total		2.02E-01	Ci	137mBa	1.37E+03 Ci
241-C-106	126Sn	Supernatant	NA	0.00E+00	Ci	14C	8.22E-03 Ci
241-C-106	126Sn	Sludge	NA	1.62E+00	Ci	151Sm	8.85E+03 Ci
241-C-106	126Sn	Total		1.62E+00	Ci	152Eu	4.57E+00 Ci
241-C-106	129I	Sludge	NA	6.30E-04	Ci	154Eu	8.18E+01 Ci
241-C-106	129I	Supernatant	NA	4.28E-07	Ci	155Eu	7.90E+01 Ci
241-C-106	129I	Total		6.31E-04	Ci	226Ra	5.16E-04 Ci
241-C-106	134Cs	Sludge	NA	3.28E-03	Ci	227Ac	2.55E-03 Ci
241-C-106	134Cs	Supernatant	NA	3.32E-05	Ci	228Ra	3.24E-03 Ci

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-47

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-C-106	134Cs	Total		3.31E-03	Ci
241-C-106	137Cs	Sludge	NA	1.45E+03	Ci
241-C-106	137Cs	Supernatant	NA	1.40E-01	Ci
241-C-106	137Cs	Total		1.45E+03	Ci
241-C-106	137mBa	Sludge	NA	1.37E+03	Ci
241-C-106	137mBa	Supernatant	NA	1.32E-01	Ci
241-C-106	137mBa	Total		1.37E+03	Ci
241-C-106	14C	Sludge	NA	8.22E-03	Ci
241-C-106	14C	Supernatant	NA	9.69E-07	Ci
241-C-106	14C	Total		8.23E-03	Ci
241-C-106	151Sm	Supernatant	NA	0.00E+00	Ci
241-C-106	151Sm	Sludge	NA	8.85E+03	Ci
241-C-106	151Sm	Total		8.85E+03	Ci
241-C-106	152Eu	Sludge	NA	4.57E+00	Ci
241-C-106	152Eu	Supernatant	NA	7.27E-05	Ci
241-C-106	152Eu	Total		4.57E+00	Ci
241-C-106	154Eu	Sludge	NA	8.18E+01	Ci
241-C-106	154Eu	Supernatant	NA	2.47E-05	Ci
241-C-106	154Eu	Total		8.18E+01	Ci
241-C-106	155Eu	Sludge	NA	7.90E+01	Ci
241-C-106	155Eu	Supernatant	NA	5.38E-05	Ci
241-C-106	155Eu	Total		7.90E+01	Ci
241-C-106	226Ra	Sludge	NA	5.16E-04	Ci
241-C-106	226Ra	Supernatant	NA	8.77E-04	Ci
241-C-106	226Ra	Total		1.39E-03	Ci
241-C-106	227Ac	Sludge	NA	2.55E-03	Ci
241-C-106	227Ac	Supernatant	NA	0.00E+00	Ci
241-C-106	227Ac	Total		2.55E-03	Ci
241-C-106	228Ac	Sludge	NA	7.77E+01	Ci
241-C-106	228Ac	Supernatant	NA	3.70E-05	Ci
241-C-106	228Ac	Total		7.77E+01	Ci
241-C-106	228Ra	Sludge	NA	3.24E-03	Ci
241-C-106	228Ra	Supernatant	NA	7.60E-12	Ci
241-C-106	228Ra	Total		3.24E-03	Ci
241-C-106	228Th	Supernatant	NA	2.28E-09	Ci
241-C-106	228Th	Sludge	NA	5.75E-04	Ci
241-C-106	228Th	Total		5.75E-04	Ci
241-C-106	229Th	Sludge	NA	1.91E-05	Ci
241-C-106	229Th	Supernatant	NA	0.00E+00	Ci
241-C-106	229Th	Total		1.91E-05	Ci
241-C-106	230Th	Supernatant	NA	4.64E-08	Ci
241-C-106	230Th	Supernatant	NA	4.64E-08	Ci
241-C-106	230Th	Sludge	NA	9.56E-04	Ci
241-C-106	230Th	Sludge	NA	9.56E-04	Ci
241-C-106	230Th	Total		4.89E-05	kg
241-C-106	231Pa	Supernatant	NA	0.00E+00	Ci
241-C-106	231Pa	Sludge	NA	2.53E-03	Ci
241-C-106	231Pa	Total		2.53E-03	Ci
241-C-106	232Th	Sludge	NA	5.60E-04	Ci
241-C-106	232Th	Supernatant	NA	1.11E-11	Ci
241-C-106	232Th	Total		5.60E-04	Ci
241-C-106	232U	Sludge	NA	5.72E-04	Ci
241-C-106	232U	Supernatant	NA	0.00E+00	Ci
241-C-106	232U	Total		5.72E-04	Ci
241-C-106	233U	Supernatant	NA	5.39E-08	Ci
241-C-106	233U	Sludge	NA	1.83E-03	Ci
241-C-106	233U	Total		1.83E-03	Ci
241-C-106	234U	Sludge	NA	9.40E-04	Ci
241-C-106	234U	Supernatant	NA	9.85E-08	Ci
241-C-106	234U	Total		9.41E-04	Ci
241-C-106	235U	Sludge	NA	3.86E-05	Ci
241-C-106	235U	Supernatant	NA	4.04E-09	Ci
241-C-106	235U	Total		3.86E-05	Ci
241-C-106	236U	Sludge	NA	1.73E-05	Ci
241-C-106	236U	Supernatant	NA	1.67E-09	Ci
241-C-106	236U	Total		1.73E-05	Ci
241-C-106	237Np	Sludge	NA	5.41E-02	Ci
241-C-106	237Np	Supernatant	NA	5.99E-08	Ci
241-C-106	237Np	Total		5.41E-02	Ci

Summary		
229Th	1.91E-05	Ci
231Pa	2.53E-03	Ci
232Th	5.60E-04	Ci
232U	5.72E-04	Ci
233U	1.83E-03	Ci
234U	9.40E-04	Ci
235U	3.86E-05	Ci
236U	1.73E-05	Ci
237Np	5.41E-02	Ci
238Pu	2.70E+00	Ci
238U	9.02E-04	Ci
239Pu	1.67E+01	Ci
240Pu	3.57E+00	Ci
241Am	6.52E+01	Ci
241Pu	3.98E+01	Ci
242Cm	1.57E-01	Ci
242Pu	4.16E-04	Ci
243Am	3.06E-03	Ci
243Cm	3.02E-01	Ci
244Cm	7.26E+00	Ci
3H	1.02E-02	Ci
59Ni	1.05E+01	Ci
60Co	1.82E+01	Ci
63Ni	7.29E+01	Ci
79Se	9.57E-03	Ci
90Sr	6.61E+04	Ci
90Y	6.61E+04	Ci
93mNb	9.82E+00	Ci
93Zr	1.04E+01	Ci
99Tc	1.65E-01	Ci

CALCULATION SHEET

PROJECT. RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-48

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-C-106	238Pu	Sludge	NA	2.70E+00	Ci		
241-C-106	238Pu	Supernatant	NA	2.10E-07	Ci		
241-C-106	238Pu	Total		2.70E+00	Ci		
241-C-106	238U	Supernatant	NA	9.49E-08	Ci		
241-C-106	238U	Sludge	NA	9.02E-04	Ci		
241-C-106	238U	Total		9.02E-04	Ci		
241-C-106	239Pu	Sludge	NA	1.67E+01	Ci		
241-C-106	239Pu	Supernatant	NA	1.31E-06	Ci		
241-C-106	239Pu	Total		1.67E+01	Ci		
241-C-106	240Pu	Sludge	NA	3.57E+00	Ci		
241-C-106	240Pu	Supernatant	NA	2.79E-07	Ci		
241-C-106	240Pu	Total		3.57E+00	Ci		
241-C-106	241Am	Sludge	NA	6.52E+01	Ci		
241-C-106	241Am	Supernatant	NA	1.35E-06	Ci		
241-C-106	241Am	Total		6.52E+01	Ci		
241-C-106	241Pu	Sludge	NA	3.98E+01	Ci		
241-C-106	241Pu	Supernatant	NA	3.10E-06	Ci		
241-C-106	241Pu	Total		3.98E+01	Ci		
241-C-106	242Cm	Sludge	NA	1.57E-01	Ci		
241-C-106	242Cm	Supernatant	NA	3.26E-09	Ci		
241-C-106	242Cm	Total		1.57E-01	Ci		
241-C-106	242Pu	Sludge	NA	4.16E-04	Ci		
241-C-106	242Pu	Supernatant	NA	3.24E-11	Ci		
241-C-106	242Pu	Total		4.16E-04	Ci		
241-C-106	243Am	Sludge	NA	3.06E-03	Ci		
241-C-106	243Am	Supernatant	NA	6.32E-11	Ci		
241-C-106	243Am	Total		3.06E-03	Ci		
241-C-106	243Cm	Sludge	NA	3.02E-01	Ci		
241-C-106	243Cm	Supernatant	NA	5.41E-08	Ci		
241-C-106	243Cm	Total		3.02E-01	Ci		
241-C-106	244Cm	Sludge	NA	7.26E+00	Ci		
241-C-106	244Cm	Supernatant	NA	1.30E-06	Ci		
241-C-106	244Cm	Total		7.26E+00	Ci		
241-C-106	3H	Supernatant	NA	1.10E-06	Ci		
241-C-106	3H	Sludge	NA	1.02E-02	Ci		
241-C-106	3H	Total		1.02E-02	Ci		
241-C-106	59Ni	Sludge	NA	1.05E+01	Ci		
241-C-106	59Ni	Supernatant	NA	0.00E+00	Ci		
241-C-106	59Ni	Total		1.05E+01	Ci		
241-C-106	60Co	Sludge	NA	1.82E+01	Ci		
241-C-106	60Co	Supernatant	NA	8.41E-06	Ci		
241-C-106	60Co	Total		1.82E+01	Ci		
241-C-106	63Ni	Sludge	NA	7.29E+01	Ci		
241-C-106	63Ni	Supernatant	NA	2.33E-06	Ci		
241-C-106	63Ni	Total		7.29E+01	Ci		
241-C-106	79Se	Sludge	NA	9.57E-03	Ci		
241-C-106	79Se	Supernatant	NA	1.02E-06	Ci		
241-C-106	79Se	Total		9.57E-03	Ci		
241-C-106	90Sr	Sludge	NA	6.61E+04	Ci		
241-C-106	90Sr	Supernatant	NA	1.42E-02	Ci		
241-C-106	90Sr	Total		6.61E+04	Ci		
241-C-106	90Y	Sludge	NA	6.61E+04	Ci		
241-C-106	90Y	Supernatant	NA	1.42E-02	Ci		
241-C-106	90Y	Total		6.61E+04	Ci		
241-C-106	93mNb	Sludge	NA	9.82E+00	Ci		
241-C-106	93mNb	Supernatant	NA	0.00E+00	Ci		
241-C-106	93mNb	Total		9.82E+00	Ci		
241-C-106	93Zr	Sludge	NA	1.04E+01	Ci		
241-C-106	93Zr	Supernatant	NA	0.00E+00	Ci		
241-C-106	93Zr	Total		1.04E+01	Ci		
241-C-106	99Tc	Sludge	NA	1.65E-01	Ci		
241-C-106	99Tc	Supernatant	NA	3.44E-06	Ci		
241-C-106	99Tc	Total		1.65E-01	Ci		
241-C-106	Ag	Sludge	NA	7.84E+00	kg	Summary	
241-C-106	Ag	Supernatant	NA	3.09E-05	kg	Ag	7.84E+00 kg
241-C-106	Ag	Total		7.84E+00	kg	Al	3.82E+02 kg
241-C-106	Al	Sludge	NA	3.82E+02	kg	As	0.00E+00 kg
241-C-106	Al	Supernatant	NA	3.02E-02	kg	B	1.19E+00 kg
241-C-106	Al	Total		3.82E+02	kg	Ba	1.64E+00 kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-49

BY. E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-C-106	As	Supernatant	NA	2.92E-04	kg
241-C-106	As	Total		2.92E-04	kg
241-C-106	B	Sludge	NA	1.19E+00	kg
241-C-106	B	Supernatant	NA	2.17E-04	kg
241-C-106	B	Total		1.19E+00	kg
241-C-106	Ba	Sludge	NA	1.64E+00	kg
241-C-106	Ba	Supernatant	NA	1.16E-05	kg
241-C-106	Ba	Total		1.64E+00	kg
241-C-106	Be	Sludge	NA	5.65E-02	kg
241-C-106	Be	Supernatant	NA	9.02E-06	kg
241-C-106	Be	Total		5.65E-02	kg
241-C-106	Bi	Sludge	NA	2.94E+00	kg
241-C-106	Bi	Supernatant	NA	5.54E-04	kg
241-C-106	Bi	Total		2.94E+00	kg
241-C-106	Br	Supernatant	NA	1.88E-02	kg
241-C-106	Br	Total		1.88E-02	kg
241-C-106	Ca	Sludge	NA	1.18E+02	kg
241-C-106	Ca	Supernatant	NA	1.11E-04	kg
241-C-106	Ca	Total		1.18E+02	kg
241-C-106	Cd	Supernatant	NA	3.09E-05	kg
241-C-106	Cd	Sludge	NA	1.44E+00	kg
241-C-106	Cd	Total		1.44E+00	kg
241-C-106	Ce	Sludge	NA	5.70E+00	kg
241-C-106	Ce	Supernatant	NA	2.83E-04	kg
241-C-106	Ce	Total		5.70E+00	kg
241-C-106	Cl	Sludge	NA	6.13E+00	kg
241-C-106	Cl	Supernatant	NA	5.67E-03	kg
241-C-106	Cl	Total		6.14E+00	kg
241-C-106	CN	Sludge	NA	7.80E-02	kg
241-C-106	CN	Supernatant	NA	3.06E-05	kg
241-C-106	CN	Total		7.80E-02	kg
241-C-106	Co	Sludge	NA	3.75E-01	kg
241-C-106	Co	Supernatant	NA	6.31E-05	kg
241-C-106	Co	Total		3.75E-01	kg
241-C-106	Cr	Sludge	NA	3.78E+00	kg
241-C-106	Cr	Supernatant	NA	2.58E-05	kg
241-C-106	Cr	Total		3.78E+00	kg
241-C-106	Cu	Sludge	NA	2.31E+00	kg
241-C-106	Cu	Supernatant	NA	2.58E-05	kg
241-C-106	Cu	Total		2.31E+00	kg
241-C-106	Eu	Sludge	NA	6.21E-01	kg
241-C-106	Eu	Supernatant	NA	1.55E-05	kg
241-C-106	Eu	Total		6.21E-01	kg
241-C-106	F	Sludge	NA	5.41E-01	kg
241-C-106	F	Supernatant	NA	1.94E-03	kg
241-C-106	F	Total		5.43E-01	kg
241-C-106	Fe	Sludge	NA	2.07E+02	kg
241-C-106	Fe	Supernatant	NA	2.96E-05	kg
241-C-106	Fe	Total		2.07E+02	kg
241-C-106	Free OH	Supernatant	NA	2.26E+00	kg
241-C-106	Free OH	Total		2.26E+00	kg
241-C-106	Hg	Sludge	NA	1.93E+00	kg
241-C-106	Hg	Supernatant	NA	9.71E-07	kg
241-C-106	Hg	Total		1.93E+00	kg
241-C-106	K	Sludge	NA	1.77E+01	kg
241-C-106	K	Supernatant	NA	4.51E-03	kg
241-C-106	K	Total		1.77E+01	kg
241-C-106	La	Sludge	NA	2.44E+00	kg
241-C-106	La	Supernatant	NA	3.22E-05	kg
241-C-106	La	Total		2.44E+00	kg
241-C-106	Li	Sludge	NA	1.13E-01	kg
241-C-106	Li	Supernatant	NA	1.80E-05	kg
241-C-106	Li	Total		1.13E-01	kg
241-C-106	Mg	Sludge	NA	7.10E+00	kg
241-C-106	Mg	Supernatant	NA	3.35E-04	kg
241-C-106	Mg	Total		7.10E+00	kg
241-C-106	Mn	Sludge	NA	5.49E+02	kg
241-C-106	Mn	Supernatant	NA	1.32E-05	kg
241-C-106	Mn	Total		5.49E+02	kg

Summary		
Be	5.65E-02	kg
Bi	2.94E+00	kg
Ca	1.18E+02	kg
Cd	1.44E+00	kg
Ce	5.70E+00	kg
Cl	6.13E+00	kg
CN	7.80E-02	kg
Co	3.75E-01	kg
Cr	3.78E+00	kg
Cu	2.31E+00	kg
F	5.41E-01	kg
Fe	2.07E+02	kg
OH	0.00E+00	kg
Hg	1.93E+00	kg
K	1.77E+01	kg
La	2.44E+00	kg
Li	1.13E-01	kg
Mg	7.10E+00	kg
Mn	5.49E+02	kg
Mo	3.05E-01	kg
Na	1.85E+02	kg
Nd	9.00E+00	kg
NH3	9.10E-01	kg
Ni	3.02E+01	kg
NO2	4.14E+01	kg
NO3	3.48E+01	kg
Oxalate	3.32E+02	kg
Pb	2.56E+01	kg
Pd	1.15E+00	kg
PO4	9.00E+01	kg
Pr	5.39E+00	kg
Rb	2.69E-01	kg
Rh	2.45E+00	kg
Ru	2.40E+00	kg
Sb	2.95E-01	kg
Se	6.24E-02	kg
Si	1.60E+01	kg
SO4	3.90E+00	kg
Sr	1.83E+00	kg
Ta	2.60E-01	kg
Te	2.40E+00	kg
Th	5.09E+00	kg
Ti	3.85E-01	kg
TIC as CO3	7.58E+01	kg
Tl	3.68E-01	kg
TOC	9.06E+01	kg
UTOTAL	2.70E+00	kg
V	2.94E-01	kg
W	0.00E+00	kg
Y	1.69E+00	kg
Zn	2.13E+00	kg
Zr	2.79E+00	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-50

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-106	Mo	Sludge	NA	3.05E-01	kg	
241-C-106	Mo	Supernatant	NA	4.51E-05	kg	
241-C-106	Mo	Total		3.05E-01	kg	
241-C-106	Na	Sludge	NA	1.85E+02	kg	
241-C-106	Na	Supernatant	NA	3.15E+00	kg	
241-C-106	Na	Total		1.88E+02	kg	
241-C-106	Nb	Sludge	NA	4.23E+00	kg	
241-C-106	Nb	Supernatant	NA	6.44E-04	kg	
241-C-106	Nb	Total		4.23E+00	kg	
241-C-106	Nd	Sludge	NA	9.00E+00	kg	
241-C-106	Nd	Supernatant	NA	1.29E-04	kg	
241-C-106	Nd	Total		9.00E+00	kg	
241-C-106	NH3	Sludge	NA	9.10E-01	kg	
241-C-106	NH3	Supernatant	NA	2.99E-03	kg	
241-C-106	NH3	Total		9.13E-01	kg	
241-C-106	Ni	Sludge	NA	3.02E+01	kg	
241-C-106	Ni	Supernatant	NA	7.34E-05	kg	
241-C-106	Ni	Total		3.02E+01	kg	
241-C-106	NO2	Sludge	NA	4.14E+01	kg	
241-C-106	NO2	Supernatant	NA	1.75E-02	kg	
241-C-106	NO2	Total		4.14E+01	kg	
241-C-106	NO3	Sludge	NA	3.48E+01	kg	
241-C-106	NO3	Supernatant	NA	1.94E-02	kg	
241-C-106	NO3	Total		3.48E+01	kg	
241-C-106	Oxalate	Sludge	NA	3.32E+02	kg	
241-C-106	Oxalate	Supernatant	NA	3.94E-01	kg	
241-C-106	Oxalate	Total		3.32E+02	kg	
241-C-106	Pb	Sludge	NA	2.56E+01	kg	
241-C-106	Pb	Supernatant	NA	3.35E-04	kg	
241-C-106	Pb	Total		2.56E+01	kg	
241-C-106	Pd	Sludge	NA	1.15E+00	kg	
241-C-106	Pd	Supernatant	NA	9.92E-04	kg	
241-C-106	Pd	Total		1.15E+00	kg	
241-C-106	PO4	Sludge	NA	9.00E+01	kg	
241-C-106	PO4	Supernatant	NA	3.37E-02	kg	
241-C-106	PO4	Total		9.00E+01	kg	
241-C-106	Pr	Sludge	NA	5.39E+00	kg	
241-C-106	Pr	Supernatant	NA	1.80E-04	kg	
241-C-106	Pr	Total		5.39E+00	kg	
241-C-106	Rb	Sludge	NA	2.69E-01	kg	
241-C-106	Rb	Supernatant	NA	7.21E-03	kg	
241-C-106	Rb	Total		2.76E-01	kg	
241-C-106	Rh	Sludge	NA	2.45E+00	kg	
241-C-106	Rh	Supernatant	NA	3.86E-04	kg	
241-C-106	Rh	Total		2.45E+00	kg	
241-C-106	Ru	Sludge	NA	2.40E+00	kg	
241-C-106	Ru	Supernatant	NA	2.30E-04	kg	
241-C-106	Ru	Total		2.40E+00	kg	
241-C-106	Sb	Sludge	NA	2.95E-01	kg	
241-C-106	Sb	Supernatant	NA	2.19E-04	kg	
241-C-106	Sb	Total		2.96E-01	kg	
241-C-106	Se	Sludge	NA	6.24E-02	kg	
241-C-106	Se	Supernatant	NA	4.25E-04	kg	
241-C-106	Se	Total		6.28E-02	kg	
241-C-106	Si	Sludge	NA	1.60E+01	kg	
241-C-106	Si	Supernatant	NA	4.85E-03	kg	
241-C-106	Si	Total		1.60E+01	kg	
241-C-106	Sm	Sludge	NA	2.51E+00	kg	
241-C-106	Sm	Supernatant	NA	1.42E-04	kg	
241-C-106	Sm	Total		2.51E+00	kg	
241-C-106	Sn	Supernatant	NA	9.02E-04	kg	
241-C-106	Sn	Total		9.02E-04	kg	
241-C-106	SO4	Sludge	NA	3.90E+00	kg	
241-C-106	SO4	Supernatant	NA	4.83E-03	kg	
241-C-106	SO4	Total		3.90E+00	kg	
241-C-106	Sr	Sludge	NA	1.83E+00	kg	
241-C-106	Sr	Supernatant	NA	3.03E-06	kg	
241-C-106	Sr	Total		1.83E+00	kg	
241-C-106	Ta	Sludge	NA	2.60E-01	kg	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO. 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-51

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary	
241-C-106	Ta	Supernatant	NA	2.70E-04	kg		
241-C-106	Ta	Total		2.60E-01	kg		
241-C-106	Te	Sludge	NA	2.40E+00	kg		
241-C-106	Te	Supernatant	NA	5.54E-04	kg		
241-C-106	Te	Total		2.40E+00	kg		
241-C-106	Th	Sludge	NA	5.09E+00	kg		
241-C-106	Th	Supernatant	NA	1.01E-07	kg		
241-C-106	Th	Total		5.09E+00	kg		
241-C-106	Ti	Sludge	NA	3.85E-01	kg		
241-C-106	Ti	Supernatant	NA	7.73E-06	kg		
241-C-106	Ti	Total		3.85E-01	kg		
241-C-106	TIC as CO	Sludge	NA	7.58E+01	kg		
241-C-106	TIC as CO	Supernatant	NA	0.00E+00	kg		
241-C-106	TIC as CO	Total		7.58E+01	kg		
241-C-106	Tl	Sludge	NA	3.68E-01	kg		
241-C-106	Tl	Supernatant	NA	3.62E-04	kg		
241-C-106	Tl	Total		3.69E-01	kg		
241-C-106	TOC	Sludge	NA	9.06E+01	kg		
241-C-106	TOC	Supernatant	NA	1.07E-01	kg		
241-C-106	TOC	Total		9.07E+01	kg		
241-C-106	UTOTAL	Sludge	NA	2.70E+00	kg		
241-C-106	UTOTAL	Supernatant	NA	2.84E-04	kg		
241-C-106	UTOTAL	Total		2.70E+00	kg		
241-C-106	V	Sludge	NA	2.94E-01	kg		
241-C-106	V	Supernatant	NA	3.35E-05	kg		
241-C-106	V	Total		2.94E-01	kg		
241-C-106	W	Supernatant	NA	1.67E-02	kg		
241-C-106	W	Total		1.67E-02	kg		
241-C-106	Y	Sludge	NA	1.69E+00	kg		
241-C-106	Y	Supernatant	NA	6.44E-06	kg		
241-C-106	Y	Total		1.69E+00	kg		
241-C-106	Zn	Sludge	NA	2.13E+00	kg		
241-C-106	Zn	Supernatant	NA	4.33E-05	kg		
241-C-106	Zn	Total		2.13E+00	kg		
241-C-106	Zr	Sludge	NA	2.79E+00	kg		
241-C-106	Zr	Supernatant	NA	2.06E-05	kg		
241-C-106	Zr	Total		2.79E+00	kg		

241-C-107	106Ru	Sludge	1C (Solid)	4.45E-11	Ci	Summary	
241-C-107	106Ru	Sludge	CWP2 (Solid)	7.42E-09	Ci	106Ru	2.08E-03 Ci
241-C-107	106Ru	Sludge	SRR (Solid)	2.08E-03	Ci	113mCd	3.76E+00 Ci
241-C-107	106Ru	Total		2.08E-03	Ci	125Sb	1.31E+02 Ci
241-C-107	113mCd	Sludge	1C (Solid)	5.23E-02	Ci	126Sn	2.21E-01 Ci
241-C-107	113mCd	Sludge	CWP2 (Solid)	1.41E-01	Ci	129I	7.15E-01 Ci
241-C-107	113mCd	Sludge	SRR (Solid)	3.57E+00	Ci	134Cs	1.62E-01 Ci
241-C-107	113mCd	Total		3.76E+00	Ci	137Cs	5.89E+04 Ci
241-C-107	125Sb	Sludge	1C (Solid)	6.98E-04	Ci	137mBa	5.56E+04 Ci
241-C-107	125Sb	Sludge	CWP2 (Solid)	7.96E-04	Ci	14C	5.56E-01 Ci
241-C-107	125Sb	Sludge	SRR (Solid)	1.31E+02	Ci	151Sm	6.31E+05 Ci
241-C-107	125Sb	Total		1.31E+02	Ci	152Eu	1.37E+02 Ci
241-C-107	126Sn	Sludge	1C (Solid)	4.34E-03	Ci	154Eu	1.25E+03 Ci
241-C-107	126Sn	Sludge	CWP2 (Solid)	1.61E-04	Ci	155Eu	6.49E+02 Ci
241-C-107	126Sn	Sludge	SRR (Solid)	2.16E-01	Ci	226Ra	8.64E-06 Ci
241-C-107	126Sn	Total		2.21E-01	Ci	227Ac	2.86E-03 Ci
241-C-107	129I	Sludge	1C (Solid)	3.88E-01	Ci	228Ra	2.75E-02 Ci
241-C-107	129I	Sludge	CWP2 (Solid)	6.81E-02	Ci	229Th	1.45E-02 Ci
241-C-107	129I	Sludge	SRR (Solid)	2.59E-01	Ci	231Pa	5.32E-04 Ci
241-C-107	129I	Total		7.15E-01	Ci	232Th	7.24E-02 Ci
241-C-107	134Cs	Sludge	1C (Solid)	5.32E-07	Ci	232U	7.61E-02 Ci
241-C-107	134Cs	Sludge	CWP2 (Solid)	4.00E-05	Ci	233U	4.72E+00 Ci
241-C-107	134Cs	Sludge	SRR (Solid)	1.62E-01	Ci	234U	3.12E+00 Ci
241-C-107	134Cs	Total		1.62E-01	Ci	235U	1.34E-01 Ci
241-C-107	137Cs	Sludge	1C (Solid)	3.20E+04	Ci	236U	5.11E-02 Ci
241-C-107	137Cs	Sludge	CWP2 (Solid)	5.61E+03	Ci	237Np	5.28E-02 Ci
241-C-107	137Cs	Sludge	SRR (Solid)	2.14E+04	Ci	238Pu	4.43E+01 Ci
241-C-107	137Cs	Total		5.89E+04	Ci	238U	3.08E+00 Ci
241-C-107	137mBa	Sludge	1C (Solid)	3.02E+04	Ci	239Pu	2.18E+03 Ci

CALCULATION SHEET

BY: E. Berrios
DATE: 12/05/05

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO : D-52

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-C-107	137mBa	Sludge	CWP2 (Solid)	5.30E+03	Ci
241-C-107	137mBa	Sludge	SRR (Solid)	2.02E+04	Ci
241-C-107	137mBa	Total		5.56E+04	Ci
241-C-107	14C	Sludge	1C (Solid)	2.07E-01	Ci
241-C-107	14C	Sludge	CWP2 (Solid)	8.62E-02	Ci
241-C-107	14C	Sludge	SRR (Solid)	2.63E-01	Ci
241-C-107	14C	Total		5.56E-01	Ci
241-C-107	151Sm	Sludge	1C (Solid)	9.14E+01	Ci
241-C-107	151Sm	Sludge	CWP2 (Solid)	1.57E+00	Ci
241-C-107	151Sm	Sludge	SRR (Solid)	6.31E+05	Ci
241-C-107	151Sm	Total		6.31E+05	Ci
241-C-107	152Eu	Sludge	1C (Solid)	2.93E-03	Ci
241-C-107	152Eu	Sludge	CWP2 (Solid)	3.54E-04	Ci
241-C-107	152Eu	Sludge	SRR (Solid)	1.37E+02	Ci
241-C-107	152Eu	Total		1.37E+02	Ci
241-C-107	154Eu	Sludge	1C (Solid)	1.98E-01	Ci
241-C-107	154Eu	Sludge	CWP2 (Solid)	2.49E-02	Ci
241-C-107	154Eu	Sludge	SRR (Solid)	1.25E+03	Ci
241-C-107	154Eu	Total		1.25E+03	Ci
241-C-107	155Eu	Sludge	1C (Solid)	8.53E-02	Ci
241-C-107	155Eu	Sludge	CWP2 (Solid)	1.13E-02	Ci
241-C-107	155Eu	Sludge	SRR (Solid)	6.49E+02	Ci
241-C-107	155Eu	Total		6.49E+02	Ci
241-C-107	226Ra	Sludge	1C (Solid)	5.72E-06	Ci
241-C-107	226Ra	Sludge	CWP2 (Solid)	1.85E-07	Ci
241-C-107	226Ra	Sludge	SRR (Solid)	2.74E-06	Ci
241-C-107	226Ra	Total		8.64E-06	Ci
241-C-107	227Ac	Sludge	1C (Solid)	4.89E-05	Ci
241-C-107	227Ac	Sludge	CWP2 (Solid)	2.80E-03	Ci
241-C-107	227Ac	Sludge	SRR (Solid)	1.38E-05	Ci
241-C-107	227Ac	Total		2.86E-03	Ci
241-C-107	228Ra	Sludge	1C (Solid)	1.36E-02	Ci
241-C-107	228Ra	Sludge	CWP2 (Solid)	2.86E-03	Ci
241-C-107	228Ra	Sludge	SRR (Solid)	1.11E-02	Ci
241-C-107	228Ra	Total		2.75E-02	Ci
241-C-107	229Th	Sludge	1C (Solid)	1.81E-08	Ci
241-C-107	229Th	Sludge	CWP2 (Solid)	1.45E-02	Ci
241-C-107	229Th	Sludge	SRR (Solid)	1.63E-08	Ci
241-C-107	229Th	Total		1.45E-02	Ci
241-C-107	231Pa	Sludge	1C (Solid)	3.65E-04	Ci
241-C-107	231Pa	Sludge	CWP2 (Solid)	1.46E-04	Ci
241-C-107	231Pa	Sludge	SRR (Solid)	2.11E-05	Ci
241-C-107	231Pa	Total		5.32E-04	Ci
241-C-107	232Th	Sludge	1C (Solid)	3.93E-02	Ci
241-C-107	232Th	Sludge	CWP2 (Solid)	6.89E-03	Ci
241-C-107	232Th	Sludge	SRR (Solid)	2.63E-02	Ci
241-C-107	232Th	Total		7.24E-02	Ci
241-C-107	232U	Sludge	1C (Solid)	2.46E-05	Ci
241-C-107	232U	Sludge	CWP2 (Solid)	7.60E-02	Ci
241-C-107	232U	Sludge	SRR (Solid)	4.53E-05	Ci
241-C-107	232U	Total		7.61E-02	Ci
241-C-107	233U	Sludge	1C (Solid)	2.05E-06	Ci
241-C-107	233U	Sludge	CWP2 (Solid)	4.72E+00	Ci
241-C-107	233U	Sludge	SRR (Solid)	1.42E-04	Ci
241-C-107	233U	Total		4.72E+00	Ci
241-C-107	234U	Sludge	1C (Solid)	1.98E+00	Ci
241-C-107	234U	Sludge	CWP2 (Solid)	6.50E-01	Ci
241-C-107	234U	Sludge	SRR (Solid)	4.93E-01	Ci
241-C-107	234U	Total		3.12E+00	Ci
241-C-107	235U	Sludge	1C (Solid)	8.82E-02	Ci
241-C-107	235U	Sludge	CWP2 (Solid)	2.54E-02	Ci
241-C-107	235U	Sludge	SRR (Solid)	2.08E-02	Ci
241-C-107	235U	Total		1.34E-01	Ci
241-C-107	236U	Sludge	1C (Solid)	2.21E-02	Ci
241-C-107	236U	Sludge	CWP2 (Solid)	1.60E-02	Ci
241-C-107	236U	Sludge	SRR (Solid)	1.30E-02	Ci
241-C-107	236U	Total		5.11E-02	Ci
241-C-107	237Np	Sludge	1C (Solid)	1.99E-03	Ci
241-C-107	237Np	Sludge	CWP2 (Solid)	1.08E-04	Ci

Summary		
240Pu	3.55E+02	Ci
241Am	6.69E+03	Ci
241Pu	1.78E+03	Ci
242Cm	2.62E+00	Ci
242Pu	1.63E-02	Ci
243Am	1.88E+00	Ci
243Cm	1.55E-01	Ci
244Cm	3.62E+00	Ci
3H	3.14E+00	Ci
59Ni	2.81E+00	Ci
60Co	1.67E+02	Ci
63Ni	2.61E+02	Ci
79Se	5.19E-02	Ci
90Sr	2.08E+06	Ci
90Y	2.08E+06	Ci
93mNb	3.72E+00	Ci
93Zr	4.50E+00	Ci
99Tc	3.77E+01	Ci

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-53

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-107	237Np	Sludge	SRR (Solid)	5.07E-02	Ci	
241-C-107	237Np	Total		5.28E-02	Ci	
241-C-107	238Pu	Sludge	1C (Solid)	8.73E+00	Ci	
241-C-107	238Pu	Sludge	CWP2 (Solid)	4.61E+00	Ci	
241-C-107	238Pu	Sludge	SRR (Solid)	3.09E+01	Ci	
241-C-107	238Pu	Total		4.43E+01	Ci	
241-C-107	238U	Sludge	1C (Solid)	2.01E+00	Ci	
241-C-107	238U	Sludge	CWP2 (Solid)	5.86E-01	Ci	
241-C-107	238U	Sludge	SRR (Solid)	4.80E-01	Ci	
241-C-107	238U	Total		3.08E+00	Ci	
241-C-107	239Pu	Sludge	1C (Solid)	1.24E+03	Ci	
241-C-107	239Pu	Sludge	CWP2 (Solid)	1.95E+02	Ci	
241-C-107	239Pu	Sludge	SRR (Solid)	7.47E+02	Ci	
241-C-107	239Pu	Total		2.18E+03	Ci	
241-C-107	240Pu	Sludge	1C (Solid)	1.35E+02	Ci	
241-C-107	240Pu	Sludge	CWP2 (Solid)	4.62E+01	Ci	
241-C-107	240Pu	Sludge	SRR (Solid)	1.73E+02	Ci	
241-C-107	240Pu	Total		3.55E+02	Ci	
241-C-107	241Am	Sludge	1C (Solid)	3.63E+03	Ci	
241-C-107	241Am	Sludge	CWP2 (Solid)	6.37E+02	Ci	
241-C-107	241Am	Sludge	SRR (Solid)	2.43E+03	Ci	
241-C-107	241Am	Total		6.69E+03	Ci	
241-C-107	241Pu	Sludge	1C (Solid)	2.27E+02	Ci	
241-C-107	241Pu	Sludge	CWP2 (Solid)	2.89E+02	Ci	
241-C-107	241Pu	Sludge	SRR (Solid)	1.27E+03	Ci	
241-C-107	241Pu	Total		1.78E+03	Ci	
241-C-107	242Cm	Sludge	1C (Solid)	6.29E-01	Ci	
241-C-107	242Cm	Sludge	CWP2 (Solid)	2.59E-02	Ci	
241-C-107	242Cm	Sludge	SRR (Solid)	1.97E+00	Ci	
241-C-107	242Cm	Total		2.62E+00	Ci	
241-C-107	242Pu	Sludge	1C (Solid)	1.88E-03	Ci	
241-C-107	242Pu	Sludge	CWP2 (Solid)	2.34E-03	Ci	
241-C-107	242Pu	Sludge	SRR (Solid)	1.21E-02	Ci	
241-C-107	242Pu	Total		1.63E-02	Ci	
241-C-107	243Am	Sludge	1C (Solid)	3.69E-01	Ci	
241-C-107	243Am	Sludge	CWP2 (Solid)	1.68E-02	Ci	
241-C-107	243Am	Sludge	SRR (Solid)	1.49E+00	Ci	
241-C-107	243Am	Total		1.88E+00	Ci	
241-C-107	243Cm	Sludge	1C (Solid)	7.02E-03	Ci	
241-C-107	243Cm	Sludge	CWP2 (Solid)	1.28E-03	Ci	
241-C-107	243Cm	Sludge	SRR (Solid)	1.47E-01	Ci	
241-C-107	243Cm	Total		1.55E-01	Ci	
241-C-107	244Cm	Sludge	1C (Solid)	1.58E-01	Ci	
241-C-107	244Cm	Sludge	CWP2 (Solid)	3.79E-02	Ci	
241-C-107	244Cm	Sludge	SRR (Solid)	3.42E+00	Ci	
241-C-107	244Cm	Total		3.62E+00	Ci	
241-C-107	3H	Sludge	1C (Solid)	3.39E-01	Ci	
241-C-107	3H	Sludge	CWP2 (Solid)	3.53E-01	Ci	
241-C-107	3H	Sludge	SRR (Solid)	2.45E+00	Ci	
241-C-107	3H	Total		3.14E+00	Ci	
241-C-107	59Ni	Sludge	1C (Solid)	1.12E-02	Ci	
241-C-107	59Ni	Sludge	CWP2 (Solid)	6.31E-01	Ci	
241-C-107	59Ni	Sludge	SRR (Solid)	2.16E+00	Ci	
241-C-107	59Ni	Total		2.81E+00	Ci	
241-C-107	60Co	Sludge	1C (Solid)	7.15E-02	Ci	
241-C-107	60Co	Sludge	CWP2 (Solid)	6.34E-01	Ci	
241-C-107	60Co	Sludge	SRR (Solid)	1.67E+02	Ci	
241-C-107	60Co	Total		1.67E+02	Ci	
241-C-107	63Ni	Sludge	1C (Solid)	1.56E+00	Ci	
241-C-107	63Ni	Sludge	CWP2 (Solid)	5.96E+01	Ci	
241-C-107	63Ni	Sludge	SRR (Solid)	2.00E+02	Ci	
241-C-107	63Ni	Total		2.61E+02	Ci	
241-C-107	79Se	Sludge	1C (Solid)	1.15E-03	Ci	
241-C-107	79Se	Sludge	CWP2 (Solid)	3.89E-05	Ci	
241-C-107	79Se	Sludge	SRR (Solid)	5.07E-02	Ci	
241-C-107	79Se	Total		5.19E-02	Ci	
241-C-107	90Sr	Sludge	1C (Solid)	3.40E+05	Ci	
241-C-107	90Sr	Sludge	CWP2 (Solid)	5.97E+04	Ci	
241-C-107	90Sr	Sludge	SRR (Solid)	1.68E+06	Ci	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-54

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units
241-C-107	90Sr	Total		2.08E+06	Ci
241-C-107	90Y	Sludge	1C (Solid)	3.40E+05	Ci
241-C-107	90Y	Sludge	CWP2 (Solid)	5.97E+04	Ci
241-C-107	90Y	Sludge	SRR (Solid)	1.68E+06	Ci
241-C-107	90Y	Total		2.08E+06	Ci
241-C-107	93mNb	Sludge	1C (Solid)	1.33E+00	Ci
241-C-107	93mNb	Sludge	CWP2 (Solid)	1.82E-03	Ci
241-C-107	93mNb	Sludge	SRR (Solid)	2.39E+00	Ci
241-C-107	93mNb	Total		3.72E+00	Ci
241-C-107	93Zr	Sludge	1C (Solid)	1.47E+00	Ci
241-C-107	93Zr	Sludge	CWP2 (Solid)	2.24E-03	Ci
241-C-107	93Zr	Sludge	SRR (Solid)	3.02E+00	Ci
241-C-107	93Zr	Total		4.50E+00	Ci
241-C-107	99Tc	Sludge	1C (Solid)	2.04E+01	Ci
241-C-107	99Tc	Sludge	CWP2 (Solid)	3.59E+00	Ci
241-C-107	99Tc	Sludge	SRR (Solid)	1.37E+01	Ci
241-C-107	99Tc	Total		3.77E+01	Ci
241-C-107	Ag	Sludge	1C (Solid)	7.77E+01	kg
241-C-107	Ag	Sludge	CWP2 (Solid)	2.61E+01	kg
241-C-107	Ag	Sludge	SRR (Solid)	1.89E+02	kg
241-C-107	Ag	Total		2.93E+02	kg
241-C-107	Al	Sludge	1C (Solid)	1.89E+04	kg
241-C-107	Al	Sludge	CWP2 (Solid)	1.64E+04	kg
241-C-107	Al	Sludge	SRR (Solid)	2.29E+04	kg
241-C-107	Al	Total		5.83E+04	kg
241-C-107	As	Sludge	1C (Solid)	5.37E+00	kg
241-C-107	As	Sludge	CWP2 (Solid)	9.42E-01	kg
241-C-107	As	Sludge	SRR (Solid)	3.59E+00	kg
241-C-107	As	Total		9.90E+00	kg
241-C-107	B	Sludge	1C (Solid)	5.97E+00	kg
241-C-107	B	Sludge	CWP2 (Solid)	1.05E+00	kg
241-C-107	B	Sludge	SRR (Solid)	3.99E+00	kg
241-C-107	B	Total		1.10E+01	kg
241-C-107	Ba	Sludge	1C (Solid)	2.62E+02	kg
241-C-107	Ba	Sludge	CWP2 (Solid)	1.52E+01	kg
241-C-107	Ba	Sludge	SRR (Solid)	4.49E+02	kg
241-C-107	Ba	Total		7.27E+02	kg
241-C-107	Be	Sludge	1C (Solid)	8.43E-01	kg
241-C-107	Be	Sludge	CWP2 (Solid)	1.48E-01	kg
241-C-107	Be	Sludge	SRR (Solid)	5.64E-01	kg
241-C-107	Be	Total		1.55E+00	kg
241-C-107	Bi	Sludge	1C (Solid)	9.80E+03	kg
241-C-107	Bi	Sludge	CWP2 (Solid)	4.83E+02	kg
241-C-107	Bi	Sludge	SRR (Solid)	5.27E+01	kg
241-C-107	Bi	Total		1.03E+04	kg
241-C-107	Ca	Sludge	1C (Solid)	4.80E+02	kg
241-C-107	Ca	Sludge	CWP2 (Solid)	8.40E+01	kg
241-C-107	Ca	Sludge	SRR (Solid)	6.73E+02	kg
241-C-107	Ca	Total		1.24E+03	kg
241-C-107	Cd	Sludge	1C (Solid)	3.23E+01	kg
241-C-107	Cd	Sludge	CWP2 (Solid)	1.27E+00	kg
241-C-107	Cd	Sludge	SRR (Solid)	6.13E+01	kg
241-C-107	Cd	Total		9.49E+01	kg
241-C-107	Ce	Sludge	1C (Solid)	3.12E+02	kg
241-C-107	Ce	Sludge	CWP2 (Solid)	4.03E+01	kg
241-C-107	Ce	Sludge	SRR (Solid)	4.24E+02	kg
241-C-107	Ce	Total		7.76E+02	kg
241-C-107	Cl	Sludge	1C (Solid)	5.72E+02	kg
241-C-107	Cl	Sludge	CWP2 (Solid)	5.88E+01	kg
241-C-107	Cl	Sludge	SRR (Solid)	2.34E+02	kg
241-C-107	Cl	Total		8.65E+02	kg
241-C-107	CN	Sludge	1C (Solid)	3.30E+00	kg
241-C-107	CN	Sludge	CWP2 (Solid)	5.79E-01	kg
241-C-107	CN	Sludge	SRR (Solid)	2.20E+00	kg
241-C-107	CN	Total		6.08E+00	kg
241-C-107	Co	Sludge	1C (Solid)	1.07E+01	kg
241-C-107	Co	Sludge	CWP2 (Solid)	1.06E+00	kg
241-C-107	Co	Sludge	SRR (Solid)	1.46E+01	kg
241-C-107	Co	Total		2.64E+01	kg

Summary		
Ag	2.93E+02	kg
Al	5.83E+04	kg
As	9.90E+00	kg
B	1.10E+01	kg
Ba	7.27E+02	kg
Be	1.55E+00	kg
Bi	1.03E+04	kg
Ca	1.24E+03	kg
Cd	9.49E+01	kg
Ce	7.76E+02	kg
Cl	8.65E+02	kg
CN	6.08E+00	kg
Co	2.64E+01	kg
Cr	9.26E+02	kg
Cu	2.27E+02	kg
F	6.34E+03	kg
Fe	1.02E+05	kg
OH	0.00E+00	kg
Hg	6.66E+01	kg
K	4.27E+02	kg
La	2.69E+02	kg
Li	1.65E+02	kg
Mg	4.75E+02	kg
Mn	5.01E+03	kg
Mo	4.56E+01	kg
Na	9.47E+04	kg
Nd	6.31E+02	kg
NH3	0.00E+00	kg
Ni	3.08E+03	kg
NO2	3.51E+04	kg
NO3	4.75E+04	kg
Oxalate	3.65E+02	kg
Pb	1.01E+04	kg
Pd	0.00E+00	kg
PO4	5.84E+04	kg
Pr	2.07E+02	kg
Rb	8.39E-01	kg
Rh	4.33E+01	kg
Ru	9.46E+02	kg
Sb	2.39E+00	kg
Se	4.99E+00	kg
Si	1.86E+03	kg
SO4	8.38E+03	kg
Sr	2.56E+02	kg
Ta	8.43E-01	kg
Te	1.79E+02	kg
Th	6.58E+02	kg
Ti	1.23E+02	kg
TIC as CO3	1.14E+04	kg
Tl	5.40E+00	kg
TOC	7.32E+02	kg

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-55

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary		
241-C-107	Cr	Sludge	1C (Solid)	5.29E+02	kg	UTOTAL	9.23E+03	kg
241-C-107	Cr	Sludge	CWP2 (Solid)	3.61E+01	kg	V	2.50E+01	kg
241-C-107	Cr	Sludge	SRR (Solid)	3.61E+02	kg	W	6.71E+02	kg
241-C-107	Cr	Total		9.26E+02	kg	Y	9.43E+01	kg
241-C-107	Cu	Sludge	1C (Solid)	8.36E+01	kg	Zn	1.76E+02	kg
241-C-107	Cu	Sludge	CWP2 (Solid)	1.74E+01	kg	Zr	7.37E+01	kg
241-C-107	Cu	Sludge	SRR (Solid)	1.27E+02	kg			
241-C-107	Cu	Total		2.27E+02	kg			
241-C-107	F	Sludge	1C (Solid)	5.77E+03	kg			
241-C-107	F	Sludge	CWP2 (Solid)	2.49E+02	kg			
241-C-107	F	Sludge	SRR (Solid)	3.19E+02	kg			
241-C-107	F	Total		6.34E+03	kg			
241-C-107	Fe	Sludge	1C (Solid)	4.17E+04	kg			
241-C-107	Fe	Sludge	CWP2 (Solid)	2.83E+03	kg			
241-C-107	Fe	Sludge	SRR (Solid)	5.79E+04	kg			
241-C-107	Fe	Total		1.02E+05	kg			
241-C-107	Hg	Sludge	1C (Solid)	3.61E+01	kg			
241-C-107	Hg	Sludge	CWP2 (Solid)	6.34E+00	kg			
241-C-107	Hg	Sludge	SRR (Solid)	2.41E+01	kg			
241-C-107	Hg	Total		6.66E+01	kg			
241-C-107	K	Sludge	1C (Solid)	2.46E+02	kg			
241-C-107	K	Sludge	CWP2 (Solid)	7.90E+00	kg			
241-C-107	K	Sludge	SRR (Solid)	1.73E+02	kg			
241-C-107	K	Total		4.27E+02	kg			
241-C-107	La	Sludge	1C (Solid)	9.87E+01	kg			
241-C-107	La	Sludge	CWP2 (Solid)	1.71E+01	kg			
241-C-107	La	Sludge	SRR (Solid)	1.53E+02	kg			
241-C-107	La	Total		2.69E+02	kg			
241-C-107	Li	Sludge	1C (Solid)	1.31E+02	kg			
241-C-107	Li	Sludge	CWP2 (Solid)	1.44E+01	kg			
241-C-107	Li	Sludge	SRR (Solid)	1.96E+01	kg			
241-C-107	Li	Total		1.65E+02	kg			
241-C-107	Mg	Sludge	1C (Solid)	2.31E+02	kg			
241-C-107	Mg	Sludge	CWP2 (Solid)	3.49E+01	kg			
241-C-107	Mg	Sludge	SRR (Solid)	2.08E+02	kg			
241-C-107	Mg	Total		4.75E+02	kg			
241-C-107	Mn	Sludge	1C (Solid)	1.84E+03	kg			
241-C-107	Mn	Sludge	CWP2 (Solid)	2.17E+02	kg			
241-C-107	Mn	Sludge	SRR (Solid)	2.95E+03	kg			
241-C-107	Mn	Total		5.01E+03	kg			
241-C-107	Mo	Sludge	1C (Solid)	2.02E+01	kg			
241-C-107	Mo	Sludge	CWP2 (Solid)	2.60E+00	kg			
241-C-107	Mo	Sludge	SRR (Solid)	2.28E+01	kg			
241-C-107	Mo	Total		4.56E+01	kg			
241-C-107	Na	Sludge	1C (Solid)	5.85E+04	kg			
241-C-107	Na	Sludge	CWP2 (Solid)	7.88E+03	kg			
241-C-107	Na	Sludge	SRR (Solid)	2.83E+04	kg			
241-C-107	Na	Total		9.47E+04	kg			
241-C-107	Nd	Sludge	1C (Solid)	2.31E+02	kg			
241-C-107	Nd	Sludge	CWP2 (Solid)	3.42E+01	kg			
241-C-107	Nd	Sludge	SRR (Solid)	3.65E+02	kg			
241-C-107	Nd	Total		6.31E+02	kg			
241-C-107	Ni	Sludge	1C (Solid)	9.37E+02	kg			
241-C-107	Ni	Sludge	CWP2 (Solid)	6.49E+02	kg			
241-C-107	Ni	Sludge	SRR (Solid)	1.49E+03	kg			
241-C-107	Ni	Total		3.08E+03	kg			
241-C-107	NO2	Sludge	1C (Solid)	2.05E+04	kg			
241-C-107	NO2	Sludge	CWP2 (Solid)	2.58E+03	kg			
241-C-107	NO2	Sludge	SRR (Solid)	1.21E+04	kg			
241-C-107	NO2	Total		3.51E+04	kg			
241-C-107	NO3	Sludge	1C (Solid)	3.43E+04	kg			
241-C-107	NO3	Sludge	CWP2 (Solid)	3.21E+03	kg			
241-C-107	NO3	Sludge	SRR (Solid)	1.00E+04	kg			
241-C-107	NO3	Total		4.75E+04	kg			
241-C-107	Oxalate	Sludge	1C (Solid)	2.01E+02	kg			
241-C-107	Oxalate	Sludge	CWP2 (Solid)	2.96E+01	kg			
241-C-107	Oxalate	Sludge	SRR (Solid)	1.34E+02	kg			
241-C-107	Oxalate	Total		3.65E+02	kg			
241-C-107	Pb	Sludge	1C (Solid)	3.45E+03	kg			

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.: D-56

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-107	Pb	Sludge	CWP2 (Solid)	1.66E+03	kg	
241-C-107	Pb	Sludge	SRR (Solid)	4.96E+03	kg	
241-C-107	Pb	Total		1.01E+04	kg	
241-C-107	PO4	Sludge	1C (Solid)	4.52E+04	kg	
241-C-107	PO4	Sludge	CWP2 (Solid)	8.25E+03	kg	
241-C-107	PO4	Sludge	SRR (Solid)	4.95E+03	kg	
241-C-107	PO4	Total		5.84E+04	kg	
241-C-107	Pr	Sludge	1C (Solid)	1.12E+02	kg	
241-C-107	Pr	Sludge	CWP2 (Solid)	1.97E+01	kg	
241-C-107	Pr	Sludge	SRR (Solid)	7.50E+01	kg	
241-C-107	Pr	Total		2.07E+02	kg	
241-C-107	Rb	Sludge	1C (Solid)	4.55E-01	kg	
241-C-107	Rb	Sludge	CWP2 (Solid)	7.98E-02	kg	
241-C-107	Rb	Sludge	SRR (Solid)	3.04E-01	kg	
241-C-107	Rb	Total		8.39E-01	kg	
241-C-107	Rh	Sludge	1C (Solid)	2.35E+01	kg	
241-C-107	Rh	Sludge	CWP2 (Solid)	4.12E+00	kg	
241-C-107	Rh	Sludge	SRR (Solid)	1.57E+01	kg	
241-C-107	Rh	Total		4.33E+01	kg	
241-C-107	Ru	Sludge	1C (Solid)	5.13E+02	kg	
241-C-107	Ru	Sludge	CWP2 (Solid)	9.00E+01	kg	
241-C-107	Ru	Sludge	SRR (Solid)	3.43E+02	kg	
241-C-107	Ru	Total		9.46E+02	kg	
241-C-107	Sb	Sludge	1C (Solid)	1.30E+00	kg	
241-C-107	Sb	Sludge	CWP2 (Solid)	2.28E-01	kg	
241-C-107	Sb	Sludge	SRR (Solid)	8.68E-01	kg	
241-C-107	Sb	Total		2.39E+00	kg	
241-C-107	Se	Sludge	1C (Solid)	2.70E+00	kg	
241-C-107	Se	Sludge	CWP2 (Solid)	4.75E-01	kg	
241-C-107	Se	Sludge	SRR (Solid)	1.81E+00	kg	
241-C-107	Se	Total		4.99E+00	kg	
241-C-107	Si	Sludge	1C (Solid)	9.78E+02	kg	
241-C-107	Si	Sludge	CWP2 (Solid)	1.22E+02	kg	
241-C-107	Si	Sludge	SRR (Solid)	7.58E+02	kg	
241-C-107	Si	Total		1.86E+03	kg	
241-C-107	SO4	Sludge	1C (Solid)	4.93E+03	kg	
241-C-107	SO4	Sludge	CWP2 (Solid)	5.01E+02	kg	
241-C-107	SO4	Sludge	SRR (Solid)	2.95E+03	kg	
241-C-107	SO4	Total		8.38E+03	kg	
241-C-107	Sr	Sludge	1C (Solid)	1.63E+02	kg	
241-C-107	Sr	Sludge	CWP2 (Solid)	2.42E+01	kg	
241-C-107	Sr	Sludge	SRR (Solid)	6.84E+01	kg	
241-C-107	Sr	Total		2.56E+02	kg	
241-C-107	Ta	Sludge	1C (Solid)	4.57E-01	kg	
241-C-107	Ta	Sludge	CWP2 (Solid)	8.02E-02	kg	
241-C-107	Ta	Sludge	SRR (Solid)	3.05E-01	kg	
241-C-107	Ta	Total		8.43E-01	kg	
241-C-107	Te	Sludge	1C (Solid)	9.68E+01	kg	
241-C-107	Te	Sludge	CWP2 (Solid)	1.70E+01	kg	
241-C-107	Te	Sludge	SRR (Solid)	6.47E+01	kg	
241-C-107	Te	Total		1.79E+02	kg	
241-C-107	Th	Sludge	1C (Solid)	3.57E+02	kg	
241-C-107	Th	Sludge	CWP2 (Solid)	6.26E+01	kg	
241-C-107	Th	Sludge	SRR (Solid)	2.39E+02	kg	
241-C-107	Th	Total		6.58E+02	kg	
241-C-107	Ti	Sludge	1C (Solid)	3.67E+01	kg	
241-C-107	Ti	Sludge	CWP2 (Solid)	1.49E+01	kg	
241-C-107	Ti	Sludge	SRR (Solid)	7.16E+01	kg	
241-C-107	Ti	Total		1.23E+02	kg	
241-C-107	TIC as CO	Sludge	1C (Solid)	6.16E+03	kg	
241-C-107	TIC as CO	Sludge	CWP2 (Solid)	1.08E+03	kg	
241-C-107	TIC as CO	Sludge	SRR (Solid)	4.12E+03	kg	
241-C-107	TIC as CO	Total		1.14E+04	kg	
241-C-107	Tl	Sludge	1C (Solid)	2.93E+00	kg	
241-C-107	Tl	Sludge	CWP2 (Solid)	5.14E-01	kg	
241-C-107	Tl	Sludge	SRR (Solid)	1.96E+00	kg	
241-C-107	Tl	Total		5.40E+00	kg	
241-C-107	TOC	Sludge	1C (Solid)	3.97E+02	kg	
241-C-107	TOC	Sludge	CWP2 (Solid)	6.97E+01	kg	

CALCULATION SHEET

PROJECT: RPP-WTP
JOB NO.: 24590
CALC NO.: 24590-WTP-M4C-FRP-00001
SHEET REV: 0D
SHEET NO.. D-57

BY: E. Berrios
DATE: 12/05/05

SUBJECT: WTP Air Emissions Inorganic and Radionuclide Constituents Feed Vector

Tank Name	Analyte	Waste Phase	Waste Type	Inventory	Units	Summary
241-C-107	TOC	Sludge	SRR (Solid)	2.66E+02	kg	
241-C-107	TOC	Total		7.32E+02	kg	
241-C-107	UTOTAL	Sludge	1C (Solid)	6.03E+03	kg	
241-C-107	UTOTAL	Sludge	CWP2 (Solid)	1.75E+03	kg	
241-C-107	UTOTAL	Sludge	SRR (Solid)	1.44E+03	kg	
241-C-107	UTOTAL	Total		9.23E+03	kg	
241-C-107	V	Sludge	1C (Solid)	1.35E+01	kg	
241-C-107	V	Sludge	CWP2 (Solid)	2.38E+00	kg	
241-C-107	V	Sludge	SRR (Solid)	9.05E+00	kg	
241-C-107	V	Total		2.50E+01	kg	
241-C-107	W	Sludge	1C (Solid)	3.64E+02	kg	
241-C-107	W	Sludge	CWP2 (Solid)	6.39E+01	kg	
241-C-107	W	Sludge	SRR (Solid)	2.43E+02	kg	
241-C-107	W	Total		6.71E+02	kg	
241-C-107	Y	Sludge	1C (Solid)	5.11E+01	kg	
241-C-107	Y	Sludge	CWP2 (Solid)	8.98E+00	kg	
241-C-107	Y	Sludge	SRR (Solid)	3.42E+01	kg	
241-C-107	Y	Total		9.43E+01	kg	
241-C-107	Zn	Sludge	1C (Solid)	7.40E+01	kg	
241-C-107	Zn	Sludge	CWP2 (Solid)	1.57E+01	kg	
241-C-107	Zn	Sludge	SRR (Solid)	8.66E+01	kg	
241-C-107	Zn	Total		1.76E+02	kg	
241-C-107	Zr	Sludge	1C (Solid)	2.67E+01	kg	
241-C-107	Zr	Sludge	CWP2 (Solid)	1.72E+00	kg	
241-C-107	Zr	Sludge	SRR (Solid)	4.53E+01	kg	
241-C-107	Zr	Total		7.37E+01	kg	

Appendix F

Report: Air Emissions Estimation of Products of Incomplete Combustion for the Hanford Tank Waste Treatment and Immobilization Plant

24590-WTP-RPT-PO-05-007, Rev 1

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Document title: **Air Emissions Estimation of Products of Incomplete Combustion for the Hanford Tank Waste Treatment and Immobilization Plant**

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History Sheet

Rev	Date	Reason for revision	Revised by
0	7/20/05	Initial Issue	E Berríos
1	1/24/06	Deleted phase information from Table 1. Also updated final approved reference for the LAW and HLW regulatory offgas test performed at VSL.	E. Berríos

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Acronyms

COPC	constituents of potential concern
DSCM	dry standard cubic meter
EPA	Environmental Protection Agency
PAH	polycyclic aromatic hydrocarbon
PIC	product of incomplete combustion
R&T	research and technology
SCFM	standard cubic feet per minute
TCO	thermal catalytic oxidizer
VSL	Vitreous State Laboratories
WTP	Hanford Tank Waste Treatment and Immobilization Plant

1 Introduction

During the initial stages of air permitting and risk assessment development, the Hanford Tank Waste Treatment and Immobilization Plant project identified 470 constituents of potential concern (COPC) to be evaluated of which 250 were classified as organic constituents in the feed and an additional 120 organic constituents as products of incomplete combustion (PICs). The PICs were comprised of both volatile and semi-volatile compounds. The semi-volatile compounds include a subset of polycyclic aromatic hydrocarbons (PAHs), and dioxins and furans. As the permitting process matured and more discussions occurred between the WTP personnel and the regulatory agencies, these numbers have changed slightly and now consist of a total of 456 COPCs of which 219 are classified as organic constituents in the feed and 135 as PICs. The remaining 102 COPCs are comprised of inorganic compounds, including radionuclides. The changes in the organic constituents were due to deletion of selected highly reactive herbicide and pesticide organics concluded not to be present in the WTP feed stream, as well as the reclassification of certain feed organic constituent to PICs. These changes are documented in the *Regulatory Data Quality Objectives Optimization Report* (24590-WTP-RPT-MGT-04-001) and in CCN 097844. Table 1 shows the updated PIC list used for this evaluation.

The initial basis for establishing air emissions rates for this original list of PICs (120 constituents) was documented in the *Estimation of Product of Incomplete Combustion Emissions for the River Protection Project Waste Treatment Plant* (RPT-24590-EN00005). This basis was established by reviewing the US Environmental Protection Agency list of combustion unit PICs and analyzing offgas emissions at the Catholic University Vitreous State Laboratory (VSL) vitrification test facility. PIC emissions rates were estimated for the purposes of human health and environmental risk assessment in two existing mixed waste treatment facilities. In conjunction with this information, relevant experimental data and applicable air pollution control standards were taken into consideration in developing the PICs air emissions estimates. Results from these evaluations concluded that a conservative approach to estimate PIC air emissions was to assume that they would be present at their detection limit at the stacks. The detection limits were then established by evaluating available melter testing data dating back to 1999 from the Catholic University of America Vitreous State Laboratories (VSL). The detection limits established by this process for the vitrification units were subsequently applied to the pretreatment stack emissions.

Since then, subsequent melter offgas tests, for regulatory and design purposes, using different WTP feeds (HLW and LAW) have been completed at VSL. Some of these tests included spiking with hazardous organic constituents. During these tests, PIC analysis was performed. It is therefore necessary to revisit the basis for the stack detection limits documented in RPT-24590-EN00005 and compare it to the recent VSL results to ensure that the original estimates are still bounding.

2 Purpose

The purpose of this report is to reconcile the recently obtained Research and Technology (R&T) data produced at VSL on PICs and compare it to the original PIC detection limit basis established in RPT-24590-EN00005. If the new data results show that previous basis is not bounding, then the new limits will become the new basis and a new air emissions estimate will need to be produced.

3 Scope

Recent R&T results includes data for PIC emissions from the melter and downstream of the thermal catalytic oxidizer (TCO) unit. The PICs generated at the melter undergo treatment throughout the primary offgas system for both LAW and HLW and are then treated through the TCO. The data of interest for this report are the PICs generated after the TCO as these will be representative of the stack emissions. Based on this, the data generated from LAW pilot melter tests will not be used, as it is only available from the melter generation point.

4 Evaluation

The first step of the evaluation included gathering the available R&T data and determining if any changes have occurred from the original basis. The second step was to update the air emissions data for the PICs using the new concentrations and updated stack conditions per engineering design.

4.1 Stack Concentrations

Four R&T reports were identified to have data for PICs downstream of the TCO unit. These are:

- Final Report Integrated Off-Gas System Test on the DM1200 Melter with RPP-WTP LAW Sub-Envelope C1 Simulants (24590-101-TSA-W000-0009-111-01, Rev 00B)
- Final Report Integrated Off-Gas System Test on the DM1200 Melter with RPP-WTP LAW Sub-Envelope A1 Simulants (24590-101-TSA-W000-0009-111-02, Rev 00B)
- Final Report Regulatory Off-gas Emissions Testing on the DM1200 Melter System Using HLW and LAW Simulants (24590-101-TSA-W000-0009-166-00001, Rev 00A)

The majority of the PIC data provided in these reports deals with dioxin and furans and several semi-volatiles. Table 2 presents a compilation of this data. The first two columns provide the PIC general data (CAS number and name). The third column shows the original stack detection limit established by RPT-24590-EN00005. The next four columns include the new R&T data used for comparison. The last three columns show the highest detection limit, and final detection limit chosen with a contingency factor of 50% applied. The logic for the contingency factor is as follows: if the highest concentration selected is the established one by RPT-24590-EN00005, then no changes are required for the concentration; if the highest concentration is based on new R&T test results, then a 50% contingency is added. This was done to provide a bounding number.

As can been seen from Table 2, Envelope C data provided the most changes to the dioxin and furans concentrations along with the only change in a semi-volatile (4,6-Dinitro-o-cresol). Envelope A caused one constituent concentration to increase (TCDD). These new concentrations, with the added 50% contingency are now considered the new bounding stack detection limits.

4.2 Air Emissions

As there were changes to the stack concentrations, a new air emissions estimate is required for the PICs. This estimate was generated as follows.

- Stack conditions for the Pretreatment , LAW, and HLW stacks were obtained from CCN 116807 *Process Engineering Stack Effluent Conditions Table 1,2, and 3 Replacement.* The stack volumetric flow rate in SCFM was converted to dry standard cubic meters per minute (DSCM/min).
- Each individual PIC concentration was then multiplied by the dry volumetric flowrate in dscm/min to arrive at a mass rate of the constituent in μg/min. The units of this mass rate were then converted to grams per second to match the units used for air permitting and environmental risk assessment purposes.

Below are detailed calculations for the process described above.

4.3 Pretreatment Facility

The stack conditions for the Pretreatment Facility, per CCN 116807 are:
Volumetric Flowrate: 4,000 SCFM
T = 100°F = 37.8 C = 310.8 K
Pressure = 14.6 psi
Relative humidity (RH) = 70%

The volumetric flow rate of dry air for this stream can be calculated by using the ideal gas law. Standard conditions are defined at a pressure of 14.7 psi and a temperature of 20 C (293 K). Converting from standard to actual gives the following flowrate:

$$\frac{P_S V_S}{T_S} = \frac{P_A V_A}{T_A}$$

where:

S = standard conditions
A = actual conditions

The actual volumetric flowrate is then calculated as:

$$V_A = V_S \times \frac{P_S}{P_A} \times \frac{T_A}{T_S}$$

$$V_A = 4{,}000 \frac{ft^3}{\min} \times \frac{14.7\,psi}{14.6\,psi} \times \frac{310.8K}{293K}$$

$V_A = 4{,}272\ ft^3/min$

The dry volumetric flowrate can now be calculated the following way:

$P_A V_A = P_D V_D$
where:
A = actual
D = dry
V_D is the variable of interest, thus:
$V_D = V_A P_A / P_D$

From above:
$V_A = 4{,}272\ ft^3/min$
$P_A = 14.6$ psi
$P_D = P_A$ - partial pressure of water at 100°F

The partial pressure of water can be calculated by using the relative humidity equation.

RH = partial pressure (pp) of water vapor in air / vapor pressure (vp) of water at 100°F
Therefore,
pp of water vapor in air = RH * vp of water at 100°F
From steam tables found in website http://science.csustan.edu/stkrm/INFO/H2O/H2O-vapor-pres.htm, vp of water at 100°F = 50 mmHg
pp = 0.70 * 50 mmHg = 35 mmHg = 0.677 psi

The dry volumetric flow rate is:

$$V_D = 4{,}272 \frac{ft^3}{\min} \times \frac{(14.6\,psi - 0.677\,psi)}{14.6\,psi}$$

$V_D = 4{,}074\ ft^3/min$ dry

Converting to dry standard conditions:

$$V_S = V_A \times \frac{P_A}{P_S} \times \frac{T_S}{T_A}$$

$$V_S = 4{,}074 \frac{ft^3}{\min} \times \frac{14.6\,psi}{14.7\,psi} \times \frac{293K}{310.8K}$$

$V_S = 3{,}815$ standard ft^3/min dry

Converting to cubic meters per minute (dscm/min):

3,815 dry SCFM * 1 m^3 / 35.3145 ft^3 = 108 dscm/min

This flowrate can now be multiplied by each individual PIC concentration to arrive at the mass rate at the stack. The PIC TCDD is used as an example below.

PIC: TCDD
CAS#: 1746-01-06
Stack concentration: 1.84E-05 μg/dscm
Stack mass rate: 1.84E-05 μg/dscm * 108 dscm/min = 1.99E-03 μg/min
Converting to grams/second:
1.99E-03 μg/min * (1 g / 1E+06 μg) * (1 min / 60 seconds) = 3.31E-11 grams/sec
This mass rate is the new air emissions estimate for this compound.

Table 3 shows the calculations for all the PICs throughout the Pretreatment Facility.

4.4 LAW Vitrification Facility

The stack conditions for the LAW Facility, per CCN 116807 are:
Volumetric Flowrate: 7,150 SCFM
T = 150°F = 65.6 C = 338.6 K
Pressure = 14.5 psi
RH = 100%

The volumetric flow rate of dry air for this stream can be calculated by using the ideal gas law. Standard conditions are defined at a pressure of 14.7 psi and a temperature of 20 C (293 K). Converting from standard to actual gives the following flowrate:

$$\frac{P_S V_S}{T_S} = \frac{P_A V_A}{T_A}$$

where:

S = standard conditions
A = actual conditions

The actual volumetric flowrate is then calculated as:

$$V_A = V_S \times \frac{P_S}{P_A} \times \frac{T_A}{T_S}$$

$$V_A = 7{,}150 \frac{ft^3}{\min} \times \frac{14.7 psi}{14.5 psi} \times \frac{338.6K}{293K}$$

$V_A = 8{,}376\ ft^3/min$

The dry volumetric flowrate can now be calculated the following way:

$P_A V_A = P_D V_D$
where:
A = actual
D = dry
V_D is the variable of interest, thus:
$V_D = P_A V_A / P_D$

From above:
$V_A = 8{,}376\ ft^3/min$
$P_A = 14.5$ psi
$P_D = P_A$ - partial pressure of water at 150°F

The partial pressure of water can be calculated by using the relative humidity equation.

RH = partial pressure (pp) of water vapor in air / vapor pressure (vp) of water at 150°F
Therefore,
pp of water vapor in air = RH * vp of water at 150°F
From steam tables found in website http://science.csustan.edu/stkrm/INFO/H2O/H2O-vapor-pres.htm, vp of water at 150°F = 196 mmHg
pp = 1 * 196 mmHg = 196 mmHg = 3.79 psi

The dry volumetric flow rate is:

$$V_D = 8{,}376 \frac{ft^3}{\min} \times \frac{(14.5 psi - 3.79 psi)}{14.5 psi}$$

$V_D = 6{,}186\ ft^3/min$ dry

Converting to dry standard conditions:

$$V_S = V_A \times \frac{P_A}{P_S} \times \frac{T_S}{T_A}$$

$$V_S = 6{,}186 \frac{ft^3}{\min} \times \frac{14.5 psi}{14.7 psi} \times \frac{293K}{338.6K}$$

$V_S = 5{,}281$ standard ft^3/min dry

Converting to cubic meters per minute (dscm/min):

5,281 dry SCFM * 1 m^3 / 35.3145 ft^3 = 150 dscm/min

This flowrate can now be multiplied by each individual PIC concentration to arrive at the mass rate at the stack. The PIC TCDD is used as an example below.

PIC: TCDD
CAS#: 1746-01-06
Stack concentration: 1.84E-05 μg/dscm
Stack mass rate: 1.84E-05 μg/dscm * 150 dscm/min = 2.75E-03 μg/min
Converting to grams/second:
2.75E-03 μg/min * (1 g / 1E+06 μg) * (1 min / 60 seconds) = 4.58E-11 grams/sec
This mass rate is the new air emissions estimate for this compound.

Table 4 shows the calculations for all the PICs throughout the LAW Facility.

4.5 HLW Vitrification Facility

The stack conditions for the HLW Facility, per CCN 116807 are (note that this information is for one stack):
Volumetric Flowrate: 2,158 SCFM
T = 275°F = 135 C = 408 K
Pressure = 14.5 psi
RH = 2.8%

The volumetric flow rate of dry air for this stream can be calculated by using the ideal gas law. Standard conditions are defined at a pressure of 14.7 psi and a temperature of 20 C (293 K). Converting from standard to actual gives the following flowrate:

$$\frac{P_S V_S}{T_S} = \frac{P_A V_A}{T_A}$$

where:

S = standard conditions
A = actual conditions

The actual volumetric flowrate is then calculated as:

$$V_A = V_S \times \frac{P_S}{P_A} \times \frac{T_A}{T_S}$$

$$V_A = 2{,}158 \frac{ft^3}{\min} \times \frac{14.7 psi}{14.5 psi} \times \frac{408K}{293K}$$

V_A = 3,046 ft^3/min

The dry volumetric flowrate can now be calculated the following way:

$P_A V_A = P_D V_D$
where:

A = actual
D = dry
V_D is the variable of interest, thus:
$V_D = P_A V_A / P_D$

From above:
V_A = 3,046 ft^3/min
P_A = 14.5 psi
P_D = P_A - partial pressure of water at 275°F

The partial pressure of water can be calculated by using the relative humidity equation.

RH = partial pressure (pp) of water vapor in air / vapor pressure (vp) of water at 275°F
Therefore,
pp of water vapor in air = RH * vp of water at 275°F
From steam tables found in website http://science.csustan.edu/stkrm/INFO/H2O/H2O-vapor-pres.htm, vp of water at 275°F = 2,635 mmHg
pp = 0.028 * 2,635 mmHg = 73.8 mmHg = 1.43 psi

The dry volumetric flow rate is:

$$V_D = 3{,}046 \frac{ft^3}{\min} \times \frac{(14.5psi - 1.43psi)}{14.5psi}$$

V_D = 2,747 ft^3/min dry

Converting to dry standard conditions:

$$V_S = V_A \times \frac{P_A}{P_S} \times \frac{T_S}{T_A}$$

$$V_S = 2{,}747 \frac{ft^3}{\min} \times \frac{14.5psi}{14.7psi} \times \frac{293K}{408K}$$

V_S = 1,946 standard ft^3/min dry

Converting to cubic meters per minute (dscm/min):

1,946 dry SCFM * 1 m^3 / 35.3145 ft^3 = 55 dscm/min

This flowrate can now be multiplied by each individual PIC concentration to arrive at the mass rate at the stack. The PIC TCDD is used as an example below.

PIC: TCDD
CAS#: 1746-01-06
Stack concentration: 1.84E-05 μg/dscm
Stack mass rate: 1.84E-05 μg/dscm * 55 dscm/min = 1.01E-03 μg/min
Converting to grams/second:
1.01E-03 μg/min * (1 g / 1E+06 μg) * (1 min / 60 seconds) = 1.69E-11 grams/sec

As there are two stacks in HLW this number is multiplied by two:
1.6970E-11 grams/sec * 2 = 3.38E-11 grams/sec
This mass rate is the new air emissions estimate for this compound.

Table 5 shows the calculations for all the PICs throughout the HLW Facility.

5 Conclusions

Recent R&T data has shown that PIC detection limits at the stack are higher than were previously predicted. Therefore, the current air emissions estimate for these compounds is no longer bounding. This new data has been reconciled and it shows that the majority of the dioxins and furans stack concentrations increased along with a few semi-volatile compounds. Based on the new concentrations a new PIC air emissions estimate has been developed and is summarized in Table 6.

Offgas testing has been concluded at the pilot melters located at VSL. Confirmatory tests will not occur until the WTP commissioning period. One remaining test deals with the activated carbon beds at the Idaho National Laboratories. If results from these tests show changes in the PIC emissions, this document will be updated to reflect these changes. Otherwise, an update will not be necessary for the PIC air emissions until the commissioning period as long as there are no changes on the stack flowrates.

6 References

24590-101-TSA-W000-0009-111-01, Rev 00B, *Final Report Integrated Off-Gas System Test on the DM1200 Melter with RPP-WTP LAW Sub-Envelope C1 Simulants*

24590-101-TSA-W000-0009-111-02, Rev 00B, *Final Report Integrated Off-Gas System Test on the DM1200 Melter with RPP-WTP LAW Sub-Envelope A1 Simulants*

24590-101-TSA-W000-0009-166-00001, Rev 00A, *Final Report Regulatory Off-gas Emissions Testing on the DM1200 Melter System Using HLW and LAW Simulants*

24590-WTP-RPT-MGT-04-001, Rev 0, *Regulatory Data Quality Objectives Optimization Report*

CCN 097844, Meeting Minutes, Lee Bostic, September 3, 2004, "Discuss and Resolve the Outstanding Risk Assessment Issues in the Risk Assessment Work Plan (RAWP)"

CCN 116807, Memorandum, Bret Yorgesen to Jennifer Su-Coker, March 23, 2005, "Process Engineering Stack Effluent Conditions Table 1, 2, and 3 Replacement"

http://science.csustan.edu/stkrm/INFO/H2O/H2O-vapor-pres.htm, Vapor Pressure of Water

RPT-24590-EN00005, Rev 0, *Estimation of Product of Incomplete Combustion Emissions for the River Protection Project Waste Treatment Plant*

Table 1 WTP Updated PIC List

CAS Registry Number	Compound	Category	Analytical Method EPA-SW-848 Method
1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	dioxin/furan	8290
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	dioxin/furan	8290
3268-87-9	Octachlorodibenzo(p)dioxin	dioxin/furan	8290
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	dioxin/furan	8290
39001-02-0	Octachlorodibenzofuran	dioxin/furan	8290
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	dioxin/furan	8290
40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	dioxin/furan	8290
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	dioxin/furan	8290
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	dioxin/furan	8290
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	dioxin/furan	8290
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	dioxin/furan	8290
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	dioxin/furan	8290
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	dioxin/furan	8290
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	dioxin/furan	8290
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	dioxin/furan	8290
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	dioxin/furan	8290
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	dioxin/furan	8290
192-97-2	Benzo(e)pyrene	PAH	8270-C (pah)
205-82-3	Benzo(j)fluoranthene	PAH	8270-C (pah)
205-99-2	Benzo(b)fluoranthene	PAH	8270-C (pah)
207-08-9	Benzo(k)fluoranthene	PAH	8270-C (pah)
218-01-9	Chrysene	PAH	8270-C (pah)
5385-75-1	Dibenzo(a,e)fluoranthene	PAH	8270-C (pah)
56-55-3	Benzo(a)anthracene	PAH	8270-C (pah)
91-57-6	2-Methylnaphthalene	PAH	8270-C (pah)
100-02-7	4-Nitrophenol	semi-volatile	8270-C
100-25-4	1,4-Dinitrobenzene	semi-volatile	8270-C
100-51-6	Benzyl alcohol	semi-volatile	8270-C
100-52-7	Benzaldehyde	semi-volatile	8270-C
101-77-9	4,4-Methylenedianiline	semi-volatile	8270-C
103-33-3	Azobenzene	semi-volatile	8270-C
105-67-9	2,4-Dimethylphenol	semi-volatile	8270-C
106-44-5	p-Cresol (4-Methyl phenol)	semi-volatile	8270-C
106-47-8	p-Chloroaniline	semi-volatile	8270-C
106-49-0	p-Toluidine	semi-volatile	8270-C
106-51-4	Quinone	semi-volatile	8270-C
107-98-2	Propylene gylcol monomethyl ether	semi-volatile	8270-C
108-60-1	Dichloroisopropyl ether	semi-volatile	8270-C
109-86-4	2-Methoxyethanol	semi-volatile	8270-C
110-80-5	2-Ethoxyethanol	semi-volatile	8270-C
111-15-9	Ethylene glycol monoethyl ether acetate	semi-volatile	8270-C
111-44-4	Bis(2-chloroethyl) ether	semi-volatile	8270-C
111-91-1	Bis(2-chloroethoxy)methane	semi-volatile	8270-C
1120-71-4	1,3-Propane sultone	semi-volatile	8270-C
118-74-1	Hexachlorobenzene	semi-volatile	8270-C
119-90-4	3,3'-Dimethoxybenzidine (ortol-dianisidine)	semi-volatile	8270-C
121-14-2	2,4-Dinitrotoluene	semi-volatile	8270-C
122-66-7	1,2-Diphenylhydrazine	semi-volatile	8270-C

Table 1 WTP Updated PIC List

CAS Registry Number	Compound	Category	Analytical Method EPA-SW-848 Method
123-33-1	Maleic hydrazide	semi-volatile	8270-C
131-11-3	Dimethylphthalate	semi-volatile	8270-C
131-89-5	2-Cyclohexyl-4,6-dinitrophenol	semi-volatile	8270-C
133-06-2	Captan	semi-volatile	8270-C
145-73-3	Endothall	semi-volatile	8270-C
23950-58-5	Pronamide	semi-volatile	8270-C
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	semi-volatile	8270-C
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	semi-volatile	8270-C
506-68-3	Cyanogen bromide	semi-volatile	8270-C
510-15-6	Chlorobenzilate	semi-volatile	8270-C
51-28-5	2,4-Dinitrophenol	semi-volatile	8270-C
51-79-6	Ethyl Carbamate (urethane)	semi-volatile	8270-C
528-29-0	o-Dinitrobenzene	semi-volatile	8270-C
532-27-4	2-Chloroacetophenone	semi-volatile	8270-C
534-52-1	4,6-Dinitro-o-cresol	semi-volatile	8270-C
57-24-9	Strychnine	semi-volatile	8270-C
57-74-9	Chlordane	semi-volatile	8270-C
584-84-9	2,4-Toluene diisocyante	semi-volatile	8270-C
58-89-9	gamma-BHC (Lindane)	semi-volatile	8270-C
60-11-7	Dimethyl aminoazobenzene	semi-volatile	8270-C
606-20-2	2,6-Dinitrotoluene	semi-volatile	8270-C
608-93-5	Pentachlorobenzene	semi-volatile	8270-C
62-50-0	Ethyl methanesulfonate	semi-volatile	8270-C
62-53-3	Aniline	semi-volatile	8270-C
65-85-0	Benzoic acid	semi-volatile	8270-C
70-30-4	Hexachlorophene	semi-volatile	8270-C
72-43-5	Methoxychlor	semi-volatile	8270-C
72-55-9	4,4'-DDE	semi-volatile	8270-C
76-44-8	Heptachlor	semi-volatile	8270-C
765-34-4	Glycidylaldehyde	semi-volatile	8270-C
77-47-4	Hexachlorocyclopentadiene	semi-volatile	8270-C
77-78-1	Dimethyl sulfate	semi-volatile	8270-C
822-06-0	Hexamethylene-1,5-diisocyanate	semi-volatile	8270-C
823-40-5	Toluene-2,6-diamine	semi-volatile	8270-C
82-68-8	Pentachloronitrobenzene (PCBN)	semi-volatile	8270-C
85-44-9	Phthalic anhydride	semi-volatile	8270-C
87-86-5	Pentachlorophenol	semi-volatile	8270-C
88-74-4	o-Nitroaniline (2-Nitroaniline)	semi-volatile	8270-C
90-04-0	o-Anisidine	semi-volatile	8270-C
91-94-1	3,3'-Dichlorobenzidine	semi-volatile	8270-C
94-59-7	Safrole	semi-volatile	8270-C
94-75-7	2,4-D and esters (!60C typed)	semi-volatile	8270-C
95-94-3	1,2,4,5-Tetrachlorobenzene	semi-volatile	8270-C
96-12-8	1,2-Dibromo-3-chloropropane	semi-volatile	8270-C
96-45-7	Ethylene thiourea	semi-volatile	8270-C
98-01-1	Furfural	semi-volatile	8270-C
98-07-7	Benzotrichloride	semi-volatile	8270-C
99-35-4	1,3,5-Trinitrobenzene	semi-volatile	8270-C

Table 1 WTP Updated PIC List

CAS Registry Number	Compound	Category	Analytical Method EPA-SW-848 Method
99-65-0	1,3-Dinitrobenzene	semi-volatile	8270-C
100-44-7	Benzyl chloride	volatile	8260-B
103-65-1	n-Propyl benzene (Isocumene)	volatile	8260-B
104-51-8	n-Butylbenzene	volatile	8260-B
106-43-4	4-Chlorotoluene (p-Tolyl chloride)	volatile	8260-B
106-89-8	Epichlorohydrin (1-chloro-2,3-epoxypropane)	volatile	8260-B
107-19-7	Propargyl alcohol	volatile	8260-B
107-21-1	Ethylene glycol	volatile	8260-B
108-67-8	1,3,5-Trimethyl benzene	volatile	8260-B
108-86-1	Bromobenzene (Phenyl bromide)	volatile	8260-B
109-77-3	Malononitrile	volatile	8260-B
124-48-1	Chlorodibromomethane	volatile	8260-B
135-98-8	sec-Butylbenzene	volatile	8260-B
156-59-2	cis-1,2-Dichloroethene	volatile	8260-B
25013-15-4	Methyl styrene (mixed isomers)	volatile	8260-B
41851-50-7	Chlorocyclopentadiene	volatile	8260-B
460-19-5	Cyanogen	volatile	8260-B
506-77-4	Cyanogen chloride	volatile	8260-B
540-73-8	1,2-Dimethylhydrazine	volatile	8260-B
542-75-6	1,3-Dichloropropene	volatile	8260-B
542-88-1	Dichloromethyl ether	volatile	8260-B
593-60-2	Bromoethene	volatile	8260-B
61626-71-9	Dichloropentadiene	volatile	8260-B
74-88-4	Iodomethane (Methyl iodide)	volatile	8260-B
74-95-3	Methylene bromide	volatile	8260-B
75-25-2	Bromoform	volatile	8260-B
75-29-6	2-Chloropropane	volatile	8260-B
75-44-5	Phosgene	volatile	8260-B
76-01-7	Pentachloroethane	volatile	8260-B
764-41-0	1,4-Dichloro-2-butene	volatile	8260-B
80-62-6	Methyl methacrylate	volatile	8260-B
87-61-6	1,2,3-Trichlorobenzene	volatile	8260-B
924-16-3	N-Nitrosodi-n-butylamine	volatile	8260-B
95-53-4	o-Toluidine	volatile	8260-B
95-63-6	1,2,4-Trimethyl benzene	volatile	8260-B
96-18-4	1,2,3-Trichloropropane	volatile	8260-B
97-63-2	Ethyl methacrylate	volatile	8260-B
98-06-6	tert-Butyl benzene	volatile	8260-B
99-87-6	p-Cymene	volatile	8260-B

Table 2 WTP PIC Stack Concentrations Evaluation

CAS Registry Number	Compound	Original Conc. µg/dscm	DM1200 Env A Conc. µg/dscm	DM1200 Env C Conc. µg/dscm	DM1200 HLW ROGT Conc. µg/dscm	DM1200 LAW ROGT Conc. µg/dscm	MAX µg/dscm	Source	MAX with Contingency µg/dscm
1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	9.38E-06	1.23E-05	1.84E-06	5.23E-06	7.06E-07	1.23E-05	Env A	1.84E-05
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	1.56E-05	4.98E-06	5.09E-06	2.40E-06	1.41E-06	1.56E-05	Original	1.56E-05
3268-87-9	Octachlorodibenzo(p)dioxin	7.82E-05	3.64E-05	2.66E-05	4.14E-05	1.73E-05	7.82E-05	Original	7.82E-05
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	3.13E-05	2.04E-05	1.47E-05	1.20E-05	5.65E-06	3.13E-05	Original	3.13E-05
39001-02-0	Octachlorodibenzofuran	6.25E-05	3.57E-05	1.95E-04	8.84E-05	3.57E-05	1.95E-04	Env C	2.92E-04
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05	5.44E-06	6.85E-06	1.55E-06	1.06E-06	1.56E-05	Original	1.56E-05
40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	1.56E-05	7.91E-06	8.30E-06	2.22E-06	7.06E-07	1.56E-05	Original	1.56E-05
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	7.82E-06	1.84E-05	8.30E-04	7.31E-06	6.00E-06	8.30E-04	Env C	1.24E-03
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.56E-05	2.72E-05	7.49E-05	3.40E-05	1.77E-05	7.49E-05	Env C	1.12E-04
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	7.82E-06	3.46E-05	1.07E-03	1.31E-05	5.65E-06	1.07E-03	Env C	1.61E-03
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	7.82E-06	1.66E-05	1.16E-03	1.51E-05	7.77E-06	1.16E-03	Env C	1.74E-03
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	1.25E-05	2.60E-05	5.26E-04	2.25E-05	1.31E-05	5.26E-04	Env C	7.89E-04
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05	5.54E-06	5.09E-06	2.37E-06	7.06E-07	1.56E-05	Original	1.56E-05
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	1.41E-05	1.89E-05	2.70E-04	8.02E-06	5.30E-06	2.70E-04	Env C	4.05E-04
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.56E-05	1.16E-04	1.54E-03	6.84E-05	4.48E-05	1.54E-03	Env C	2.31E-03
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	1.41E-05	6.14E-05	1.07E-03	4.85E-05	3.07E-05	1.07E-03	Env C	1.61E-03
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	1.56E-05	5.86E-06	2.37E-05	3.99E-06	2.47E-06	2.37E-05	Env C	3.55E-05
192-97-2	Benzo(e)pyrene	3	5.40E-02	0.00E+00	0.00E+00	0.00E+00	3	Original	3
205-82-3	Benzo(j)fluoranthene	3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	Original	3
205-99-2	Benzo(b)fluoranthene	3	3.22E-02	0.00E+00	0.00E+00	0.00E+00	3	Original	3
207-08-9	Benzo(k)fluoranthene	3	8.12E-03	0.00E+00	0.00E+00	0.00E+00	3	Original	3
218-01-9	Chrysene	3	2.39E-02	0.00E+00	0.00E+00	0.00E+00	3	Original	3
5385-75-1	Dibenzo(a,e)fluoranthene	3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	Original	3
56-55-3	Benzo(a)anthracene	3	4.13E-03	0.00E+00	0.00E+00	0.00E+00	3	Original	3
91-57-6	2-Methylnaphthalene	3	3.00E+00	0.00E+00	0.00E+00	0.00E+00	3	Original	3
100-02-7	4-Nitrophenol	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
100-25-4	1,4-Dinitrobenzene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
100-51-6	Benzyl alcohol	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
100-52-7	Benzaldehyde	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
101-77-9	4,4-Methylenedianiline	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
103-33-3	Azobenzene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
105-67-9	2,4-Dimethylphenol	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
106-44-5	p-Cresol (4-Methyl phenol)	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
106-47-8	p-Chloroaniline	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
106-49-0	p-Toluidine	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
106-51-4	Quinone	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
107-98-2	Propylene gylcol monomethyl ether	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
108-60-1	Dichloroisopropyl ether	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
109-86-4	2-Methoxyethanol	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
110-80-5	2-Ethoxyethanol	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
111-15-9	Ethylene glycol monoethyl ether acetate	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
111-44-4	Bis(2-chloroethyl) ether	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
111-91-1	Bis(2-chloroethoxy)methane	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
1120-71-4	1,3-Propane sultone	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
118-74-1	Hexachlorobenzene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
119-90-4	3,3'-Dimethoxybenzidine (ortol-dianisidine)	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
121-14-2	2,4-Dinitrotoluene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
122-66-7	1,2-Diphenylhydrazine	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
123-33-1	Maleic hydrazide	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
131-11-3	Dimethylphthalate	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
131-89-5	2-Cyclohexyl-4,6-dinitrophenol	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
133-06-2	Captan	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
145-73-3	Endothall	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
23950-58-5	Pronamide	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
506-68-3	Cyanogen bromide	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
510-15-6	Chlorobenzilate	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
51-28-5	2,4-Dinitrophenol	15	0.00E+00	7.63E-01	0.00E+00	0.00E+00	15	Original	15
51-79-6	Ethyl Carbamate (urethane)	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
528-29-0	o-Dinitrobenzene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
532-27-4	2-Chloroacetophenone	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
534-52-1	4,6-Dinitro-o-cresol	15	0.00E+00	1.97E+02	0.00E+00	0.00E+00	197	Env C	295
57-24-9	Strychnine	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
57-74-9	Chlordane	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
584-84-9	2,4-Toluene diisocyante	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
58-89-9	gamma-BHC (Lindane)	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
60-11-7	Dimethyl aminoazobenzene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
606-20-2	2,6-Dinitrotoluene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
608-93-5	Pentachlorobenzene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
62-50-0	Ethyl methanesulfonate	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15

Table 2 WTP PIC Stack Concentrations Evaluation

CAS Registry Number	Compound	Original Conc. µg/dscm	DM1200 Env A Conc. µg/dscm	DM1200 Env C Conc. µg/dscm	DM1200 HLW ROGT Conc. µg/dscm	DM1200 LAW ROGT Conc. µg/dscm	MAX µg/dscm	Source	MAX with Contingency µg/dscm
62-53-3	Aniline	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
65-85-0	Benzoic acid	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
70-30-4	Hexachlorophene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
72-43-5	Methoxychlor	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
72-55-9	4,4'-DDE	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
76-44-8	Heptachlor	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
765-34-4	Glycidylaldehyde	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
77-47-4	Hexachlorocyclopentadiene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
77-78-1	Dimethyl sulfate	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
822-06-0	Hexamethylene-1,5-diisocyanate	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
823-40-5	Toluene-2,6-diamine	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
82-68-8	Pentachloronitrobenzene (PCBN)	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
85-44-9	Phthalic anhydride	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
87-86-5	Pentachlorophenol	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
88-74-4	o-Nitroanilme (2-Nitroaniline)	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
90-04-0	o-Anisidine	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
91-94-1	3,3'-Dichlorobenzidine	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
94-59-7	Safrole	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
94-75-7	2,4-D and esters (!60C typed)	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
95-94-3	1,2,4,5-Tetrachlorobenzene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
96-12-8	1,2-Dibromo-3-chloropropane	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
96-45-7	Ethylene thiourea	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
98-01-1	Furfural	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
98-07-7	Benzotrichloride	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
99-35-4	1,3,5-Trinitrobenzene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
99-65-0	1,3-Dinitrobenzene	15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	15	Original	15
100-44-7	Benzyl chloride	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
103-65-1	n-Propyl benzene (Isocumene)	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
104-51-8	n-Butylbenzene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
106-43-4	4-Chlorotoluene (p-Tolyl chloride)	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
106-89-8	Epichlorohydrin (1-chloro-2,3-epoxypropane)	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
107-19-7	Propargyl alcohol	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
107-21-1	Ethylene glycol	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
108-67-8	1,3,5-Trimethyl benzene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
108-86-1	Bromobenzene (Phenyl bromide)	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
109-77-3	Malononitrile	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
124-48-1	Chlorodibromomethane	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
135-98-8	sec-Butylbenzene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
156-59-2	cis-1,2-Dichloroethene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
25013-15-4	Methyl styrene (mixed isomers)	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
41851-50-7	Chlorocyclopentadiene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
460-19-5	Cyanogen	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
506-77-4	Cyanogen chloride	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
540-73-8	1,2-Dimethylhydrazine	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
542-75-6	1,3-Dichloropropene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
542-88-1	Dichloromethyl ether	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
593-60-2	Bromoethene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
61626-71-9	Dichloropentadiene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
74-88-4	Iodomethane (Methyl iodide)	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
74-95-3	Methylene bromide	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
75-25-2	Bromoform	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
75-29-6	2-Chloropropane	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
75-44-5	Phosgene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
76-01-7	Pentachloroethane	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
764-41-0	1,4-Dichloro-2-butene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
80-62-6	Methyl methacrylate	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
87-61-6	1,2,3-Trichlorobenzene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
924-16-3	N-Nitrosodi-n-butylamine	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
95-53-4	o-Toluidine	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
95-63-6	1,2,4-Trimethyl benzene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
96-18-4	1,2,3-Trichloropropane	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
97-63-2	Ethyl methacrylate	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
98-06-6	tert-Butyl benzene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2
99-87-6	p-Cymene	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	Original	2

General Notes:

1. All concentrations are after TCO
2. If previous concentration is the max, no changes applied
3. If highest concentration is based on new numbers, then 50% contingency is applied

Table 3 Pretreatment Facility Stack PIC Air Emissions

CAS Registry Number	Compound	Max Conc. µg/dscm	PT Stack Mass Rate µg/min	PT Stack Mass Rate g/sec
1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	1.84E-05	1.99E-03	3.31E-11
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	1.56E-05	1.69E-03	2.81E-11
3268-87-9	Octachlorodibenzo(p)dioxin	7.82E-05	8.44E-03	1.41E-10
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	3.13E-05	3.38E-03	5.63E-11
39001-02-0	Octachlorodibenzofuran	2.92E-04	3.15E-02	5.25E-10
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05	1.69E-03	2.81E-11
40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	1.56E-05	1.69E-03	2.81E-11
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	1.24E-03	1.34E-01	2.24E-09
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.12E-04	1.21E-02	2.02E-10
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	1.61E-03	1.73E-01	2.89E-09
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	1.74E-03	1.88E-01	3.14E-09
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	7.89E-04	8.53E-02	1.42E-09
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05	1.69E-03	2.81E-11
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	4.05E-04	4.38E-02	7.30E-10
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.31E-03	2.49E-01	4.16E-09
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	1.61E-03	1.74E-01	2.90E-09
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	3.55E-05	3.84E-03	6.40E-11
192-97-2	Benzo(e)pyrene	3	3.24E+02	5.40E-06
205-82-3	Benzo(j)fluoranthene	3	3.24E+02	5.40E-06
205-99-2	Benzo(b)fluoranthene	3	3.24E+02	5.40E-06
207-08-9	Benzo(k)fluoranthene	3	3.24E+02	5.40E-06
218-01-9	Chrysene	3	3.24E+02	5.40E-06
5385-75-1	Dibenzo(a,e)fluoranthene	3	3.24E+02	5.40E-06
56-55-3	Benzo(a)anthracene	3	3.24E+02	5.40E-06
91-57-6	2-Methylnaphthalene	3	3.24E+02	5.40E-06
100-02-7	4-Nitrophenol	15	1.62E+03	2.70E-05
100-25-4	1,4-Dinitrobenzene	15	1.62E+03	2.70E-05
100-51-6	Benzyl alcohol	15	1.62E+03	2.70E-05
100-52-7	Benzaldehyde	15	1.62E+03	2.70E-05
101-77-9	4,4-Methylenedianiline	15	1.62E+03	2.70E-05
103-33-3	Azobenzene	15	1.62E+03	2.70E-05
105-67-9	2,4-Dimethylphenol	15	1.62E+03	2.70E-05
106-44-5	p-Cresol (4-Methyl phenol)	15	1.62E+03	2.70E-05
106-47-8	p-Chloroaniline	15	1.62E+03	2.70E-05
106-49-0	p-Toluidine	15	1.62E+03	2.70E-05
106-51-4	Quinone	15	1.62E+03	2.70E-05
107-98-2	Propylene gylcol monomethyl ether	15	1.62E+03	2.70E-05
108-60-1	Dichloroisopropyl ether	15	1.62E+03	2.70E-05
109-86-4	2-Methoxyethanol	15	1.62E+03	2.70E-05
110-80-5	2-Ethoxyethanol	15	1.62E+03	2.70E-05
111-15-9	Ethylene glycol monoethyl ether acetate	15	1.62E+03	2.70E-05
111-44-4	Bis(2-chloroethyl) ether	15	1.62E+03	2.70E-05
111-91-1	Bis(2-chloroethoxy)methane	15	1.62E+03	2.70E-05
1120-71-4	1,3-Propane sultone	15	1.62E+03	2.70E-05
118-74-1	Hexachlorobenzene	15	1.62E+03	2.70E-05
119-90-4	3,3'-Dimethoxybenzidine (ortol-dianisidine)	15	1.62E+03	2.70E-05
121-14-2	2,4-Dinitrotoluene	15	1.62E+03	2.70E-05
122-66-7	1,2-Diphenylhydrazine	15	1.62E+03	2.70E-05
123-33-1	Maleic hydrazide	15	1.62E+03	2.70E-05
131-11-3	Dimethylphthalate	15	1.62E+03	2.70E-05
131-89-5	2-Cyclohexyl-4,6-dinitrophenol	15	1.62E+03	2.70E-05
133-06-2	Captan	15	1.62E+03	2.70E-05
145-73-3	Endothall	15	1.62E+03	2.70E-05
23950-58-5	Pronamide	15	1.62E+03	2.70E-05

Table 3 Pretreatment Facility Stack PIC Air Emissions

CAS Registry Number	*Compound*	Max Conc. µg/dscm	PT Stack Mass Rate µg/min	PT Stack Mass Rate g/sec
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	15	1.62E+03	2.70E-05
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	15	1.62E+03	2.70E-05
506-68-3	Cyanogen bromide	15	1.62E+03	2.70E-05
510-15-6	Chlorobenzilate	15	1.62E+03	2.70E-05
51-28-5	2,4-Dinitrophenol	15	1.62E+03	2.70E-05
51-79-6	Ethyl Carbamate (urethane)	15	1.62E+03	2.70E-05
528-29-0	o-Dinitrobenzene	15	1.62E+03	2.70E-05
532-27-4	2-Chloroacetophenone	15	1.62E+03	2.70E-05
534-52-1	4,6-Dinitro-o-cresol	295	3.19E+04	5.31E-04
57-24-9	Strychnine	15	1.62E+03	2.70E-05
57-74-9	Chlordane	15	1.62E+03	2.70E-05
584-84-9	2,4-Toluene diisocyante	15	1.62E+03	2.70E-05
58-89-9	gamma-BHC (Lindane)	15	1.62E+03	2.70E-05
60-11-7	Dimethyl aminoazobenzene	15	1.62E+03	2.70E-05
606-20-2	2,6-Dinitrotoluene	15	1.62E+03	2.70E-05
608-93-5	Pentachlorobenzene	15	1.62E+03	2.70E-05
62-50-0	Ethyl methanesulfonate	15	1.62E+03	2.70E-05
62-53-3	Aniline	15	1.62E+03	2.70E-05
65-85-0	Benzoic acid	15	1.62E+03	2.70E-05
70-30-4	Hexachlorophene	15	1.62E+03	2.70E-05
72-43-5	Methoxychlor	15	1.62E+03	2.70E-05
72-55-9	4,4'-DDE	15	1.62E+03	2.70E-05
76-44-8	Heptachlor	15	1.62E+03	2.70E-05
765-34-4	Glycidylaldehyde	15	1.62E+03	2.70E-05
77-47-4	Hexachlorocyclopentadiene	15	1.62E+03	2.70E-05
77-78-1	Dimethyl sulfate	15	1.62E+03	2.70E-05
822-06-0	Hexamethylene-1,5-diisocyanate	15	1.62E+03	2.70E-05
823-40-5	Toluene-2,6-diamine	15	1.62E+03	2.70E-05
82-68-8	Pentachloronitrobenzene (PCBN)	15	1.62E+03	2.70E-05
85-44-9	Phthalic anhydride	15	1.62E+03	2.70E-05
87-86-5	Pentachlorophenol	15	1.62E+03	2.70E-05
88-74-4	o-Nitroaniline (2-Nitroaniline)	15	1.62E+03	2.70E-05
90-04-0	o-Anisidine	15	1.62E+03	2.70E-05
91-94-1	3,3'-Dichlorobenzidine	15	1.62E+03	2.70E-05
94-59-7	Safrole	15	1.62E+03	2.70E-05
94-75-7	2,4-D and esters (!60C typed)	15	1.62E+03	2.70E-05
95-94-3	1,2,4,5-Tetrachlorobenzene	15	1.62E+03	2.70E-05
96-12-8	1,2-Dibromo-3-chloropropane	15	1.62E+03	2.70E-05
96-45-7	Ethylene thiourea	15	1.62E+03	2.70E-05
98-01-1	Furfural	15	1.62E+03	2.70E-05
98-07-7	Benzotrichloride	15	1.62E+03	2.70E-05
99-35-4	1,3,5-Trinitrobenzene	15	1.62E+03	2.70E-05
99-65-0	1,3-Dinitrobenzene	15	1.62E+03	2.70E-05
100-44-7	Benzyl chloride	2	2.16E+02	3.60E-06
103-65-1	n-Propyl benzene (Isocumene)	2	2.16E+02	3.60E-06
104-51-8	n-Butylbenzene	2	2.16E+02	3.60E-06
106-43-4	4-Chlorotoluene (p-Tolyl chloride)	2	2.16E+02	3.60E-06
106-89-8	Epichlorohydrin (1-chloro-2,3-epoxypropane)	2	2.16E+02	3.60E-06
107-19-7	Propargyl alcohol	2	2.16E+02	3.60E-06
107-21-1	Ethylene glycol	2	2.16E+02	3.60E-06
108-67-8	1,3,5-Trimethyl benzene	2	2.16E+02	3.60E-06
108-86-1	Bromobenzene (Phenyl bromide)	2	2.16E+02	3.60E-06
109-77-3	Malononitrile	2	2.16E+02	3.60E-06
124-48-1	Chlorodibromomethane	2	2.16E+02	3.60E-06

Table 3 Pretreatment Facility Stack PIC Air Emissions

CAS Registry Number	Compound	Max Conc. µg/dscm	PT Stack Mass Rate µg/min	PT Stack Mass Rate g/sec
135-98-8	sec-Butylbenzene	2	2.16E+02	3.60E-06
156-59-2	cis-1,2-Dichloroethene	2	2.16E+02	3.60E-06
25013-15-4	Methyl styrene (mixed isomers)	2	2.16E+02	3.60E-06
41851-50-7	Chlorocyclopentadiene	2	2.16E+02	3.60E-06
460-19-5	Cyanogen	2	2.16E+02	3.60E-06
506-77-4	Cyanogen chloride	2	2.16E+02	3.60E-06
540-73-8	1,2-Dimethylhydrazine	2	2.16E+02	3.60E-06
542-75-6	1,3-Dichloropropene	2	2.16E+02	3.60E-06
542-88-1	Dichloromethyl ether	2	2.16E+02	3.60E-06
593-60-2	Bromoethene	2	2.16E+02	3.60E-06
61626-71-9	Dichloropentadiene	2	2.16E+02	3.60E-06
74-88-4	Iodomethane (Methyl iodide)	2	2.16E+02	3.60E-06
74-95-3	Methylene bromide	2	2.16E+02	3.60E-06
75-25-2	Bromoform	2	2.16E+02	3.60E-06
75-29-6	2-Chloropropane	2	2.16E+02	3.60E-06
75-44-5	Phosgene	2	2.16E+02	3.60E-06
76-01-7	Pentachloroethane	2	2.16E+02	3.60E-06
764-41-0	1,4-Dichloro-2-butene	2	2.16E+02	3.60E-06
80-62-6	Methyl methacrylate	2	2.16E+02	3.60E-06
87-61-6	1,2,3-Trichlorobenzene	2	2.16E+02	3.60E-06
924-16-3	N-Nitrosodi-n-butylamine	2	2.16E+02	3.60E-06
95-53-4	o-Toluidine	2	2.16E+02	3.60E-06
95-63-6	1,2,4-Trimethyl benzene	2	2.16E+02	3.60E-06
96-18-4	1,2,3-Trichloropropane	2	2.16E+02	3.60E-06
97-63-2	Ethyl methacrylate	2	2.16E+02	3.60E-06
98-06-6	tert-Butyl benzene	2	2.16E+02	3.60E-06
99-87-6	p-Cymene	2	2.16E+02	3.60E-06

PT Stack Conditions:

Volumetric Flow:	4,000 SCFM	
Temperature:	100 F	311 K
Water content:	0.03 lb H2O/lb air	
Density:	0.0624 lb/ft3	
Relative Humidity:	70%	
Pressure:	14.6 psi	
VP H2O @ 100F:	50 mmHg	
Standard temperature:	20 C	293 K
Standard pressure:	14.7 psi	
Actual volumetric flowrate:	4,272 ACFM	

$V_D = V_A P_A/P_D$

$P_D = P_A$ - partial pressure (pp) water @ 100F

pp = RH * VP H2O @ 100F

pp =	35 mmHg
pp =	0.677 psi
P_D =	13.9 psi
V_D =	4074 DCFM
V_S =	3815 SCFM
Dry volumetric rate:	108 DSCM/min

Table 4 LAW Facility Stack PIC Air Emissions

CAS Registry Number	Compound	Max Conc. µg/dscm	LAW Stack Mass Rate µg/min	LAW Stack Mass Rate g/sec
1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	1.84E-05	2.75E-03	4.58E-11
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	1.56E-05	2.34E-03	3.90E-11
3268-87-9	Octachlorodibenzo(p)dioxin	7.82E-05	1.17E-02	1.95E-10
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	3.13E-05	4.67E-03	7.79E-11
39001-02-0	Octachlorodibenzofuran	2.92E-04	4.36E-02	7.27E-10
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05	2.34E-03	3.90E-11
40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	1.56E-05	2.34E-03	3.90E-11
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	1.24E-03	1.86E-01	3.10E-09
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.12E-04	1.68E-02	2.80E-10
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	1.61E-03	2.40E-01	4.00E-09
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	1.74E-03	2.61E-01	4.34E-09
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	7.89E-04	1.18E-01	1.97E-09
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05	2.34E-03	3.90E-11
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	4.05E-04	6.06E-02	1.01E-09
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.31E-03	3.45E-01	5.76E-09
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	1.61E-03	2.41E-01	4.01E-09
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	3.55E-05	5.31E-03	8.86E-11
192-97-2	Benzo(e)pyrene	3	4.49E+02	7.48E-06
205-82-3	Benzo(j)fluoranthene	3	4.49E+02	7.48E-06
205-99-2	Benzo(b)fluoranthene	3	4.49E+02	7.48E-06
207-08-9	Benzo(k)fluoranthene	3	4.49E+02	7.48E-06
218-01-9	Chrysene	3	4.49E+02	7.48E-06
5385-75-1	Dibenzo(a,e)fluoranthene	3	4.49E+02	7.48E-06
56-55-3	Benzo(a)anthracene	3	4.49E+02	7.48E-06
91-57-6	2-Methylnaphthalene	3	4.49E+02	7.48E-06
100-02-7	4-Nitrophenol	15	2.24E+03	3.74E-05
100-25-4	1,4-Dinitrobenzene	15	2.24E+03	3.74E-05
100-51-6	Benzyl alcohol	15	2.24E+03	3.74E-05
100-52-7	Benzaldehyde	15	2.24E+03	3.74E-05
101-77-9	4,4-Methylenedianiline	15	2.24E+03	3.74E-05
103-33-3	Azobenzene	15	2.24E+03	3.74E-05
105-67-9	2,4-Dimethylphenol	15	2.24E+03	3.74E-05
106-44-5	p-Cresol (4-Methyl phenol)	15	2.24E+03	3.74E-05
106-47-8	p-Chloroaniline	15	2.24E+03	3.74E-05
106-49-0	p-Toluidine	15	2.24E+03	3.74E-05
106-51-4	Quinone	15	2.24E+03	3.74E-05
107-98-2	Propylene gylcol monomethyl ether	15	2.24E+03	3.74E-05
108-60-1	Dichloroisopropyl ether	15	2.24E+03	3.74E-05
109-86-4	2-Methoxyethanol	15	2.24E+03	3.74E-05
110-80-5	2-Ethoxyethanol	15	2.24E+03	3.74E-05
111-15-9	Ethylene glycol monoethyl ether acetate	15	2.24E+03	3.74E-05
111-44-4	Bis(2-chloroethyl) ether	15	2.24E+03	3.74E-05
111-91-1	Bis(2-chloroethoxy)methane	15	2.24E+03	3.74E-05
1120-71-4	1,3-Propane sultone	15	2.24E+03	3.74E-05
118-74-1	Hexachlorobenzene	15	2.24E+03	3.74E-05
119-90-4	3,3'-Dimethoxybenzidine (ortol-dianisidine)	15	2.24E+03	3.74E-05
121-14-2	2,4-Dinitrotoluene	15	2.24E+03	3.74E-05
122-66-7	1,2-Diphenylhydrazine	15	2.24E+03	3.74E-05
123-33-1	Maleic hydrazide	15	2.24E+03	3.74E-05
131-11-3	Dimethylphthalate	15	2.24E+03	3.74E-05
131-89-5	2-Cyclohexyl-4,6-dinitrophenol	15	2.24E+03	3.74E-05
133-06-2	Captan	15	2.24E+03	3.74E-05
145-73-3	Endothall	15	2.24E+03	3.74E-05
23950-58-5	Pronamide	15	2.24E+03	3.74E-05

Table 4 LAW Facility Stack PIC Air Emissions

CAS Registry Number	Compound	Max Conc. µg/dscm	LAW Stack Mass Rate µg/min	LAW Stack Mass Rate g/sec
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	15	2.24E+03	3.74E-05
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	15	2.24E+03	3.74E-05
506-68-3	Cyanogen bromide	15	2.24E+03	3.74E-05
510-15-6	Chlorobenzilate	15	2.24E+03	3.74E-05
51-28-5	2,4-Dinitrophenol	15	2.24E+03	3.74E-05
51-79-6	Ethyl Carbamate (urethane)	15	2.24E+03	3.74E-05
528-29-0	o-Dinitrobenzene	15	2.24E+03	3.74E-05
532-27-4	2-Chloroacetophenone	15	2.24E+03	3.74E-05
534-52-1	4,6-Dinitro-o-cresol	295	4.41E+04	7.36E-04
57-24-9	Strychnine	15	2.24E+03	3.74E-05
57-74-9	Chlordane	15	2.24E+03	3.74E-05
584-84-9	2,4-Toluene diisocyante	15	2.24E+03	3.74E-05
58-89-9	gamma-BHC (Lindane)	15	2.24E+03	3.74E-05
60-11-7	Dimethyl aminoazobenzene	15	2.24E+03	3.74E-05
606-20-2	2,6-Dinitrotoluene	15	2.24E+03	3.74E-05
608-93-5	Pentachlorobenzene	15	2.24E+03	3.74E-05
62-50-0	Ethyl methanesulfonate	15	2.24E+03	3.74E-05
62-53-3	Aniline	15	2.24E+03	3.74E-05
65-85-0	Benzoic acid	15	2.24E+03	3.74E-05
70-30-4	Hexachlorophene	15	2.24E+03	3.74E-05
72-43-5	Methoxychlor	15	2.24E+03	3.74E-05
72-55-9	4,4'-DDE	15	2.24E+03	3.74E-05
76-44-8	Heptachlor	15	2.24E+03	3.74E-05
765-34-4	Glycidylaldehyde	15	2.24E+03	3.74E-05
77-47-4	Hexachlorocyclopentadiene	15	2.24E+03	3.74E-05
77-78-1	Dimethyl sulfate	15	2.24E+03	3.74E-05
822-06-0	Hexamethylene-1,5-diisocyanate	15	2.24E+03	3.74E-05
823-40-5	Toluene-2,6-diamine	15	2.24E+03	3.74E-05
82-68-8	Pentachloronitrobenzene (PCBN)	15	2.24E+03	3.74E-05
85-44-9	Phthalic anhydride	15	2.24E+03	3.74E-05
87-86-5	Pentachlorophenol	15	2.24E+03	3.74E-05
88-74-4	o-Nitroaniline (2-Nitroaniline)	15	2.24E+03	3.74E-05
90-04-0	o-Anisidine	15	2.24E+03	3.74E-05
91-94-1	3,3'-Dichlorobenzidine	15	2.24E+03	3.74E-05
94-59-7	Safrole	15	2.24E+03	3.74E-05
94-75-7	2,4-D and esters (!60C typed)	15	2.24E+03	3.74E-05
95-94-3	1,2,4,5-Tetrachlorobenzene	15	2.24E+03	3.74E-05
96-12-8	1,2-Dibromo-3-chloropropane	15	2.24E+03	3.74E-05
96-45-7	Ethylene thiourea	15	2.24E+03	3.74E-05
98-01-1	Furfural	15	2.24E+03	3.74E-05
98-07-7	Benzotrichloride	15	2.24E+03	3.74E-05
99-35-4	1,3,5-Trinitrobenzene	15	2.24E+03	3.74E-05
99-65-0	1,3-Dinitrobenzene	15	2.24E+03	3.74E-05
100-44-7	Benzyl chloride	2	2.99E+02	4.98E-06
103-65-1	n-Propyl benzene (Isocumene)	2	2.99E+02	4.98E-06
104-51-8	n-Butylbenzene	2	2.99E+02	4.98E-06
106-43-4	4-Chlorotoluene (p-Tolyl chloride)	2	2.99E+02	4.98E-06
106-89-8	Epichlorohydrin (1-chloro-2,3-epoxypropane)	2	2.99E+02	4.98E-06
107-19-7	Propargyl alcohol	2	2.99E+02	4.98E-06
107-21-1	Ethylene glycol	2	2.99E+02	4.98E-06
108-67-8	1,3,5-Trimethyl benzene	2	2.99E+02	4.98E-06
108-86-1	Bromobenzene (Phenyl bromide)	2	2.99E+02	4.98E-06
109-77-3	Malononitrile	2	2.99E+02	4.98E-06
124-48-1	Chlorodibromomethane	2	2.99E+02	4.98E-06

Table 4 LAW Facility Stack PIC Air Emissions

CAS Registry Number	Compound	Max Conc. µg/dscm	LAW Stack Mass Rate µg/min	LAW Stack Mass Rate g/sec
135-98-8	sec-Butylbenzene	2	2.99E+02	4.98E-06
156-59-2	cis-1,2-Dichloroethene	2	2.99E+02	4.98E-06
25013-15-4	Methyl styrene (mixed isomers)	2	2.99E+02	4.98E-06
41851-50-7	Chlorocyclopentadiene	2	2.99E+02	4.98E-06
460-19-5	Cyanogen	2	2.99E+02	4.98E-06
506-77-4	Cyanogen chloride	2	2.99E+02	4.98E-06
540-73-8	1,2-Dimethylhydrazine	2	2.99E+02	4.98E-06
542-75-6	1,3-Dichloropropene	2	2.99E+02	4.98E-06
542-88-1	Dichloromethyl ether	2	2.99E+02	4.98E-06
593-60-2	Bromoethene	2	2.99E+02	4.98E-06
61626-71-9	Dichloropentadiene	2	2.99E+02	4.98E-06
74-88-4	Iodomethane (Methyl iodide)	2	2.99E+02	4.98E-06
74-95-3	Methylene bromide	2	2.99E+02	4.98E-06
75-25-2	Bromoform	2	2.99E+02	4.98E-06
75-29-6	2-Chloropropane	2	2.99E+02	4.98E-06
75-44-5	Phosgene	2	2.99E+02	4.98E-06
76-01-7	Pentachloroethane	2	2.99E+02	4.98E-06
764-41-0	1,4-Dichloro-2-butene	2	2.99E+02	4.98E-06
80-62-6	Methyl methacrylate	2	2.99E+02	4.98E-06
87-61-6	1,2,3-Trichlorobenzene	2	2.99E+02	4.98E-06
924-16-3	N-Nitrosodi-n-butylamine	2	2.99E+02	4.98E-06
95-53-4	o-Toluidine	2	2.99E+02	4.98E-06
95-63-6	1,2,4-Trimethyl benzene	2	2.99E+02	4.98E-06
96-18-4	1,2,3-Trichloropropane	2	2.99E+02	4.98E-06
97-63-2	Ethyl methacrylate	2	2.99E+02	4.98E-06
98-06-6	tert-Butyl benzene	2	2.99E+02	4.98E-06
99-87-6	p-Cymene	2	2.99E+02	4.98E-06

LAW Stack Conditions:

Volumetric Flow:	7,150 SCFM	
Temperature:	150 F	339 K
Water content:	0.186 lb H2O/lb air	
Density:	0.0616 lb/ft3	
Relative Humidity:	100%	
Pressure:	14.5 psi	
VP H2O @ 150F:	196 mmHg	
Standard temperature:	20 C	293 K
Standard pressure:	14.7 psi	
Actual volumetric flowrate:	8,376 ACFM	

$V_D = V_A P_A/P_D$

$P_D = P_A$ - partial pressure (pp) water @ 100F

pp = RH * VP H2O @ 100F

pp =	196 mmHg
pp =	3.79 psi
P_D =	10.7 psi
V_D =	6186 DCFM
V_S =	5281 SCFM
Dry volumetric rate:	150 DSCM/min

Table 5 HLW Facility Stack PIC Air Emissions

CAS Registry Number	Compound	Max Conc. µg/dscm	HLW Stack Mass Rate µg/min	HLW Stack Mass Rate g/sec	Total HLW Mass Rate g/sec
1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	1.84E-05	1.01E-03	1.69E-11	3.38E-11
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	1.56E-05	8.61E-04	1.44E-11	2.87E-11
3268-87-9	Octachlorodibenzo(p)dioxin	7.82E-05	4.31E-03	7.18E-11	1.44E-10
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	3.13E-05	1.72E-03	2.87E-11	5.74E-11
39001-02-0	Octachlorodibenzofuran	2.92E-04	1.61E-02	2.68E-10	5.36E-10
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05	8.61E-04	1.44E-11	2.87E-11
40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	1.56E-05	8.61E-04	1.44E-11	2.87E-11
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	1.24E-03	6.86E-02	1.14E-09	2.29E-09
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.12E-04	6.19E-03	1.03E-10	2.06E-10
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	1.61E-03	8.84E-02	1.47E-09	2.95E-09
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	1.74E-03	9.60E-02	1.60E-09	3.20E-09
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	7.89E-04	4.35E-02	7.25E-10	1.45E-09
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	1.56E-05	8.61E-04	1.44E-11	2.87E-11
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	4.05E-04	2.23E-02	3.72E-10	7.44E-10
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.31E-03	1.27E-01	2.12E-09	4.24E-09
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	1.61E-03	8.87E-02	1.48E-09	2.96E-09
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	3.55E-05	1.96E-03	3.26E-11	6.53E-11
192-97-2	Benzo(e)pyrene	3	1.65E+02	2.75E-06	5.51E-06
205-82-3	Benzo(j)fluoranthene	3	1.65E+02	2.75E-06	5.51E-06
205-99-2	Benzo(b)fluoranthene	3	1.65E+02	2.75E-06	5.51E-06
207-08-9	Benzo(k)fluoranthene	3	1.65E+02	2.75E-06	5.51E-06
218-01-9	Chrysene	3	1.65E+02	2.75E-06	5.51E-06
5385-75-1	Dibenzo(a,e)fluoranthene	3	1.65E+02	2.75E-06	5.51E-06
56-55-3	Benzo(a)anthracene	3	1.65E+02	2.75E-06	5.51E-06
91-57-6	2-Methylnaphthalene	3	1.65E+02	2.75E-06	5.51E-06
100-02-7	4-Nitrophenol	15	8.26E+02	1.38E-05	2.75E-05
100-25-4	1,4-Dinitrobenzene	15	8.26E+02	1.38E-05	2.75E-05
100-51-6	Benzyl alcohol	15	8.26E+02	1.38E-05	2.75E-05
100-52-7	Benzaldehyde	15	8.26E+02	1.38E-05	2.75E-05
101-77-9	4,4-Methylenedianiline	15	8.26E+02	1.38E-05	2.75E-05
103-33-3	Azobenzene	15	8.26E+02	1.38E-05	2.75E-05
105-67-9	2,4-Dimethylphenol	15	8.26E+02	1.38E-05	2.75E-05
106-44-5	p-Cresol (4-Methyl phenol)	15	8.26E+02	1.38E-05	2.75E-05
106-47-8	p-Chloroaniline	15	8.26E+02	1.38E-05	2.75E-05
106-49-0	p-Toluidine	15	8.26E+02	1.38E-05	2.75E-05
106-51-4	Quinone	15	8.26E+02	1.38E-05	2.75E-05
107-98-2	Propylene gylcol monomethyl ether	15	8.26E+02	1.38E-05	2.75E-05
108-60-1	Dichloroisopropyl ether	15	8.26E+02	1.38E-05	2.75E-05
109-86-4	2-Methoxyethanol	15	8.26E+02	1.38E-05	2.75E-05
110-80-5	2-Ethoxyethanol	15	8.26E+02	1.38E-05	2.75E-05
111-15-9	Ethylene glycol monoethyl ether acetate	15	8.26E+02	1.38E-05	2.75E-05
111-44-4	Bis(2-chloroethyl) ether	15	8.26E+02	1.38E-05	2.75E-05
111-91-1	Bis(2-chloroethoxy)methane	15	8.26E+02	1.38E-05	2.75E-05
1120-71-4	1,3-Propane sultone	15	8.26E+02	1.38E-05	2.75E-05
118-74-1	Hexachlorobenzene	15	8.26E+02	1.38E-05	2.75E-05
119-90-4	3,3'-Dimethoxybenzidine (ortol-dianisidine)	15	8.26E+02	1.38E-05	2.75E-05
121-14-2	2,4-Dinitrotoluene	15	8.26E+02	1.38E-05	2.75E-05
122-66-7	1,2-Diphenylhydrazine	15	8.26E+02	1.38E-05	2.75E-05
123-33-1	Maleic hydrazide	15	8.26E+02	1.38E-05	2.75E-05
131-11-3	Dimethylphthalate	15	8.26E+02	1.38E-05	2.75E-05
131-89-5	2-Cyclohexyl-4,6-dinitrophenol	15	8.26E+02	1.38E-05	2.75E-05
133-06-2	Captan	15	8.26E+02	1.38E-05	2.75E-05
145-73-3	Endothall	15	8.26E+02	1.38E-05	2.75E-05
23950-58-5	Pronamide	15	8.26E+02	1.38E-05	2.75E-05

Table 5 HLW Facility Stack PIC Air Emissions

CAS Registry Number	Compound	Max Conc. µg/dscm	HLW Stack Mass Rate µg/min	HLW Stack Mass Rate g/sec	Total HLW Mass Rate g/sec
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	15	8.26E+02	1.38E-05	2.75E-05
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	15	8.26E+02	1.38E-05	2.75E-05
506-68-3	Cyanogen bromide	15	8.26E+02	1.38E-05	2.75E-05
510-15-6	Chlorobenzilate	15	8.26E+02	1.38E-05	2.75E-05
51-28-5	2,4-Dinitrophenol	15	8.26E+02	1.38E-05	2.75E-05
51-79-6	Ethyl Carbamate (urethane)	15	8.26E+02	1.38E-05	2.75E-05
528-29-0	o-Dinitrobenzene	15	8.26E+02	1.38E-05	2.75E-05
532-27-4	2-Chloroacetophenone	15	8.26E+02	1.38E-05	2.75E-05
534-52-1	4,6-Dinitro-o-cresol	295	1.63E+04	2.71E-04	5.42E-04
57-24-9	Strychnine	15	8.26E+02	1.38E-05	2.75E-05
57-74-9	Chlordane	15	8.26E+02	1.38E-05	2.75E-05
584-84-9	2,4-Toluene diisocyante	15	8.26E+02	1.38E-05	2.75E-05
58-89-9	gamma-BHC (Lindane)	15	8.26E+02	1.38E-05	2.75E-05
60-11-7	Dimethyl aminoazobenzene	15	8.26E+02	1.38E-05	2.75E-05
606-20-2	2,6-Dinitrotoluene	15	8.26E+02	1.38E-05	2.75E-05
608-93-5	Pentachlorobenzene	15	8.26E+02	1.38E-05	2.75E-05
62-50-0	Ethyl methanesulfonate	15	8.26E+02	1.38E-05	2.75E-05
62-53-3	Aniline	15	8.26E+02	1.38E-05	2.75E-05
65-85-0	Benzoic acid	15	8.26E+02	1.38E-05	2.75E-05
70-30-4	Hexachlorophene	15	8.26E+02	1.38E-05	2.75E-05
72-43-5	Methoxychlor	15	8.26E+02	1.38E-05	2.75E-05
72-55-9	4,4'-DDE	15	8.26E+02	1.38E-05	2.75E-05
76-44-8	Heptachlor	15	8.26E+02	1.38E-05	2.75E-05
765-34-4	Glycidylaldehyde	15	8.26E+02	1.38E-05	2.75E-05
77-47-4	Hexachlorocyclopentadiene	15	8.26E+02	1.38E-05	2.75E-05
77-78-1	Dimethyl sulfate	15	8.26E+02	1.38E-05	2.75E-05
822-06-0	Hexamethylene-1,5-diisocyanate	15	8.26E+02	1.38E-05	2.75E-05
823-40-5	Toluene-2,6-diamine	15	8.26E+02	1.38E-05	2.75E-05
82-68-8	Pentachloronitrobenzene (PCBN)	15	8.26E+02	1.38E-05	2.75E-05
85-44-9	Phthalic anhydride	15	8.26E+02	1.38E-05	2.75E-05
87-86-5	Pentachlorophenol	15	8.26E+02	1.38E-05	2.75E-05
88-74-4	o-Nitroaniline (2-Nitroaniline)	15	8.26E+02	1.38E-05	2.75E-05
90-04-0	o-Anisidine	15	8.26E+02	1.38E-05	2.75E-05
91-94-1	3,3'-Dichlorobenzidine	15	8.26E+02	1.38E-05	2.75E-05
94-59-7	Safrole	15	8.26E+02	1.38E-05	2.75E-05
94-75-7	2,4-D and esters (!60C typed)	15	8.26E+02	1.38E-05	2.75E-05
95-94-3	1,2,4,5-Tetrachlorobenzene	15	8.26E+02	1.38E-05	2.75E-05
96-12-8	1,2-Dibromo-3-chloropropane	15	8.26E+02	1.38E-05	2.75E-05
96-45-7	Ethylene thiourea	15	8.26E+02	1.38E-05	2.75E-05
98-01-1	Furfural	15	8.26E+02	1.38E-05	2.75E-05
98-07-7	Benzotrichloride	15	8.26E+02	1.38E-05	2.75E-05
99-35-4	1,3,5-Trinitrobenzene	15	8.26E+02	1.38E-05	2.75E-05
99-65-0	1,3-Dinitrobenzene	15	8.26E+02	1.38E-05	2.75E-05
100-44-7	Benzyl chloride	2	1.10E+02	1.84E-06	3.67E-06
103-65-1	n-Propyl benzene (Isocumene)	2	1.10E+02	1.84E-06	3.67E-06
104-51-8	n-Butylbenzene	2	1.10E+02	1.84E-06	3.67E-06
106-43-4	4-Chlorotoluene (p-Tolyl chloride)	2	1.10E+02	1.84E-06	3.67E-06
106-89-8	Epichlorohydrin (1-chloro-2,3-epoxypropane)	2	1.10E+02	1.84E-06	3.67E-06
107-19-7	Propargyl alcohol	2	1.10E+02	1.84E-06	3.67E-06
107-21-1	Ethylene glycol	2	1.10E+02	1.84E-06	3.67E-06
108-67-8	1,3,5-Trimethyl benzene	2	1.10E+02	1.84E-06	3.67E-06
108-86-1	Bromobenzene (Phenyl bromide)	2	1.10E+02	1.84E-06	3.67E-06
109-77-3	Malononitrile	2	1.10E+02	1.84E-06	3.67E-06
124-48-1	Chlorodibromomethane	2	1.10E+02	1.84E-06	3.67E-06

Table 5 HLW Facility Stack PIC Air Emissions

CAS Registry Number	Compound	Max Conc. µg/dscm	HLW Stack Mass Rate µg/min	HLW Stack Mass Rate g/sec	Total HLW Mass Rate g/sec
135-98-8	sec-Butylbenzene	2	1.10E+02	1.84E-06	3.67E-06
156-59-2	cis-1,2-Dichloroethene	2	1.10E+02	1.84E-06	3.67E-06
25013-15-4	Methyl styrene (mixed isomers)	2	1.10E+02	1.84E-06	3.67E-06
41851-50-7	Chlorocyclopentadiene	2	1.10E+02	1.84E-06	3.67E-06
460-19-5	Cyanogen	2	1.10E+02	1.84E-06	3.67E-06
506-77-4	Cyanogen chloride	2	1.10E+02	1.84E-06	3.67E-06
540-73-8	1,2-Dimethylhydrazine	2	1.10E+02	1.84E-06	3.67E-06
542-75-6	1,3-Dichloropropene	2	1.10E+02	1.84E-06	3.67E-06
542-88-1	Dichloromethyl ether	2	1.10E+02	1.84E-06	3.67E-06
593-60-2	Bromoethene	2	1.10E+02	1.84E-06	3.67E-06
61626-71-9	Dichloropentadiene	2	1.10E+02	1.84E-06	3.67E-06
74-88-4	Iodomethane (Methyl iodide)	2	1.10E+02	1.84E-06	3.67E-06
74-95-3	Methylene bromide	2	1.10E+02	1.84E-06	3.67E-06
75-25-2	Bromoform	2	1.10E+02	1.84E-06	3.67E-06
75-29-6	2-Chloropropane	2	1.10E+02	1.84E-06	3.67E-06
75-44-5	Phosgene	2	1.10E+02	1.84E-06	3.67E-06
76-01-7	Pentachloroethane	2	1.10E+02	1.84E-06	3.67E-06
764-41-0	1,4-Dichloro-2-butene	2	1.10E+02	1.84E-06	3.67E-06
80-62-6	Methyl methacrylate	2	1.10E+02	1.84E-06	3.67E-06
87-61-6	1,2,3-Trichlorobenzene	2	1.10E+02	1.84E-06	3.67E-06
924-16-3	N-Nitrosodi-n-butylamine	2	1.10E+02	1.84E-06	3.67E-06
95-53-4	o-Toluidine	2	1.10E+02	1.84E-06	3.67E-06
95-63-6	1,2,4-Trimethyl benzene	2	1.10E+02	1.84E-06	3.67E-06
96-18-4	1,2,3-Trichloropropane	2	1.10E+02	1.84E-06	3.67E-06
97-63-2	Ethyl methacrylate	2	1.10E+02	1.84E-06	3.67E-06
98-06-6	tert-Butyl benzene	2	1.10E+02	1.84E-06	3.67E-06
99-87-6	p-Cymene	2	1.10E+02	1.84E-06	3.67E-06

HLW Stack Conditions:

Volumetric Flow:	2,158	SCFM	
Temperature:	275	F	408 K
Water content:	0.05	lb H2O/lb air	
Density:	0.047	lb/ft3	
Relative Humidity:	3%		
Pressure:	14.5	psi	
VP H2O @ 150F:	2635	mmHg	
Standard temperature:	20	C	293 K
Standard pressure:	14.7	psi	
Actual volumetric flowrate:	3,046	ACFM	

$V_D = V_A P_A/P_D$

$P_D = P_A$ - partial pressure (pp) water @ 100F

pp = RH * VP H2O @ 100F

pp =	73.78	mmHg
pp =	1.43	psi
P_D =	13.1	psi
V_D =	2747	DCFM
V_S =	1946	SCFM
Dry volumetric rate:	55	DSCM/min

Table 6 Summary WTP Stacks PIC Air Emissions

CAS Registry Number	Compound	PT Stack Mass Rate g/sec	LAW Stack Mass Rate g/sec	HLW Stack Mass Rate g/sec
1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	3.31E-11	4.58E-11	3.38E-11
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	2.81E-11	3.90E-11	2.87E-11
3268-87-9	Octachlorodibenzo(p)dioxin	1.41E-10	1.95E-10	1.44E-10
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	5.63E-11	7.79E-11	5.74E-11
39001-02-0	Octachlorodibenzofuran	5.25E-10	7.27E-10	5.36E-10
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	2.81E-11	3.90E-11	2.87E-11
40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	2.81E-11	3.90E-11	2.87E-11
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	2.24E-09	3.10E-09	2.29E-09
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.02E-10	2.80E-10	2.06E-10
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	2.89E-09	4.00E-09	2.95E-09
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	3.14E-09	4.34E-09	3.20E-09
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	1.42E-09	1.97E-09	1.45E-09
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	2.81E-11	3.90E-11	2.87E-11
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	7.30E-10	1.01E-09	7.44E-10
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.16E-09	5.76E-09	4.24E-09
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	2.90E-09	4.01E-09	2.96E-09
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	6.40E-11	8.86E-11	6.53E-11
192-97-2	Benzo(e)pyrene	5.40E-06	7.48E-06	5.51E-06
205-82-3	Benzo(j)fluoranthene	5.40E-06	7.48E-06	5.51E-06
205-99-2	Benzo(b)fluoranthene	5.40E-06	7.48E-06	5.51E-06
207-08-9	Benzo(k)fluoranthene	5.40E-06	7.48E-06	5.51E-06
218-01-9	Chrysene	5.40E-06	7.48E-06	5.51E-06
5385-75-1	Dibenzo(a,e)fluoranthene	5.40E-06	7.48E-06	5.51E-06
56-55-3	Benzo(a)anthracene	5.40E-06	7.48E-06	5.51E-06
91-57-6	2-Methylnaphthalene	5.40E-06	7.48E-06	5.51E-06
100-02-7	4-Nitrophenol	2.70E-05	3.74E-05	2.75E-05
100-25-4	1,4-Dinitrobenzene	2.70E-05	3.74E-05	2.75E-05
100-51-6	Benzyl alcohol	2.70E-05	3.74E-05	2.75E-05
100-52-7	Benzaldehyde	2.70E-05	3.74E-05	2.75E-05
101-77-9	4,4-Methylenedianiline	2.70E-05	3.74E-05	2.75E-05
103-33-3	Azobenzene	2.70E-05	3.74E-05	2.75E-05
105-67-9	2,4-Dimethylphenol	2.70E-05	3.74E-05	2.75E-05
106-44-5	p-Cresol (4-Methyl phenol)	2.70E-05	3.74E-05	2.75E-05
106-47-8	p-Chloroaniline	2.70E-05	3.74E-05	2.75E-05
106-49-0	p-Toluidine	2.70E-05	3.74E-05	2.75E-05
106-51-4	Quinone	2.70E-05	3.74E-05	2.75E-05
107-98-2	Propylene gylcol monomethyl ether	2.70E-05	3.74E-05	2.75E-05
108-60-1	Dichloroisopropyl ether	2.70E-05	3.74E-05	2.75E-05
109-86-4	2-Methoxyethanol	2.70E-05	3.74E-05	2.75E-05
110-80-5	2-Ethoxyethanol	2.70E-05	3.74E-05	2.75E-05
111-15-9	Ethylene glycol monoethyl ether acetate	2.70E-05	3.74E-05	2.75E-05
111-44-4	Bis(2-chloroethyl) ether	2.70E-05	3.74E-05	2.75E-05
111-91-1	Bis(2-chloroethoxy)methane	2.70E-05	3.74E-05	2.75E-05
1120-71-4	1,3-Propane sultone	2.70E-05	3.74E-05	2.75E-05
118-74-1	Hexachlorobenzene	2.70E-05	3.74E-05	2.75E-05
119-90-4	3,3'-Dimethoxybenzidine (ortol-dianisidine)	2.70E-05	3.74E-05	2.75E-05
121-14-2	2,4-Dinitrotoluene	2.70E-05	3.74E-05	2.75E-05
122-66-7	1,2-Diphenylhydrazine	2.70E-05	3.74E-05	2.75E-05

Table 6 Summary WTP Stacks PIC Air Emissions

CAS Registry Number	Compound	PT Stack Mass Rate g/sec	LAW Stack Mass Rate g/sec	HLW Stack Mass Rate g/sec
123-33-1	Maleic hydrazide	2.70E-05	3.74E-05	2.75E-05
131-11-3	Dimethylphthalate	2.70E-05	3.74E-05	2.75E-05
131-89-5	2-Cyclohexyl-4,6-dinitrophenol	2.70E-05	3.74E-05	2.75E-05
133-06-2	Captan	2.70E-05	3.74E-05	2.75E-05
145-73-3	Endothall	2.70E-05	3.74E-05	2.75E-05
23950-58-5	Pronamide	2.70E-05	3.74E-05	2.75E-05
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	2.70E-05	3.74E-05	2.75E-05
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	2.70E-05	3.74E-05	2.75E-05
506-68-3	Cyanogen bromide	2.70E-05	3.74E-05	2.75E-05
510-15-6	Chlorobenzilate	2.70E-05	3.74E-05	2.75E-05
51-28-5	2,4-Dinitrophenol	2.70E-05	3.74E-05	2.75E-05
51-79-6	Ethyl Carbamate (urethane)	2.70E-05	3.74E-05	2.75E-05
528-29-0	o-Dinitrobenzene	2.70E-05	3.74E-05	2.75E-05
532-27-4	2-Chloroacetophenone	2.70E-05	3.74E-05	2.75E-05
534-52-1	4,6-Dinitro-o-cresol	5.31E-04	7.36E-04	5.42E-04
57-24-9	Strychnine	2.70E-05	3.74E-05	2.75E-05
57-74-9	Chlordane	2.70E-05	3.74E-05	2.75E-05
584-84-9	2,4-Toluene diisocyante	2.70E-05	3.74E-05	2.75E-05
58-89-9	gamma-BHC (Lindane)	2.70E-05	3.74E-05	2.75E-05
60-11-7	Dimethyl aminoazobenzene	2.70E-05	3.74E-05	2.75E-05
606-20-2	2,6-Dinitrotoluene	2.70E-05	3.74E-05	2.75E-05
608-93-5	Pentachlorobenzene	2.70E-05	3.74E-05	2.75E-05
62-50-0	Ethyl methanesulfonate	2.70E-05	3.74E-05	2.75E-05
62-53-3	Aniline	2.70E-05	3.74E-05	2.75E-05
65-85-0	Benzoic acid	2.70E-05	3.74E-05	2.75E-05
70-30-4	Hexachlorophene	2.70E-05	3.74E-05	2.75E-05
72-43-5	Methoxychlor	2.70E-05	3.74E-05	2.75E-05
72-55-9	4,4'-DDE	2.70E-05	3.74E-05	2.75E-05
76-44-8	Heptachlor	2.70E-05	3.74E-05	2.75E-05
765-34-4	Glycidylaldehyde	2.70E-05	3.74E-05	2.75E-05
77-47-4	Hexachlorocyclopentadiene	2.70E-05	3.74E-05	2.75E-05
77-78-1	Dimethyl sulfate	2.70E-05	3.74E-05	2.75E-05
822-06-0	Hexamethylene-1,5-diisocyanate	2.70E-05	3.74E-05	2.75E-05
823-40-5	Toluene-2,6-diamine	2.70E-05	3.74E-05	2.75E-05
82-68-8	Pentachloronitrobenzene (PCBN)	2.70E-05	3.74E-05	2.75E-05
85-44-9	Phthalic anhydride	2.70E-05	3.74E-05	2.75E-05
87-86-5	Pentachlorophenol	2.70E-05	3.74E-05	2.75E-05
88-74-4	o-Nitroaniline (2-Nitroaniline)	2.70E-05	3.74E-05	2.75E-05
90-04-0	o-Anisidine	2.70E-05	3.74E-05	2.75E-05
91-94-1	3,3'-Dichlorobenzidine	2.70E-05	3.74E-05	2.75E-05
94-59-7	Safrole	2.70E-05	3.74E-05	2.75E-05
94-75-7	2,4-D and esters (!60C typed)	2.70E-05	3.74E-05	2.75E-05
95-94-3	1,2,4,5-Tetrachlorobenzene	2.70E-05	3.74E-05	2.75E-05
96-12-8	1,2-Dibromo-3-chloropropane	2.70E-05	3.74E-05	2.75E-05
96-45-7	Ethylene thiourea	2.70E-05	3.74E-05	2.75E-05
98-01-1	Furfural	2.70E-05	3.74E-05	2.75E-05
98-07-7	Benzotrichloride	2.70E-05	3.74E-05	2.75E-05
99-35-4	1,3,5-Trinitrobenzene	2.70E-05	3.74E-05	2.75E-05

Table 6 Summary WTP Stacks PIC Air Emissions

CAS Registry Number	Compound	PT Stack Mass Rate g/sec	LAW Stack Mass Rate g/sec	HLW Stack Mass Rate g/sec
99-65-0	1,3-Dinitrobenzene	2.70E-05	3.74E-05	2.75E-05
100-44-7	Benzyl chloride	3.60E-06	4.98E-06	3.67E-06
103-65-1	n-Propyl benzene (Isocumene)	3.60E-06	4.98E-06	3.67E-06
104-51-8	n-Butylbenzene	3.60E-06	4.98E-06	3.67E-06
106-43-4	4-Chlorotoluene (p-Tolyl chloride)	3.60E-06	4.98E-06	3.67E-06
106-89-8	Epichlorohydrin (1-chloro-2,3-epoxypropane)	3.60E-06	4.98E-06	3.67E-06
107-19-7	Propargyl alcohol	3.60E-06	4.98E-06	3.67E-06
107-21-1	Ethylene glycol	3.60E-06	4.98E-06	3.67E-06
108-67-8	1,3,5-Trimethyl benzene	3.60E-06	4.98E-06	3.67E-06
108-86-1	Bromobenzene (Phenyl bromide)	3.60E-06	4.98E-06	3.67E-06
109-77-3	Malononitrile	3.60E-06	4.98E-06	3.67E-06
124-48-1	Chlorodibromomethane	3.60E-06	4.98E-06	3.67E-06
135-98-8	sec-Butylbenzene	3.60E-06	4.98E-06	3.67E-06
156-59-2	cis-1,2-Dichloroethene	3.60E-06	4.98E-06	3.67E-06
25013-15-4	Methyl styrene (mixed isomers)	3.60E-06	4.98E-06	3.67E-06
41851-50-7	Chlorocyclopentadiene	3.60E-06	4.98E-06	3.67E-06
460-19-5	Cyanogen	3.60E-06	4.98E-06	3.67E-06
506-77-4	Cyanogen chloride	3.60E-06	4.98E-06	3.67E-06
540-73-8	1,2-Dimethylhydrazine	3.60E-06	4.98E-06	3.67E-06
542-75-6	1,3-Dichloropropene	3.60E-06	4.98E-06	3.67E-06
542-88-1	Dichloromethyl ether	3.60E-06	4.98E-06	3.67E-06
593-60-2	Bromoethene	3.60E-06	4.98E-06	3.67E-06
61626-71-9	Dichloropentadiene	3.60E-06	4.98E-06	3.67E-06
74-88-4	Iodomethane (Methyl iodide)	3.60E-06	4.98E-06	3.67E-06
74-95-3	Methylene bromide	3.60E-06	4.98E-06	3.67E-06
75-25-2	Bromoform	3.60E-06	4.98E-06	3.67E-06
75-29-6	2-Chloropropane	3.60E-06	4.98E-06	3.67E-06
75-44-5	Phosgene	3.60E-06	4.98E-06	3.67E-06
76-01-7	Pentachloroethane	3.60E-06	4.98E-06	3.67E-06
764-41-0	1,4-Dichloro-2-butene	3.60E-06	4.98E-06	3.67E-06
80-62-6	Methyl methacrylate	3.60E-06	4.98E-06	3.67E-06
87-61-6	1,2,3-Trichlorobenzene	3.60E-06	4.98E-06	3.67E-06
924-16-3	N-Nitrosodi-n-butylamine	3.60E-06	4.98E-06	3.67E-06
95-53-4	o-Toluidine	3.60E-06	4.98E-06	3.67E-06
95-63-6	1,2,4-Trimethyl benzene	3.60E-06	4.98E-06	3.67E-06
96-18-4	1,2,3-Trichloropropane	3.60E-06	4.98E-06	3.67E-06
97-63-2	Ethyl methacrylate	3.60E-06	4.98E-06	3.67E-06
98-06-6	tert-Butyl benzene	3.60E-06	4.98E-06	3.67E-06
99-87-6	p-Cymene	3.60E-06	4.98E-06	3.67E-06

Appendix G

Update 2: Vapor Phase Partitioning Coefficients

CCN 129507

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R10663840

Memorandum

To: Edgardo Berrios, MS4-C1 Date: January 6, 2006

From: Lee Bostic CCN: 129507

Ext: 371-3127

Subject: **UPDATE 2: VAPOR PHASE PARTITIONING COEFFICIENTS**

References: 1) CCN 057415, Memo, from G. Bertolin, SAIC, to J. Cook, BNI, "Phase Determination for COPCs Potentially Emitted from the Hanford Tank Waste Treatment and Immobilization Plant (WTP)," dated May 2, 2003.

2) CCN 101085, Memo, from D. B. Blumenkranz, to J. R. Cook, "Update to Vapor Phase Partitioning Coefficients," dated February 9, 2005.

1.0 Purpose

This memorandum updates the vapor phase partitioning coefficients and phase type provided by Reference 2. The methodology determines the phase type of constituents of potential concern (COPCs) in the Hanford Tank Waste Treatment and Immobilization Plant (WTP) offgas emissions by determining the vapor phase partitioning coefficients (F_v). F_v is used to classify a COPC into one of three categories:

- Vapor phase
- Particle phase
- Particle-bound phase

An F_v value is calculated for each COPC identified by WTP as having a potential to be fed to the process facility and emitted to the atmosphere from the WTP process.

2.0 Background

The phase type of a COPC affects the efficiency of the WTP offgas control system for that compound. For example, the particle and particle-bound phases will be attenuated by HEPA filtration, whereas the vapor phase constituents will not. In addition, the phase type affects the uptake of COPCs in WTP emissions by environmental receptors.

The memorandum documenting the phase type for WTP COPCs was originally issued in 2003 by Science Applications International Corporation (SAIC), reference 1. It was updated in 2005 by WTP staff, reference 2. This second update incorporates more recently available data for the WTP COPCs, re-calculates the F_v, and updates the previous phase determination.

A major change to the data update approach was necessary when the US Environmental Protection Agency (EPA) updated the 1998 version of the Human Health Risk Assessment Protocol [HHRAP] (EPA 1998) and issued the final HHRAP (EPA 2005a). Previously, EPA published F_v values in Appendix A-3 to the 1998 HHRAP. In the 2005 HHRAP (EPA 2005a) EPA removed the published Fv values and referred the user to their Companion Database (EPA 2005b) for the data required to calculate the F_v.

3.0 Applicable Codes and Standards

None. See text and reference list for applicable EPA guidance documents.

The sources of data, methods, and results of this analysis are consistent with the EPA HHRAP (EPA 2005a).

4.0 Methodology

The phase of each COPC is based on its F_v, a unitless parameter which is defined as the fraction of the COPC that is in the vapor phase. F_v has a range of 0 to 1. COPCs with F_v values approaching 0 have low vapor pressures and are considered to be primarily in the particle phase, while COPCs with F_v values of 1 have high vapor pressures and are therefore considered to exist primarily in the vapor phase. COPCs with intermediate F_v values are considered to be in the particle-bound phase.

The following criteria are the basis for determining the phase type of a COPC:

- $F_v < 0.05$; phase type = particle
- $F_v = 1.0$; phase type = vapor
- $0.05 \leq F_v < 1.0$; phase type = particle-bound

The F_v value and phase type for COPCs is determined by using the equations presented in Section 4.2. The phase determination is found in Table 2. If data were not available or needed for a phase determination calculation, it is indicated as n/a, not available.

4.1 Assumptions and Other Applicable Data

The procedure for computing F_v values is described in the final HHRAP (EPA 2005a). Data necessary for calculation of F_v includes the melting point temperature and vapor pressure. Section 4.2 provides details of the calculation.

Melting point temperature and vapor pressure data were obtained from several sources in the hierarchy listed here (note, complete references are provided in Section 6.0):

1. *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Final,* EPA 2005a
2. *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Companion Database,* EPA 2005b.
3. *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds,* EPA 2003.
4. *Superfund Chemical Data Matrix (SCDM),* EPA. 2004.
5. Syracuse Research Corporation (SRC). CHEMFATE Database, SRC 2005a.
6. Syracuse Research Corporation (SRC). PHYSPROP Database, SRC 2005b.
7. *Chemical Properties Handbook,* Chapter 7 Table: "Vapor Pressure: Organic Compounds", Yaws 1999

The EPA HHRAP Companion Database (EPA 2005b), TCDD Reassessment (EPA 2003), and the SCDM (EPA 2004) are secondary data references, which refer in many cases to one of the other references in the hierarchy. The selection process started by reviewing the secondary reference; to confirm the secondary reference, the primary reference was reviewed and data was taken from the primary source. The data source was updated to the primary reference and used if it was available. If the primary reference was not available, the secondary database reference was used and noted as the data source.

The SRC 2005a CHEMFATE data source was preferred to the SRC 2005b PHYSPROP data source. If more than one value was found in SRC 2005a, the recommended value was selected; if more that one value was recommended, the measured value was selected or if both values were calculated the higher value was selected. If no value was available in CHEMFATE (SRC 2005a) a value was selected from PHYSPROP (SRC 2005B) or Yaws 1999, if available. Attachment 1 provides copies of the raw data used in calculating the F_v.

4.2 Organics

For organic COPCs that are liquid at ambient conditions, F_v is defined by the following equation[1]:

$$F_v = 1 - (cS_T)/(p^\circ_L + cS_T) \qquad \text{Eq. 1}$$

where,

F_v = Fraction of compound in the vapor phase (unitless)
c = Junge constant[2] (1.7×10^{-4} atm-cm)

[1] HHRAP (EPA 2005a), Appendix A, Section A2-2.5, Equation A-2-1.

$p°_L$ = Liquid phase vapor pressure of compound (atm)
S_T = Whitby's average surface area of particulates (3.5×10^{-6} cm^2/cm^3 air)

Bidleman (1998) determined that F_v is explained better by the liquid phase vapor pressure ($p°_L$) rather than the solid phase vapor pressure ($p°_s$). Therefore, if a COPC is a solid at ambient conditions, the following equation[3] was used to determine the liquid phase vapor pressure of the COPC before calculating F_v in Equation 1.

$$\text{Ln}\,(p°_L / p°_s) = \Delta S_f/R \cdot (T_m - T_a)/ T_a \qquad \text{Eq. 2}$$

where,

$p°_L$ = Liquid-phase vapor pressure of chemical (atm)
$p°_s$ = Solid-phase vapor pressure of chemical (atm)
$\Delta S_f/R$ = Entropy of fusion over the universal gas constant = 6.79 (unitless)
T_m = Melting point of chemical (°K)
T_a = Ambient temperature = 298 °K

Physical property data were taken from the data sources in the hierarchical order as described in Section 4.1.

4.3 Metals

All metals (with the exception of mercury) are considered to be nonvolatile (e.g. particles) and are therefore assigned an F_v of 0 (EPA 2005a). Elemental mercury, is assigned an F_v of 1; divalent mercury (Hg^{+2}) is assigned an F_v of 0.85 (EPA 2005a). Methyl mercury is not assumed to form in the WTP process; it forms after deposition in the environment, is considered to be nonvolatile, and assigned an F_v of 0 (EPA 2005a).

4.4 Radionuclides

Radionuclides, with the exception of tritium, carbon-14, and iodine-129, are metals and therefore assigned an F_v of 0, consistent with the HHRAP (EPA 2005a) guidance for metals. Tritium is always found as a vapor at ambient conditions. Carbon-14 is assumed to exist as $^{14}CO_2$, and is therefore considered to be a vapor phase compound. Non-radioactive iodine has a vapor pressure of 0.233 mm Hg at 25°C (SRC 2005b) and thus, has an F_v of 1; the non-radioactive value was used for iodine-129.

Assumptions: $F_v = 1$ for tritium, carbon-14, and iodine-129; for other radionuclides $F_v = 0$.

[2] The Junge constant can depend on (1) the compound (sorbate) molecular weight, (2) the surface concentration for monolayer coverage, and (3) the difference between the heat of desorption from the particle surface and the heat of vaporization of the liquid-phase sorbate. Because a constant was used for these calculations, some uncertainty is introduced.

[3] HHRAP (EPA 2005a), Appendix A, Section A2-2.5, Equation A-2-2.

4.5 Compounds Without Data

Several compounds have vapor pressure data but do not have melting point temperature data to enable determination of whether the vapor pressure given is for a solid or liquid phase. In those events, the vapor pressure was assumed to be for a liquid[4].

The vapor pressure for one COPC, trichlorofluoroethane, CAS # 27154-33-2 was calculated from equations in Yaws 1999. The calculated value was assumed to be for the liquid phase. Data were not found for two other COPCs, Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide, CAS# 96-69-5 and dichloropentadiene, CAS# 61626-71-9.

Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide (CAS# 96-69-5) is a solid at ambient temperatures and has a melting temperature of 150 °C and a molecular weight of 358.5378 g/mol. The compound contains two phenyl groups connected with a carbon-sulfur-carbon bond. Each phenyl ring has a hydroxyl, methyl, and butyl group attached (Table 1). Diphenyl disulfide, nitrophenyl phenyl sulfide, 4-chloro-4'-nitrodiphenyl sulfide, and 4,4'-di-tert-butyldiphenylmethane were all considered as possible sources of surrogate F_v or vapor pressure data, however, no data on these chemicals was found in available resources. Examination of data available for COPCs within that weight range that were solids at ambient temperatures indicates bus (3-tert-butyl-4-hydroxy-6-methyl-phenyl) sulfide is likely to be particle-bound with a F_v value in the range of 0.5 to 1.0. The conservative approach is to consider bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide a vapor and assign a F_v value of 1.0. This assumption is supported by diphenyl sulfide, a compound made of two phenyl groups connected with a carbon-sulfur-carbon bond, which had a F_v of 0.994 when computed using the vapor pressure.

For dichloropentadiene (CAS# 61626-71-9), no information on specific isomers could be located. The data for structurally similar compounds, 1,3-pentadiene, 1,3-butadiene, cis-1,3-dichloropropene, and trans-1,3-dichloropropene indicate that light-weight alkene chains bonded with chlorine atoms typically exist in the vapor phase ($F_v = 1.0$). Based on its structural similarity to these compounds, dichloropentadiene was assigned a F_v value of 1.0.

5.0 Results

These results confirm and update the values originally provided by SAIC (057415) and updated by Blumenkranz (101085). The results provide the basis for determining the phase type and modeling of each COPC identified in the WTP emissions estimate used to support permitting. Table 2 presents data for each of the COPCs being evaluated, including melting point temperature, as found in the source data, melting point temperature in degrees Kelvin, vapor

[4] This assumption is likely realistic; however some non-conservative uncertainty is introduced since the F_v would be slightly higher if the vapor pressure used was $p°_s$, though it is unlikely to change the phase determination for the COPC.

Pressure, as found and vapor pressure converted to liquid vapor pressure in atmospheres, calculated F_v value and the phase type determination. The results are used in determining the decontamination factor for each COPC in the offgas processing system. The table is sorted by organic and inorganic COPC groups; COPCs of particular interest are grouped (i.e., Dioxins/furans, PCBs, and polycyclic aromatic hydrocarbons [PAHs]) and then by CAS number.

Updated values are rounded to four significant digits since that is likely the limit of the physical property measurement precision. Vapor pressures for COPCs with melting point temperature greater than 25°C were considered to be solid phase vapor pressures and the updated data were converted from solid vapor pressure at ambient temperatures to liquid vapor pressure (per Equation 2) for use in the F_v computation (Equation 1).

At the bottom of Table 2 are found eleven additional constituents found in Hanford tank vapor space during a survey by CH2M Hill Hanford Group (CHG). These COPCs were intentionally segregated from other constituents we have agreed with Ecology to evaluate because currently, we have not been able to locate applicable toxicity data for evaluating them. However, data is continually updated and therefore these COPCs will be tracked in the emission estimate.

6.0 References

Bidleman, T.F., 1988. "Atmospheric Processes." *Environmental Science and Technology*. Volume 22, Pages 361-367.

EPA, 1998. *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume 1 (Text)*. Peer Review Draft. EPA530-D-98-001A, Office of Solid Waste and Emergency Response, July 1998.

EPA 2003, *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds,* NAS Review Draft, EPA/600/P-00/001Cb, US Environmental Protection Agency, Office of Research and Development, December 2003.

EPA. 2004, *Superfund Chemical Data Matrix (SCDM).* OERR. Washington, D.C. January 2004.

EPA 2005a, *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, US Environmental Protection Agency*, Final, EPA530-R-05-006, Office of Solid Waste and Emergency Response, September 2005.

EPA 2005b, *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Companion Database*, US Environmental Protection Agency, Office of Solid Waste and Emergency Response, downloaded November 21, 2005. Current data can be accessed from web link:
http://www.epa.gov/earth1r6/6pd/rcra_c/protocol/protocol.htm

SRC 2005a, Syracuse Research Corporation (SRC). December 2005 download. *CHEMFATE Database.* SRC. Syracuse, NY, web link: http://www.syrres.com/esc/chemfate.htm.

SRC 2005b, Syracuse Research Corporation (SRC). December 2005 download. *PHYSPROP Database.* SRC. Syracuse, NY, web link: http://www.syrres.com/esc/physdemo.htm.

Yaws 1999, Yaws, C.L., *Chemical Properties Handbook*, Chapter 7 Table: "Vapor Pressure: Organic Compounds", McGraw-Hill, Online version available at web link: http://www.knovel.com/knovel2/Toc.jsp?SpaceID=0&BookID=49&VerticalID=0&NodeID=78617026&ClickedNodeID=78617026&FromSearch=false&Action=expand&FilterMode=false&View=4&CollapseAll=false - node78617026.

Table 1. Surrogate F_v Values

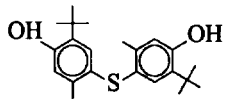
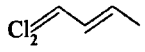
Compound Structure	CAS Number	Compound	Phase Type	Vapor Fraction (F_v)	Basis for F_v
	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	vapor	1.00	Conservative assumption. Similar compounds have high F_v values.
	61626-71-9	Dichloropentadiene	vapor	1.00	Conservative assumption. Light-weight alkene compound.

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
100-00-5	p-Nitrochlorobenzene	F	LSB	83.5	356.5	SRC 2005b	2.19E-02	2.88E-05	SRC 2005b	1.09E-04	1	vapor	
100-02-7	4-Nitrophenol	P	LSB	115	388	SRC 2005a	4.10E-05	5.39E-08	SRC 2005a	4.19E-07	0.999	particle bound	
100-21-0	p-Phthalic acid	F	OLSVOL	300	573	SRC 2005a	9.20E-06	1.21E-08	SRC 2005a	6.37E-06	1	vapor	
100-25-4	1,4-Dinitrobenzene	F	LSB	174	447	SRC 2005b	2.61E-05	3.43E-08	SRC 2005b	1.02E-06	0.999	particle bound	
100-41-4	Ethyl benzene	F	ANHH	-94.975	178.025	SRC 2005a	9.60E+00	1.26E-02	SRC 2005a	1.26E-02	1	vapor	
100-42-5	Styrene	F	ANHH	-30.628	242.372	SRC 2005a	6.12E+00	8.05E-03	EPA 2004	8.05E-03	1	vapor	
100-44-7	Benzyl chloride	P	LSB	-39.2	233.8	SRC 2005a	1.30E+00	1.71E-03	SRC 2005a	1.71E-03	1	vapor	
100-51-6	Benzyl alcohol	P	ANHH	-15.2	257.8	SRC 2005b	6.26E-02	8.24E-05	SRC 2005a	8.24E-05	1	vapor	
100-52-7	Benzaldehyde	P	ANHH	-26	247	SRC 2005b	1.27E-01	1.67E-04	SRC 2005b	1.67E-04	1	vapor	
10061-01-5	cis-1,3-Dichloropropene	F	NAHH	-50	223	SRC 2005b	2.63E+01	3.46E-02	SRC 2005b	3.46E-02	1	vapor	
10061-02-6	trans-1,3-Dichloropropene	F	NAHH	n/a [6]	273		3.40E+01	4.47E-02	SRC 2005b	4.47E-02	1	vapor	
101-55-3	4-Bromophenylphenyl ether	F	OHSVOL	18.7	291.7	SRC 2005a	1.50E-03	1.97E-06	SRC 2005a	1.97E-06	1	vapor	
101-77-9	4,4-Methylenedianiline	P	OLSVOL	89	362	SRC 2005a	2.97E+00	3.91E-03	SRC 2005a	1.68E-02	1	vapor	
101-84-8	Diphenyl ether	F	OLSVOL	28	301	SRC 2005a	2.00E-02	2.63E-05	SRC 2005a	2.82E-05	1	vapor	
103-33-3	Azobenzene	P	OHSVOL	68	341	SRC 2005b	3.61E-04	4.75E-07	SRC 2005b	1.27E-06	1	vapor	
103-65-1	n-Propyl benzene (Isocumene)	P	LSB	-99.5	173.5	SRC 2005b	3.42E+00	4.50E-03	SRC 2005a	4.50E-03	1	vapor	

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
104-51-8	n-Butylbenzene	P	LSB	-87.9	185.1	SRC 2005b	1.06E+00	1.39E-03	SRC 2005b	1.39E-03	1	vapor	
105-67-9	2,4-Dimethylphenol	P	LSB	24.54	297.54	SRC 2005a	9.80E-02	1.29E-04	SRC 2005a	1.29E-04	1	vapor	
106-35-4	3-Heptanone	F	NANHH	-39	234	SRC 2005b	2.60E+00	3.42E-03	SRC 2005b	3.42E-03	1	vapor	
106-42-3	p-Xylene	F	ANHH	13.263	286.263	SRC 2005a	8.90E+00	1.17E-02	SRC 2005a	1.17E-02	1	vapor	
106-43-4	4-Chlorotoluene (p-Tolyl chloride)	P	LSB	7.5	280.5	SRC 2005b	2.69E+00	3.54E-03	SRC 2005a	3.54E-03	1	vapor	
106-44-5	p-Cresol	P	LSB	34.739	307.739	SRC 2005a	1.10E-01	1.45E-04	SRC 2005a	1.81E-04	1	vapor	
106-46-7	1,4-Dichlorobenzene	F	LSB	53.13	326.13	SRC 2005a	1.00E+00	1.32E-03	SRC 2005a	2.50E-03	1	vapor	
106-47-8	p-Chloroaniline	P	LSB	72.5	345.5	SRC 2005b	1.23E-02	1.62E-05	SRC 2005a	4.78E-05	1	vapor	
106-49-0	p-Toluidine	P	LSB	43.7	316.7	SRC 2005b	2.86E-01	3.76E-04	SRC 2005b	5.76E-04	1	vapor	
106-51-4	Quinone	P	OLSVOL	115.7	388.7	SRC 2005a	3.75E+01	4.93E-02	SRC 2005a	3.90E-01	1	vapor	
106-88-7	1,2-Epoxybutane	F	NANHH	-150	123	SRC 2005a	1.80E+02	2.37E-01	SRC 2005a	2.37E-01	1	vapor	
106-89-8	Epichlorohydrin	P	OLSVOL	-57.2	215.8	SRC 2005a	1.64E+01	2.16E-02	SRC 2005a	2.16E-02	1	vapor	
106-93-4	Ethylene dibromide	F	OLSVOL	9.79	282.79	SRC 2005a	1.33E+01	1.75E-02	SRC 2005a	1.75E-02	1	vapor	
106-97-8	Butane	F	NANHH	-138.4	134.6	SRC 2005a	1.82E+03	2.39E+00	SRC 2005b	2.39E+00	1	vapor	
106-99-0	1,3-Butadiene	F	NANHH	-108.966	164.034	SRC 2005a	2.11E+03	2.77E+00	SRC 2005a	2.77E+00	1	vapor	
107-02-8	Acrolein	F	NANHH	-86.95	186.05	SRC 2005a	2.74E+02	3.61E-01	SRC 2005a	3.61E-01	1	vapor	

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
107-05-1	3-Chloropropene (Allyl chloride)	F	NAHH	-134.5	138.5	SRC 2005a	3.68E+02	4.84E-01	SRC 2005a	4.84E-01	1	vapor	
107-06-2	1,2-Dichloroethane	F	NAHH	-35.66	237.34	SRC 2005a	7.89E+01	1.04E-01	SRC 2005a	1.04E-01	1	vapor	
107-12-0	Propionitrile	F	NANHH	-91.8	181.2	SRC 2005a	4.74E+01	6.24E-02	SRC 2005a	6.24E-02	1	vapor	
107-13-1	Acrylonitrile	F	NANHH	-83.55	189.45	SRC 2005a	1.09E+02	1.43E-01	SRC 2005a	1.43E-01	1	vapor	
107-18-6	2-Propene-1-ol (Allyl Alcohol)	F	NANHH	-129	144	SRC 2005a	2.61E+01	3.43E-02	SRC 2005a	3.43E-02	1	vapor	
107-19-7	Propargyl alcohol	P	NANHH	-51.8	221.2	SRC 2005a	1.56E+01	2.05E-02	SRC 2005a	2.05E-02	1	vapor	
107-21-1	Ethylene glycol	P	OLSVOL	-12.6	260.4	SRC 2005a	9.20E-02	1.21E-04	SRC 2005a	1.21E-04	1	vapor	
107-31-3	Formic acid, methyl ester	F	NANHH	-99	174	SRC 2005b	5.86E+02	7.71E-01	SRC 2005a	7.71E-01	1	vapor	
107-66-4	Dibutylphosphate	F	OHSVOL	n/a	273		9.60E-05	1.26E-07	SRC 2005b	1.26E-07	0.995	particle bound	
107-87-9	2-Pentanone	F	NANHH	-78	195	SRC 2005a	3.54E+01	4.66E-02	SRC 2005a	4.66E-02	1	vapor	
107-98-2	Propylene glycol monomethyl ether	P	NANHH	-142	131	SRC 2005a	1.25E+01	1.64E-02	SRC 2005a	1.64E-02	1	vapor	
108-03-2	1-Nitropropane	F	NANHH	-108	165	SRC 2005b	1.01E+01	1.33E-02	SRC 2005b	1.33E-02	1	vapor	
108-05-4	Vinyl acetate	F	NANHH	-92.8	180.2	SRC 2005a	9.02E+01	1.19E-01	SRC 2005a	1.19E-01	1	vapor	
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	F	NANHH	-84	189	SRC 2005a	1.99E+01	2.61E-02	SRC 2005a	2.61E-02	1	vapor	
108-20-3	Bis(isopropyl)ether	F	NANHH	-86.8	186.2	SRC 2005b	1.49E+02	1.96E-01	SRC 2005a	1.96E-01	1	vapor	
108-38-3	m-Xylene	F	ANHH	-47.872	225.128	SRC 2005a	8.45E+00	1.11E-02	SRC 2005a	1.11E-02	1	vapor	

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	*Fv* [3]	Phase Type	Source for non-calculated *Fv*'s
108-39-4	m-Cresol	F	LSB	12.22	285.22	SRC 2005a	1.38E-01	1.82E-04	SRC 2005a	1.82E-04	1	vapor	
108-60-1	Dichloroisopropyl ether (2,2'-Oxybis(1-chloropropane))	P	OLSVOL	-97	176	SRC 2005a	8.80E-01	1.16E-03	SRC 2005a	1.16E-03	1	vapor	
108-67-8	1,3,5-Trimethyl benzene	P	LSB	-44.7	228.3	SRC 2005b	2.48E+00	3.26E-03	SRC 2005b	3.26E-03	1	vapor	
108-86-1	Bromobenzene (Phenyl bromide)	P	LSB	-30.6	242.4	SRC 2005b	4.18E+00	5.50E-03	SRC 2005b	5.50E-03	1	vapor	
108-87-2	Methylcyclohexane	F	NANHH	-126.6	146.4	SRC 2005b	4.60E+01	6.05E-02	SRC 2005b	6.05E-02	1	vapor	
108-88-3	Toluene	F	ANHH	-94.991	178.009	SRC 2005a	2.84E+01	3.74E-02	SRC 2005a	3.74E-02	1	vapor	
108-90-7	Chlorobenzene	F	LSB	-45.58	227.42	SRC 2005a	1.20E+01	1.58E-02	SRC 2005a	1.58E-02	1	vapor	
108-93-0	Cyclohexanol	F	OLSVOL	24	297	SRC 2005a	8.00E-01	1.05E-03	SRC 2005a	1.05E-03	1	vapor	
108-94-1	Cyclohexanone	F	NANHH	-31	242	SRC 2005b	4.33E+00	5.70E-03	SRC 2005a	5.70E-03	1	vapor	
108-95-2	Phenol	F	LSB	40.9	313.9	SRC 2005a	2.76E-01	3.63E-04	SRC 2005a	5.22E-04	1	vapor	
109-66-0	n-Pentane	F	NANHH	-130	143	SRC 2005a	5.14E+02	6.76E-01	SRC 2005b	6.76E-01	1	vapor	
109-77-3	Malononitrile	P	OLSVOL	32	305	SRC 2005b	2.00E-01	2.63E-04	SRC 2005b	3.09E-04	1	vapor	
109-86-4	2-Methoxyethanol	P	NANHH	-85.1	187.9	SRC 2005a	9.01E+00	1.19E-02	SRC 2005a	1.19E-02	1	vapor	
109-99-9	Tetrahydrofuran	F	OLSVOL	-108.3	164.7	SRC 2005b	1.62E+02	2.13E-01	SRC 2005a	2.13E-01	1	vapor	
110-12-3	5-Methyl-2-hexanone	F	NANHH	-73.9	199.1	SRC 2005a	5.20E+00	6.84E-03	SRC 2005a	6.84E-03	1	vapor	
110-43-0	2-Heptanone	F	NANHH	-35.5	237.5	SRC 2005a	2.73E+00	3.59E-03	SRC 2005a	3.59E-03	1	vapor	

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
110-54-3	n-Hexane	F	NANHH	-95.3	177.7	SRC 2005b	1.51E+02	1.99E-01	SRC 2005a	1.99E-01	1	vapor	
110-62-3	n-Valeraldehyde	F	NANHH	-91.5	181.5	SRC 2005b	2.60E+01	3.42E-02	SRC 2005b	3.42E-02	1	vapor	
110-80-5	2-Ethoxyethanol	P	NANHH	-100	173	SRC 2005a	5.31E+00	6.99E-03	SRC 2005a	6.99E-03	1	vapor	
110-82-7	Cyclohexane	F	NANHH	6.554	279.554	SRC 2005a	9.69E+01	1.27E-01	SRC 2005a	1.27E-01	1	vapor	
110-83-8	Cyclohexene	F	NANHH	-103.5	169.5	SRC 2005b	8.90E+01	1.17E-01	SRC 2005b	1.17E-01	1	vapor	
110-86-1	Pyridine	F	OLSVOL	-41.55	231.45	SRC 2005a	2.08E+01	2.74E-02	SRC 2005a	2.74E-02	1	vapor	
111-15-9	Ethylene glycol monoethyl ether acetate	P	OLSVOL	-61.7	211.3	SRC 2005b	2.34E+00	3.08E-03	SRC 2005a	3.08E-03	1	vapor	
111-44-4	Bis(2-chloroethyl) ether	P	OLSVOL	-46.8	226.2	SRC 2005a	1.55E+00	2.04E-03	SRC 2005a	2.04E-03	1	vapor	
111-65-9	n-Octane	F	NANHH	-56.8	216.2	SRC 2005b	1.41E+01	1.86E-02	SRC 2005b	1.86E-02	1	vapor	
111-76-2	Ethylene glycol monobutyl ether	F	OLSVOL	-75	198	SRC 2005a	8.67E-01	1.14E-03	SRC 2005a	1.14E-03	1	vapor	
111-84-2	n-Nonane	F	NANHH	-53.5	219.5	SRC 2005b	4.45E+00	5.86E-03	SRC 2005a	5.86E-03	1	vapor	
111-91-1	Bis(2-chloroethoxy)methane	P	OLSVOL	-32	241	SRC 2005a	1.40E-04	1.84E-07	SRC 2005a	1.84E-07	0.997	particle bound	
1120-71-4	1,3-Propane sultone	P	OLSVOL	95.68	368.68	SRC 2005a	1.70E+01	2.24E-02	SRC 2005a	1.12E-01	1	vapor	
117-81-7	Bis(2-ethylhexyl) phthalate (DEHP)	F	PHT	-50	223	SRC 2005a	6.78E-08	8.92E-11	SRC 2005a	8.92E-11	0.13	particle bound	
117-84-0	n-Dioctyl phthalate	F	PHT	-25	248	SRC 2005a	2.60E-06	3.42E-09	SRC 2005a	3.42E-09	0.852	particle bound	
118-74-1	Hexachlorobenzene	P	OHSVOL	228.7	501.7	SRC 2005a	1.80E-05	2.37E-08	SRC 2005a	2.46E-06	1	vapor	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
119-90-4	3,3'-Dimethoxybenzidine	P	OHSVOL	138	411	SRC 2005a	2.12E-07	2.79E-10	SRC 2005a	3.66E-09	0.86	particle bound	
120-82-1	1,2,4-Trichlorobenzene	F	LSB	17	290	SRC 2005a	4.31E-01	5.66E-04	SRC 2005a	5.66E-04	1	vapor	
120-83-2	2,4-Dichlorophenol	F	LSB	43	316	SRC 2005a	6.70E-02	8.82E-05	SRC 2005a	1.33E-04	1	vapor	
121-14-2	2,4-Dinitrotoluene	P	LSB	70	343	SRC 2005a	1.47E-04	1.93E-07	SRC 2005a	5.39E-07	0.999	particle bound	
121-44-8	Triethylamine	F	NANHH	-115	158	SRC 2005a	5.71E+01	7.51E-02	SRC 2005a	7.51E-02	1	vapor	
121-69-7	Dimethylaniline	F	OLSVOL	2.45	275.45	SRC 2005a	7.00E-01	9.21E-04	SRC 2005a	9.21E-04	1	vapor	
122-39-4	N,N-Diphenylamine	F	OLSVOL	53	326	SRC 2005a	6.68E-04	8.79E-07	SRC 2005a	1.66E-06	1	vapor	
122-66-7	1,2-Diphenylhydrazine	P	OLSVOL	126	399	SRC 2005a	4.31E-04	5.67E-07	SRC 2005a	5.66E-06	1	vapor	
123-19-3	4-Heptanone	F	NANHH	-33	240	SRC 2005b	6.12E+00	8.05E-03	SRC 2005b	8.05E-03	1	vapor	
123-33-1	Maleic hydrazide	P	OLSVOL	306	579	SRC 2005a	2.77E-06	3.64E-09	SRC 2005b	2.20E-06	1	vapor	
123-38-6	n-Propionaldehyde	F	NANHH	-80	193	SRC 2005a	3.17E+02	4.17E-01	SRC 2005a	4.17E-01	1	vapor	
123-51-3	3-Methyl-1-butanol	F	NANHH	-117.2	155.8	SRC 2005b	2.37E+00	3.12E-03	SRC 2005b	3.12E-03	1	vapor	
123-86-4	Acetic acid n-butyl ester	F	NANHH	-78	195	SRC 2005b	1.15E+01	1.51E-02	SRC 2005a	1.51E-02	1	vapor	
123-91-1	1,4-Dioxane	F	NANHH	11.8	284.8	SRC 2005a	3.81E+01	5.01E-02	SRC 2005a	5.01E-02	1	vapor	
124-48-1	Chlorodibromomethane	P	NAHH	-22	251	SRC 2005a	4.90E+00	6.45E-03	SRC 2005a	6.45E-03	1	vapor	
126-73-8	Tributyl phosphate	F	OHSVOL	-79	194	SRC 2005a	1.20E-04	1.58E-07	SRC 2005a	1.58E-07	0.996	particle bound	

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126-98-7	2-Methyl-2-propenenitrile	F	NANHH	-35.8	237.2	SRC 2005b	7.12E+01	9.37E-02	SRC 2005a	9.37E-02	1	vapor	
127-18-4	1,1,2,2-Tetrachloroethene	F	NAHH	-22.35	250.65	SRC 2005a	1.86E+01	2.44E-02	SRC 2005a	2.44E-02	1	vapor	
127-19-5	N,N-Dimethylacetamide	F	NANHH	-20	253	SRC 2005b	2.00E+00	2.63E-03	SRC 2005b	2.63E-03	1	vapor	
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	F	OHSVOL	71	344	SRC 2005b	5.16E-03	6.79E-06	SRC 2005b	1.94E-05	1	vapor	
131-11-3	Dimethyl phthalate	P	PHT	2	275	SRC 2005a	1.65E-03	2.17E-06	SRC 2005a	2.17E-06	1	vapor	
131-89-5	2-Cyclohexyl-4,6-dinitrophenol	P	OHSVOL	107	380	SRC 2005b	4.19E-08	5.51E-11	SRC 2005b	3.57E-10	0.375	particle bound	
132-64-9	Dibenzofuran	F	ANHH	81	354	SRC 2005b	1.80E-04	2.37E-07	SRC 2005b	8.48E-07	0.999	particle bound	
133-06-2	Captan	P	OHSVOL	178	451	SRC 2005a	6.00E-05	7.89E-08	SRC 2005a	2.58E-06	1	vapor	
135-98-8	sec-Butylbenzene	P	LSB	-82.7	190.3	SRC 2005b	1.75E+00	2.30E-03	SRC 2005b	2.30E-03	1	vapor	
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	F	NANHH	-83.6	189.4	SRC 2005a	9.37E+01	1.23E-01	SRC 2005a	1.23E-01	1	vapor	
141-79-7	4-Methyl-3-penten-2-one	F	NANHH	-59	214	SRC 2005b	1.10E+01	1.45E-02	SRC 2005a	1.45E-02	1	vapor	
142-82-5	n-Heptane	F	NANHH	-90.6	182.4	SRC 2005b	4.60E+01	6.05E-02	SRC 2005b	6.05E-02	1	vapor	
144-62-7	Oxalic acid	F	OLSVOL	189.5	462.5	SRC 2005b	2.34E-04	3.08E-07	SRC 2005b	1.31E-05	1	vapor	
145-73-3	Endothall	P	PEST	144	417	SRC 2005b	1.57E-10	2.07E-13	SRC 2005b	3.11E-12	0.005	particle	
156-59-2	cis-1,2-Dichloroethene	P	NAHH	-80.1	192.9	SRC 2005a	2.03E+02	2.67E-01	SRC 2005a	2.67E-01	1	vapor	
156-60-5	trans-1,2-Dichloroethylene	F	NAHH	-49.8	223.2	SRC 2005a	3.33E+02	4.38E-01	SRC 2005a	4.38E-01	1	vapor	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	*Fv* [3]	Phase Type	Source for non-calculated *Fv*'s
1634-04-4	Methyl tert-butyl ether	F	NANHH	-109	164	SRC 2005a	2.49E+02	3.28E-01	SRC 2005a	3.28E-01	1	vapor	
23950-58-5	Pronamide	P	OHSVOL	155	428	SRC 2005b	4.35E-07	5.72E-10	SRC 2005b	1.11E-08	0.949	particle bound	
25013-15-4	Methyl styrene (mixed isomers)	P	OLSVOL	n/a	273	SRC 2005b	1.50E+00	1.97E-03	SRC 2005b	1.97E-03	1	vapor	
25551-13-7	Trimethyl benzene	F	LSB	n/a	273	SRC 2005b	2.10E+00	2.76E-03	SRC 2005b	2.76E-03	1	vapor	
26140-60-3	Terphenyls	F	OHSVOL	n/a	273	SRC 2005b	3.09E-06	4.07E-09	SRC 2005b	4.07E-09	0.872	particle bound	
27154-33-2	Trichlorofluoroethane	F	NAHH	n/a				7.51E-02	Yaws 1999	7.51E-02	1	vapor	
287-92-3	Cyclopentane	F	NANHH	-93.8	179.2	SRC 2005b	3.18E+02	4.18E-01	SRC 2005a	4.18E-01	1	vapor	
319-84-6	alpha-BHC	P	PEST	160	433	SRC 2005a	4.50E-05	5.92E-08	SRC 2005a	1.28E-06	1	vapor	
319-85-7	beta-BHC	P	PEST	315	588	SRC 2005a	4.66E-07	6.13E-10	SRC 2005a	4.54E-07	0.999	particle bound	
4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	F	NANHH	-76.5	196.5	SRC 2005b	3.00E+01	3.95E-02	SRC 2005b	3.95E-02	1	vapor	
41851-50-7	Chlorocyclopentadiene	P	OLSVOL	n/a	273	SRC 2005b	2.04E+01	2.68E-02	SRC 2005b	2.68E-02	1	*vapor*	
460-19-5	Cyanogen	P	NANHH	-27.9	245.1	SRC 2005b	4.30E+03	5.66E+00	SRC 2005a	5.66E+00	1	vapor	
50-00-0	Formaldehyde	F	NANHH	-92	181	SRC 2005a	5.24E+03	6.89E+00	SRC 2005a	6.89E+00	1	vapor	
506-68-3	Cyanogen bromide	P	NAHH	52	325	SRC 2005b	1.22E+02	1.61E-01	SRC 2005b	2.97E-01	1	vapor	
506-77-4	Cyanogen chloride	P	NAHH	-6.5	266.5	SRC 2005b	1.23E+03	1.61E+00	SRC 2005a	1.61E+00	1	vapor	
510-15-6	Chlorobenzilate	P	OHSVOL	37	310	SRC 2005a	2.20E-06	2.89E-09	SRC 2005a	3.81E-09	0.865	particle bound	
51-28-5	2,4-Dinitrophenol	P	LSB	114	387	SRC 2005a	5.10E-03	6.71E-06	SRC 2005a	5.10E-05	1	vapor	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	*Fv* [3]	Phase Type	Source for non-calculated *Fv*'s
51-79-6	Ethyl Carbamate (urethane)	P	OLSVOL	48	321	SRC 2005a	7.60E-01	1.00E-03	SRC 2005a	1.69E-03	1	vapor	
528-29-0	o-Dinitrobenzene	P	LSB	118.5	391.5	SRC 2005b	4.55E-05	5.99E-08	SRC 2005b	5.04E-07	0.999	particle bound	
532-27-4	2-Chloroacetophenone	P	OLSVOL	58	331	SRC 2005a	5.40E-03	7.11E-06	SRC 2005a	1.51E-05	1	vapor	
534-52-1	4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	P	LSB	84	357	SRC 2005a	3.24E-04	4.26E-07	SRC 2005a	1.64E-06	1	vapor	
540-59-0	1,2-Dichloroethylene	F	NAHH	-57	216	SRC 2005a	2.01E+02	2.64E-01	SRC 2005a	2.64E-01	1	vapor	
540-73-8	1,2-Dimethylhydrazine	P	OLSVOL	-85	188	SRC 2005a	6.99E+01	9.20E-02	SRC 2005a	9.20E-02	1	vapor	
540-84-1	2,2,4-Trimethylpentane	F	NANHH	-107.3	165.7	SRC 2005b	4.93E+01	6.49E-02	SRC 2005b	6.49E-02	1	vapor	
541-73-1	1,3-Dichlorobenzene	F	LSB	-24.76	248.24	SRC 2005a	2.15E+00	2.83E-03	SRC 2005a	2.83E-03	1	vapor	
542-75-6	1,3-Dichloropropene	P	NAHH	-48	225	SRC 2005a	3.40E+01	4.47E-02	SRC 2005a	4.47E-02	1	vapor	
542-88-1	Dichloromethyl ether	P	OLSVOL	-41.5	231.5	SRC 2005a	3.00E+01	3.95E-02	SRC 2005a	3.95E-02	1	vapor	
56-23-5	Carbon tetrachloride	F	NAHH	-23	250	SRC 2005a	1.14E+02	1.50E-01	SRC 2005a	1.50E-01	1	vapor	
563-80-4	3-Methyl-2-butanone	F	NANHH	-92	181	SRC 2005b	5.22E+01	6.87E-02	SRC 2005a	6.87E-02	1	vapor	
57-14-7	1,1-Dimethylhydrazine	F	OLSVOL	-57.2	215.8	SRC 2005a	1.57E+02	2.07E-01	SRC 2005a	2.07E-01	1	vapor	
57-24-9	Strychnine	P	OHSVOL	290	563	SRC 2005a	9.43E-12	1.24E-14	SRC 2005a	5.20E-12	0.009	particle	
57-74-9	Chlordane	P	PEST	107	380	SRC 2005a	9.80E-06	1.29E-08	SRC 2005a	8.35E-08	0.993	particle bound	
584-84-9	2,4-Toluene diisocyante	P	OLSVOL	19.5	292.5	SRC 2005a	8.00E-03	1.05E-05	SRC 2005a	1.05E-05	1	vapor	

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58-89-9	gamma-BHC (Lindane)	P	PEST	112	385	SRC 2005a	4.10E-04	5.39E-07	SRC 2005a	3.92E-06	1	vapor	
58-90-2	2,3,4,6-Tetrachlorophenol	F	AHH	70	343	SRC 2005a	1.44E-03	1.89E-06	SRC 2005a	5.28E-06	1	vapor	
591-78-6	2-Hexanone	F	NANHH	-55.5	217.5	SRC 2005b	1.16E+01	1.53E-02	SRC 2005a	1.53E-02	1	vapor	
593-60-2	Bromoethene	P	NAHH	-139.54	133.46	SRC 2005a	1.03E+03	1.36E+00	SRC 2005a	1.36E+00	1	vapor	
59-50-7	4-Chloro-3-methylphenol	F	AHH	67	340	SRC 2005b	5.00E-02	6.58E-05	SRC 2005b	1.71E-04	1	vapor	
59-89-2	N-Nitrosomorpholine	F	OLSVOL	29	302	SRC 2005a	3.60E-02	4.74E-05	SRC 2005a	5.19E-05	1	vapor	
60-11-7	Dimethyl aminoazobenzene	P	OHSVOL	114	387	SRC 2005a	7.00E-08	9.21E-11	SRC 2005a	7.00E-10	0.54	particle bound	
60-29-7	Ethyl ether	F	NANHH	-116.3	156.7	SRC 2005b	5.37E+02	7.07E-01	SRC 2005a	7.07E-01	1	vapor	
603-34-9	Triphenylamine	F	OHSVOL	127	400	SRC 2005b	3.92E-04	5.16E-07	SRC 2005b	5.27E-06	1	vapor	
60-34-4	Methylhydrazine	F	OLSVOL	-52.4	220.6	SRC 2005a	5.00E+01	6.58E-02	SRC 2005a	6.58E-02	1	vapor	
60-35-5	Acetamide	F	NANHH	69.5	342.5	SRC 2005a	1.10E-01	1.45E-04	SRC 2005a	3.99E-04	1	vapor	
606-20-2	2,6-Dinitrotoluene	P	LSB	71	344	SRC 2005a	5.67E-04	7.46E-07	SRC 2005a	2.13E-06	1	vapor	
608-93-5	Pentachlorobenzene	P	OHSVOL	86	359	SRC 2005a	2.19E-03	2.88E-06	SRC 2005a	1.16E-05	1	vapor	
61626-71-9	Dichloropentadiene	P	OLSVOL	n/a					n/a	n/a	1	vapor	Conservative Assumption
621-64-7	di-n-Propylnitrosamine	F	OLSVOL	7	280	SRC 2005a	1.30E-01	1.71E-04	SRC 2005a	1.71E-04	1	vapor	
62-50-0	Ethyl methanesulfonate	P	OLSVOL	-0.41	272.59	SRC 2005a	2.06E-01	2.71E-04	SRC 2005a	2.71E-04	1	vapor	

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62-53-3	Aniline	P	LSB	-5.98	267.02	EPA 2004	4.90E-01	6.45E-04	EPA 2004	6.45E-04	1	vapor	
627-13-4	Nitric acid, propyl ester	F	OLSVOL	-100	173	SRC 2005b	2.35E+01	3.09E-02	SRC 2005b	3.09E-02	1	vapor	
62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	F	OLSVOL	-50	223	SRC 2005a	2.70E+00	3.55E-03	SRC 2005a	3.55E-03	1	vapor	
630-20-6	1,1,1,2-Tetrachloroethane	F	NAHH	-68.7	204.3	SRC 2005a	1.20E+01	1.58E-02	SRC 2005a	1.58E-02	1	vapor	
64-17-5	Ethyl alcohol	F	NANHH	-114.49	158.51	SRC 2005a	5.93E+01	7.80E-02	SRC 2005a	7.80E-02	1	vapor	
64-18-6	Formic acid	F	NANHH	8.27	281.27	SRC 2005a	4.53E+01	5.96E-02	SRC 2005a	5.96E-02	1	vapor	
64-19-7	Acetic acid	F	NANHH	16.6	289.6	SRC 2005b	1.57E+01	2.07E-02	SRC 2005a	2.07E-02	1	vapor	
65-85-0	Benzoic acid	P	OLSVOL	122.4	395.4	SRC 2005b	7.00E-04	9.21E-07	SRC 2005b	8.47E-06	1	vapor	
67-56-1	Methyl alcohol	F	NANHH	-97.68	175.32	SRC 2005a	1.26E+02	1.66E-01	SRC 2005a	1.66E-01	1	vapor	
67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	F	NANHH	-88	185	SRC 2005a	4.54E+01	5.98E-02	SRC 2005a	5.98E-02	1	vapor	
67-64-1	2-Propanone (Acetone)	F	NANHH	-94.7	178.3	SRC 2005a	2.30E+02	3.03E-01	SRC 2005a	3.03E-01	1	vapor	
67-66-3	Chloroform	F	NAHH	-63.52	209.48	SRC 2005a	1.97E+02	2.60E-01	SRC 2005a	2.60E-01	1	vapor	
67-72-1	Hexachloroethane	F	OHSVOL	186.8	459.8	SRC 2005a	2.10E-01	2.76E-04	SRC 2005a	1.10E-02	1	vapor	
684-16-2	Hexafluoroacetone	F	NAHH	-125	148	SRC 2005b	5.00E+00	6.58E-03	SRC 2005a	6.58E-03	1	vapor	
70-30-4	Hexachlorophene	P	OHSVOL	165	438	SRC 2005a	1.50E-10	1.97E-13	SRC 2005a	4.79E-12	0.008	particle	
71-23-8	n-Propyl alcohol	F	NANHH	-127	146	SRC 2005a	2.10E+01	2.76E-02	SRC 2005a	2.76E-02	1	vapor	

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
71-36-3	n-Butyl alcohol	F	NANHH	-88.62	184.38	SRC 2005a	7.00E+00	9.21E-03	SRC 2005a	9.21E-03	1	vapor	
71-43-2	Benzene	F	ANHH	5.53	278.53	SRC 2005a	9.50E+01	1.25E-01	SRC 2005a	1.25E-01	1	vapor	
71-55-6	1,1,1-Trichloroethane	F	NAHH	-30.4	242.6	SRC 2005a	1.24E+02	1.63E-01	SRC 2005a	1.63E-01	1	vapor	
72-43-5	Methoxychlor	P	PEST	89	362	SRC 2005a	6.00E-07	7.89E-10	SRC 2005a	3.39E-09	0.851	particle bound	
72-55-9	4,4'-DDE	P	PEST	89	362	SRC 2005a	6.00E-06	7.89E-09	SRC 2005a	3.39E-08	0.983	particle bound	
74-83-9	Bromomethane	F	NAHH	-94.07	178.93	SRC 2005a	1.62E+03	2.13E+00	SRC 2005a	2.13E+00	1	vapor	
74-87-3	Chloromethane	F	NAHH	-97.7	175.3	SRC 2005a	4.30E+03	5.66E+00	SRC 2005a	5.66E+00	1	vapor	
74-88-4	Iodomethane (Methyl iodide)	P	NAHH	-66.45	206.55	SRC 2005a	4.04E+02	5.32E-01	SRC 2005a	5.32E-01	1	vapor	
74-95-3	Methylene bromide	P	NAHH	-52.7	220.3	SRC 2005a	4.44E+01	5.84E-02	SRC 2005a	5.84E-02	1	vapor	
74-97-5	Bromochloromethane	F	NAHH	-87.9	185.1	SRC 2005b	1.43E+02	1.88E-01	SRC 2005b	1.88E-01	1	vapor	
74-99-7	Methylacetylene	F	NANHH	-102.7	170.3	SRC 2005b	4.31E+03	5.67E+00	SRC 2005b	5.67E+00	1	vapor	
75-00-3	Chloroethane	F	NAHH	-136.4	136.6	SRC 2005a	1.01E+03	1.33E+00	SRC 2005a	1.33E+00	1	vapor	
75-01-4	1-Chloroethene	F	NAHH	-153.8	119.2	SRC 2005a	2.98E+03	3.92E+00	SRC 2005a	3.92E+00	1	vapor	
75-05-8	Acetonitrile	F	NANHH	-45	228	SRC 2005a	8.88E+01	1.17E-01	SRC 2005a	1.17E-01	1	vapor	
75-07-0	Acetaldehyde	F	NANHH	-123	150	SRC 2005a	9.02E+02	1.19E+00	SRC 2005a	1.19E+00	1	vapor	
75-09-2	Dichloromethane	F	NAHH	-94.92	178.08	SRC 2005a	4.33E+02	5.70E-01	SRC 2005a	5.70E-01	1	vapor	

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
75-12-7	Formamide	F	NANHH	2.55	275.55	SRC 2005a	6.10E-02	8.03E-05	SRC 2005a	8.03E-05	1	vapor	
75-15-0	Carbon disulfide	F	NANHH	-120	153	EPA 2004	3.59E+02	4.72E-01	SRC 2005a	4.72E-01	1	vapor	
75-21-8	Oxirane	F	NANHH	-111	162	SRC 2005a	1.31E+03	1.73E+00	SRC 2005a	1.73E+00	1	vapor	
75-25-2	Bromoform	P	NAHH	8.05	281.05	SRC 2005a	5.51E+00	7.25E-03	SRC 2005a	7.25E-03	1	vapor	
75-27-4	Bromodichloromethane	F	NAHH	-55	218	SRC 2005a	5.00E+01	6.58E-02	SRC 2005a	6.58E-02	1	vapor	
75-29-6	2-Chloropropane	P	NAHH	-117.2	155.8	SRC 2005b	5.15E+02	6.78E-01	SRC 2005b	6.78E-01	1	vapor	
75-34-3	1,1-Dichloroethane	F	NAHH	-96.96	176.04	SRC 2005a	2.27E+02	2.99E-01	SRC 2005a	2.99E-01	1	vapor	
75-35-4	1,1-Dichloroethene	F	NAHH	-122.56	150.44	SRC 2005a	6.00E+02	7.89E-01	SRC 2005a	7.89E-01	1	vapor	
75-43-4	Dichlorofluoromethane	F	NAHH	-135	138	SRC 2005b	1.36E+03	1.79E+00	SRC 2005a	1.79E+00	1	vapor	
75-44-5	Phosgene	P	NANHH	-118	155	SRC 2005a	1.42E+03	1.87E+00	SRC 2005a	1.87E+00	1	vapor	
75-45-6	Chlorodifluoromethane	F	NAHH	-157.4	115.6	SRC 2005b	7.25E+03	9.54E+00	SRC 2005b	9.54E+00	1	vapor	
75-50-3	Trimethylamine	F	NANHH	-124	149	SRC 2005a	1.61E+03	2.11E+00	SRC 2005a	2.11E+00	1	vapor	
75-52-5	Nitromethane	F	NANHH	-28.5	244.5	SRC 2005b	3.58E+01	4.71E-02	SRC 2005b	4.71E-02	1	vapor	
75-55-8	2-Methylaziridine	F	NANHH	-65	208	SRC 2005a	1.12E+02	1.47E-01	SRC 2005a	1.47E-01	1	vapor	
75-61-6	Difluorodibromomethane	F	NAHH	-110.1	162.9	SRC 2005b	8.20E+02	1.08E+00	SRC 2005a	1.08E+00	1	vapor	
75-63-8	Trifluorobromomethane	F	NAHH	-172	101	SRC 2005b	1.22E+04	1.61E+01	SRC 2005b	1.61E+01	1	vapor	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
75-65-0	2-Methyl-2-propanol	F	NANHH	25.62	298.62	SRC 2005a	4.17E+01	5.49E-02	SRC 2005a	5.56E-02	1	vapor	
75-69-4	Trichlorofluoromethane	F	NAHH	-110.48	162.52	EPA 2004	8.03E+02	1.06E+00	EPA 2004	1.06E+00	1	vapor	
75-71-8	Dichlorodifluoromethane	F	NAHH	-158	115	SRC 2005a	4.85E+03	6.38E+00	SRC 2005a	6.38E+00	1	vapor	
76-01-7	Pentachloroethane	P	NAHH	-29	244	SRC 2005a	3.50E+00	4.61E-03	SRC 2005a	4.61E-03	1	vapor	
76-03-9	Trichloroacetic acid	F	NAHH	57.5	330.5	SRC 2005b	6.00E-02	7.89E-05	SRC 2005b	1.66E-04	1	vapor	
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	F	NAHH	40.6	313.6	SRC 2005b	6.00E+01	7.89E-02	SRC 2005b	1.13E-01	1	vapor	
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	F	NAHH	26	299	SRC 2005b	2.20E+04	2.90E+01	SRC 2005a	2.96E+01	1	vapor	
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	F	NAHH	-36.4	236.6	SRC 2005a	3.32E+02	4.36E-01	SRC 2005a	4.36E-01	1	vapor	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	F	NAHH	-94	179	SRC 2005a	2.01E+03	2.65E+00	SRC 2005a	2.65E+00	1	vapor	
76-15-3	Chloropentafluoroethane	F	NAHH	-99.4	173.6	SRC 2005b	7.59E+02	9.99E-01	SRC 2005a	9.99E-01	1	vapor	
764-41-0	1,4-Dichloro-2-butene	P	NAHH	3.5	276.5	SRC 2005b	3.00E+00	3.95E-03	SRC 2005b	3.95E-03	1	vapor	
76-44-8	Heptachlor	P	PEST	96	369	SRC 2005a	4.00E+04	5.26E+01	SRC 2005a	2.65E+02	1	vapor	
765-34-4	Glycidylaldehyde	P	NANHH	-62	211	SRC 2005a	2.70E+01	3.55E-02	SRC 2005a	3.55E-02	1	vapor	
77-47-4	Hexachlorocyclopentadiene	P	OHSVOL	11.34	284.34	SRC 2005a	6.00E-02	7.89E-05	SRC 2005a	7.89E-05	1	vapor	
77-78-1	Dimethyl sulfate	P	OLSVOL	-27	246	SRC 2005a	6.80E-01	8.95E-04	SRC 2005a	8.95E-04	1	vapor	
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	F	NANHH	-108	165	SRC 2005a	1.05E+01	1.38E-02	SRC 2005a	1.38E-02	1	vapor	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
78-87-5	1,2-Dichloropropane	F	NAHH	-70	203	EPA 2004	5.20E+01	6.84E-02	SRC 2005a	6.84E-02	1	vapor	
78-92-2	1-Methylpropyl alcohol (2-Butanol)	F	NANHH	-114.7	158.3	SRC 2005a	1.83E+01	2.41E-02	SRC 2005a	2.41E-02	1	vapor	
78-93-3	2-Butanone	F	NANHH	-87	186	EPA 2004	9.53E+01	1.25E-01	SRC 2005a	1.25E-01	1	vapor	
79-00-5	1,1,2-Trichloroethane	F	NAHH	-37	236	EPA 2004	2.33E+01	3.06E-02	SRC 2005a	3.06E-02	1	vapor	
79-01-6	1,1,2-Trichloroethylene	F	NAHH	-84.8	188.2	SRC 2005a	7.35E+01	9.67E-02	SRC 2005a	9.67E-02	1	vapor	
79-09-4	Propionic acid	F	NANHH	-20.8	252.2	SRC 2005a	3.53E+00	4.64E-03	SRC 2005a	4.64E-03	1	vapor	
79-10-7	2-Propenoic acid	F	OLSVOL	13.5	286.5	SRC 2005a	4.00E+00	5.26E-03	SRC 2005a	5.26E-03	1	vapor	
79-20-9	Methyl acetate	F	NANHH	-98.1	174.9	SRC 2005a	2.16E+02	2.84E-01	SRC 2005a	2.84E-01	1	vapor	
79-34-5	1,1,2,2-Tetrachloroethane	F	NAHH	-44	229	SRC 2005a	4.62E+00	6.08E-03	SRC 2005a	6.08E-03	1	vapor	
80-62-6	Methyl methacrylate	P	NANHH	-48	225	SRC 2005b	3.84E+01	5.05E-02	SRC 2005a	5.05E-02	1	vapor	
822-06-0	Hexamethylene-1,5-diisocyanate	P	OHSVOL	-67	206	SRC 2005b	3.00E-02	3.95E-05	SRC 2005a	3.95E-05	1	vapor	
823-40-5	Toluene-2,6-diamine	P	LSB	105	378	SRC 2005a	2.46E-03	3.24E-06	SRC 2005a	2.00E-05	1	vapor	
82-68-8	Pentachloronitrobenzene	P	OHSVOL	144	417	SRC 2005b	1.13E-04	1.49E-07	SRC 2005a	2.24E-06	1	vapor	
84-66-2	Diethyl phthalate	F	PHT	-41	232	EPA 2004	1.65E-03	2.17E-06	SRC 2005a	2.17E-06	1	vapor	
84-74-2	Dibutyl phthalate	F	PHT	-35	238	EPA 2004	7.30E-05	9.61E-08	SRC 2005a	9.61E-08	0.994	particle bound	
85-44-9	Phthalic anhydride	P	OLSVOL	130.8	403.8	SRC 2005b	5.17E-04	6.80E-07	SRC 2005a	7.58E-06	1	vapor	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
85-68-7	Butylbenzyl phthalate	F	PHT	-35	238	SRC 2005a	8.25E-06	1.09E-08	SRC 2005a	1.09E-08	0.948	particle bound	
87-61-6	1,2,3-Trichlorobenzene	P	LSB	52.6	325.6	SRC 2005a	2.10E-01	2.76E-04	SRC 2005a	5.18E-04	1	vapor	
87-68-3	Hexachlorobutadiene	F	OHSVOL	-21	252	EPA 2004	2.21E-01	2.91E-04	SRC 2005a	2.91E-04	1	vapor	
87-86-5	Pentachlorophenol	P	OHSVOL	170	443	EPA 2004	3.17E-05	4.17E-08	SRC 2005a	1.14E-06	0.999	particle bound	
88-06-2	2,4,6-Trichlorophenol	F	LSB	69	342	EPA 2004	2.40E-02	3.16E-05	SRC 2005a	8.61E-05	1	vapor	
88-72-2	2-Nitrotoluene	F	ANHH	-10	263	SRC 2005b	1.88E-01	2.47E-04	SRC 2005b	2.47E-04	1	vapor	
88-74-4	o-Nitroaniline	P	LSB	71.2	344.2	SRC 2005b	8.78E-04	1.16E-06	SRC 2005a	3.31E-06	1	vapor	
88-75-5	2-Nitrophenol	F	LSB	44.8	317.8	SRC 2005b	1.13E-01	1.49E-04	SRC 2005a	2.33E-04	1	vapor	
90-04-0	o-Anisidine	P	OLSVOL	5	278	SRC 2005a	8.00E-02	1.05E-04	SRC 2005a	1.05E-04	1	vapor	
91-22-5	Quinoline	F	OLSVOL	-14.85	258.15	SRC 2005a	6.00E-02	7.89E-05	SRC 2005a	7.89E-05	1	vapor	
91-94-1	3,3'-Dichlorobenzidine	P	OHSVOL	132	405	SRC 2005a	3.71E-08	4.88E-11	SRC 2005a	5.59E-10	0.484	particle bound	
924-16-3	N-Nitrosodi-n-butylamine	P	OLSVOL	2.13	275.13	SRC 2005a	3.00E-02	3.95E-05	SRC 2005a	3.95E-05	1	vapor	
92-52-4	1,1`-Biphenyl	F	OLSVOL	69	342	SRC 2005a	9.64E-03	1.27E-05	SRC 2005a	3.46E-05	1	vapor	
92-93-3	4-Nitrobiphenyl	F	ANHH	113.7	386.7	SRC 2005a	1.00E-04	1.32E-07	SRC 2005a	9.93E-07	0.999	particle bound	
94-59-7	Safrole	P	OLSVOL	11.2	284.2	SRC 2005a	7.06E-02	9.29E-05	SRC 2005a	9.29E-05	1	vapor	
94-75-7	2,4-D and esters (160C typed)	P	PEST	140.5	413.5	SRC 2005a	6.00E-07	7.89E-10	SRC 2005a	1.10E-08	0.949	particle bound	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
95-47-6	o-Xylene	F	ANHH	-25.182	247.818	SRC 2005a	6.61E+00	8.70E-03	SRC 2005a	8.70E-03	1	vapor	
95-48-7	o-Cresol	F	LSB	30.944	303.944	SRC 2005a	2.99E-01	3.93E-04	SRC 2005a	4.50E-04	1	vapor	
95-49-8	2-Chlorotoluene	F	LSB	-35.59	237.41	SRC 2005a	3.43E+00	4.51E-03	SRC 2005a	4.51E-03	1	vapor	
95-50-1	1,2-Dichlorobenzene	F	LSB	17.01	290.01	SRC 2005a	1.36E+00	1.79E-03	SRC 2005a	1.79E-03	1	vapor	
95-53-4	o-Toluidine	P	LSB	-16.1	256.9	SRC 2005a	3.20E-01	4.21E-04	SRC 2005a	4.21E-04	1	vapor	
95-57-8	2-Chlorophenol	F	LSB	9.8	282.8	SRC 2005b	2.34E+00	3.08E-03	SRC 2005a	3.08E-03	1	vapor	
95-63-6	1,2,4-Trimethyl benzene	P	LSB	-43.78	229.22	SRC 2005a	2.10E+00	2.76E-03	SRC 2005a	2.76E-03	1	vapor	
95-94-3	1,2,4,5-Tetrachlorobenzene	P	OHSVOL	139.5	412.5	SRC 2005a	5.40E-03	7.11E-06	SRC 2005a	9.65E-05	1	vapor	
95-95-4	2,4,5-Trichlorophenol	F	LSB	68	341	SRC 2005a	2.00E-02	2.63E-05	SRC 2005a	7.01E-05	1	vapor	
96-12-8	1,2-Dibromo-3-chloropropane	P	NAHH	6	279	SRC 2005a	5.80E-01	7.63E-04	SRC 2005a	7.63E-04	1	vapor	
96-18-4	1,2,3-Trichloropropane	P	NAHH	-14.7	258.3	SRC 2005a	3.69E+00	4.85E-03	SRC 2005a	4.85E-03	1	vapor	
96-22-0	3-Pentanone	F	NANHH	-39	234	SRC 2005b	3.77E+01	4.96E-02	SRC 2005b	4.96E-02	1	vapor	
96-45-7	Ethylene thiourea	P	OLSVOL	203	476	SRC 2005a	1.40E-04	1.84E-07	SRC 2005a	1.06E-05	1	vapor	
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	F	OHSVOL						n/a	n/a	1	vapor	Conservative Assumption
97-63-2	Ethyl methacrylate	P	NANHH	-44.7	228.3	SRC 2005a	2.06E+01	2.71E-02	SRC 2005a	2.71E-02	1	vapor	
98-01-1	Furfural	P	OLSVOL	-36.5	236.5	SRC 2005b	2.21E+00	2.91E-03	SRC 2005a	2.91E-03	1	vapor	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	*Fv* [3]	Phase Type	Source for non-calculated *Fv*'s
98-06-6	tert-Butyl benzene	P	LSB	-57.8	215.2	SRC 2005b	2.20E+00	2.89E-03	SRC 2005b	2.89E-03	1	vapor	
98-07-7	Benzotrichloride	P	LSB	-4.75	268.25	SRC 2005a	4.70E-01	6.18E-04	SRC 2005a	6.18E-04	1	vapor	
98-51-1	p-tert-Butyltoluene	F	NANHH	-52	221	SRC 2005b	6.71E-01	8.83E-04	SRC 2005a	8.83E-04	1	vapor	
98-82-8	Cumene	F	LSB	-96.033	176.967	SRC 2005a	4.50E+00	5.92E-03	SRC 2005a	5.92E-03	1	vapor	
98-83-9	alpha-Methylstyrene	F	LSB	-23.2	249.8	SRC 2005b	2.50E+00	3.29E-03	SRC 2005a	3.29E-03	1	vapor	
98-86-2	Acetophenone	F	OLSVOL	19.62	292.62	SRC 2005a	3.97E-01	5.22E-04	SRC 2005a	5.22E-04	1	vapor	
98-95-3	Nitrobenzene	F	LSB	5.76	278.76	SRC 2005a	2.45E-01	3.22E-04	SRC 2005a	3.22E-04	1	vapor	
99-35-4	1,3,5-Trinitrobenzene	P	OHSVOL	121.5	394.5	SRC 2005a	6.44E-06	8.47E-09	SRC 2005a	7.64E-08	0.992	particle bound	
99-65-0	1,3-Dinitrobenzene	P	LSB	90	363	SRC 2005a	9.00E-04	1.18E-06	SRC 2005a	5.21E-06	1	vapor	
99-87-6	p-Cymene	P	NANHH	-68.9	204.1	SRC 2005b	1.46E+00	1.92E-03	SRC 2005a	1.92E-03	1	vapor	
1321-64-8	Pentachloronaphthalene	F	HPAH	n/a	273	SRC 2005b	1.49E-05	1.96E-08	SRC 2005b	1.96E-08	0.971	particle bound	
1321-65-9	Trichloronaphthalene	F	HPAH	n/a	273	SRC 2005b	3.14E-04	4.13E-07	SRC 2005b	4.13E-07	0.999	particle bound	
1335-87-1	Hexachloronaphthalene	F	HPAH	118.3	391.3	SRC 2005a	3.33E-06	4.38E-09	SRC 2005b	3.67E-08	0.984	particle bound	
1335-88-2	Tetrachloronaphthalene	F	HPAH	198	471	SRC 2005b	1.00E-06	1.32E-09	SRC 2005b	6.78E-08	0.991	particle bound	
189-55-9	Dibenzo[a,i]pyrene	F	HPAH	281.5	554.5	SRC 2005a	2.00E-12	2.63E-15	SRC 2005a	9.09E-13	0.002	particle	
189-64-0	Dibenzo[a,h]pyrene	F	HPAH	317	590	SRC 2005b	6.41E-12	8.43E-15	SRC 2005b	6.54E-12	0.011	particle	

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
191-24-2	Benzo[g,h,i]perylene	F	HPAH	277	550	SRC 2005a	1.01E-10	1.33E-13	SRC 2005a	4.14E-11	0.065	particle bound	
191-30-0	Benzo[a,i]pyrene	F	HPAH	162.4	435.4	SRC 2005b	4.80E-10	6.32E-13	SRC 2005b	1.45E-11	0.024	particle	
192-65-4	Dibenzo[a,e]pyrene	F	HPAH	233.5	506.5	SRC 2005b	7.03E-11	9.25E-14	SRC 2005b	1.07E-11	0.018	particle	
192-97-2	Benzo[e]pyrene	P	HPAH	310	583	SRC 2005b	5.70E-09	7.50E-12	SRC 2005b	4.96E-09	0.893	particle bound	
193-39-5	Indeno[1,2,3-cd]pyrene	F	HPAH	163.6	436.6	SRC 2005a	1.00E-10	1.32E-13	SRC 2005a	3.10E-12	0.005	particle	
205-82-3	Benzo[j]fluoranthene	F	HPAH	166	439	SRC 2005b	2.62E-08	3.45E-11	SRC 2005b	8.57E-10	0.59	particle bound	
205-99-2	Benzo[b]fluoranthene	F	HPAH	168	441	SRC 2005a	5.00E-07	6.58E-10	SRC 2005a	1.71E-08	0.966	particle bound	
206-44-0	Fluoranthene	F	HPAH	111	384	SRC 2005a	7.80E-06	1.03E-08	SRC 2005a	7.28E-08	0.992	particle bound	
207-08-9	Benzo[k]fluoranthene	F	HPAH	217	490	SRC 2005a	2.00E-09	2.63E-12	SRC 2005a	2.09E-10	0.26	particle bound	
218-01-9	Chrysene	F	HPAH	255	528	SRC 2005a	6.23E-09	8.20E-12	SRC 2005a	1.55E-09	0.722	particle bound	
2234-13-1	Octachloronaphthalene	F	HPAH	197	470	SRC 2005a	1.52E-08	2.00E-11	SRC 2005a	1.01E-09	0.629	particle bound	
224-42-0	Dibenz[a,j]acridine	F	HPAH	216	489	SRC 2005b	1.85E-09	2.43E-12	SRC 2005b	1.89E-10	0.241	particle bound	
226-36-8	Dibenz[a,h]acridine	F	HPAH	226	499	SRC 2005b	1.85E-09	2.43E-12	SRC 2005b	2.37E-10	0.285	particle bound	
3697-24-3	5-Methylchrysene	F	HPAH	118	391	SRC 2005b	2.53E-07	3.33E-10	SRC 2005b	2.77E-09	0.823	particle bound	
50-32-8	Benzo[a]pyrene	F	HPAH	179.3	452.3	SRC 2005a	5.49E-09	7.22E-12	SRC 2005a	2.43E-10	0.29	particle bound	
53-70-3	Dibenz[a,h]anthracene	F	HPAH	269	542	SRC 2005a	1.00E-10	1.32E-13	SRC 2005a	3.42E-11	0.054	particle bound	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
5385-75-1	Dibenzo[a,e]fluoranthene	P	HPAH	232	505	SRC 2005b	7.33E-11	9.64E-14	SRC 2005b	1.08E-11	0.018	particle	
56-49-5	3-Methylcholanthrene	F	HPAH	179	452	SRC 2005a	7.73E-09	1.02E-11	SRC 2005a	3.40E-10	0.364	particle bound	
56-55-3	Benzo[a]anthracene	F	HPAH	84	357	EPA 2004	1.05E-07	1.38E-10	SRC 2005a	5.30E-10	0.471	particle bound	
120-12-7	Anthracene	F	LPAH	216.4	489.4	SRC 2005a	2.67E-06	3.51E-09	SRC 2005a	2.75E-07	0.998	particle bound	
129-00-0	Pyrene	F	LPAH	151	424	SRC 2005a	4.59E-06	6.04E-09	SRC 2005a	1.07E-07	0.994	particle bound	
208-96-8	Acenaphthylene	F	LPAH	88	361	SRC 2005a	9.12E-04	1.20E-06	SRC 2005a	5.04E-06	1	vapor	
602-87-9	5-Nitroacenaphthene	F	LPAH	100.5	373.5	SRC 2005b	2.65E-05	3.49E-08	SRC 2005b	1.95E-07	0.997	particle bound	
83-32-9	Acenaphthene	F	LPAH	93	366	EPA 2004	2.50E-03	3.29E-06	SRC 2005a	1.55E-05	1	vapor	
85-01-8	Phenanthrene	F	LPAH	99	372	EPA 2004	1.12E-04	1.47E-07	SRC 2005a	7.96E-07	0.999	particle bound	
86-73-7	Fluorene	F	LPAH	110	383	EPA 2004	6.33E-04	8.33E-07	SRC 2005a	5.78E-06	1	vapor	
91-20-3	Naphthalene	F	LPAH	80.29	353.29	SRC 2005a	8.50E-02	1.12E-04	SRC 2005a	3.94E-04	1	vapor	
91-57-6	2-Methylnaphthalene	P	LPAH	34.6	307.6	SRC 2005a	5.50E-02	7.24E-05	SRC 2005a	9.01E-05	1	vapor	
91-58-7	2-Chloronaphthalene	F	LPAH	59.5	332.5	SRC 2005a	7.98E-03	1.05E-05	SRC 2005a	2.30E-05	1	vapor	
95-13-6	Indene	F	LPAH	-1.8	271.2	SRC 2005b	2.23E+00	2.93E-03	SRC 2005a	2.93E-03	1	vapor	
1746-01-6	2,3,7,8-Tetrachlorodibenzo(p)dioxin	P	D/F	306	579	EPA 2003	1.50E-09	1.97E-12	EPA 2003	1.19E-09	0.667	particle bound	
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	P	D/F	244	517	EPA 2003	4.90E-11	6.45E-14	EPA 2003	9.47E-12	0.016	particle	

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
3268-87-9	1,2,3,4,6,7,8,9 Octachlorodibenzo(p)dioxin	P	D/F	326	599	EPA 2003	8.25E-13	1.09E-15	EPA 2003	1.03E-12	0.002	particle	
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	P	D/F	265	538	EPA 2003	5.60E-12	7.37E-15	EPA 2003	1.75E-12	0.003	particle	
39001-02-0	1,2,3,4,6,7,8,9 Octachlorodibenzofuran	P	D/F	260	533	EPA 2003	3.75E-12	4.93E-15	EPA 2003	1.04E-12	0.002	particle	
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	P	D/F	275	548	EPA 2003	3.80E-11	5.00E-14	EPA 2003	1.49E-11	0.024	particle	
40321-76-4	1,2,3,7,8-Pentachlorodibenzo(p)dioxin	P	D/F	241	514	EPA 2003	4.40E-10	5.79E-13	EPA 2003	7.94E-11	0.118	particle bound	
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	P	D/F	228	501	EPA 2003	1.50E-08	1.97E-11	EPA 2003	2.01E-09	0.772	particle bound	
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	P	D/F	223	496	EPA 2003	4.70E-11	6.18E-14	EPA 2003	5.63E-12	0.009	particle	
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	P	D/F	196.5	469.5	EPA 2003	2.60E-09	3.42E-12	EPA 2003	1.70E-10	0.223	particle bound	
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	P	D/F	227	500	EPA 2003	1.70E-09	2.24E-12	EPA 2003	2.23E-10	0.273	particle bound	
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	P	D/F	234	507	EPA 2003	2.20E-10	2.89E-13	EPA 2003	3.39E-11	0.054	particle bound	
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	P	D/F	286	559	EPA 2003	3.60E-11	4.74E-14	EPA 2003	1.81E-11	0.03	particle	
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	P	D/F	240	513	EPA 2003	2.00E-10	2.63E-13	EPA 2003	3.53E-11	0.056	particle bound	
67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	P	D/F	237	510	EPA 2003	3.50E-11	4.61E-14	EPA 2003	5.77E-12	0.01	particle	
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	P	D/F	226.5	499.5	EPA 2003	2.40E-10	3.16E-13	EPA 2003	3.11E-11	0.05	particle bound	
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	P	D/F	249	522	EPA 2003	1.80E-10	2.37E-13	EPA 2003	3.90E-11	0.062	particle bound	
1336-36-3	Polychlorinated biphenyls (PCBs)	F	PCB	n/a	273		3.75E-01	4.93E-04	SRC 2005a	4.93E-04	1	vapor	

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CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl (PBC 118)	F	PCB	113	386	EPA 2003	3.14E-07	4.13E-10	EPA 2003	3.07E-09	0.838	particle bound	
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	F	PCB	181	454	EPA 2003	4.47E-07	5.88E-10	EPA 2003	2.06E-08	0.972	particle bound	
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	F	PCB	117.5	390.5	EPA 2003	8.28E-07	1.09E-09	EPA 2003	8.97E-09	0.938	particle bound	
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	F	PCB	210	483	EPA 2003	1.81E-07	2.38E-10	EPA 2003	1.61E-08	0.964	particle bound	
35065-29-3	2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	F	PCB	114	387	EPA 2003	2.72E-07	3.58E-10	[5] EPA 2003	2.72E-09	0.82	particle bound	
35065-30-6	2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170)	F	PCB	138.5	411.5	EPA 2003	6.46E-09	8.50E-12	EPA 2003	1.13E-10	0.159	particle bound	
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	F	PCB	131	404	EPA 2003	1.47E-07	1.93E-10	EPA 2003	2.16E-09	0.784	particle bound	
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	F	PCB	163	436	EPA 2003	1.31E-08	1.72E-11	EPA 2003	4.00E-10	0.402	particle bound	
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	F	PCB	127	400	EPA 2003	1.95E-07	2.57E-10	EPA 2003	2.62E-09	0.815	particle bound	
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	F	PCB	161	434	EPA 2003	2.96E-07	3.89E-10	EPA 2003	8.64E-09	0.936	particle bound	
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl (PCB 123)	F	PCB	135	408	EPA 2003	8.78E-07	1.16E-09	EPA 2003	1.42E-08	0.96	particle bound	
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	F	PCB	162	435	EPA 2003	5.47E-08	7.20E-11	EPA 2003	1.63E-09	0.733	particle bound	
70362-50-4	3,4,4',5-Tetrachlorobiphenyl (PCB 81)	F	PCB	163	436	EPA 2003	7.85E-07	1.03E-09	EPA 2003	2.40E-08	0.976	particle bound	
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	F	PCB	99	372	EPA 2003	4.18E-07	5.50E-10	EPA 2003	2.97E-09	0.833	particle bound	
18540-29-9	Chromium (hexavalent)	F	METAL						n/a	n/a	0	particle	EPA 2005a
7429-90-5	Aluminum	F	METAL						n/a	n/a	0	particle	EPA 2005a
7439-89-6	Iron	F	METAL						n/a	n/a	0	particle	EPA 2005a

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7439-92-1	Lead	F	METAL						n/a	n/a	0	particle	EPA 2005a
7439-93-2	Lithium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7439-95-4	Magnesium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7439-96-5	Manganese	F	METAL						n/a	n/a	0	particle	EPA 2005a
7439-97-6	Mercury - elemental	F	METAL						n/a	n/a	1	vapor	EPA 2005a
7487-94-7	Mercury - Hg+2	F	METAL						n/a	n/a	0.85	particle bound	EPA 2005a
22967-92-6	Methylmercury	F	METAL						n/a	n/a	0	particle	EPA 2005a
7439-98-7	Molybdenum	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-02-0	Nickel	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-09-7	Potassium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-16-6	Rhodium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-21-3	Silicon	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-22-4	Silver	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-23-5	Sodium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-24-6	Strontium (total)	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-25-7	Tantalum	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-28-0	Thallium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-31-5	Tin	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-33-7	Tungsten	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-36-0	Antimony	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-38-2	Arsenic	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-39-3	Barium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-41-7	Beryllium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-42-8	Boron	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-43-9	Cadmium	F	METAL						n/a	n/a	0	particle	EPA 2005a

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7440-48-4	Cobalt	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-50-8	Copper	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-61-1	Uranium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-62-2	Vanadium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-65-5	Yttrium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-66-6	Zinc	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-67-7	Zirconium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-69-9	Bismuth	F	METAL						n/a	n/a	0	particle	EPA 2005a
7440-70-2	Calcium	F	METAL						n/a	n/a	0	particle	EPA 2005a
7723-14-0	Phosphorous	F	METAL						n/a	n/a	0	particle	EPA 2005a
7782-49-2	Selenium	F	METAL						n/a	n/a	0	particle	EPA 2005a
14265-44-2	Phosphate	F	NMA						n/a	n/a	0	particle	Assumption
14280-30-9	Hydroxide	F	NMA						n/a	n/a	0	particle	Assumption
14797-55-8	Nitrate	F	NMA						n/a	n/a	0	particle	Assumption
14797-65-0	Nitrite	F	NMA						n/a	n/a	0	particle	Assumption
14808-79-8	Sulfate	F	NMA						n/a	n/a	0	particle	Assumption
16887-00-6	Chloride	F	NMA						n/a	n/a	0	particle	Assumption
16984-48-8	Fluoride	F	NMA						n/a	n/a	0	particle	Assumption
24959-67-9	Bromide	F	NMA	n/a	273	SRC 2005b	7.94E-09	1.04E-11	SRC 2005b	1.04E-11	0.017	particle	Assumption
57-12-5	Cyanide	F	NMA	n/a	273		3.08E+02	4.05E-01	SRC 2005b	4.05E-01	1	vapor	
63705-05-5	Total sulfur	F	NMA						n/a	n/a	0	particle	EPA 2005a
7553-56-2	Iodine	F	NMA	113.6	386.6	SRC 2005b	2.33E-01	3.07E-04	SRC 2005b	2.31E-03	1	vapor	
7647-01-0	Hydrogen Chloride	F	NMA	n/a	273		3.54E+04	4.66E+01	SRC 2005a	4.66E+01	1	vapor	

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7664-39-3	Hydrogen Fluoride	F	NMA	-83.36	189.64	SRC 2005b	9.17E+02	1.21E+00	SRC 2005a	1.21E+00	1	vapor	
7664-41-7	Ammonia/Ammonium	F	NMA	-77.7	195.3	SRC 2005b	7.51E+03	9.88E+00	SRC 2005a	9.88E+00	1	vapor	
7782-50-5	Chlorine	F	NMA	-101	172	SRC 2005b	5.85E+03	7.70E+00	SRC 2005a	7.70E+00	1	vapor	
10102-44-0	Nitrogen dioxide	F	CrtPOL	-9.3	263.7	SRC 2005b	9.08E+02	1.19E+00	SRC 2005a	1.19E+00	1	vapor	
630-08-0	Carbon monoxide	F	CrtPOL						n/a	n/a	1	vapor	
7446-09-5	Sulfur dioxide	F	CrtPOL						n/a	n/a	1	vapor	
no cas #	Particulate matter	F	CrtPOL						n/a	n/a	0	particle	
10028-17-8	Tritium	F	RAD						n/a	n/a	1	vapor	Assumption
10045-97-3	Cesium-137	F	RAD						n/a	n/a	0	particle	EPA 2005a
10098-91-6	Yttrium-90	F	RAD						n/a	n/a	0	particle	EPA 2005a
10098-97-2	Strontium-90	F	RAD						n/a	n/a	0	particle	EPA 2005a
10198-40-0	Cobalt-60	F	RAD						n/a	n/a	0	particle	EPA 2005a
13966-29-5	Uranium-234	F	RAD						n/a	n/a	0	particle	EPA 2005a
13967-48-1	Ruthenium-106	F	RAD						n/a	n/a	0	particle	EPA 2005a
13967-70-9	Cesium-134	F	RAD						n/a	n/a	0	particle	EPA 2005a
13968-55-3	Uranium-233	F	RAD						n/a	n/a	0	particle	EPA 2005a
13981-15-2	Curium-244	F	RAD						n/a	n/a	0	particle	EPA 2005a
13981-16-3	Plutonium-238	F	RAD						n/a	n/a	0	particle	EPA 2005a
13981-37-8	Nickel-63	F	RAD						n/a	n/a	0	particle	EPA 2005a
13981-97-0	Barium-137m	F	RAD						n/a	n/a	0	particle	EPA 2005a
13982-10-0	Plutonium-242	F	RAD						n/a	n/a	0	particle	EPA 2005a
13982-63-3	Radium-226	F	RAD						n/a	n/a	0	particle	EPA 2005a
13982-70-2	Uranium-236	F	RAD						n/a	n/a	0	particle	EPA 2005a

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
13994-20-2	Neptunium-237	F	RAD						n/a	n/a	0	particle	EPA 2005a
14119-32-5	Plutonium-241	F	RAD						n/a	n/a	0	particle	EPA 2005a
14119-33-6	Plutonium-240	F	RAD						n/a	n/a	0	particle	EPA 2005a
14133-76-7	Technetium-99	F	RAD						n/a	n/a	0	particle	EPA 2005a
14158-29-3	Uranium-232	F	RAD						n/a	n/a	0	particle	EPA 2005a
14234-35-6	Antimony-125	F	RAD						n/a	n/a	0	particle	EPA 2005a
14331-85-2	Protactinium-231	F	RAD						n/a	n/a	0	particle	EPA 2005a
14336-66-4	Cadmium-113m	F	RAD						n/a	n/a	0	particle	EPA 2005a
14336-70-0	Nickel-59	F	RAD						n/a	n/a	0	particle	EPA 2005a
14391-16-3	Europium-155	F	RAD						n/a	n/a	0	particle	EPA 2005a
14596-10-2	Americium-241	F	RAD						n/a	n/a	0	particle	EPA 2005a
14683-23-9	Europium-152	F	RAD						n/a	n/a	0	particle	EPA 2005a
14762-75-5	Carbon-14	F	RAD						n/a	n/a	1	vapor	Assumption
14952-40-0	Actinium-227	F	RAD						n/a	n/a	0	particle	EPA 2005a
14993-75-0	Americium-243	F	RAD						n/a	n/a	0	particle	EPA 2005a
15046-84-1	Iodine-129	F	RAD	113.6	386.6	SRC 2005b	2.33E-01	3.07E-04	SRC 2005b	2.31E-03	1	vapor	
15117-48-3	Plutonium-239	F	RAD						n/a	n/a	0	particle	EPA 2005a
15117-96-1	Uranium-235	F	RAD						n/a	n/a	0	particle	EPA 2005a
15262-20-1	Radium-228	F	RAD						n/a	n/a	0	particle	EPA 2005a
15510-73-3	Curium-242	F	RAD						n/a	n/a	0	particle	EPA 2005a
15585-10-1	Europium-154	F	RAD						n/a	n/a	0	particle	EPA 2005a
15594-54-4	Thorium-229	F	RAD						n/a	n/a	0	particle	EPA 2005a
15715-94-3	Samarium-151	F	RAD						n/a	n/a	0	particle	EPA 2005a
15751-77-6	Zirconium-93	F	RAD						n/a	n/a	0	particle	EPA 2005a
15757-87-6	Curium-243	F	RAD						n/a	n/a	0	particle	EPA 2005a

Table 2. Vapor Phase Partitioning Coefficients (F_v) and Phase Determination

CAS# [3]	COPC Name	PIC [3] / Feed[1]	Class[2]	Tm [3] °C	Tm [3] °K	Tm [3] Source [7]	Vp [3] mmHg	Vp [3] atm	Vp [3] Source [7]	Vp [3] Used [4]	Fv [3]	Phase Type	Source for non-calculated Fv's
15758-45-9	Selenium-79	F	RAD						n/a	n/a	0	particle	EPA 2005a
15832-50-5	Tin-126	F	RAD						n/a	n/a	0	particle	EPA 2005a
7440-29-1	Thorium-232	F	RAD						n/a	n/a	0	particle	EPA 2005a
7440-03-1	Niobium-93m	F	RAD						n/a	n/a	0	particle	EPA 2005a
7440-61-1R	Uranium-238	F	RAD						n/a	n/a	0	particle	EPA 2005a
CHG Identified Compounds in Tank Headspace													
100-40-3	4-Vinylcyclohexene	F	NANHH	-108.9	164.1	SRC 2005b	1.57E+01	2.07E-02	SRC 2005a	2.07E-02	1	vapor	
104-76-7	2-Ethyl-1-Hexanol	F	NANHH	-76	197	SRC 2005a	1.36E-01	1.79E-04	SRC 2005a	1.79E-04	1	vapor	
10595-95-6	N-Methyl-N-Nitrosoethamine	F	OLSVOL	n/a	273	SRC 2005b	1.10E+00	1.45E-03	SRC 2005b	1.45E-03	1	vapor	
109-74-0	Butyronitrile	F	NANHH	-111.9	161.1	SRC 2005b	1.95E+01	2.57E-02	SRC 2005b	2.57E-02	1	vapor	
110-59-8	Valeronitrile	F	NANHH	-96.2	176.8	SRC 2005b	7.30E+00	9.61E-03	SRC 2005a	9.61E-03	1	vapor	
123-72-8	Butyraldehyde	F	NANHH	-96.4	176.6	SRC 2005a	1.11E+02	1.47E-01	SRC 2005a	1.47E-01	1	vapor	
134-32-7	1-Naphthylamine	F	LPAH	50	323	SRC 2005a	2.75E-03	3.62E-06	SRC 2005a	6.40E-06	1	vapor	
589-38-8	3-Hexanone	F	NANHH	-55.5	217.5	SRC 2005b	1.39E+01	1.83E-02	SRC 2005b	1.83E-02	1	vapor	
628-73-9	Hexanenitrile	F	NANHH	-80.3	192.7	SRC 2005b	2.85E+00	3.75E-03	SRC 2005a	3.75E-03	1	vapor	
75-02-5	Vinyl Fluoride	F	NAHH	-156	117	SRC 2005a	6.00E+00	7.89E-03	SRC 2005a	7.89E-03	1	vapor	
79-46-9	2-Nitropropane	F	NANHH	-91.32	181.68	SRC 2005a	1.80E+01	2.37E-02	SRC 2005a	2.37E-02	1	vapor	

Table Notes:

[1] P= PIC and F=Feed Constituent

[2] **Class Legend**

Non-aromatic Halogenated Hydrocarbons	NAHH
Non-aromatic Nonhalogenated Hydrocarbons	NANHH
Non-metals and Anions	NMA
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)	OHSVOL
Other Light Semivolatile Compounds (molecular weight <200 g/mole)	OLSVOL
Phthalates	PHT
Polychlorinated Biphenyls (PCBs)	PCB
Radionuclides	Rad
Aromatic Halogenated Hydrocarbons	AHH
Aromatic Nonhalogenated Hydrocarbons	ANHH
Criteria Pollutants	CrtPol
Dioxin and Furan Compounds (PCDDs/PCDFs)	D/F
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)	HPAH
Herbicides and Organochlorinated Pesticides	PEST
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)	LPAH
Light Substituted Benzene Compounds (molecular weight <200 g/mole)	LSB
Metals	Metal

[3] **Abbreviations**

CAS# = Chemical Abstracts Registry Service

COPC = Constituent of Potential Concern

PIC = Product of Incomplete Combustion

Tm = Melting Point Temperature

°C = Degrees Centigrade

°K = Degrees Kelvin

Vp = Vapor Pressure

mmHg = Millimeters of Mercury

atm = Atmosphere

F_v = Fraction of COPC in vapor phase

[4] "Vp Used" Column identifies the liquid vapor pressure used to calculate the F_v

[5] 2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180) has two values in this document; the value provided in Appendix A, Table A1 appears to be the correct one and was selected.

[6] n/a = Not Available

[7] Source references are provided in Section 6.0

129507

O. Lee Bostic
Environmental Data Management Lead
Environmental & Nuclear Safety

DBB/OLB/es

Attachment: WTP Risk Assessment Work Plan Identified Constituents of Potential Concern (COPC) Supporting Data

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Distribution

Addressee	MSIN
Berrios, E.	MS4-C1
Blumenkranz, D. B.	MS4-D2
Bostic, O. L.	MS4-D2
Cook, J. R.	MS4-D2
PDC	MS9-A

Attachment to CCN 129507

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED
CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORTING DATA

- *Aromatic Halogenated Hydrocarbons* *(AHH)*
- *Aromatic Nonhalogenated Hydrocarbons* *(ANHH)*
- *CHG-Identified Compounds in Tank Headspace* *(CHG)*
- *Criteria Pollutants* *(CrtPol)*
- *Dioxin and Furan Compounds (PCDDs/PCDFs) & Polychlorinated Biphenyls (PCBs)* *(D/F / PCB)*
- *Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)* *(HPAH)*
- *Herbicides and Organochlorinated Pesticides* *(PEST)*
- *Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)* *(LPAH)*
- *Light Substituted Benzene Compounds (molecular weight <200 g/mole)* *(LSB)*
- *Metals* *(Metal)*
- *Non-aromatic Halogenated Hydrocarbons* *(NAHH)*
- *Non-aromatic Nonhalogenated Hydrocarbons* *(NANHH)*
- *Non-metals and Anions* *(NMA)*
- *Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)* *(OHSVOL)*
- *Other Light Semivolatile Compounds (molecular weight >200 g/mole)* *(OLSVOL)*
- *Phthalates* *(PHT)*

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Aromatic Halogenated Hydrocarbons (AHH)

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000059-50-7
Chem Name  : 3-METHYL-4-CHLOROPHENOL
Mol Formula: C7H7ClO
Mol Weight : 142.59
Melting Pt : 67 deg C
Boiling Pt : 235 deg C
Water Solubility:
   Value : 3830 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KUHNE,R ET AL. (1995)
Log P (octanol-water):
   Value : 3.10
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.05 mm Hg
   Temp  : 20 deg C
   Type  : EXP
   Ref   : MABEY,WR ET AL. (1981)
pKa Dissociation Constant:
   Value : 9.55
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 2.45E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 2.57E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000058-90-2 Name: 2,3,4,6-TETRACHLOROPHENOL

```
*****************************************************************************
MELT    2,3,4,6-TETRACHLOROPHENOL                          CAS#    58-90-2
  Melting Point  :  69-70       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  FREITER,ER (1978A)
*****************************************************************************

VP      2,3,4,6-TETRACHLOROPHENOL                          CAS#    58-90-2
  Vapor Pressure :  1.44E-3     MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BIDLEMAN,TF & RENBERG,L (1985)
*****************************************************************************
```

BIDLEMAN,TF & RENBERG,L (1985)
BIDLEMAN,T.F.; RENBERG,L.; DETERMINATION OF VAPOR PRESSURES FOR CHLOROGUAIACOLS, CHLOROVERATROLES, AND NONYLPHENOL BY GAS CHROMATOGRAPHY.; CHEMOSPHERE; 14:1475-81; 1985

FREITER,ER (1978A)
FREITER,E.R.; CHLOROPHENOLS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD NEW YORK,NY; WILEY INTERSCIENCE. 5:864-72; 1978A

End of Search

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Aromatic Nonhalogenated Hydrocarbons (ANHH)

CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-41-4 Name: ETHYLBENZENE

```
*****************************************************************************
MELT    ETHYLBENZENE                                          CAS#   100-41-4
  Melting Point  :  -94.975     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ETHYLBENZENE                                          CAS#   100-41-4
  Vapor Pressure :  .9571E 01   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  DREISBACH,RR (1955)
*****************************************************************************

VP      ETHYLBENZENE                                          CAS#   100-41-4
  Vapor Pressure :  .9508E 01   .20E 02     .40E 02     .100E 03    TORR
                    CALCULATED
  Temperature (C):  25.00       38.60       52.75       74.105
  Remarks        :  CALC FROM ANTOINE EQN
  Abbrev. Ref.   :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP      ETHYLBENZENE                                          CAS#   100-41-4
  Vapor Pressure :  9.60        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

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ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE

STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Ethyl benzene
CAS Number: 000100-41-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-1	mg/kg/day	IRIS
Inhal RfD:	2.9E-1	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	3.5E+3	mg/kg	ACGIH
Dermal LD50:	1.5E+4	mg/kg	RTECS
Gas Inhal LC50:	4.0E+3	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.3E+3	µg/L	ECOTOX
Salt Ecol LC50:	2.1E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	9.1E+1	days	THOMAS
Photolysis:	2.1E-1	days	CHEMFATE
Biodeg:	2.0E+1	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.8E-1	days	THOMAS
Photolysis:	2.1E-1	days	CHEMFATE
Biodeg:	2.0E+1	days	CHEMFATE
Radio:		days	
Log Kow:	3.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.1E+2	
Density:	8.7E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	9.6E+0	Torr	CHEMFATE
Henry's Law:	7.9E-3	atm-m3/mol	CHEMFATE
Water Solub:	1.7E+2	mg/L	CHEMFATE
Distrib Coef:	7.3E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	3.1E+0		CHEMFATE
Water Solub:	1.7E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-9.5E+1	C
Boiling Point:	1.4E+2	C
Formula:	C8 H10	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-41-4 Name: ETHYLBENZENE

```
*****************************************************************************
MELT    ETHYLBENZENE                                          CAS#   100-41-4
  Melting Point  :  -94.975     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ETHYLBENZENE                                          CAS#   100-41-4
  Vapor Pressure :  .9571E 01   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  DREISBACH,RR (1955)
*****************************************************************************

VP      ETHYLBENZENE                                          CAS#   100-41-4
  Vapor Pressure :  .9508E 01   .20E 02     .40E 02     .100E 03    TORR
                    CALCULATED
  Temperature (C):  25.00       38.60       52.75       74.105
  Remarks        :  CALC FROM ANTOINE EQN
  Abbrev. Ref.   :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP      ETHYLBENZENE                                          CAS#   100-41-4
  Vapor Pressure :  9.60        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

DREISBACH,RR (1955)
DREISBACH,R.R.; PHYSICAL PROPERTIES OF CHEMICAL COMPOUNDS. I.; ADVANCES IN CHEMISTRY SERIES NO. 15.; WASHINGTON, DC: AMERICAN CHEMICAL SOCIETY.; 1955

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

ZWOLINSKI,BJ & WILHOIT,RC (1971)
ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE

STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

End of Search

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-42-5 Name: STYRENE

```
*****************************************************************************
MELT    STYRENE                                                CAS#   100-42-5
  Melting Point  :  -30.628     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      STYRENE                                                CAS#   100-42-5
  Vapor Pressure :  .55E 01     .135E 02    TORR        MEASURED
  Temperature (C):  20.         37.
  Abbrev. Ref.   :  NATIONAL ACADEMY OF SCIENCES (1980)
*****************************************************************************

VP      STYRENE                                                CAS#   100-42-5
  Vapor Pressure :  6.4         MM HG       MEAS
  Temperature (C):  25
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************

VP      STYRENE                                                CAS#   100-42-5
  Vapor Pressure :  6.12        MM HG       MEAS
  Temperature (C):  25
  Remarks        :  INTERPOLATED DATA OBTAINED IN THE RANGE -31 TO 375 DEG C,
                    SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

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DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

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NATIONAL ACADEMY OF SCIENCES; THE ALKYL BENZENES.; WASHINGTON, DC: NATIONA ACADEMY PRESS. USEPA CONTRACT 68-01-4655; 1980

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RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY

WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Styrene
CAS Number: 000100-42-5

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-1	mg/kg/day	IRIS
Inhal RfD:	2.9E-1	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	5.0E+3	mg/kg	ACGIH
Dermal LD50:		mg/kg	
Gas Inhal LC50:	2.8E+3	ppm	ACGIH
Dust Inhal LC50:	1.0E+4	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.8E+3	µg/L	ECOTOX
Salt Ecol LC50:	5.1E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	9.0E+1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.7E-1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
Log Kow:	3.0E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.0E+2	
Density:	9.1E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.1E+0	Torr	CHEMFATE
Henry's Law:	2.7E-3	atm-m3/mol	CHEMFATE
Water Solub:	3.1E+2	mg/L	CHEMFATE
Distrib Coef:	1.2E+2	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	3.0E+0		CHEMFATE
Water Solub:	3.1E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-3.1E+1	C
Boiling Point:	1.5E+2	C
Formula:	C8 H8	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-42-5 Name: STYRENE

```
*****************************************************************************
MELT    STYRENE                                              CAS#   100-42-5
  Melting Point  :  -30.628     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      STYRENE                                              CAS#   100-42-5
  Vapor Pressure :  .55E 01     .135E 02    TORR        MEASURED
  Temperature (C):  20.         37.
  Abbrev. Ref.   :  NATIONAL ACADEMY OF SCIENCES (1980)
*****************************************************************************

VP      STYRENE                                              CAS#   100-42-5
  Vapor Pressure :  6.4         MM HG       MEAS
  Temperature (C):  25
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************

VP      STYRENE                                              CAS#   100-42-5
  Vapor Pressure :  6.12        MM HG       MEAS
  Temperature (C):  25
  Remarks        :  INTERPOLATED DATA OBTAINED IN THE RANGE -31 TO 375 DEG C,
                    SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

NATIONAL ACADEMY OF SCIENCES (1980)
NATIONAL ACADEMY OF SCIENCES; THE ALKYL BENZENES.; WASHINGTON, DC: NATIONA ACADEMY PRESS. USEPA CONTRACT 68-01-4655; 1980

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY

WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-51-6 Name: BENZYL ALCOHOL

```
*****************************************************************************
VP      BENZYL ALCOHOL                                        CAS#   100-51-6
  Vapor Pressure :  .1E-01      TORR        MEASURED
  Temperature (C):  30.
  Abbrev. Ref.   :  RINGK,W (1978)
*****************************************************************************

VP      BENZYL ALCOHOL                                        CAS#   100-51-6
  Vapor Pressure :  .626E-01    .137E 00    TORR        MEASURED
  Temperature (C):  20.         29.5
  Remarks        :  UNITS CONVERTED, UPPER TEMP MEASURED, LOWER ONE EXTRAP FRO
                    ANTOINE EQN
  Abbrev. Ref.   :  GRAYSON,BT & FOSBRAEY,LA (1982)
*****************************************************************************
```

GRAYSON,BT & FOSBRAEY,LA (1982)
GRAYSON,B.T.; FOSBRAEY,L.A.; DETERMINATION OF THE VAPOUR PRESSURE OF PESTICIDES.; PESTIC. SCI.; 13:269-78.; 1982

RINGK,W (1978)
RINGK,W.; BENZYL ALCOHOL AND B-PHENETHYL GLYCOL.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 3:793-82.; 1978

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000100-51-6
Chem Name  : BENZYL ALCOHOL
Mol Formula: C7H8O
Mol Weight : 108.14
Melting Pt : -15.2 deg C
Boiling Pt : 205.3 deg C
Water Solubility:
   Value : 4.29E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.10
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.094 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value : 15.4
   Temp  :
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 3.37E-007 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ABRAHAM,MH ET AL. (1994)
Atmospheric OH Rate Constant:
   Value : 2.29E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000100-52-7
Chem Name  : BENZALDEHYDE
Mol Formula: C7H6O
Mol Weight : 106.13
Melting Pt : -26 deg C
Boiling Pt : 179 deg C
Water Solubility:
   Value : 6570 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.48
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.127 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : AMBROSE,D ET AL. (1975A)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 2.67E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BETTERTON,EA & HOFFMAN,MR (1988)
Atmospheric OH Rate Constant:
   Value : 1.29E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-52-7 Name: BENZALDEHYDE

```
*****************************************************************************
VP      BENZALDEHYDE                                        CAS#   100-52-7
  Vapor Pressure :  .127E 01    .30E 01     .65E 01     TORR        MEASURED
  Temperature (C):  25.0        38.5        51.9
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1975A)
*****************************************************************************

VP      BENZALDEHYDE                                        CAS#   100-52-7
  Vapor Pressure :  .975E 00    TORR        MEASURED
  Temperature (C):  26.2
  Abbrev. Ref.   :  WILLIAMS,AE (1978)
*****************************************************************************
```

AMBROSE,D ET AL. (1975A)
AMBROSE,D.; CONNETT,J.E.; GREEN,J.H.S.; HALES,J.L.; HEAD,A.J.; MARTIN,J.F.; THERMODYNAMIC PROPERTIES OF ORGANIC OXYGEN COMPOUNDS. 42. PHYSICAL AND THERMODYNAMIC PROPERTIES OF BENZALDEHYDE.; J. CHEM. THERM.; 7:1143-57.; 197

WILLIAMS,AE (1978)
WILLIAMS,A.E.; BENZALDEHYDE.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 3:736-43.; 1978

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Xylene, p-
CAS Number: 000106-42-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	5.0E+3	mg/kg	RTECS
Dermal LD50:		mg/kg	
Gas Inhal LC50:	3.9E+3	ppm	ACGIH
Dust Inhal LC50:	1.5E+1	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.6E+3	µg/L	ECOTOX
Salt Ecol LC50:	2.0E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	9.1E+1	days	THOMAS
Photolysis:	8.3E-2	days	CHEMFATE
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.8E-1	days	THOMAS
Photolysis:	8.3E-2	days	CHEMFATE
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
Log Kow:	3.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.1E+2	
Density:	8.6E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	8.9E+0	Torr	CHEMFATE
Henry's Law:	7.7E-3	atm-m3/mol	CHEMFATE
Water Solub:	1.6E+2	mg/L	CHEMFATE
Distrib Coef:	7.8E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	3.1E+0		CHEMFATE
Water Solub:	1.6E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.3E+1	C
Boiling Point:	1.4E+2	C
Formula:	C8 H10	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-42-3 Name: P-XYLENE

```
*****************************************************************************
MELT    P-XYLENE                                          CAS#   106-42-3
  Melting Point  :  13.263      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      P-XYLENE                                          CAS#   106-42-3
  Vapor Pressure :  .3460E+01   .8760E+01   .1984E+02   TORR        CALCULATED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  CALC FROM ANTOINE EQN
  Abbrev. Ref.   :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP      P-XYLENE                                          CAS#   106-42-3
  Vapor Pressure :  8.84        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************

VP      P-XYLENE                                          CAS#   106-42-3
  Vapor Pressure :  8.90        MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

ZWOLINSKI,BJ & WILHOIT,RC (1971)

ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Xylene, m-
CAS Number: 000108-38-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E+0	mg/kg/day	HEAST
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	5.3E+3	mg/kg	ACGIH
Dermal LD50:	1.2E+4	mg/kg	ACGIH
Gas Inhal LC50:	5.3E+3	ppm	ACGIH
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	5.3E+3	µg/L	ECOTOX
Salt Ecol LC50:	2.9E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	9.1E+1	days	THOMAS
Photolysis:	1.2E-1	days	CHEMFATE
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.8E-1	days	THOMAS
Photolysis:	1.2E-1	days	CHEMFATE
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
Log Kow:	3.2E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.1E+2	
Density:	8.6E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	8.5E+0	Torr	CHEMFATE
Henry's Law:	7.3E-3	atm-m3/mol	CHEMFATE
Water Solub:	1.6E+2	mg/L	CHEMFATE
Distrib Coef:	8.1E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	3.2E+0		CHEMFATE
Water Solub:	1.6E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-4.8E+1	C
Boiling Point:	1.4E+2	C
Formula:	C8 H10	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000108-38-3 Name: M-XYLENE

```
*****************************************************************************
MELT    M-XYLENE                                            CAS#   108-38-3
  Melting Point  :  -47.872     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      M-XYLENE                                            CAS#   108-38-3
  Vapor Pressure :  .830E 01    TORR        CALCULATED
  Temperature (C):  25.
  Remarks        :  CALC FROM ANTOINE EQN
  Abbrev. Ref.   :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP      M-XYLENE                                            CAS#   108-38-3
  Vapor Pressure :  8.29        MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************

VP      M-XYLENE                                            CAS#   108-38-3
  Vapor Pressure :  8.454       MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

ZWOLINSKI,BJ & WILHOIT,RC (1971)
ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF

VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Toluene
CAS Number: 000108-88-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-1	mg/kg/day	IRIS
Inhal RfD:	1.1E-1	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	2.6E+3	mg/kg	ACGIH
Dermal LD50:	1.2E+4	mg/kg	ACGIH
Gas Inhal LC50:	5.3E+3	ppm	ACGIH
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	4.9E+3	µg/L	ECOTOX
Salt Ecol LC50:	3.1E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	8.4E+1	days	THOMAS
Photolysis:	2.8E-1	days	CHEMFATE
Biodeg:	9.0E+1	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.1E-1	days	THOMAS
Photolysis:	2.8E-1	days	CHEMFATE
Biodeg:	9.0E+1	days	CHEMFATE
Radio:		days	
Log Kow:	2.7E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	9.2E+1	
Density:	8.7E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.8E+1	Torr	CHEMFATE
Henry's Law:	6.6E-3	atm-m3/mol	CHEMFATE
Water Solub:	5.3E+2	mg/L	CHEMFATE
Distrib Coef:	3.6E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:	3.1E+1		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	3.0E+3		ECOTOX
Salt BCF:	3.1E+1		ECOTOX
Log Kow:	2.7E+0		CHEMFATE
Water Solub:	5.3E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-9.5E+1	C
Boiling Point:	1.1E+2	C
Formula:	C7 H8	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000108-88-3 Name: TOLUENE

```
*****************************************************************************
MELT    TOLUENE                                              CAS#   108-88-3
  Melting Point  :  -94.991     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      TOLUENE                                              CAS#   108-88-3
  Vapor Pressure :  28.4        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000132-64-9 Name: DIBENZOFURAN

```
*****************************************************************************
MELT    DIBENZOFURAN                                          CAS#   132-64-9
  Melting Point  :  81-83       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DEAN,JA (1985)
*****************************************************************************

VP      DIBENZOFURAN                                          CAS#   132-64-9
  Vapor Pressure :  1.8E-4      MM HG
  Temperature (C):  25
  Remarks        :  CALCULATED BY PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************


   DEAN,JA (1985)
   DEAN,J.A.; LANGE'S HANDBOOK OF CHEMISTRY 13TH ED.;  NY, NY: MCGRAW-HILL BOO
   CO.; 1985

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Benzene
CAS Number: 000071-43-2

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	4.0E-3	mg/kg/day	IRIS
Inhal RfD:	8.6E-3	mg/kg/day	IRIS
Oral Slope:	5.5E-2	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	A		
Inhal Slope:	2.7E-2	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	A		
Oral ED10:	3.7E+0	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	A		
Inhal ED10:	3.7E+0	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	A		
Oral LD50:	9.3E+2	mg/kg	RTECS
Dermal LD50:	4.8E+1	mg/kg	RTECS
Gas Inhal LC50:	1.0E+4	ppm	RTECS
Dust Inhal LC50:	1.5E+2	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.0E+3	µg/L	ECOTOX
Salt Ecol LC50:	1.0E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	7.8E+1	days	THOMAS
Photolysis:	6.7E+2	days	CHEMFATE
Biodeg:	6.0E+0	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	8.4E-1	days	THOMAS
Photolysis:	6.7E+2	days	CHEMFATE
Biodeg:	6.0E+0	days	CHEMFATE
Radio:		days	
Log Kow:	2.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	7.8E+1	
Density:	8.8E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	9.5E+1	Torr	CHEMFATE
Henry's Law:	5.6E-3	atm-m3/mol	CHEMFATE
Water Solub:	1.8E+3	mg/L	CHEMFATE
Distrib Coef:	1.2E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.4E+3		ECOTOX
Salt BCF:	8.5E+3		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	2.2E+3		ECOTOX
Salt BCF:	1.0E+4		ECOTOX
Log Kow:	2.1E+0		CHEMFATE
Water Solub:	1.8E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	5.5E+0	C
Boiling Point:	8.0E+1	C
Formula:	C6 H6	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000071-43-2 Name: BENZENE

```
*****************************************************************************
MELT    BENZENE                                              CAS#    71-43-2
  Melting Point  :  5.53        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      BENZENE                                              CAS#    71-43-2
  Vapor Pressure :  .95E 02     TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  THIBODEAUX,LJ (1981)
*****************************************************************************

VP      BENZENE                                              CAS#    71-43-2
  Vapor Pressure :  .4553E+02   .9518E+02   .1828E+03   TORR        CALCULATED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  CALC FROM ANTOINE EQN
  Abbrev. Ref.   :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP      BENZENE                                              CAS#    71-43-2
  Vapor Pressure :  95.2        MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      BENZENE                                              CAS#    71-43-2
  Vapor Pressure :  95.0        MM HG
  Temperature (C):  25
  Remarks        :  EVALUATED DATABASE - SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

THIBODEAUX,LJ (1981)
THIBODEAUX,L.J.; ESTIMATING THE AIR EMISSIONS OF CHEMICALS FROM HAZARDOUS WASTE LANDFILLS.; J. HAZARDOUS MATERIALS; 4:235-44.; 1981

ZWOLINSKI,BJ & WILHOIT,RC (1971)
ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000088-72-2
Chem Name  : 2-NITROTOLUENE
Mol Formula: C7H7NO2
Mol Weight : 137.14
Melting Pt : -10 deg C
Boiling Pt : 222 deg C
Water Solubility:
   Value : 650 mg/L
   Temp  : 30 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 2.30
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.188 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : PERRY,RH & GREEN,D (1984)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.25E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ALTSCHUH,J ET AL. (1999)
Atmospheric OH Rate Constant:
   Value : 7E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000092-93-3 Name: P-NITROBIPHENYL

```
*****************************************************************************
MELT    P-NITROBIPHENYL                                        CAS#    92-93-3
  Melting Point  :  113.7      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      P-NITROBIPHENYL                                        CAS#    92-93-3
  Vapor Pressure :  1.0E-4      MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED FROM THE WSOL AND HENRY'S LAW CONSTANT, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************


   MERCK INDEX (1983)
   MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH
   ED.;  WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Xylene, o-
CAS Number: 000095-47-6

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E+0	mg/kg/day	HEAST
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	5.0E+3	mg/kg	RTECS
Dermal LD50:		mg/kg	
Gas Inhal LC50:	4.6E+3	ppm	ACGIH
Dust Inhal LC50:	3.0E+1	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	5.3E+3	µg/L	ECOTOX
Salt Ecol LC50:	1.1E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	9.1E+1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.8E-1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
Log Kow:	3.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.1E+2	
Density:	8.8E-1	g/mL @ 10.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.6E+0	Torr	CHEMFATE
Henry's Law:	5.2E-3	atm-m3/mol	CHEMFATE
Water Solub:	1.8E+2	mg/L	CHEMFATE
Distrib Coef:	7.3E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	3.1E+0		CHEMFATE
Water Solub:	1.8E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-2.5E+1	C
Boiling Point:	1.4E+2	C
Formula:	C8 H10	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000095-47-6 Name: O-XYLENE

```
*****************************************************************************
MELT    O-XYLENE                                          CAS#    95-47-6
  Melting Point  :  -25.182      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      O-XYLENE                                          CAS#    95-47-6
  Vapor Pressure :  .2550E+01   .6620E+01   .1534E+02   TORR        CALCULATED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  CALC FROM ANTOINE EQN
  Abbrev. Ref.   :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP      O-XYLENE                                          CAS#    95-47-6
  Vapor Pressure :  6.61        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

ZWOLINSKI,BJ & WILHOIT,RC (1971)
ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

End of Search

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

CHG-Identified Compounds in Tank Headspace (CHG)

CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-40-3 Name: 4-VINYLCYCLOHEXENE

```
*****************************************************************************
VP      4-VINYLCYCLOHEXENE                                  CAS#   100-40-3
  Vapor Pressure :  1.571E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000100-40-3
Chem Name  : 4-VINYLCYCLOHEXENE
Mol Formula: C8H12
Mol Weight : 108.18
Melting Pt : -108.9 deg C
Boiling Pt : 128 deg C
Water Solubility:
   Value : 50 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 3.93
   Type  : EXP
   Ref   : CHEM INSPECT TEST INST (1992)
Vapor Pressure:
   Value : 15.7 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0448 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 8.93E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000104-76-7 Name: 2-ETHYL-1-HEXANOL

```
*****************************************************************************
MELT    2-ETHYL-1-HEXANOL                                   CAS#   104-76-7
  Melting Point  :  -76          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      2-ETHYL-1-HEXANOL                                   CAS#   104-76-7
  Vapor Pressure :  0.136        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 010595-95-6
Chem Name  : N-METHYL-N-NITROSOETHAMINE
Mol Formula: C3H8N2O
Mol Weight : 88.11
Melting Pt :
Boiling Pt : 170 deg C
Water Solubility:
   Value : 3E+005 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : IARC (1978)
Log P (octanol-water):
   Value : 0.04
   Type  : EXP
   Ref   : VERA,A ET AL. (1992)
Vapor Pressure:
   Value : 1.1 mm Hg
   Temp  : 20 deg C
   Type  : EST
   Ref   : KLEIN,RG (1982)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.44E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1988)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000109-74-0
Chem Name  : BUTYRONITRILE
Mol Formula: C4H7N
Mol Weight : 69.11
Melting Pt : -111.9 deg C
Boiling Pt : 117.6 deg C
Water Solubility:
   Value : 3.3E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : 0.53
   Type  : EXP
   Ref   : TANII,H & HASHIMOTO,K (1984)
Vapor Pressure:
   Value : 19.5 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 5.23E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BUTLER,JAV AND RAMCHANDANI,CN (1935)
Atmospheric OH Rate Constant:
   Value : 7.56E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1988)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000110-59-8 Name: VALERONITRILE

```
*****************************************************************************
VP      VALERONITRILE                                          CAS#   110-59-8
  Vapor Pressure :  7.300E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000110-59-8
Chem Name  : VALERONITRILE
Mol Formula: C5H9N
Mol Weight : 83.13
Melting Pt : -96.2 deg C
Boiling Pt : 141.3 deg C
Water Solubility:
   Value : 7750 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 1.12
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 7.3 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 7.15E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.67E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000123-72-8 Name: BUTRALDEHYDE

```
*****************************************************************************
MELT    BUTRALDEHYDE                                          CAS#   123-72-8
  Melting Point  :  -96.4      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      BUTRALDEHYDE                                          CAS#   123-72-8
  Vapor Pressure :  .122E 02    TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  SHERMAN,PD (1978A)
*****************************************************************************

VP      BUTRALDEHYDE                                          CAS#   123-72-8
  Vapor Pressure :  111.4      MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

SHERMAN,PD (1978A)
SHERMAN,P.D.; BUTYRALDEHYDE.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 4:376-6.; 1978A

End of Search

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000134-32-7 Name: 1-NAPHTHYLAMINE

```
*****************************************************************************
MELT    1-NAPHTHYLAMINE                                        CAS#   134-32-7
  Melting Point  :  50          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1-NAPHTHYLAMINE                                        CAS#   134-32-7
  Vapor Pressure :  2.75E-3     MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM EXPERIMENTAL DATA OBTAINED IN THE RANGE
                    52-372 DEG C, CORRECTED FOR SUPERCOOLED LIQUID, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

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End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000589-38-8
Chem Name  : 3-HEXANONE
Mol Formula: C6H12O
Mol Weight : 100.16
Melting Pt : -55.5 deg C
Boiling Pt : 123.5 deg C
Water Solubility:
   Value : 1.47E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.24
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 13.9 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YAWS,CL (1994A)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000125 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 6.9E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000628-73-9 Name: HEXANENITRILE

```
*****************************************************************************
VP      HEXANENITRILE                                        CAS#   628-73-9
  Vapor Pressure :  2.850E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000628-73-9
Chem Name  : HEXANENITRILE
Mol Formula: C6H11N
Mol Weight : 97.16
Melting Pt : -80.3 deg C
Boiling Pt : 163.6 deg C
Water Solubility:
   Value : 2480 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 1.66
   Type  : EXP
   Ref   : TANII,H & HASHIMOTO,K (1984)
Vapor Pressure:
   Value : 2.85 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 9.49E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 3.09E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

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CAS #: 000075-02-5 Name: FLUOROETHENE

```
*****************************************************************************
MELT    FLUOROETHENE                                          CAS#    75-02-5
  Melting Point  :  -156        DEGC
  Remarks        :  CALCULATED BY EQUATION 20 IN NEELY,WB & BLAU,GE (1985), SR
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      FLUOROETHENE                                          CAS#    75-02-5
  Vapor Pressure :  2.0E4       MM HG
  Temperature (C):  22.98
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ENGINEERING SCIENCES DATA UNIT (1976)
*****************************************************************************

VP      FLUOROETHENE                                          CAS#    75-02-5
  Vapor Pressure :  6.000E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

ENGINEERING SCIENCES DATA UNIT (1976)
ENGINEERING SCIENCES DATA UNIT.; VAPOR PRESSURES AND CRITICAL POINTS OF LIQUIDS. VII. HALOGENATED ETHANES AND ETHYLENES.; ENG. SCI. DATA ITEM. 76004. PP.43.; 1976

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000079-46-9 Name: 2-NITROPROPANE

```
*****************************************************************************
MELT    2-NITROPROPANE                                          CAS#    79-46-9
  Melting Point  :  -91.32      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BAKER,PJJR & BOLLMEIER,AFJR (1981)
*****************************************************************************

VP      2-NITROPROPANE                                          CAS#    79-46-9
  Vapor Pressure :  .1742E 02   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  DORIGAN,J ET AL. (1976)
*****************************************************************************

VP      2-NITROPROPANE                                          CAS#    79-46-9
  Vapor Pressure :  18          MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BAKER,PJJR & BOLLMEIER,AFJR (1981)
*****************************************************************************
```

BAKER,PJJR & BOLLMEIER,AFJR (1981)
BAKER,P.J. JR.; BOLLMEIER,A.F. JR.; NITROPARAFFINS.; IN: KIRK-OTHMER ENCYC CHEM. TECH. 15:969-87.; 1981

DORIGAN,J ET AL. (1976)
DORIGAN,J.; FULLER,B.; DUFFY,R.; PRELIMINARY SCORING OF SELECTED ORGANIC AI POLLUTANTS. APPENDIX III-CHEMISTRY, PRODUCTION, AND TOXICITY OF CHEMICALS F THROUGH N.; EPA-450/3-77-008D. RESEARCH TRIANGLE PARK,NC: U.S. EPA. PP.303 1976

End of Search

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Criteria Pollutants (CrtPol)

CHEMFATE Search Results

Return to EFDB page

CAS #: 010102-44-0 Name: NITROGEN DIOXIDE

```
*****************************************************************************
VP      NITROGEN DIOXIDE                                    CAS# 10102-44-0
  Vapor Pressure :  9.079E+02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************


   DAUBERT,TE & DANNER,RP (1989)
   DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE
   CHEMICALS: DATA COMPILATION.;  DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA,
   AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK,
   NY., 4 VOL.; 1989

End of Search
```

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 010102-44-0
Chem Name  : NITROGEN DIOXIDE
Mol Formula: NO2
Mol Weight : 46.01
Melting Pt : -9.3 deg C
Boiling Pt : 21.15 deg C
Water Solubility:
   Value : 1.71E+005 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : -0.58
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 900 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0245 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.1E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : GROSJEAN,D (1985)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value. References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000630-08-0
Chem Name  : CARBON MONOXIDE
Mol Formula: CO
Mol Weight : 28.01
Melting Pt : -205 deg C
Boiling Pt : -191.5 deg C
Water Solubility:
   Value : 2290 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 1.78
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 1.55E+008 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : YAWS,CL (1994)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Atmospheric OH Rate Constant:
   Value : 6.86E-015 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value. References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 007446-09-5
Chem Name  : SULFUR DIOXIDE
Mol Formula: O2S
Mol Weight : 64.06
Melting Pt : -72 deg C
Boiling Pt : -10 deg C
Water Solubility:
   Value : 1.07E+005 mg/L
   Temp  : 21 deg C
   Type  : EXP
   Ref   : VENABLE,CS & FUWA,T (1922)
Log P (octanol-water):
   Value : -2.20
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 3000 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00081 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BETTERTON,EA (1992)
Atmospheric OH Rate Constant:
   Value : 6E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Dioxin and Furan Compounds (PCDDs/PCDFs) (D/F) &
Polychlorinated Biphenyls (PCBs) (PCB)

DRAFT
DO NOT CITE OR QUOTE

December 2003
NAS Review Draft
www.epa.gov/ncea/dioxin

Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) and Related Compounds

Part I: Estimating Exposure to Dioxin-Like Compounds

Volume 2: Properties, Environmental Levels, and Background Exposures

Exposure Assessment and Risk Characterization Group
National Center for Environmental Assessment - Washington Office
Office of Research and Development
U.S. Environmental Protection Agency
Washington, DC

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Table 2-3. Selected Physical-Chemical Property Values for the "Dioxin-Like" CDD, CDF, and PCB Congeners

Chemical	Melting Point		Water Solubility			Vapor Pressure			Henry's Constant		Log K_{ow}	
CAS No. (IUPAC No.)	Value (°C)[a]	Ref.	Value (mg/l)[a,c]	Temp. (°C)	Ref. [R][b]	Value (mm Hg)[a,c]	Temp. (°C)	Ref. [R][b]	Value (atm-m³/mol)[a]	Ref. [R][b]	Value	Ref. [R][b]
Tetrachlorodibenzo-p-dioxins (MW = 321.98)												
2,3,7,8-TCDD 1746-01-6	305-306	9	1.93E-05	25	4,53 [1]	(1.50E-09)	25	9,53 [2]	(3.29E-05)	53 [4]	6.80	53 [1]
Congener Group Average			(3.3E-04)	25	20	(1.4E-08)	25	20	(1.7E-05)	20	(6.5)	20
Pentachlorodibenzo-p-dioxins (MW = 356.42)												
1,2,3,7,8-PeCDD 40321-76-4	240-241	9				(4.4E-10)	25	9 [4]			6.64	10 [2]
Congener Group Average			(1.18E-04)	20	20	(5.6E-10)	25	20	(2.6E-06)	20	(6.6)	20
Hexachlorodibenzo-p-dioxins (MW = 390.87)												
1,2,3,4,7,8-HxCDD 39227-28-6	273-275	9	4.42E-06	25	6,53 [2]	(3.8E-11)	25	53 [4]	(1.07E-05)	53 [4]	7.80	53 [4]
1,2,3,6,7,8-HxCDD 57653-85-7	285-286	9				(3.6E-11)	25	9 [5]				
1,2,3,7,8,9-HxCDD 19408-74-3	243-244	9				(4.9E-11)	25	9 [5]				
Congener Group Average			(4.4E-06)	25	20	(4.4E-11)	25	20	(1.1E-05)	20	(7.3)	20
Heptachlorodibenzo-p-dioxins (MW = 425.31)												
1,2,3,4,6,7,8-HpCDD 35822-46-9	264-265	9	2.40E-06	20	6,53 [2]	(5.6E-12)	25	9,53 [4]	(1.26E-05)	53 [4]	8.00	53 [4]
Congener Group Average			(2.4E-06)	20	20	(3.2E-11)	25	20	(1.26E-05)	20	(8.0)	20
Octachlorodibenzo-p-dioxins (MW = 460.76)												
1,2,3,4,6,7,8,9-OCDD 3268-87-9	325-326	6	7.4E-08	25	5,53 [2]	(8.25E-13)	25	9,53 [2]	(6.75E-06)	5,53 [4]	8.20	5,53 [2]

Table 2-3. P-Chem Properties for the Dioxin-Like Congeners (continued)

Chemical	Melting Point		Water Solubility			Vapor Pressure			Henry's Constant		Log K_{ow}	
CAS No. (IUPAC No.)	Value (°C)[a]	Ref.	Value (mg/l)[a,e]	Temp. (°C)	Ref. [R][b]	Value (mm Hg)[a,e]	Temp. (°C)	Ref. [R][b]	Value (atm-m³/mol)[b]	Ref. [R][b]	Value	Ref. [R][b]
Tetrachlorodibenzofurans (MW = 305.98)												
2,3,7,8-TCDF 51207-31-9	227-228	21	4.19E-04	22.7	11 [2]	(1.5E-08)	25	21,53 [4]	(1.44E-05)	53 [4]	6.1	53 [2]
Congener Group Average			(4.2E-04)	22.7	20	(2.5E-08)	25	20	(1.4E-05)	20	(6.2)	20
Pentachlorodibenzofurans (MW = 340.42)												
1,2,3,7,8-PeCDF 57117-41-6	225-227	21				(1.7E-09)	25	21 [4]			6.79	10 [2]
2,3,4,7,8-PeCDF 57117-31-4	196-196.5	21	2.36E-04	22.7	11 [2]	(2.6E-09)	25	21,53 [4]	(4.98E-06)	53 [4]	6.5	53 [2]
Congener Group Average			(2.4E-04)	22.7	20	(2.7E-09)	25	20	(5.0E-06)	20	(6.4)	20
Hexachlorodibenzofurans (MW = 374.87)												
1,2,3,4,7,8-HxCDF 70648-26-9	225.5-226.5	21	8.25E-06	22.7	11 [2]	(2.4E-10)	25	21,53 [5]	(1.43E-05)	19 [5]	(7.0)	53
1,2,3,6,7,8-HxCDF 57117-44-9	232-234	21	1.77E-05	22.7	11 [2]	(2.2E-10)	25	21 [5]	(7.31E-06)	53 [5]		
1,2,3,7,8,9-HxCDF 72918-21-9	246-249[d]	21										
2,3,4,6,7,8-HxCDF 60851-34-5	239-240	21				(2.0E-10)	25	21 [5]				
Congener Group Average			(1.3E-05)	22.7	20	(2.8E-10)	25	20	(1.1E-05)	20	(7.0)	20
Heptachlorodibenzofurans (MW = 409.31)												
1,2,3,4,6,7,8-HpCDF 67562-39-4	236-237	21	1.35E-06	22.7	11 [2]	(3.5E-11)	25	21,53 [4]	(1.41E-05)	53 [4]	(7.4)	53 [2]

Table 2-3. P-Chem Properties for the Dioxin-Like Congeners (continued)

Chemical	Melting Point		Water Solubility			Vapor Pressure			Henry's Constant		Log K_{ow}	
CAS No. (IUPAC No.)	Value (°C)[a]	Ref.	Value (mg/l)[a,c]	Temp. (°C)	Ref. [R][b]	Value (mm Hg)[a,c]	Temp. (°C)	Ref. [R][b]	Value (atm-m³/mol)[a]	Ref. [R][b]	Value	Ref. [R][b]
1,2,3,4,7,8,9-HpCDF 55673-89-7	221-223	21				1.07E-10 (4.7E-11)	25	21,53 [4]				
Congener Group Average			(1.4E-06)	22.7	20	(4.7E-11)	25	20	(1.4E-05)	20	(7.4)	20
Octachlorodibenzofurans (MW=444.76)												
1,2,3,4,6,7,8,9-OCDF 39001-02-0	258-260	21	(1.16E-06)	25	11 [2]	3.75E-12	25	21 [2]	(1.88E-06)	19 [4]	8.0	53 [4]
Tetrachloro-PCB (MW=291.99)												
3,3',4,4'-TCB 32598-13-3 (77)	180-181	58	1.0E-03	25	56 [2]	4.47E-07	25	56 [2]	1.70E-05	56 [2]	6.5	56 [2]
3,4,4',5-TCB 70362-60-4 (81)	160-163	58	2.92E-03	25	17 [5]	(7.85E-07)	25	18 [4]	1.28E-04	41 [4]	(6.36)	15 [5]
Pentachloro-PCB (MW=326.44)												
2,3,3',4,4'-PeCB 32598-14-4 (105)	116.5-117.5	56	(1.90E-03)	25	35 [5]	(8.28E-07)	25	18 [4]	(9.93E-05)	35 [5]	(6.0)	56 [2]
2,3,4,4',5-PeCB 74472-37-0 (114)	98-99	58	(2.58E-03)	20	41 [2]	(4.18E-07)	20	41 [2]	6.90E-05	41 [4]	(6.65)	15 [5]
2,3',4,4',5-PeCB 31508-00-6 (118)	111-113	58	(1.59E-03)	20	41 [2]	(3.14E-07)	20	41 [2]	8.50E-05	41 [4]	7.12	31 [4]
2',3,4,4',5-PeCB 65510-44-3(123)	134-135	58	(1.64E-03)	25	17 [5]	(8.78E-07)	25	18 [4]	1.74E-04	35 [5]	(6.74)	15 [5]
3,3',4,4',5-PeCB 57465-28-8 (126)	160-161	58	(1.03E-03)	25	17 [5]	(2.96E-07)	25	18 [4]	(5.40E-05)	35 [5]	(6.89)	15 [5]
Hexachloro-PCB (MW=360.88)												

Table 2-3. P-Chem Properties for the Dioxin-Like Congeners (continued)

Chemical	Melting Point		Water Solubility			Vapor Pressure			Henry's Constant		Log K_{ow}	
CAS No. (IUPAC No.)	Value (°C)[a]	Ref.	Value (mg/l)[a,c]	Temp. (°C)	Ref. [R][b]	Value (mm Hg)[a,c]	Temp. (°C)	Ref. [R][b]	Value (atm-m³/mol)[a]	Ref. [R][b]	Value	Ref. [R][b]
2,3,3',4,4',5-HxCB 38380-08-4 (156)	129.5-131	58	(4.10E-04)	20	41 [2]	(1.47E-07)	25	18 [2]	8.70E-04	43 [4]	7.16	14 [3]
2,3,3',4,4',5'-HxCB 69782-90-7 (157)	161-162	58	(3.61E-04)	25	17 [5]	(5.47E-08)	25	18 [4]	5.80E-04	43 [4]	7.19	14 [3]
2,3',4,4',5,5'-HxCB 52663-72-6 (167)	125-127	58	(3.61E-04)	25	17 [5]	(1.95E-07)	25	18 [4]	(1.10E-04)	35 [5]	7.09	14 [3]
3,3',4,4',5,5'-HxCB 32774-16-6 (169)	208-210	58	(3.61E-05)	25	17 [5]	(1.81E-07)	25	56 [5]	(6.52E-05)	35 [5]	7.46	14 [3]
Heptachloro-PCB (MW = 395.33)												
2,3,3',4,4',5,5'-HpCB 39635-31-9 (189)	162-163	58	(6.26E-05)	25	17 [5]	(1.31E-08)	25	18 [4]	(6.65E-05)	35 [5]	(7.71)	15 [5]
2,2',3,3',4,4',5-HpCB 35065-30-6 (170)	136.5-138.5	58	(2.27E-04)	20	41 [2]	(6.46E-09)	25	41 [2]	1.50E-05	41 [4]	(7.27)	15 [5]
2,2',3,4,4',5,5'-HpCB 35069-29-3 (180)	112.5-114	58	(4.40E-04)	20	41 [2]	(2.72E-08)	25	41 [2]	3.20E-05	41 [4]	(7.36)	15 [5]

Footnote References

a Values are presented as they appeared in the referenced article. Values in ( ) are either estimated or are calculated/extrapolated from experimental values.

b [R] is the ranking of the value from the cited reference.

c For several PCB congeners, subcooled liquid values were converted to solid values using the melting points presented in this table and the conversion methodology presented in Eitzer and Hites (1988) and Mackay et al. (1992).

$\ln (P_{sc}/P_s) = 6.79 (T_m - T)/T$

where: P_{sc} = subcooled value
P_s = solid value
T_m = melting point (°K)
T = ambient temperature (°K)

d The melting point value for this congener obtained from Ref. 21; however, it was attributed through a probably typographical error to 1,2,3,6,8,9-HxCDF.

1. Marple et al. (1986a)
2. USEPA (1990)
3. Podoll et al. (1986)
4. Marple et al. (1986b)
5. Shiu et al. (1988)
6. Friesen et al. (1985)
8. Burkhard and Kuehl (1986)
9. Rordorf (1987)
10 Sijm et al. (1989)
11. Friesen et al. (1990b)
13. Dunnivant and Elzerman (1988)
14. Risby et al. (1990)
15. Hawker and Connell (1988)
16. Sabljic and Gusten (1989)
17. Abramowitz and Yalkowsky (1990)
18. Foreman and Bidleman (1985)
19. Calculated by the VP/WS ratio technique
20. Average of all literature values (measured and calculated)
21. Rordorf (1989)
22. Dulin et al. (1986)
23. Choudhry and Webster (1987)
25. Choudhry et al. (1990)
30. Orth et al. (1989)
31. Rapaport and Eisenreich (1984)
33. Eitzer and Hites (1988)
35. Dunnivant et al. (1992)
41. Murphy et al. (1987)
43. Murphy et al. (1983)
45. Webster et al. (1986)
50. Marple et al. (1987)
51. Santl et al. (1994)
52. Rordorf et al. (1990)
53. Mackay et al. (1992a)
54. Eitzer and Hites (1989)
55. Sacan and Inel (1995)
56. Mackay et al. (1992b)

Table 2-3. P-Chem Properties for the Dioxin-Like Congeners (continued)

within a homologue group

42. EPRI (1990)

58. Bolgar et al. (1995)

APPENDIX A. ENVIRONMENTAL CHEMISTRY

The tables in this appendix are discussed in Chapter 2. References listed at the end of each table are included in the reference list at the end of Chapter 2. Following are the tables included in this Appendix:

Page

Table A-1. Physical and Chemical Properties For the Dioxin, Furan, and PCB Congeners A-2

Table A-2. Rankings For the Physical and Chemical Property Literature A-17

Table A-1. P-Chem Properties for the Dioxin, Furan, and PCB Congeners

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
Tetrachlorodibenzo-p-dioxins (MW=321.98)												
1,2,3,4-TCDD 30746-58-8	3.88E-04- 6.30E-04 [5.50E-04]	25 [25]	5,38,46,51,53 [53]	1.81E-08- 4.80E-08 [4.80E-08]	25 [25]	9,33,53 [9,53]	1.99E-05- (3.70E-05) [1.99E-05]	5,51,53 [51]	(5.50)- (8.97) [6.60]	5,7,8,10, 26,29,53 [53]		
1,2,3,6-TCDD 71669-25-5									6.86	10		
1,2,3,7-TCDD 67028-18-6	2.80E-04- 7.30E-04 [4.20E-04]	20-26 [20]	6,53 [6,53]	(7.50E-09)- (5.3E-08) [7.50E-09]	25 [25]	9,21,52,5 3 [21,53]	(7.57E-06)	9,53	(5.50)- (8.81) [6.90]	5,7,8,10, 26,53 [53]	4.26- 6.55	45,53
1,2,3,8-TCDD 53555-02-5									6.48	10		
1,2,3,9-TCDD 71669-26-6									6.39	10		
1,2,4,6-TCDD 71669-27-7									6.10	10		
1,2,4,7-TCDD 71669-28-8									6.25	10		
1,2,4,8-TCDD 71669-29-9									6.25	10		
1,2,4,9-TCDD 71665-99-1									6.10	10		
1,2,6,7-TCDD 40581-90-6												
1,2,6,8-TCDD 67323-56-2									6.43	10		
1,2,6,9-TCDD 40581-91-7												

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,2,7,8-TCDD 34816-53-0									6.38	10		
1,2,7,9-TCDD 71669-23-3									6.86	10		
1,2,8,9-TCDD 62470-54-6												
1,3,6,8-TCDD 33423-92-6	1.68E-04-(6.0E-04) [3.2E-04]	20-25 [20]	6,7,38,53 [7,53]	(5.25E-09)-4.03E-06 [5.25E-09]	20-25 [25]	7,9,53 [9,53]	(5.92E-06)-6.81E-05 [6.95E-06]	5,7,53 [53]	(5.5)-(9.43) [7.10]	5,7,8,10, 26,53 [5,53]	2.05-(6.74)	53
1,3,6,9-TCDD 71669-24-4									6.25	10		
1,3,7,8-TCDD 50585-46-1				(6.3E-09)	25	9			6.30	10		
1,3,7,9-TCDD 62470-53-5									6.39-7.06 [6.39]	8,10 [10]		
1,4,6,9-TCDD 40581-93-9									6.38	10		
1,4,7,8-TCDD 40581-94-0									6.39	10		
2,3,7,8-TCDD 1746-01-6	7.91E-06-4.83E-04 [1.93E-05]	17-25 [25]	1,2,4,5,27, 36,50,53 [4,53]	7.40E-10-3.38E-08 [1.50E-09]	25 [25]	2,3,5,9,3 4,53 [9,53]	(2.07E-08)-(1.02E-04) [3.29E-05]	2,3,5,53 [53]	5.38-8.93 [6.80]	2,4,5,8,10, 50,53 [53]	3.06-8.50 [6.4-6.66]	32,47,48, 49,50,53,57 [50,57]
Congener Group Average	(3.3E-04)	25	20	(1.4E-08)	25	20	(1.7E-05)	20	(6.5)	20		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{oa}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
Pentachlorodibenzo-p-dioxins (MW = 356.42)												
1,2,3,4,6-PeCDD 67028-19-7									6.30	10		
1,2,3,4,7-PeCDD 39227-61-7	9.55E-05- 8.16E-03 [1.18E-04]	20-26 [20]	5,6,38,53 [6,53]	(6.60E-10)- 7.5E-09 [6.60E-10]	25 [25]	5,9,53 [9,53]	(2.63E-06)	5,53	6.60- (10.05) [7.40]	5,7,8,10, 26,53 [53]	4.85- 6.38	45,53
1,2,3,6,7-PeCDD 71925-15-0									6.74	10		
1,2,3,6,8-PeCDD 71925-16-1									6.53	10		
1,2,3,6,9-PeCDD 82291-34-7									6.24	10		
1,2,3,7,8-PeCDD 40321-76-4				(4.4E-10)- 9.48E-10 [4.40E-10]	25 [25]	9,33 [9]			6.64	10		
1,2,3,7,9-PeCDD 71925-17-2									6.40	10		
1,2,3,8,9-PeCDD 71925-18-3												
1,2,4,6,7-PeCDD 82291-35-8												
1,2,4,6,8-PeCDD 71998-76-0												
1,2,4,6,9-PeCDD 82291-36-9									6.60	10		
1,2,4,7,8-PeCDD 58802-08-7				(5.8E-10)	25	9			6.20	10		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,2,4,7,9-PeCDD 82291-37-0												
1,2,4,8,9-PeCDD 82291-38-1												
Congener Group Average	(1.18E-04)	20	20	(5.6E-10)	25	20	(2.6E-06)	20	(6.6)	20		
Hexachlorodibenzo-p-dioxins (MW=390.87)												
1,2,3,4,6,7-HxCDD 58200-66-1												
1,2,3,4,6,8-HxCDD 58200-67-2									6.85	10		
1,2,3,4,6,9-HxCDD 58200-68-3												
1,2,3,4,7,8-HxCDD 39227-28-6	4.00E-06-6.44E-06 [4.42E-06]	21-26 [25]	5,6,53 [6,53]	(3.8E-11)-1.01E-10 [3.8E-11]	25 [25]	5,9,33,53 [9,53]	(1.07E-05)-(4.46E-05) [1.07E-05]	5,19,53 [53]	7.79-10.44 [7.80]	7,8,26,53 [53]	5.02-(7.10)	45,53
1,2,3,6,7,8-HxCDD 57653-85-7				(3.6E-11)	25	9						
1,2,3,6,7,9-HxCDD 64461-98-9									7.59	10		
1,2,3,6,8,9-HxCDD 58200-69-4									7.59	10		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{oa}		Log K_{ow}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,2,3,7,8,9-HxCDD 19408-74-3				(4.9E-11)	25	9						
1,2,4,6,7,9-HxCDD 39227-62-8				(5.1E-11)	25	9			6.85	10		
1,2,4,6,8,9-HxCDD 58802-09-8									6.85	10		
Congener Group Average	(4.4E-06)	25	20	(4.4E-11)	25	20	(1.1E-05)	20	(7.3)	20		
Heptachlorodibenzo-p-dioxins (MW=425.31)												
1,2,3,4,6,7,8-HpCDD 35822-46-9	2.3E-06-2.56E-06 [2.4E-06]	20-26 [20]	5,6,53 [6,53]	(5.6E-12)-(2.40E-10) [5.6E-12]	25 [25]	9,33,53 [9,53]	(1.31E-06)-(1.26E-05) [1.26E-05]	5,53 [53]	7.92-(11.98) [8.00]	7,8,10,26,53 [53]	5.47-(7.80)	53
1,2,3,4,6,7,9-HpCDD 58200-70-7												
Congener Group Average	(2.4E-06)	20	20	(5.6E-12)	25	20	(1.3E-05)	20	(8.0)	20		
Octachlorodibenzo-p-dioxin (MW=460.76)												
1,2,3,4,6,7,8,9-OCDD 3268-87-9	7.4E-08-7.36E-06 [7.4E-08]	20-25 [25]	5,6,7,53 [5,53]	(8.25E-13)-6.54E-08 [8.25E-13]	20-25	7,9,33,53 [9,53]	(6.75E-06)	5,53	(7.5)-(13) [8.20]	5,7,8,26,29,53 [5,53]	5.92-(7.90)	53
Tetrachlorodibenzofurans (MW=305.98)												
1,2,3,4-TCDF 30402-14-3				(3.1E-08)	25	21			6.17	10		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{oc}		Log K_{ow}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,2,3,6-TCDF 83704-21-6									6.15	10		
1,2,3,7-TCDF 83704-22-7				(3.2E-08)	25	21						
1,2,3,8-TCDF 62615-08-1				(2.1E-08)	25	21			6.15	10		
1,2,3,9-TCDF 83704-23-8									6.06	10		
1,2,4,6-TCDF 71998-73-7												
1,2,4,7-TCDF 83719-40-8												
1,2,4,8-TCDF 64126-87-0				(2.2E-08)	25	21			6.31	10		
1,2,4,9-TCDF 83704-24-9												
1,2,6,7-TCDF 83704-25-0				(2.0E-08)	25	21			6.25	10		
1,2,6,8-TCDF 83710-07-0												
1,2,6,9-TCDF 70648-18-9												
1,2,7,8-TCDF 58802-20-3				(1.8E-08)	25	21			6.23	10		
1,2,7,9-TCDF 83704-26-1				(2.5E-08)	25	21			6.25	10		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,2,8,9-TCDF 70648-22-5												
1,3,4,6-TCDF 83704-27-2									6.31	10		
1,3,4,7-TCDF 70648-16-7									6.23	10		
1,3,4,8-TCDF 92341-04-3									6.13	10		
1,3,4,9-TCDF 83704-28-3									5.89	10		
1,3,6,7-TCDF 57117-36-9				(2.8E-08)	25	21						
1,3,6,8-TCDF 71998-72-6				(2.7E-08)	25	21			6.37	10		
1,3,6,9-TCDF 83690-98-6												
1,3,7,8-TCDF 57117-35-8									6.34	10		
1,3,7,9-TCDF 64560-17-4				(1.9E-08)	25	21			6.34	10		
1,4,6,7-TCDF 66794-59-0				(2.6E-08)	25	21			6.15	10		
1,4,6,8-TCDF 82911-58-8												
1,4,6,9-TCDF 70648-19-0									5.60	10		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,4,7,8-TCDF 83704-29-4												
1,6,7,8-TCDF 83704-33-0									6.17	10		
2,3,4,6-TCDF 83704-30-7				(4.0E-08)	25	21			6.11	10		
2,3,4,7-TCDF 83704-31-8				(2.9E-08)	25	21			6.06	10		
2,3,4,8-TCDF 83704-32-9				(2.8E-08)	25	21						
2,3,6,7-TCDF 57117-39-2				(2.1E-08)	25	21			6.31	10		
2,3,6,8-TCDF 57117-37-0				(2.0E-08)	25	21			6.73	10		
2,3,7,8-TCDF 51207-31-9	4.19E-04	22.7	11	8.96E-09- (1.5E-08) [1.5E-08]	25 [25]	21,33,53 [21,53]	(1.44E-05)- (1.48E-05) [1.44E-05]	53,54 [53]	5.82-6.53 [6.1]	8,10,53 [53]	(5.20)- (7.50)	53
2,4,6,7-TCDF 57117-38-1				(3.3E-08)	25	21			6.25	10		
2,4,6,8-TCDF 58802-19-0				(2.0E-08)	25	21			6.17	10		
3,4,6,7-TCDF 57117-40-5												
Congener Group Average	(4.2E-04)	22.7	20	(2.5E-08)	25	20	(1.4E-05)	20	(6.2)	20		
Pentachlorodibenzofurans (MW = 340.42)												

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,2,3,4,6-PeCDF 83704-47-6				(2.7E-09)	25	21						
1,2,3,4,7-PeCDF 83704-48-7									6.53	10		
1,2,3,4,8-PeCDF 67517-48-0				(3.6E-09)	25	21			6.79	10		
1,2,3,4,9-PeCDF 83704-49-8												
1,2,3,6,7-PeCDF 57117-42-7				(2.2E-09)	25	21			6.26	10		
1,2,3,6,8-PeCDF 83704-51-2									6.33	10		
1,2,3,6,9-PeCDF 83704-52-3												
1,2,3,7,8-PeCDF 57117-41-6				(1.7E-09)-2.72E-09 [1.7E-09]	25	21,33 [21]			6.79	10		
1,2,3,7,9-PeCDF 83704-53-4												
1,2,3,8,9-PeCDF 83704-54-5												
1,2,4,6,7-PeCDF 83704-50-1				(3.5E-09)	25	21			6.27	10		
1,2,4,6,8-PeCDF 69698-57-3				(2.3E-09)	25	21			6.34	10		
1,2,4,6,9-PeCDF 70648-24-7									6.59	10		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{oc}		Log K_{ow}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,2,4,7,8-PeCDF 58802-15-6				(1.5E-09)	25	21			6.26	10		
1,2,4,7,9-PeCDF 71998-74-8				(2.6E-09)	25	21			6.19	10		
1,2,4,8,9-PeCDF 70648-23-6												
1,2,6,7,8-PeCDF 69433-00-7				(1.9E-09)	25	21			6.42	10		
1,2,6,7,9-PeCDF 70872-82-1									6.51	10		
1,3,4,6,7-PeCDF 83704-36-3				(2.7E-09)	25	21			6.19	10		
1,3,4,6,8-PeCDF 83704-55-6									6.24	10		
1,3,4,6,9-PeCDF 70648-15-6									6.34	10		
1,3,4,7,8-PeCDF 58802-16-7				(4.3E-09)	25	21						
1,3,4,7,9-PeCDF 70648-20-3									6.33	10		
1,3,6,7,8-PeCDF 70648-21-4												
1,4,6,7,8-PeCDF 83704-35-2									6.53	10		
2,3,4,6,7-PeCDF 57117-43-8				(2.4E-09)	25	21			6.47	10		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
2,3,4,6,8-PeCDF 67481-22-5				(1.9E-09)	25	21			6.59	10		
2,3,4,7,8-PeCDF 57117-31-4	2.36E-04	22.7	11	(2.63E-09)-3.29E-09 [2.63E-09]	25 [25]	21,33 [53]	(4.98E-06)	53	6.92-(7.82) [6.5]	10,53 [53]	5.59-(7.40)	53
Congener Group Average	(2.4E-04)	22.7	20	(2.7E-09)	25	20	(5.0E-06)	20	(6.4)	20		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
Hexachlorodibenzofurans (MW = 374.87)												
1,2,3,4,6,7-HxCDF 79060-60-9				(2.4E-10)	25	21						
1,2,3,4,6,8-HxCDF 69698-60-8				(2.2E-10)	25	21						
1,2,3,4,6,9-HxCDF 91538-83-9				(4.1E-10)	25	21						
1,2,3,4,7,8-HxCDF 70648-26-9	8.25E-06	22.7	11	(2.4E-10)-(6.7E-10) [2.4E-10]	25 [25]	21,52,53 [21,53]	(1.43E-05)	19	(7.0)	53	(7.40)	53
1,2,3,4,7,9-HxCDF 91538-84-0				(2.8E-10)	25	21						
1,2,3,4,8,9-HxCDF 92341-07-6												
1,2,3,6,7,8-HxCDF 57117-44-9	1.77E-05	22.7	11	(2.2E-10) - (6.68E-10) [2.2E-10]	25 [25]	21,53 [21,53]	(6.1E-06)-(7.31E-06) [7.31E-06]	19,53 [53]				
1,2,3,6,7,9-HxCDF 92341-06-5												
1,2,3,6,8,9-HxCDF 75198-38-8				(3.4E-10)	25	21						

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,2,3,7,8,9-HxCDF 72918-21-9				(1.8E-10)	25	21						
1,2,4,6,7,8-HxCDF 67562-40-7				(2.6E-10)	25	21						
1,2,4,6,7,9-HxCDF 75627-02-0				(5.7E-10)	25	21						
1,2,4,6,8,9-HxCDF 69698-59-5				(1.8E-10)	25	21						
1,3,4,6,7,8-HxCDF 71998-75-9				(2.3E-10)	25	21						
1,3,4,6,7,9-HxCDF 92341-05-4												
2,3,4,6,7,8-HxCDF 60851-34-5				(2.0E-10)	25	21						
Congener Group Average	(1.3E-05)	22.7	20	(2.8E-10)	25	20	(1.1E-05)	20	(7.0)	20		
Heptachlorodibenzofurans (MW=409.31)												
1,2,3,4,6,7,8-HpCDF 67562-39-4	1.35E-06	22.7	11	(3.5E-11)-1.33E-10 [3.5E-11]	25 [25]	21,33 [21,53]	(1.41E-05)-(5.3E-05) [1.41E-05]	19,53 [53]	7.92-(9.25) [7.4]	10,53 [53]	6.00-(7.90)	53

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
1,2,3,4,6,7,9-HpCDF 70648-25-8												
1,2,3,4,6,8,9-HpCDF 69698-58-4				(5.8E-11)	25	21						
1,2,3,4,7,8,9-HpCDF 55673-89-7				(4.7E-11)-1.07E-10 [4.7E-11]	25 [25]	21,33 [21,53]					5.00-(6.70)	53
Congener Group Average	(1.4E-06)	22.7	20	(4.7E-11)	25	20	(1.4E-05)	20	(7.4)	20		
Octachlorodibenzofurans (MW=444.76)												
1,2,3,4,6,7,8,9-OCDF 39001-02-0	(1.16E-06)	25	11	(3.75E-12)	25	21	(1.88E-06)	19	(7.0)-(13) [8.0]	8,26,29,53 [53]	6.00-(7.40)	53
Tetrachloro-PCB (MW=291.99)												
3,3',4,4'-TCB 32598-13-3	(5.5E-04)-(1.7E-01) [1.03E-03]	25	12,13,17,28,35,38,40,44,56 [56]	1.37E-07-4.47E-07 [4.47E-07]	25	13,18,56 [56]	1.70E-05-(1.0E-04) [1.70E-05]	13,35,39,56 [56]	5.62-6.77 [6.5]	8,15,31,55,56 [56]	(4.41)-(5.75)	56
3,4,4',5-TCB 70362-60-4 (81)	2.92E-03	25	17	(7.85E-07)	25	18	1.28E-04	41	(6.36)	15		
Pentachloro-PCB (MW=326.44)												
2,3,3',4,4'-PeCB 32598-14-4	(1.9E-03)-(1.1E-02) [1.90E-03]	25	17,35,37,56 [35]	(8.28E-07)	25	18	(6.0E-05)-(9.93E-05) [9.93E-05]	16,35 [35]	(6.3)-(6.6) [6.0]	15,37,55,56 [56]		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
2,3,4,4',5-PeCB 74472-37-0	(2.58E-03)- (1.1E-02) [2.58E-03]	20-25 [20]	17,35,37,41 [41]	(4.18E-07)- (1.43E-04) [4.18E-07]	20-25 [20]	18,41 [41]	6.90E-05- (1.4E-04) [6.90E-05]	16,35,41 [41]	(6.3)-(6.65) [6.65]	15,37 [15]		
2,3',4,4',5-PeCB 31508-00-6	(1.59E-03)- (1.1E-02) [1.59E-03]	20-25 [20]	17,35,37,41 [41]	(3.14E-07)- (1.38E-06) [3.14E-07]	20-25 [20]	18,41 [41]	8.50E-05- 4.0E-04 [8.50E-05]	16,35,41, 43 [41]	(6.2)-7.12 [7.12]	15,31,37, 55 [31]	(5.7)	42
3,3',4,4',5-PeCB 57465-28-8	(1.03E-03)	25	17	(2.19E-07)- (3.72E-07) [2.96E-07]	25	18 [18]	(5.4E-05)- (8.2E-05) [5.40E-05]	16,35 [35]	(6.26)- (6.89) [6.89]	15,37 [15]		
2',3,4,4',5-PeCB 65510-44-3	(1.64E-03)	25	17	(7.62E-07)- (9.95E-07) [8.78E-07]	25	18 [18]	(1.74E-04)- (2.62E-04) [1.74E-04]	16,35 [35]	(6.74)	15		
Hexachloro-PCB (MW=360.88)												
2,3,3',4,4',5- HxCB 38380-08-4	(4.10E-04)- (2.4E-03) [4.10E-04]	20-25 [20]	17,37,41 [41]	(1.47E-07)	25	18	(2.2E-05) -8.7E-04 [8.70E-04]	16,35,43 [43]	(6.64)- (7.16) [7.16]	14,15,37 [14]		
2,3,3',4,4',5'- HxCB 69782-90-7	(3.61E-04)	25	17	(5.47E-08)- (1.08E-07) [5.47E-08]	25	18	(6.6E-05) -5.8E-04 [5.80E-04]	16,35,43 [43]	7.18-(7.20) [7.19]	14,15 [14]		
2,3',4,4',5,5'- HxCB 52663-72-6	(3.61E-04)- (2.44E-03) [3.61E-04]	25	17,37 [17]	(1.46E-07)- (1.95E-07) [1.95E-07]	25	18	(1.1E-04)- (1.2E-04) [1.10E-04]	16,35 [35]	(6.64)- (7.27) [7.09]	14,15,37 [14]		
3,3',4,4',5,5'- HxCB 32774-16-6	(3.61E-05)- (2.5E-03) [3.61E-05]	25	17,35,37 [17]	(8.1E-09)- (3.5E-07) [1.81E-07][d]	25	56	(1.6E-05)- (6.5E-05) [6.52E-05]	16,35,56 [35]	(6.64)-7.46 [7.46]	14,15,37, 56 [14]	(6.60)	56
Heptachloro-PCB (MW=396.33)												
2,3,3',4,4',5,5'- HpCB 39635-31-9	(4.5E-05)- (5.3E-04) [6.26E-05]	25	17,35,37 [17]	(1.19E-08)- (1.73E-08) [1.31E-08]	25	18	(6.6E-05)	35	(7.0)-(7.71) [7.71]	15,37 [15]		

Table A-1 (continued)

Congener	Water Solubility			Vapor Pressure			Henry's Law Constant		Log K_{ow}		Log K_{oc}	
CAS No.	Value[a,c] (mg/l)	Temp. (°C)	Ref.	Value[a,b] (mm Hg)	Temp. (°C)	Ref.	Value[a] (atm-m³/mol)	Ref.	Value[a]	Ref.	Value[a]	Ref.
2,2',3,3',4,4',5-HpCB 35065-30-6	(1.19E-04)-(5.21E-04) [2.27E-04]	20-25 [20]	17,35,37,41 [41]	(6.46E-09)-8.60E-09 [6.46E-09]	20-25 [25]	18,41 [41]	(1.50E-05)-(8.73E-05) [1.50E-05]	35,41 [41]	(7.03)-(7.27) [7.27]	15,37,42,56 [15]	5.5-6.8	42,56
2,2',3,4,4',5,5'-HpCB 35069-29-3	(2.25E-04)-(4.40E-04) [4.40E-04]	20-25 [20]	17,35,37,41 [41]	3.39E-08-(2.72E-07) [2.72E-07]	20-25 [25]	18,41 [41]	(3.20E-05)-(1.07E-04) [3.20E-05]	35,41 [41]	(6.70)-(7.36) [7.36]	15,37,42,56 [15]	5.1-7.4	42,56

Footnote References

[a] Values are presented as they appeared in the referenced article. Values in ( ) are either estimated or are calculated/extrapolated from experimental values.
[b] [R] is the ranking of the value from the cited reference.
[c] For several PCB congeners, subcooled liquid values were converted to solid values using the melting points presented in this table and the conversion methodology presented in Eitzer and Hites (1988) and Mackay et al. (1992).
[d] The selected vapor pressure value for PCB-169 is the midpoint of the range of calculated values.

$$\ln (P_{sc}/P_s) = 6.79\ (T_m - T)/T$$

where: P_{sc} = subcooled value
P_s = solid value
T_m = melting point (°K)
T = ambient temperature (°K)

1. Marple et al. (1986a)
2. USEPA (1990)
3. Podoll et al. (1986)
4. Marple et al. (1986b)
5. Shiu et al. (1988)
6. Friesen et al. (1985)
7. Webster et al. (1985)
8. Burkhard and Kuehl (1986)
9. Rordorf (1987)
10. Sijm et al. (1989)
11. Friesen et al. (1990b)
12. Dickhut et al. (1986)
20. Average of all selected and single values within a congener group
21. Rordorf (1989)
22. Dulin et al. (1986)
23. Choudhry and Webster (1987)
24. Choudhry and Webster (1989)
25. Choudhry et al. (1990)
26. Sarna et al. (1984)
27. Adams and Blaine (1986)
28. Mackay et al. (1980)
29. Doucette and Andren (1988a)
30. Orth et al. (1989)
31. Rapaport and Eisenreich (1984)
39. Dunnivant et al. (1988)
40. Opperhuizen et al. (1988)
41. Murphy et al. (1987)
42. EPRI (1990)
43. Murphy et al. (1983)
44. Yalkowsky et al. (1983)
45. Webster et al. (1986)
46. Doucette and Andren (1988b)
47. Walters and Guiseppi-Elie (1988)
48. Jackson et al. (1986)
49. Puri et al. (1989)
50. Marple et al. (1987)

Table A-1 (continued)

13. Dunnivant and Elzerman (1988)
14. Risby et al. (1990)
15. Hawker and Connell (1988)
16. Sabljic and Gusten (1989)
17. Abramowitz and Yalkowsky (1990)
18. Foreman and Bidleman (1985)
19. Calculated by the VP/WS ratio technique
32. Lodge and Cook (1989)
33. Eitzer and Hites (1988)
34. Rordorf (1985)
35. Dunnivant et al. (1992)
36. Lodge (1989)
37. Patil (1991)
38. Nirmalakhandan and Speece (1989)
51. Santl et al. (1994)
52. Rordorf et al. (1990)
53. Mackay et al. (1992a)
54. Eitzer and Hites (1989)
55. Sacan and Inel (1995)
56. Mackay, et al. (1992b)
57. Walters et al. (1989)

Table A-2. Rankings for the P-Chem Property Literature

Reference Number	Ranking[a]					
	Water Solubility	Vapor Pressure	Henry's Constant	Log K_{ow}	Log K_{oc}	Photo Quantum Yield
1	2					
3		2	4			
4				1		
5	2		4	1		
6	2					
7	2	2	2	4		
8				4		
9		2 & 4				
10				1 & 2		
11	2					
12	1					
13	1	4	2			
14				3		
15				2 & 5		
16			5			
17	5					
18		2 & 4				
19			5			
20	5	5	5	5	5	
21		2 & 4				
22						2
23						2
24						2
25						2
26				5		
27	2					

Table A-2 (continued)

Reference Number	Ranking[a]					
	Water Solubility	Vapor Pressure	Henry's Constant	Log K_{ow}	Log K_{oc}	Photo Quantum Yield
1	2					
28	5					
29				5		
30						2
31				4		
32					1	
33		4				
34		4				
35	5		5			
36	2					
37	5			5		
38	5					
39			2			
40	2					
41	2	2	4			
42					4	
43			4			
44	5					
45					2	
46	2					
47					1	
48					1	
49					2	
50	1			1	1	
51	2		2			
52		4				

Table A-2 (continued)

Reference Number	Ranking[a]					
	Water Solubility	Vapor Pressure	Henry's Constant	Log K_{ow}	Log K_{oc}	Photo Quantum Yield
1	2					
54			4			
55				4		
57					1	

Footnote References

[a] P-chem properties with two ranks indicates that some of the values for the chemicals in the reference had been verified by another laboratory, and some values have not been verified yet. It also indicates that more than one methodology may have been used in the reference to determine the p-chem property.

1. Marple et al. (1986a)
3. Podoll et al. (1986)
4. Marple et al. (1986b)
5. Shiu et al. (1988)
6. Friesen et al. (1985)
7. Webster et al. (1985)
8. Burkhard and Kuehl (1986)
9. Rordorf (1987)
10. Sijm et al. (1989)
11. Friesen et al. (1990)
12. Dickhut et al. (1986)
13. Dunnivant and Elzerman (1988)
14. Risby et al. (1990)
15. Hawker and Connell (1988)
16. Sabljic and Gunsten (1989)
17. Abramowitz and Yalkowsky (1990)
18. Foreman and Bidleman (1985)
19. Calculated by the VP/WS ratio technique
20. Average of all literature values (measured and calculated) within a congener group.
21. Rordorf (1989)
22. Dulin et al. (1986)
23. Choudhry and Webster (1987)
24. Choudhry and Webster (1989)
25. Choudhry et al. (1990)
26. Sarna et al. (1984)
27. Adams and Blaine (1986)
28. Mackay et al. (1980)
29. Doucette and Andren (1988)
30. Orth et al. (1989)
31. Rapaport and Eisenreich (1984)
32. Lodge and Cook (1989)
33. Eitzer and Hites (1988)
34. Rordorf (1985)
35. Dunnivant et al. (1992)
36. Lodge (1989)
37. Patil (1991)
38. Nirmalakhandan and Speece (1989)
39. Dunnivant et al. (1988)
40. Opperhuizen et al. (1988)
41. Murphy et al. (1987)
42. EPRI (199)
43. Murphy et al. (1983)
44. Yalkowsky et al. (1983)
45. Webster et al. (1986)
46. Doucette and Andren (1988)
47. Walters and Guiseppi-Elie (1988)
48. Jackson et al. (1986)
49. Puri et al. (1989)
50. Marple et al. (1987)
51. Santl et al. (1994)
52. Rordorf et al. (1990)
53. Mackay et al. (1992a)
54. Eitzer and Hites (1989)
55. Sacan and Inel (1995)
56. Mackay et al. (1992b)
57. Walters et al. (1989)

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Heavy Polycyclic Aromatic Hydrocarbons (molecular weight > 222 g/mole) (HPAH)

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 001321-64-8
Chem Name  : PENTACHLORONAPHTHALENES
Mol Formula: C10H3Cl5
Mol Weight : 300.40
Melting Pt :
Boiling Pt :
Water Solubility:
   Value : 0.0425 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 6.88
   Type  : EST
   Ref   : CLOGP (1986)
Vapor Pressure:
   Value : 1.49E-005 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000118 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 4.01E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1987)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 001321-65-9
Chem Name  : TRICHLORONAPHTHALENES
Mol Formula: C10H5Cl3
Mol Weight : 231.51
Melting Pt :
Boiling Pt :
Water Solubility:
   Value : 0.065 mg/L
   Temp  :
   Type  : EXP
   Ref   : ISNARD,P & LAMBERT,S (1989)
Log P (octanol-water):
   Value : 5.10
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 0.000314 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000214 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.98E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1987)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 001335-87-1 Name: HEXACHLORONAPHTHALENE

```
*****************************************************************************
MELT    HEXACHLORONAPHTHALENE                                  CAS#  1335-87-1
  Melting Point  :  118.3       DEG C
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      HEXACHLORONAPHTHALENE                                  CAS#  1335-87-1
  Remarks        :  NO APPROPRIATE ESTIMATION METHOD
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************


   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 001335-87-1
Chem Name  : HEXACHLORONAPTHALENE
Mol Formula: C10H2Cl6
Mol Weight : 334.85
Melting Pt : 118.3 deg C
Boiling Pt : 370 deg C
Water Solubility:
   Value : 0.0015 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 7.04
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 3.33E-006 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 8.7E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.8E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1987)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 001335-88-2
Chem Name  : TETRACHLORONAPHTHALENES
Mol Formula: C10H4Cl4
Mol Weight : 265.96
Melting Pt : 114-198 deg C
Boiling Pt :
Water Solubility:
   Value : 0.0056 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : OPPERHUIZEN,A (1987); average value
Log P (octanol-water):
   Value : 5.86
   Type  : EXP
   Ref   : OPPERHUIZEN,A (1987); average value
Vapor Pressure:
   Value : 1E-006 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : HL X WSOL
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000159 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 8.9E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1988)
```

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CHEMFATE Search Results

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CAS #: 000189-55-9 Name: DIBENZO(A,I)PYRENE

```
*****************************************************************************
MELT    DIBENZO(A,I)PYRENE                                  CAS#   189-55-9
  Melting Point  :  281.5-282.5 DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BUCKINGHAM,J (1982)
*****************************************************************************

VP      DIBENZO(A,I)PYRENE                                  CAS#   189-55-9
  Vapor Pressure :  2.0E-12     MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED BY (HENL)*(WSOL)=VP, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************
```

BUCKINGHAM,J (1982)
BUCKINGHAM,J.; DICTIONARY OF ORGANIC COMPOUNDS; 5TH ED VOL1,; NEW YORK, CHAPMAN & HALL,:P567; 1982

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000189-64-0
Chem Name  : DIBENZO[A,H]PYRENE
Mol Formula: C24H14
Mol Weight : 302.38
Melting Pt : 317 deg C
Boiling Pt :
Water Solubility:
   Value : 3.5E-005 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 7.28
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 6.41E-012 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.41E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 5E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000191-24-2 Name: BENZO(GHI)PERYLENE

```
*****************************************************************************
MELT     BENZO(GHI)PERYLENE                                    CAS#   191-24-2
  Melting Point   :  277-279     DEG C
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  ALDRICH (1988)
*****************************************************************************

VP       BENZO(GHI)PERYLENE                                    CAS#   191-24-2
  Vapor Pressure  :  1.01E-10    MMHG
  Temperature (C) :  25
  Remarks         :  EXTRAPOLATED FROM EXPERIMENTAL DATA IN THE RANGE 116-195 D
                     C, SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  MURRAY,JJ ET AL. (1974)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

MURRAY,JJ ET AL. (1974)
MURRAY,J.J.; POTTIE,R.F.; PUPP,C.; VAPOR PRESSURES AND ENTHALPIES OF SUBLIMATION OF FIVE POLYCYCLIC AROMATIC HYDROCARBONS.; CAN. J. CHEM.; 52:557-63.; 1974

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000191-30-0
Chem Name  : DIBENZO[a,l]PYRENE
Mol Formula: C24H14
Mol Weight : 302.38
Melting Pt : 162.4 deg C
Boiling Pt :
Water Solubility:
   Value : 0.00036 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 7.71
   Type  : EXP
   Ref   : DE VOOGT,P ET AL. (1990)
Vapor Pressure:
   Value : 4.8E-010 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.41E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 5E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000192-65-4
Chem Name  : DIBENZO[a,e]PYRENE
Mol Formula: C24H14
Mol Weight : 302.38
Melting Pt : 233.5 deg C
Boiling Pt :
Water Solubility:
   Value : 8.02E-005 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 7.28
   Type  : EST
   Ref   : MEYLAM,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 7.03E-011 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.41E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 5E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000192-97-2
Chem Name  : BENZO(E)PYRENE
Mol Formula: C20H12
Mol Weight : 252.32
Melting Pt : 177.5 deg C
Boiling Pt : 310-312 deg C  at  1.00E+01 mm Hg
Water Solubility:
   Value : 0.0063 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : PEARLMAN,RS ET AL. (1984)
Log P (octanol-water):
   Value : 6.44
   Type  : EXP
   Ref   : DE VOOGT,P ET AL. (1990)
Vapor Pressure:
   Value : 5.7E-009 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : MURRAY,JJ ET AL. (1974)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 3E-007 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 1.5E-010 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1988)
```

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SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Indeno(1,2,3-cd)pyrene
CAS Number: 000193-39-5

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	7.3E-1	(mg/kg/day)^-1	LIVECHEM
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	No		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	2.8E+2		
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.0E-10	Torr	CHEMFATE
Henry's Law:	1.6E-6	atm-m3/mol	CHEMFATE
Water Solub:	2.2E-5	mg/L	CHEMFATE
Distrib Coef:	5.3E+5	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	6.6E+0		CHEMFATE
Water Solub:	2.2E-5		CHEMFATE
Geo Mean Sol:		mg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	2.7E+2	days	THOMAS
Photolysis:	2.5E+2	days	FATERATE
Biodeg:	7.3E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.2E+2	days	THOMAS
Photolysis:	2.5E+2	days	FATERATE
Biodeg:	7.3E+2	days	FATERATE
Radio:		days	
Log Kow:	6.6E+0		CHEMFATE

OTHER DATA

Melting Point:	1.6E+2	C
Boiling Point:	5.4E+2	C
Formula:	C22 H12	

CLASS INFORMATION

Class	Parent Substance

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CHEMFATE Search Results

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CAS #: 000193-39-5 Name: INDENO(1,2,3-CD)PYRENE

```
*****************************************************************************
MELT    INDENO(1,2,3-CD)PYRENE                              CAS#   193-39-5
  Melting Point  :  163.6       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  IARC (1983A)
*****************************************************************************

VP      INDENO(1,2,3-CD)PYRENE                              CAS#   193-39-5
  Vapor Pressure :  1.0E-10     MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SIMS,RC & OVERCASH,MR (1983)
*****************************************************************************
```

IARC (1983A)
IARC; MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO HUMANS. VOL.32. POLYNUCLEAR AROMATIC COMPOUNDS. PART I. CHEMICAL ENVIRONMENTAL AND EXPERIMENTAL DATA.; LYON,FRANCE: INTERNATIONAL AGENCY FO RESEARCH ON CANCER.; 1983A

SIMS,RC & OVERCASH,MR (1983)
SIMS,R.C.; OVERCASH,M.R.; FATE OF POLYNUCLEAR AROMATIC COMPOUNDS (PNAS) IN SOIL-PLANT SYSTEMS.; RESIDUE REVIEWS.; 88:1-68.; 1983

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000205-82-3
Chem Name  : BENZO(J)FLUORANTHENE
Mol Formula: C20H12
Mol Weight : 252.32
Melting Pt : 166 deg C
Boiling Pt :
Water Solubility:
   Value : 0.0025 mg/L
   Temp  :
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 6.11
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 2.62E-008 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 2.03E-007 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 5.36E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

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CAS #: 000205-99-2 Name: BENZO(B)FLUORANTHENE

```
*****************************************************************************
MELT     BENZO(B)FLUORANTHENE                                   CAS#   205-99-2
  Melting Point   :  167-168      DEG C
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP       BENZO(B)FLUORANTHENE                                   CAS#   205-99-2
  Vapor Pressure :  5E-7         MM HG
  Temperature (C):  25
  Remarks         :  MAY BE EXPERIMENTAL OR ESTIMATED, SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  PERWAK,J ET AL. (1982B)
*****************************************************************************
```

PERWAK,J ET AL. (1982B)
PERWAK,J.; BYRNE,M.; COONS,S.; GOYER,M.; HARRIS,J.; CRUSE,P.; DEROSIER,R.; MOSS,K.; WENDT,S.; EXPOSURE AND RISK ASSESSMENT FOR BENZO(A)PYRENE AND OTHE POLYCYCLIC AROMATIC HYDROCARBONS. VOL 4.; EPA-440/4-85-020-V4. (NTIS PB 85 222-586). WASHINGTON, DC: USEPA. 215 PP.; 1982B

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Benzo(j,k)fluorene (Fluoranthene)
CAS Number: 000206-44-0

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	4.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	2.0E+3	mg/kg	RTECS
Dermal LD50:	3.2E+3	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	9.0E-1	µg/L	ECOTOX
Salt Ecol LC50:	9.0E-2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.3E+2	days	THOMAS
Photolysis:	2.6E+0	days	FATERATE
Biodeg:	4.4E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	3.5E+0	days	THOMAS
Photolysis:	2.6E+0	days	FATERATE
Biodeg:	4.4E+2	days	FATERATE
Radio:		days	
Log Kow:	5.0E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	2.0E+2		
Density:	1.3E+0	g/mL @ 0.00	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	7.8E-6	Torr	LIVECHEM
Henry's Law:	1.6E-5	atm-m3/mol	CHEMFATE
Water Solub:	2.1E-1	mg/L	CHEMFATE
Distrib Coef:	1.1E+4	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	3.8E+2		VER_BCF
Salt BCF:	5.9E+3		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	3.1E+3		ECOTOX
Salt BCF:	5.9E+3		ECOTOX
Log Kow:	5.0E+0		CHEMFATE
Water Solub:	2.1E-1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.1E+2	C
Boiling Point:	3.8E+2	C
Formula:	C16 H10	

CLASS INFORMATION

Class	Parent Substance

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CHEMFATE Search Results

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CAS #: 000206-44-0 Name: FLUORANTHENE

```
*****************************************************************************
MELT    FLUORANTHENE                                          CAS#   206-44-0
  Melting Point  :  111          DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP      FLUORANTHENE                                          CAS#   206-44-0
  Vapor Pressure :  1.23E-8      MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM EXPERIMENTAL DATA OBTAINED IN THE RANGE
                    56-80 DEG C
  Abbrev. Ref.   :  BOYD,RH ET AL. (1965)
*****************************************************************************
```

BOYD,RH ET AL. (1965)
BOYD,R.H.; CHRISTENSEN,R.L.; PUA,R.; THE HEATS OF COMBUSTION OF ACENAPHTHEN ACENAPHTHYLENE, AND FLUORANTHENE. STRAIN AND DELOCALIZATION IN BRIDGED NAPHTHALENES.; J. AM. CHEM. SOC.; 87:3554-9.; 1965

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Benzo(k)fluoranthene
CAS Number: 000207-08-9

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	7.3E-2	(mg/kg/day)^-1	LIVECHEM
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.9E+2	days	THOMAS
Photolysis:	2.1E+1	days	FATERATE
Biodeg:	2.1E+3	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	4.8E+1	days	THOMAS
Photolysis:	2.1E+1	days	FATERATE
Biodeg:	2.1E+3	days	FATERATE
Radio:		days	
Log Kow:	6.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	2.5E+2		
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.0E-9	Torr	CHEMFATE
Henry's Law:	8.3E-7	atm-m3/mol	CHEMFATE
Water Solub:	8.0E-4	mg/L	CHEMFATE
Distrib Coef:	1.9E+5	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:	2.0E+5		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	1.3E+4		ECOTOX
Salt BCF:	2.0E+5		ECOTOX
Log Kow:	6.1E+0		CHEMFATE
Water Solub:	8.0E-4		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	2.2E+2	C
Boiling Point:	4.8E+2	C
Formula:	C20 H12	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000207-08-9 Name: BENZO(K)FLUORANTHENE

```
*****************************************************************************
MELT     BENZO(K)FLUORANTHENE                                   CAS#   207-08-9
  Melting Point  :  217          DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP       BENZO(K)FLUORANTHENE                                   CAS#   207-08-9
  Vapor Pressure :  2.0E-9       MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED VALUE FROM EXPERIMENTAL DATA IN THE TEMP RANG
                    89-165 DEG C, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MURRAY,JJ ET AL. (1974)
*****************************************************************************
```

MURRAY,JJ ET AL. (1974)
MURRAY,J.J.; POTTIE,R.F.; PUPP,C.; VAPOR PRESSURES AND ENTHALPIES OF SUBLIMATION OF FIVE POLYCYCLIC AROMATIC HYDROCARBONS.; CAN. J. CHEM.; 52:557-63.; 1974

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Chrysene
CAS Number: 000218-01-9

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	7.3E-3	(mg/kg/day)^-1	LIVECHEM
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:	1.0E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.4E+2	days	THOMAS
Photolysis:	1.8E-1	days	CHEMFATE
Biodeg:	1.0E+3	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	8.5E+0	days	THOMAS
Photolysis:	1.8E-1	days	CHEMFATE
Biodeg:	1.0E+3	days	FATERATE
Radio:		days	
Log Kow:	5.7E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.3E+2	
Density:	1.3E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.2E-9	Torr	CHEMFATE
Henry's Law:	9.5E-5	atm-m3/mol	CHEMFATE
Water Solub:	6.3E-3	mg/L	CHEMFATE
Distrib Coef:	6.0E+4	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:	8.2E+0		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	6.1E+3		ECOTOX
Salt BCF:	6.5E+2		ECOTOX
Log Kow:	5.7E+0		CHEMFATE
Water Solub:	6.3E-3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	2.6E+2	C
Boiling Point:	4.5E+2	C
Formula:	C18 H12	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000218-01-9 Name: CHRYSENE

```
*****************************************************************************
MELT    CHRYSENE                                              CAS#   218-01-9
  Melting Point  :  254-255     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      CHRYSENE                                              CAS#   218-01-9
  Vapor Pressure :  6.23E-9     MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE, EXTRAPOLATED FROM PUBLISHED DATA,
                    MEASURED OVER THE INTERVAL OF 80 - 145 DEG C
  Abbrev. Ref.   :  HOYER,H & PEPERLE,W (1958)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

HOYER,H & PEPERLE,W (1958)
HOYER,H.; PEPERLE,W.; DETERMINATION OF THE VAPOR PRESSURE AND HEAT OF SUBLIMATION OF ORGANIC COMPOUNDS.; Z. ELEKTROCHEM.; 62:61-6.; 1958

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 002234-13-1 Name: OCTACHLORONAPHTHALENE

```
*****************************************************************************
MELT    OCTACHLORONAPHTHALENE                                CAS#  2234-13-1
  Melting Point  :  197-198     DEG C
  Remarks        :  SRC RECOMMEDNED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP      OCTACHLORONAPHTHALENE                                CAS#  2234-13-1
  Vapor Pressure :  1.52E-8     MM HG
  Temperature (C):  22
  Remarks        :  EXTRAPOLATED USING CLAUSIUS CLAPEYRON EQUATION USING A HEA
                    OF VAPORIZATION OF 40 CAL/GRAM AND A HEAT OF FUSION = 15
                    CAL/GRAM AND A BOILING POINT = 440-442 AT 7.4 MM HG, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************
```

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS
66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000224-42-0
Chem Name  : DIBENZ[a,j]ACRIDINE
Mol Formula: C21H13N
Mol Weight : 279.34
Melting Pt : 216 deg C
Boiling Pt :
Water Solubility:
   Value : 0.018 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 5.63
   Type  : EXP
   Ref   : HELWEG,C ET AL. (1997A)
Vapor Pressure:
   Value : 1.85E-009 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.9E-009 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HWOARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 2.8E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000226-36-8
Chem Name  : DIBENZ(A,H)ACRIDINE
Mol Formula: C21H13N
Mol Weight : 279.34
Melting Pt : 226 deg C
Boiling Pt :
Water Solubility:
   Value : 0.159 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : PEARLMAN,RS ET AL. (1984)
Log P (octanol-water):
   Value : 5.73
   Type  : EXP
   Ref   : HELWEG,C ET AL. (1997A)
Vapor Pressure:
   Value : 1.85E-009 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.9E-009 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 5E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 003697-24-3
Chem Name  : 5-METHYLCHRYSENE
Mol Formula: C19H14
Mol Weight : 242.32
Melting Pt : 118 deg C
Boiling Pt :
Water Solubility:
   Value : 0.062 mg/L
   Temp  : 27 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 6.07
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 2.53E-007 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 5.53E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.31E-010 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Benzo(a)pyrene
CAS Number: 000050-32-8

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	7.3E+0	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:	4.0E-3	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	4.0E-3	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	5.0E+0	µg/L	ECOTOX
Salt Ecol LC50:	1.0E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.8E+2	days	THOMAS
Photolysis:	2.3E-2	days	CHEMFATE
Biodeg:	5.3E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	3.6E+1	days	THOMAS
Photolysis:	2.3E-2	days	CHEMFATE
Biodeg:	5.3E+2	days	FATERATE
Radio:		days	
Log Kow:	6.0E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	2.5E+2		
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	5.5E-9	Torr	CHEMFATE
Henry's Law:	1.1E-6	atm-m3/mol	CHEMFATE
Water Solub:	1.6E-3	mg/L	CHEMFATE
Distrib Coef:	1.6E+5	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	2.9E+5		ECOTOX
Salt BCF:	9.6E+5		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	2.9E+5		ECOTOX
Salt BCF:	9.6E+5		ECOTOX
Log Kow:	6.0E+0		CHEMFATE
Water Solub:	1.6E-3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.8E+2	C
Boiling Point:	3.1E+2	C
Formula:	C20 H12	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000050-32-8 Name: BENZO(A)PYRENE

```
*****************************************************************************
MELT     BENZO(A)PYRENE                                          CAS#     50-32-8
  Melting Point   :  179-179.3    DEGC
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  MERCK INDEX (1983)
*****************************************************************************

VP       BENZO(A)PYRENE                                          CAS#     50-32-8
  Vapor Pressure :  5.49E-9      MM HG
  Temperature (C):  25
  Remarks         :  SRC RECOMMENDED VALUE, EXTRAPOLATED VALUE (SRC,1988)
  Abbrev. Ref.    :  MURRAY,JJ ET AL. (1974)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

MURRAY,JJ ET AL. (1974)
MURRAY,J.J.; POTTIE,R.F.; PUPP,C.; VAPOR PRESSURES AND ENTHALPIES OF SUBLIMATION OF FIVE POLYCYCLIC AROMATIC HYDROCARBONS.; CAN. J. CHEM.; 52:557-63.; 1974

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dibenz(a,h)anthracene
CAS Number: 000053-70-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	7.3E+0	(mg/kg/day)^-1	LIVECHEM
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:	2.8E-3	mg/kg/day	SPHEM
Oral ED10 Wgt:	B2		
Inhal ED10:	2.8E-3	mg/kg/day	SPHEM
Inhal ED10 Wgt:	B2		
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	5.1E+2	days	THOMAS
Photolysis:	3.3E+1	days	FATERATE
Biodeg:	9.4E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	3.3E+2	days	THOMAS
Photolysis:	3.3E+1	days	FATERATE
Biodeg:	9.4E+2	days	FATERATE
Radio:		days	
Log Kow:	6.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	No		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	2.8E+2		
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.0E-10	Torr	CHEMFATE
Henry's Law:	1.5E-8	atm-m3/mol	CHEMFATE
Water Solub:	2.5E-3	mg/L	CHEMFATE
Distrib Coef:	5.8E+5	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	5.0E+4		ECOTOX
Salt BCF:			
Log Kow:	6.5E+0		CHEMFATE
Water Solub:	2.5E-3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	2.7E+2	C
Boiling Point:		C
Formula:	C22 H14	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000053-70-3 Name: DIBENZ(A,H)ANTHRACENE

```
*****************************************************************************
MELT     DIBENZ(A,H)ANTHRACENE                                CAS#     53-70-3
  Melting Point  :  269          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  HASSETT,JJ ET AL. (1980)
*****************************************************************************

VP       DIBENZ(A,H)ANTHRACENE                                CAS#     53-70-3
  Vapor Pressure :  1.0E-10      MM HG
  Remarks        :  ESTIMATED VALUE, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979A)
*****************************************************************************
```

CALLAHAN,MA ET AL. (1979A)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS-VOLUME II.; EPA-440/4-79-029 WASHINGTON,DC: U.S. EPA.; 1979A

HASSETT,JJ ET AL. (1980)
HASSETT,J.J.; MEANS,J.C.; BANWART,W.L.; WOOD,S.G.; SORPTION PROPERTIES OF SEDIMENTS AND ENERGY-RELATED POLLUTANTS.; EPA-600/3-80-041. ATHENS,GA: U.S EPA. PP.133.; 1980

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 005385-75-1
Chem Name  : Dibenzo(a,e)fluoranthene
Mol Formula: C24H14
Mol Weight : 302.38
Melting Pt : 232 deg C
Boiling Pt :
Water Solubility:
   Value : 0.000212 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 7.28
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 7.33E-011 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 7.91E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 6.45E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000056-49-5 Name: 3-METHYLCHOLANTHRENE

```
*****************************************************************************
MELT    3-METHYLCHOLANTHRENE                                  CAS#    56-49-5
  Melting Point  :  179-180     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      3-METHYLCHOLANTHRENE                                  CAS#    56-49-5
  Vapor Pressure :  7.73E-9     MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************


   MERCK INDEX (1983)
   MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH
   ED.;  WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Benz(a)anthracene
CAS Number: 000056-55-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	7.3E-1	(mg/kg/day)^-1	LIVECHEM
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:	4.7E-2	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	4.7E-2	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.0E+1	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.4E+2	days	THOMAS
Photolysis:	2.5E-2	days	CHEMFATE
Biodeg:	6.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	4.5E+0	days	THOMAS
Photolysis:	2.5E-2	days	CHEMFATE
Biodeg:	6.8E+2	days	FATERATE
Radio:		days	
Log Kow:	5.7E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	2.3E+2		
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.1E-7	Torr	CHEMFATE
Henry's Law:	3.4E-6	atm-m3/mol	CHEMFATE
Water Solub:	9.4E-3	mg/L	CHEMFATE
Distrib Coef:	6.0E+4	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	1.0E+4		ECOTOX
Salt BCF:			
Log Kow:	5.7E+0		CHEMFATE
Water Solub:	9.4E-3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	8.4E+1	C
Boiling Point:		C
Formula:	C18 H12	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000056-55-3 Name: BENZ(A)ANTHRACENE

```
*****************************************************************************
MELT     BENZ(A)ANTHRACENE                                    CAS#    56-55-3
  Melting Point  :  160          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MACKAY,D & SHIU,WY (1981)
*****************************************************************************

VP       BENZ(A)ANTHRACENE                                    CAS#    56-55-3
  Vapor Pressure :  3.05E-8      MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED VALUE (SRC,1988)
  Abbrev. Ref.   :  PUPP,C ET AL. (1974)
*****************************************************************************

VP       BENZ(A)ANTHRACENE                                    CAS#    56-55-3
  Vapor Pressure :  1.05E-7      MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED VALUE FOR DATA FOR LIQUID, SRC RECOMMENDED
                    VALUE
  Abbrev. Ref.   :  MURRAY,JJ ET AL. (1974)
*****************************************************************************
```

MACKAY,D & SHIU,WY (1981)
MACKAY,D.; SHIU,W.Y.; A CRITICAL REVIEW OF HENRY'S LAW CONSTANTS FOR CHEMICALS OF ENVIRONMENTAL INTEREST.; J. PHYS. CHEM. REF. DATA.; 19:1175-99 1981

MURRAY,JJ ET AL. (1974)
MURRAY,J.J.; POTTIE,R.F.; PUPP,C.; VAPOR PRESSURES AND ENTHALPIES OF SUBLIMATION OF FIVE POLYCYCLIC AROMATIC HYDROCARBONS.; CAN. J. CHEM.; 52:557-63.; 1974

PUPP,C ET AL. (1974)
PUPP,C.; LAO,R.C.; MURRAY,J.J.; POTTIE,R.F.; EQUILIBRIUM VAPOR CONCENTRATIO OF SOME POLYCYCLIC AROMATIC HYDROCARBONS, AS4O6 AND SEO2 AND THE COLLECTION EFFICIENCIES OF THESE AIR POLLUTANTS.; ATMOS. ENVIRON.; 8:915-25; 1974

End of Search

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Herbicides and Organochlorinated Pesticides (PEST)

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000145-73-3
Chem Name  : ENDOTHAL
Mol Formula: C8H10O5
Mol Weight : 186.17
Melting Pt : 144 deg C
Boiling Pt :
Water Solubility:
   Value : 1E+005 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : WSSA (1983)
Log P (octanol-water):
   Value : 1.91
   Type  : EXP
   Ref   : REINERT,KH (1984)
Vapor Pressure:
   Value : 1.57E-010 mm Hg
   Temp  : 24 deg C
   Type  : EXP
   Ref   : TOMLIN,C (1997)
pKa Dissociation Constant:
   Value : 3.4
   Temp  :
   Type  :
   Ref   : TOMLIN,C (1994)
Henry's Law Constant:
   Value : 3.85E-016 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 2.03E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Hexachlorocyclohexane, alpha-
CAS Number: 000319-84-6

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	6.3E+0	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:	6.3E+0	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2		
Oral ED10:	1.9E-2	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	1.9E-2	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	7.8E+1	mg/kg	RTECS
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	8.2E+2	µg/L	ECOTOX
Salt Ecol LC50:	4.0E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	2.1E+2	days	FATERATE
Volatility:		days	
Photolysis:		days	
Biodeg:	1.4E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	2.1E+2	days	FATERATE
Volatility:		days	
Photolysis:		days	
Biodeg:	1.4E+2	days	FATERATE
Radio:		days	
Log Kow:	3.8E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:			
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.5E-5	Torr	CHEMFATE
Henry's Law:	1.1E-5	atm-m3/mol	CHEMFATE
Water Solub:	2.0E+0	mg/L	CHEMFATE
Distrib Coef:	2.5E+0	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	2.8E+3		ECOTOX
Salt BCF:	2.5E+5		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	2.8E+3		ECOTOX
Salt BCF:	2.5E+5		ECOTOX
Log Kow:	3.8E+0		CHEMFATE
Water Solub:	2.0E+0		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:		C
Boiling Point:		C
Formula:	C6 H6 Cl6	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000319-84-6 Name: ALPHA-HEXACHLOROCYCLOHEXANE

```
*****************************************************************************
MELT    ALPHA-HEXACHLOROCYCLOHEXANE                          CAS#   319-84-6
  Melting Point  :  159-160     DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979)
*****************************************************************************

VP      ALPHA-HEXACHLOROCYCLOHEXANE                          CAS#   319-84-6
  Vapor Pressure :  4.50E-5     MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM EXPERIMENTAL DATA OBTAINED IN THE T-RANG
                    OF 40-70 DEG C, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCHWABE,K & LEGLER,C (1960)
*****************************************************************************
```

CALLAHAN,MA ET AL. (1979)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS.; EPA-440/4-79-029A. WASHINGTON,DC: U.S.EPA.; 1979

SCHWABE,K & LEGLER,C (1960)
SCHWABE,K.; LEGLER,C.; VAPOR PRESSURES, HEATS, AND ENTROPIES OF SUBLIMATION OF THE HEXACHLOROCYCLOHEXANES.; Z. ELEKTROCHEM.; 64:902-5.; 1960

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Hexachlorocyclohexane, beta-
CAS Number: 000319-85-7

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	1.8E+0	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	C		
Inhal Slope:	1.9E+0	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	C		
Oral ED10:	9.4E-2	mg/kg/day	EPA_ED10
Oral ED10 Wgt:			
Inhal ED10:	9.4E-2	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:			
Oral LD50:	6.0E+3	mg/kg	RTECS
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	7.7E+2	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	2.1E+2	days	FATERATE
Volatility:	2.5E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.2E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	2.1E+2	days	FATERATE
Volatility:	9.7E+1	days	THOMAS
Photolysis:		days	
Biodeg:	1.2E+2	days	FATERATE
Radio:		days	
Log Kow:	3.8E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.9E+2	
Density:	1.9E+0	g/mL @ 19.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.7E-7	Torr	CHEMFATE
Henry's Law:	7.4E-7	atm-m3/mol	CHEMFATE
Water Solub:	2.4E-1	mg/L	CHEMFATE
Distrib Coef:	2.5E+0	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	2.9E+2		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	1.5E+3		ECOTOX
Salt BCF:			
Log Kow:	3.8E+0		CHEMFATE
Water Solub:	2.4E-1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:		C
Boiling Point:	6.0E+1	C
Formula:	C6 H6 Cl6	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000319-85-7 Name: BETA-HEXACHLOROCYCLOHEXANE

```
*****************************************************************************
MELT    BETA-HEXACHLOROCYCLOHEXANE                          CAS#   319-85-7
  Melting Point  :  314-315     DEG C
  Remarks        :  SUBLIMES, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP      BETA-HEXACHLOROCYCLOHEXANE                          CAS#   319-85-7
  Vapor Pressure :  4.66E-7     MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA OBTAINED IN THE T-RANGE OF 40-70 DE
                    C, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCHWABE,K & LEGLER,C (1960)
*****************************************************************************
```

SCHWABE,K & LEGLER,C (1960)
SCHWABE,K.; LEGLER,C.; VAPOR PRESSURES, HEATS, AND ENTROPIES OF SUBLIMATION OF THE HEXACHLOROCYCLOHEXANES.; Z. ELEKTROCHEM.; 64:902-5.; 1960

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Chlordane
CAS Number: 000057-74-9

TOXICITY

Parameter	Value		Unit	Source
Oral RfD:	5.0E-4		mg/kg/day	IRIS
Inhal RfD:	2.0E-4		mg/kg/day	IRIS
Oral Slope:	3.5E-1		(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2			
Inhal Slope:	3.5E-1		(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2			
Oral ED10:	6.6E-2		mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2			
Inhal ED10:	6.6E-2		mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2			
Oral LD50:	3.0E+2		mg/kg	ACGIH
Dermal LD50:	5.9E+2		mg/kg	ACGIH
Gas Inhal LC50:			ppm	
Dust Inhal LC50:	2.0E+1		mg/L	RTECS
ACUTE				
Fresh CMC:	2.4E+0	G	µg/L	WATCRIT
Salt CMC:	9.0E-2	G	µg/L	WATCRIT
CHRONIC				
Fresh CCC:	4.3E-3	G, aa	µg/L	WATCRIT
Salt CCC:	4.0E-3	G, aa	µg/L	WATCRIT
Fresh Ecol LC50:	8.0E-1		µg/L	ECOTOX
Salt Ecol LC50:	1.8E+0		µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	6.7E+5	days	CHEMFATE
Volatility:	1.8E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.4E+3	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	6.7E+5	days	CHEMFATE
Volatility:	2.9E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.4E+3	days	FATERATE
Radio:		days	
Log Kow:	5.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	4.1E+2	
Density:	1.6E+0	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	9.8E-6	Torr	CHEMFATE
Henry's Law:	4.9E-5	atm-m3/mol	CHEMFATE
Water Solub:	5.6E-2	mg/L	CHEMFATE
Distrib Coef:	2.4E+2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:	7.3E+3		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	3.8E+4		ECOTOX
Salt BCF:	7.3E+3		ECOTOX
Log Kow:	5.5E+0		CHEMFATE
Water Solub:	5.6E-2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.1E+2	C
Boiling Point:	1.8E+2	C
Formula:	C10 H6 Cl8	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000057-74-9 Name: CHLORDANE

```
*****************************************************************************
MELT    CHLORDANE                                          CAS#    57-74-9
  Melting Point  :  104-107     DEGC
  Remarks        :  RANGE FOR ALPHA AND BETA ISOMERS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WORTHING,CR & WALKER,SB (1983)
*****************************************************************************

VP      CHLORDANE                                          CAS#    57-74-9
  Vapor Pressure :  9.8E-6      MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WORTHING,CR & WALKER,SB (1983)
*****************************************************************************
```

WORTHING,CR & WALKER,SB (1983)
WORTHING,C.R.; WALKER,S.B.; PESTICIDE MANUAL 7TH ED; BRITISH CROP PROTECTIO
COUNCIL. LAVENHAM SUFFOLK, ENGLAND: LAVENHAM PRESS LTD; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000058-89-9 Name: GAMMA-HEXACHLOROCYCLOHEXANE

```
*****************************************************************************
MELT     GAMMA-HEXACHLOROCYCLOHEXANE                          CAS#     58-89-9
  Melting Point  :  112-113      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP       GAMMA-HEXACHLOROCYCLOHEXANE                          CAS#     58-89-9
  Vapor Pressure :  4.1E-4       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BIDLEMAN,TF (1984)
*****************************************************************************
```

BIDLEMAN,TF (1984)
BIDLEMAN,T.F.; ESTIMATION OF VAPOR PRESSURES FOR NONPOLAR ORGANIC COMPOUNDS BY CAPILLARY GAS CHROMATOGRAPHY.; ANAL.CHEM.; 56:2490-6.; 1984

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Methoxychlor
CAS Number: 000072-43-5

TOXICITY

Parameter	Value		Unit	Source
Oral RfD:	5.0E-3		mg/kg/day	IRIS
Inhal RfD:			mg/kg/day	
Oral Slope:			(mg/kg/day)^-1	
Oral Wt-of-Evid:				
Inhal Slope:			(mg/kg/day)^-1	
Inhal Wt-of-Evid:				
Oral ED10:			mg/kg/day	
Oral ED10 Wgt:				
Inhal ED10:			mg/kg/day	
Inhal ED10 Wgt:				
Oral LD50:	1.9E+3		mg/kg	ACGIH
Dermal LD50:	6.0E+3		mg/kg	RTECS
Gas Inhal LC50:			ppm	
Dust Inhal LC50:			mg/L	
ACUTE				
Fresh CMC:			µg/L	
Salt CMC:			µg/L	
CHRONIC				
Fresh CCC:	3.0E-2	F2	µg/L	WATCRIT
Salt CCC:	3.0E-2	F2	µg/L	WATCRIT
Fresh Ecol LC50:	8.5E-2		µg/L	ECOTOX
Salt Ecol LC50:	2.1E-1		µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	3.8E+2	days	FATERATE
Volatility:	1.7E+2	days	THOMAS
Photolysis:	1.4E+2	days	CHEMFATE
Biodeg:	3.7E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	3.8E+2	days	FATERATE
Volatility:	4.6E+0	days	THOMAS
Photolysis:	1.4E+2	days	CHEMFATE
Biodeg:	3.7E+2	days	FATERATE
Radio:		days	
Log Kow:	4.8E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	3.5E+2	
Density:	1.4E+0	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.0E-7	Torr	CHEMFATE
Henry's Law:	1.6E-5	atm-m3/mol	CHEMFATE
Water Solub:	4.5E-2	mg/L	LIVECHEM
Distrib Coef:	1.5E+4	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	3.0E+0		ECOTOX
Salt BCF:	1.2E+4		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	8.6E+3		ECOTOX
Salt BCF:	1.2E+4		ECOTOX
Log Kow:	4.8E+0		CHEMFATE
Water Solub:	4.5E-2		LIVECHEM
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	8.7E+1	C
Boiling Point:		C
Formula:	C16 H15 Cl3 O2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000072-43-5 Name: METHOXYCHLOR

```
*****************************************************************************
MELT    METHOXYCHLOR                                          CAS#    72-43-5
  Melting Point  :  89          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WORTHING,CR & WALKER,SB (1983)
*****************************************************************************

VP      METHOXYCHLOR                                          CAS#    72-43-5
  Vapor Pressure :  6E-7        MM HG
  Temperature (C):  25
  Remarks        :
             1   :  ESTIMATED BASED ON A MP = 89 DEG C
             2   :   BP ESTIMATED USING METHOD OF LYMAN,WJ (1985)
             3   :   VP ESTIMATION BASED ON BP USING PCCHEM, SRC RECOMMENDED
                    VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************
```

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

WORTHING,CR & WALKER,SB (1983)
WORTHING,C.R.; WALKER,S.B.; PESTICIDE MANUAL 7TH ED; BRITISH CROP PROTECTIO
COUNCIL. LAVENHAM SUFFOLK, ENGLAND: LAVENHAM PRESS LTD; 1983

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: DDE

CAS Number: 000072-55-9

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	3.4E-1	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:	2.6E-1	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	2.6E-1	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	7.0E+2	mg/kg	RTECS
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.1E+1	µg/L	ECOTOX
Salt Ecol LC50:	1.8E+0	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.6E+2	days	THOMAS
Photolysis:	1.0E+0	days	CHEMFATE
Biodeg:	5.8E+3	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	3.8E+0	days	THOMAS
Photolysis:	1.0E+0	days	CHEMFATE
Biodeg:	5.8E+3	days	FATERATE
Radio:		days	
Log Kow:	5.7E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	3.2E+2		
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.0E-6	Torr	CHEMFATE
Henry's Law:	2.1E-5	atm-m3/mol	CHEMFATE
Water Solub:	1.2E-1	mg/L	LIVECHEM
Distrib Coef:	6.8E+5	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	5.1E+5		ECOTOX
Salt BCF:	9.2E+4		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	5.1E+5		ECOTOX
Salt BCF:	9.2E+4		ECOTOX
Log Kow:	5.7E+0		CHEMFATE
Water Solub:	1.2E-1		LIVECHEM
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	8.9E+1	C
Boiling Point:		C
Formula:	C14 H8 Cl4	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000072-55-9 Name: P,P'-DDE

```
*****************************************************************************
MELT    P,P'-DDE                                          CAS#    72-55-9
  Melting Point  :  89          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BIDLEMAN,TF & FOREMAN,WT (1987)
*****************************************************************************

VP      P,P'-DDE                                          CAS#    72-55-9
  Vapor Pressure :  6.0E-6      MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM MEASUREMENTS BETWEEN 70-130 DEG C, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  BIDLEMAN,TF (1984)
*****************************************************************************
```

BIDLEMAN,TF & FOREMAN,WT (1987)
BIDLEMAN,T.F.; FOREMAN,W.T.; VAPOR-PARTICLE PARTITIONING OF SEMIVOLATILE ORGANIC COMPOUNDS; ADV. CHEM. SER.; 216:27-56; 1987

BIDLEMAN,TF (1984)
BIDLEMAN,T.F.; ESTIMATION OF VAPOR PRESSURES FOR NONPOLAR ORGANIC COMPOUNDS BY CAPILLARY GAS CHROMATOGRAPHY.; ANAL.CHEM.; 56:2490-6.; 1984

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Heptachlor

CAS Number: 000076-44-8

TOXICITY

Parameter	Value		Unit	Source
Oral RfD:	5.0E-4		mg/kg/day	IRIS
Inhal RfD:			mg/kg/day	
Oral Slope:	4.5E+0		(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2			
Inhal Slope:	4.5E+0		(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2			
Oral ED10:	8.5E-3		mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2			
Inhal ED10:	8.5E-3		mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2			
Oral LD50:	4.0E+1		mg/kg	ACGIH
Dermal LD50:	1.2E+2		mg/kg	ACGIH
Gas Inhal LC50:	9.8E+0		ppm	ACGIH
Dust Inhal LC50:			mg/L	
ACUTE				
Fresh CMC:	5.2E-1	G	µg/L	WATCRIT
Salt CMC:	5.3E-2	G	µg/L	WATCRIT
CHRONIC				
Fresh CCC:	3.8E-3	G, aa	µg/L	WATCRIT
Salt CCC:	3.6E-3	G, aa	µg/L	WATCRIT
Fresh Ecol LC50:	2.0E-1		µg/L	ECOTOX
Salt Ecol LC50:	2.0E-2		µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	5.4E+0	days	FATERATE
Volatility:	1.7E+2	days	THOMAS
Photolysis:		days	
Biodeg:	6.5E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	5.4E+0	days	FATERATE
Volatility:	2.0E+0	days	THOMAS
Photolysis:		days	
Biodeg:	6.5E+1	days	FATERATE
Radio:		days	
Log Kow:	4.3E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	3.7E+2	
Density:	1.6E+0	g/mL @ 9.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.0E-4	Torr	CHEMFATE
Henry's Law:	1.5E+0	atm-m3/mol	CHEMFATE
Water Solub:	1.8E-1	mg/L	CHEMFATE
Distrib Coef:	2.1E+5	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:	1.8E+4		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	2.4E+4		ECOTOX
Salt BCF:	3.7E+4		ECOTOX
Log Kow:	4.3E+0		CHEMFATE
Water Solub:	1.8E-1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	9.6E+1	C
Boiling Point:		C
Formula:	C10 H5 Cl7	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000076-44-8 Name: HEPTACHLOR

```
*****************************************************************************
MELT    HEPTACHLOR                                          CAS#    76-44-8
  Melting Point  :  95-96       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WORTHING,CR & WALKER,SB (1983)
*****************************************************************************

VP      HEPTACHLOR                                          CAS#    76-44-8
  Vapor Pressure :  4.000E-04   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WORTHING,CR & WALKER,SB (1983)
*****************************************************************************
```

WORTHING,CR & WALKER,SB (1983)
WORTHING,C.R.; WALKER,S.B.; PESTICIDE MANUAL 7TH ED; BRITISH CROP PROTECTIO
COUNCIL. LAVENHAM SUFFOLK, ENGLAND: LAVENHAM PRESS LTD; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000094-75-7 Name: 2,4-D

```
*****************************************************************************
MELT    2,4-D                                                CAS#    94-75-7
  Melting Point  :  140.5       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MARTIN,H & WORTHING,CR (1977)
*****************************************************************************

VP      2,4-D                                                CAS#    94-75-7
  Vapor Pressure :  6.0E-7      MM HG
  Temperature (C):  25
  Remarks        :  NOT KNOWN IF MEASURED OR ESTIMATED, SRC SUGGESTED VALUE
  Abbrev. Ref.   :  NEELY,WB (1982)
*****************************************************************************


   MARTIN,H & WORTHING,CR (1977)
   MARTIN,H.; WORTHING,C.R.;   PESTICIDE MANUAL. FIFTH EDITION, BRITISH CROP
   PROTECTION COUNCIL. 563 PP.; 1977

   NEELY,WB (1982)
   NEELY,W.B.; ORGANIZING DATA FOR ENVIRONMENTAL STUDIES.; ENVIRON. TOXICOL.
   CONTAM.; 1:259-66.; 1982

End of Search
```

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED
CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole) (LPAH)

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Anthracene

CAS Number: 000120-12-7

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-1	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.0E+0	µg/L	ECOTOX
Salt Ecol LC50:	3.6E+0	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.2E+2	days	THOMAS
Photolysis:	3.1E-2	days	CHEMFATE
Biodeg:	6.3E+0	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.8E+0	days	THOMAS
Photolysis:	3.1E-2	days	CHEMFATE
Biodeg:	6.3E+0	days	CHEMFATE
Radio:		days	
Log Kow:	4.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.8E+2	
Density:	1.3E+0	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.7E-6	Torr	CHEMFATE
Henry's Law:	6.5E-5	atm-m3/mol	CHEMFATE
Water Solub:	4.3E-2	mg/L	CHEMFATE
Distrib Coef:	4.5E+3	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.7E+4		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	1.7E+4		ECOTOX
Salt BCF:			
Log Kow:	4.5E+0		CHEMFATE
Water Solub:	4.3E-2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	2.2E+2	C
Boiling Point:	3.4E+2	C
Formula:	C14 H10	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000120-12-7 Name: ANTHRACENE

```
*****************************************************************************
MELT    ANTHRACENE                                          CAS#   120-12-7
  Melting Point   :  216.2-216.4 DEGC
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  ALDRICH (1988)
*****************************************************************************

VP      ANTHRACENE                                          CAS#   120-12-7
  Vapor Pressure  :  .765E-05    TORR        MEASURED
  Temperature (C) :  20.
  Remarks         :  UNITS CONVERTED, EXTRAP, RANGE OF MEASUREMENTS 50-80 DEGC
  Abbrev. Ref.    :  GRAYSON,BT & FOSBRAEY,LA (1982)
*****************************************************************************

VP      ANTHRACENE                                          CAS#   120-12-7
  Vapor Pressure  :  2.67E-6     MM HG
  Temperature (C) :  25
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  SCALA,AJ & BANERJEE,S (1982)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

GRAYSON,BT & FOSBRAEY,LA (1982)
GRAYSON,B.T.; FOSBRAEY,L.A.; DETERMINATION OF THE VAPOUR PRESSURE OF PESTICIDES.; PESTIC. SCI.; 13:269-78.; 1982

SCALA,AJ & BANERJEE,S (1982)
SCALA,A.J.; BANERJEE,S.; VAPOR PRESSURE INTERLABORATORY REPORT.; SYRACUSE,NY: SYRACUSE RESEARCH CORPORATION. FINAL REPORT FOR NATIONAL BUREA OF STANDARDS. 8 PP. AND APPENDICES.; 1982

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Pyrene
CAS Number: 000129-00-0

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	3.5E+1	µg/L	ECOTOX
Salt Ecol LC50:	8.9E-1	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.3E+2	days	THOMAS
Photolysis:	2.8E-2	days	CHEMFATE
Biodeg:	1.9E+3	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	4.5E+0	days	THOMAS
Photolysis:	2.8E-2	days	CHEMFATE
Biodeg:	1.9E+3	days	FATERATE
Radio:		days	
Log Kow:	4.9E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value
Metal Contain:	No
Organic:	Yes
Gas:	Yes
Particulate:	Yes
Radionuclide:	No
Rad. Element:	No
Molecular Weight:	2.0E+2
Density:	1.3E+0 g/mL @ 23.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.6E-6	Torr	CHEMFATE
Henry's Law:	1.1E-5	atm-m3/mol	CHEMFATE
Water Solub:	1.4E+0	mg/L	CHEMFATE
Distrib Coef:	9.5E+3	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	8.4E+5		ECOTOX
Salt BCF:	4.4E+3		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	8.4E+5		ECOTOX
Salt BCF:	6.4E+3		ECOTOX
Log Kow:	4.9E+0		CHEMFATE
Water Solub:	1.4E+0		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.5E+2	C
Boiling Point:	4.0E+2	C
Formula:	C16 H10	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000129-00-0 Name: PYRENE

```
*****************************************************************************
MELT    PYRENE                                                  CAS#   129-00-0
  Melting Point  :  149-151     DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      PYRENE                                                  CAS#   129-00-0
  Vapor Pressure :  2.45E-6     MM HG       CALC
  Temperature (C):  25
  Remarks        :  INTERPOLATED FROM EXPERIMENRAL DATA OBTAINED IN THE RANGE
                    -90 DEG C
  Abbrev. Ref.   :  HOYER,H & PEPERLE,W (1958)
*****************************************************************************

VP      PYRENE                                                  CAS#   129-00-0
  Vapor Pressure :  4.59E-6     MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA FOR THE LIQUID COMPOUND OVER THE
                    RANGE 70-120 DEG C AND CONVERTED TO THE VAPOR PRESSURE OF
                    THE SOLID USING A MEASURED HEAT OF VAPORIZATION ON 20.5
                    CAL/G (DAUBERT & DANNER (1989)
  Abbrev. Ref.   :  BIDLEMAN,TF (1984)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

BIDLEMAN,TF (1984)
BIDLEMAN,T.F.; ESTIMATION OF VAPOR PRESSURES FOR NONPOLAR ORGANIC COMPOUNDS BY CAPILLARY GAS CHROMATOGRAPHY.; ANAL.CHEM.; 56:2490-6.; 1984

HOYER,H & PEPERLE,W (1958)
HOYER,H.; PEPERLE,W.; DETERMINATION OF THE VAPOR PRESSURE AND HEAT OF SUBLIMATION OF ORGANIC COMPOUNDS.; Z. ELEKTROCHEM.; 62:61-6.; 1958

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000208-96-8 Name: ACENAPHTHYLENE

```
*****************************************************************************
MELT    ACENAPHTHYLENE                                          CAS#   208-96-8
  Melting Point  :  88-91       DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      ACENAPHTHYLENE                                          CAS#   208-96-8
  Vapor Pressure :  9.12E-4     MM HG
  Temperature (C):  25
  Remarks        :  EXPERIMENTAL VALUE INTERPOLATED FROM THE T-RANGE OF
                    13.02-45.00 DEG C, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOYD,RH ET AL. (1965)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

BOYD,RH ET AL. (1965)
BOYD,R.H.; CHRISTENSEN,R.L.; PUA,R.; THE HEATS OF COMBUSTION OF ACENAPHTHEN ACENAPHTHYLENE, AND FLUORANTHENE. STRAIN AND DELOCALIZATION IN BRIDGED NAPHTHALENES.; J. AM. CHEM. SOC.; 87:3554-9.; 1965

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000602-87-9
Chem Name  : ACENAPHTHYLENE, 1,2-DIHYDRO-5-NITRO-
Mol Formula: C12H9NO2
Mol Weight : 199.21
Melting Pt : 100.5 deg C
Boiling Pt :
Water Solubility:
   Value : 0.91 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : GANG,Y & XIAOBAI,X (1992)
Log P (octanol-water):
   Value : 3.85
   Type  : EXP
   Ref   : DEBNATH,AK ET AL. (1992)
Vapor Pressure:
   Value : 2.65E-005 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.11E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 8.3E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Acenaphthene
CAS Number: 000083-32-9

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	6.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	5.0E+1	µg/L	ECOTOX
Salt Ecol LC50:	1.7E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.1E+2	days	THOMAS
Photolysis:	2.5E+0	days	FATERATE
Biodeg:	1.0E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.3E+0	days	THOMAS
Photolysis:	2.5E+0	days	FATERATE
Biodeg:	1.0E+2	days	FATERATE
Radio:		days	
Log Kow:	3.9E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.5E+2	
Density:	1.2E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.5E-3	Torr	CHEMFATE
Henry's Law:	1.6E-4	atm-m3/mol	CHEMFATE
Water Solub:	3.6E+0	mg/L	CHEMFATE
Distrib Coef:	1.1E+3	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	3.9E+2		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	3.9E+2		ECOTOX
Salt BCF:			
Log Kow:	3.9E+0		CHEMFATE
Water Solub:	3.6E+0		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	9.3E+1	C
Boiling Point:	2.8E+2	C
Formula:	C12 H10	

CLASS INFORMATION

Class	Parent Substance

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000083-32-9 Name: ACENAPHTHENE

```
*****************************************************************************
VP      ACENAPHTHENE                                          CAS#    83-32-9
  Vapor Pressure :  0.0025      MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOYD,RH ET AL. (1965)
*****************************************************************************


   BOYD,RH ET AL. (1965)
   BOYD,R.H.; CHRISTENSEN,R.L.; PUA,R.; THE HEATS OF COMBUSTION OF ACENAPHTHEN
   ACENAPHTHYLENE, AND FLUORANTHENE. STRAIN AND DELOCALIZATION IN BRIDGED
   NAPHTHALENES.; J. AM. CHEM. SOC.; 87:3554-9.; 1965

End of Search
```

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Phenanthrene
CAS Number: 000085-01-8

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	7.0E+1	µg/L	ECOTOX
Salt Ecol LC50:	4.6E+1	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.2E+2	days	THOMAS
Photolysis:	3.5E-1	days	CHEMFATE
Biodeg:	2.0E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	2.7E+0	days	THOMAS
Photolysis:	3.5E-1	days	CHEMFATE
Biodeg:	2.0E+2	days	FATERATE
Radio:		days	
Log Kow:	4.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.8E+2	
Density:	9.8E-1	g/mL @ 4.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.1E-4	Torr	CHEMFATE
Henry's Law:	2.3E-5	atm-m3/mol	CHEMFATE
Water Solub:	1.1E+0	mg/L	CHEMFATE
Distrib Coef:	3.7E+3	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:	1.2E+3		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	1.1E+4		ECOTOX
Salt BCF:	1.3E+3		ECOTOX
Log Kow:	4.5E+0		CHEMFATE
Water Solub:	1.1E+0		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	9.9E+1	C
Boiling Point:	3.4E+2	C
Formula:	C14 H10	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000085-01-8 Name: PHENANTHRENE

```
*****************************************************************************
VP      PHENANTHRENE                                          CAS#    85-01-8
  Vapor Pressure :  1.12E-4     MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCALA,AJ & BANERJEE,S (1982)
*****************************************************************************
```

SCALA,AJ & BANERJEE,S (1982)
SCALA,A.J.; BANERJEE,S.; VAPOR PRESSURE INTERLABORATORY REPORT.;
SYRACUSE,NY: SYRACUSE RESEARCH CORPORATION. FINAL REPORT FOR NATIONAL BUREA
OF STANDARDS. 8 PP. AND APPENDICES.; 1982

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Fluorene
CAS Number: 000086-73-7

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	4.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	3.7E+2	µg/L	ECOTOX
Salt Ecol LC50:	7.0E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.1E+2	days	THOMAS
Photolysis:		days	
Biodeg:	5.1E+3	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.7E+0	days	THOMAS
Photolysis:		days	
Biodeg:	5.1E+3	days	CHEMFATE
Radio:		days	
Log Kow:	4.2E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	1.7E+2		
Density:	1.2E+0	g/mL @ 0.00	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.3E-4	Torr	CHEMFATE
Henry's Law:	6.4E-5	atm-m3/mol	CHEMFATE
Water Solub:	2.0E+0	mg/L	CHEMFATE
Distrib Coef:	2.1E+3	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	7.3E+2		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	2.2E+3		ECOTOX
Salt BCF:			
Log Kow:	4.2E+0		CHEMFATE
Water Solub:	2.0E+0		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.1E+2	C
Boiling Point:	3.0E+2	C
Formula:	C13 H10	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000086-73-7 Name: FLUORENE

```
*****************************************************************************
VP      FLUORENE                                            CAS#    86-73-7
  Vapor Pressure :  .1800E 02   TORR        MEASURED
  Temperature (C):  161.
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1973)
*****************************************************************************

VP      FLUORENE                                            CAS#    86-73-7
  Vapor Pressure :  8.42E-3     MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM EXPERIMENTAL DATA RANGING FROM 161-300.4
                    DEG C
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      FLUORENE                                            CAS#    86-73-7
  Vapor Pressure :  6.33E-04    MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM EXPERIMENTAL DATA RANGING FROM 115-597 D
                    C, AND CONVERTED TO VAPOR PRESSURE OF THE SOLID BY EQN 5.1
                    IN MABEY,WR ET AL. (1981). SRC RECOMMENDED VALUE.
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1973)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOUR PRESSURES OF PURE SUBSTANCES.; N YORK, NY: ELSEVIER SCIENTIFIC PUB. CO. 626 PP.; 1973

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Naphthalene
CAS Number: 000091-20-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	4.0E-2	mg/kg/day	LIVECHEM
Inhal RfD:	8.6E-4	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	1.8E+3	mg/kg	ACGIH
Dermal LD50:	2.5E+3	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:	2.8E+2	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.4E+2	µg/L	ECOTOX
Salt Ecol LC50:	6.8E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.0E+2	days	THOMAS
Photolysis:	3.0E+0	days	CHEMFATE
Biodeg:	2.3E+1	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.1E+0	days	THOMAS
Photolysis:	3.0E+0	days	CHEMFATE
Biodeg:	2.3E+1	days	CHEMFATE
Radio:		days	
Log Kow:	3.3E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.3E+2	
Density:	1.0E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	8.5E-2	Torr	CHEMFATE
Henry's Law:	4.8E-4	atm-m3/mol	CHEMFATE
Water Solub:	3.1E+1	mg/L	CHEMFATE
Distrib Coef:	3.0E+2	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.3E+4		ECOTOX
Salt BCF:	1.2E+3		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	1.3E+4		ECOTOX
Salt BCF:	1.2E+3		ECOTOX
Log Kow:	3.3E+0		CHEMFATE
Water Solub:	3.1E+1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	8.0E+1	C
Boiling Point:	2.2E+2	C
Formula:	C10 H8	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000091-20-3 Name: NAPHTHALENE

```
*****************************************************************************
MELT    NAPHTHALENE                                          CAS#    91-20-3
  Melting Point  :  80.29       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      NAPHTHALENE                                          CAS#    91-20-3
  Vapor Pressure :  .506E-01    .123E 00    TORR        MEASURED
  Temperature (C):  20.         27.8
  Remarks        :  UNITS CONVERTED, UPPER TEMP MEASURED, LOWER ONE EXTRAP FRO
                    ANTOINE EQN
  Abbrev. Ref.   :  GRAYSON,BT & FOSBRAEY,LA (1982)
*****************************************************************************

VP      NAPHTHALENE                                          CAS#    91-20-3
  Vapor Pressure :  .6720E-01   .2336E+00   .6956E+00   TORR        CALCULATED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  CALC FROM ANTOINE EQN, EXTRAPOLATED FROM 86.6 DEGC (10 MM)
  Abbrev. Ref.   :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP      NAPHTHALENE                                          CAS#    91-20-3
  Vapor Pressure :  0.085       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1975C)
*****************************************************************************
```

AMBROSE,D ET AL. (1975C)
AMBROSE,D.; ELLENDER,J.H.; SPRAKE,C.H.S.; TOWNSEND,R.; THERMODYNAMIC PROPERTIES OF FLOURINE COMPOUNDS. VAPOR PRESSURE OF THE THREE TETRAFLOUROBENZENES AND 1,3,5,-TRICHLORO-2,4,6-TRIFLUOROBENZENE.; J. CHEM. SOC. FARADAY TRANS. 1.; 71:35-41.; 1975C

GRAYSON,BT & FOSBRAEY,LA (1982)
GRAYSON,B.T.; FOSBRAEY,L.A.; DETERMINATION OF THE VAPOUR PRESSURE OF PESTICIDES.; PESTIC. SCI.; 13:269-78.; 1982

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

ZWOLINSKI,BJ & WILHOIT,RC (1971)
ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000091-57-6 Name: 2-METHYLNAPHTHALENE

```
*****************************************************************************
MELT    2-METHYLNAPHTHALENE                                   CAS#    91-57-6
  Melting Point  :  34.6        DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DEAN,JA (1985)
*****************************************************************************

VP      2-METHYLNAPHTHALENE                                   CAS#    91-57-6
  Vapor Pressure :  6.81E-02    MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED USING ANTOINES EQUATION FROM A TEMPERATURE
                    RANGE 139.2 TO 241.8 DEG C, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      2-METHYLNAPHTHALENE                                   CAS#    91-57-6
  Vapor Pressure :  5.500E-02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  KARYAKIN,NV ET AL. (1968)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DEAN,JA (1985)
DEAN,J.A.; LANGE'S HANDBOOK OF CHEMISTRY 13TH ED.; NY, NY: MCGRAW-HILL BOO CO.; 1985

KARYAKIN,NV ET AL. (1968)
KARYAKIN,N.V.; RABINOVICH,I.B.; PAKHOMOV,L.G.; HEATS OF SUBLIMATION OF NAPHTHALENE AND ITS MONODERIVATIVES.; ZH. FIZ. KHIM.; 42:1814-6.; 1968

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000091-58-7 Name: 2-CHLORONAPHTHALENE

```
*****************************************************************************
MELT    2-CHLORONAPHTHALENE                                  CAS#    91-58-7
  Melting Point  :  59.5        DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      2-CHLORONAPHTHALENE                                  CAS#    91-58-7
  Vapor Pressure :  .17E-01     TORR        CALCULATED
  Temperature (C):  20.
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979)
*****************************************************************************

VP      2-CHLORONAPHTHALENE                                  CAS#    91-58-7
  Vapor Pressure :  7.98E-3     MM HG       CALC
  Temperature (C):  25
  Remarks        :
            1    :  SRC RECOMMENDED VALUE
            2    :   EXTRAPOLATED USING ANTOINES EQN FROM 4 DATA PTS IN THE TE
                    RANGE OF 120 TO 256 DEGC C, MERCK INDEX (1983)
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      2-CHLORONAPHTHALENE                                  CAS#    91-58-7
  Vapor Pressure :  7.980E-03   MM HG       CALCULATED
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************
```

CALLAHAN,MA ET AL. (1979)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS.; EPA-440/4-79-029A. WASHINGTON,DC: U.S.EPA.; 1979

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000095-13-6 Name: INDENE

```
*****************************************************************************
VP      INDENE                                                  CAS#    95-13-6
  Vapor Pressure :  .223E 01    TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.    :  DORIGAN,J ET AL. (1976)
*****************************************************************************
```

DORIGAN,J ET AL. (1976)
DORIGAN,J.; FULLER,B.; DUFFY,R.; PRELIMINARY SCORING OF SELECTED ORGANIC AI POLLUTANTS. APPENDIX III-CHEMISTRY, PRODUCTION, AND TOXICITY OF CHEMICALS F THROUGH N.; EPA-450/3-77-008D. RESEARCH TRIANGLE PARK,NC: U.S. EPA. PP.303 1976

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000095-13-6
Chem Name  : INDENE
Mol Formula: C9H8
Mol Weight : 116.16
Melting Pt : -1.8 deg C
Boiling Pt : 182 deg C
Water Solubility:
   Value : 332 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 2.92
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 1.1 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00159 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 5.1E-011 cm3/molecule-sec
   Temp  : 22 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1994)
```

Back To PhysProp Demo Page

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED
CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Light Substituted Benzene Compounds (molecular weight <200 /mole) (LSB)

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000100-00-5
Chem Name  : P-CHLORONITROBENZENE
Mol Formula: C6H4ClNO2
Mol Weight : 157.56
Melting Pt : 83.5 deg C
Boiling Pt : 242 deg C
Water Solubility:
   Value : 225 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 2.39
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.0219 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 4.89E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ALTSCHUH,J ET AL. (1999)
Atmospheric OH Rate Constant:
   Value : 1.71E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-02-7 Name: 4-NITROPHENOL

```
*****************************************************************************
MELT    4-NITROPHENOL                                          CAS#   100-02-7
  Melting Point  :  113-115     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      4-NITROPHENOL                                          CAS#   100-02-7
  Vapor Pressure :  4.1E-5      MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED VALUE CHOSEN DUE TO COMPATABILITY WITH MEASUR
                    HENRY'S LAW CONSTANT, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCHMIDT-BLEEK,F ET AL. (1982)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

SCHMIDT-BLEEK,F ET AL. (1982)
SCHMIDT-BLEEK,F.; HABERLAND,W.; KLEIN,A.W.; CAROLI,S.; STEPS TOWARDS ENVIRONMENTAL HAZARD ASSESSMENT OF NEW CHEMICALS (INCLUDING A HAZARD RANKIN SCHEME, BASED UPON DIRECTIVE 79/831/EEC).; CHEMOSPERE.; 11:383-415.; 1982

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000100-25-4
Chem Name  : P-DINITROBENZENE
Mol Formula: C6H4N2O4
Mol Weight : 168.11
Melting Pt : 174 deg C
Boiling Pt : 297 deg C
Water Solubility:
   Value : 69 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.46
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2.61E-005 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : HLX WSOL
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 8.39E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 2.13E-014 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-44-7 Name: BENZYL CHLORIDE

```
*****************************************************************************
MELT    BENZYL CHLORIDE                                        CAS#   100-44-7
  Melting Point  :  -39.2        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  GELFAND,S (1979)
*****************************************************************************

VP      BENZYL CHLORIDE                                        CAS#   100-44-7
  Vapor Pressure :  .481E 01     TORR        MEASURED
  Temperature (C):  47.84
  Remarks        :  DETM ANTOINE EQN FROM 48-117 DEGC
  Abbrev. Ref.   :  ASHCROFT,SJ (1976)
*****************************************************************************

VP      BENZYL CHLORIDE                                        CAS#   100-44-7
  Vapor Pressure :  .9800E+00    .5000E+01   TORR        MEASURED
  Temperature (C):  22.0         47.8
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  GELFAND,S (1979)
*****************************************************************************

VP      BENZYL CHLORIDE                                        CAS#   100-44-7
  Vapor Pressure :  1.30         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MACKAY,D ET AL. (1982)
*****************************************************************************

VP      BENZYL CHLORIDE                                        CAS#   100-44-7
  Vapor Pressure :  1.31         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE, EVALUATED DATABASE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

ASHCROFT,SJ (1976)
ASHCROFT,S.J.; VAPOR PRESSURES AND ENTHALPIES OF VAPORIZATION OF BENZYL HALIDES.; J. CHEM. ENGIN. DATA; 21:397-8.; 1976

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

GELFAND,S (1979)
GELFAND,S.; BENZYLCHLORIDE, BENZALCHLORIDE, AND BENZOTRICHLORIDE.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 5:828-38.; 1979

MACKAY,D ET AL. (1982)
MACKAY,D.; BOBRA,A.; CHAN,D.W.; SHIU,W.Y.; VAPOR PRESSURE CORRELATIONS FOR LOW-VOLATILITY ENVIRONMENTAL CHEMICALS.; ENVIRON. SCI. TECHNOL.; 16:645-9.; 1982

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000103-65-1 Name: N-PROPYLBENZENE

```
*****************************************************************************
VP      N-PROPYLBENZENE                                        CAS#   103-65-1
  Vapor Pressure :  3.420E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000103-65-1
Chem Name  : N-PROPYLBENZENE
Mol Formula: C9H12
Mol Weight : 120.20
Melting Pt : -99.5 deg C
Boiling Pt : 159.2 deg C
Water Solubility:
   Value : 52.2 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : TEWARI,YB ET AL (1982A)
Log P (octanol-water):
   Value : 3.69
   Type  : EXP
   Ref   : SANGSTER (1994)
Vapor Pressure:
   Value : 3.42 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0105 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SANEMASA,I ET AL. (1982)
Atmospheric OH Rate Constant:
   Value : 6E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000104-51-8
Chem Name  : N-BUTYLBENZENE
Mol Formula: C10H14
Mol Weight : 134.22
Melting Pt : -87.9 deg C
Boiling Pt : 183.3 deg C
Water Solubility:
   Value : 11.8 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 4.38
   Type  : EXP
   Ref   : DEBRUIJN,J ET AL. (1989)
Vapor Pressure:
   Value : 1.06 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : CHAO,J ET AL. (1983)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0159 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 8.72E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dimethyl phenol, 2,4-
CAS Number: 000105-67-9

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.8E+3	µg/L	ECOTOX
Salt Ecol LC50:	9.4E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.3E+2	days	THOMAS
Photolysis:		days	
Biodeg:	7.0E+0	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	3.0E+1	days	THOMAS
Photolysis:		days	
Biodeg:	7.0E+0	days	FATERATE
Radio:		days	
Log Kow:	2.3E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.2E+2	
Density:	9.6E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	9.8E-2	Torr	CHEMFATE
Henry's Law:	2.0E-6	atm-m3/mol	CHEMFATE
Water Solub:	7.9E+3	mg/L	CHEMFATE
Distrib Coef:	3.2E+1	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.5E+2		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	1.5E+2		ECOTOX
Salt BCF:			
Log Kow:	2.3E+0		CHEMFATE
Water Solub:	7.9E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	2.5E+1	C
Boiling Point:	2.1E+2	C
Formula:	C8 H10 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000105-67-9 Name: 2,4-XYLENOL

```
*****************************************************************************
MELT    2,4-XYLENOL                                          CAS#   105-67-9
  Melting Point  :  24.54       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      2,4-XYLENOL                                          CAS#   105-67-9
  Vapor Pressure :  .621E-01    TORR        MEASURED
  Temperature (C):  20.
  Remarks        :  SUPERCOOLED LIQUID
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979A)
*****************************************************************************

VP      2,4-XYLENOL                                          CAS#   105-67-9
  Vapor Pressure :  0.098       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************
```

CALLAHAN,MA ET AL. (1979A)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS-VOLUME II.; EPA-440/4-79-029 WASHINGTON,DC: U.S. EPA.; 1979A

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-43-4 Name: 4-CHLROTOLUENE

```
*****************************************************************************
VP      4-CHLROTOLUENE                                        CAS#   106-43-4
  Vapor Pressure :  2.690E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000106-43-4
Chem Name  : P-CHLOROTOLUENE
Mol Formula: C7H7Cl
Mol Weight : 126.59
Melting Pt : 7.5 deg C
Boiling Pt : 162.4 deg C
Water Solubility:
   Value : 106 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 3.33
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2.69 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00438 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 1.82E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Methyl phenol, 4-
CAS Number: 000106-44-5

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	5.0E-3	mg/kg/day	HEAST
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	1.8E+3	mg/kg	ACGIH
Dermal LD50:	3.0E+2	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:	5.9E+2	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.4E+3	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.2E+2	days	THOMAS
Photolysis:	8.1E-4	days	CHEMFATE
Biodeg:	6.7E-1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	2.6E+1	days	THOMAS
Photolysis:	8.1E-4	days	CHEMFATE
Biodeg:	6.7E-1	days	FATERATE
Radio:		days	
Log Kow:	1.9E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.1E+2	
Density:	1.0E+0	g/mL @ 40.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.1E-1	Torr	CHEMFATE
Henry's Law:	7.9E-7	atm-m3/mol	CHEMFATE
Water Solub:	2.2E+4	mg/L	CHEMFATE
Distrib Coef:	1.2E+1	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	1.9E+0		CHEMFATE
Water Solub:	2.2E+4		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	3.6E+1	C
Boiling Point:	2.0E+2	C
Formula:	C7 H8 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-44-5 Name: P-CRESOL

```
*****************************************************************************
MELT    P-CRESOL                                            CAS#   106-44-5
  Melting Point  :  34.739      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      P-CRESOL                                            CAS#   106-44-5
  Vapor Pressure :  0.11        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dichlorobenzene, 1,4-
CAS Number: 000106-46-7

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:	2.3E-1	mg/kg/day	IRIS
Oral Slope:	2.4E-2	(mg/kg/day)^-1	HEAST
Oral Wt-of-Evid:	C		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	1.6E+3	mg/kg	ACGIH
Dermal LD50:	5.0E+3	mg/kg	ACGIH
Gas Inhal LC50:		ppm	
Dust Inhal LC50:	3.1E+1	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	8.8E+2	µg/L	ECOTOX
Salt Ecol LC50:	2.0E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	3.2E+3	days	CHEMFATE
Volatility:	1.1E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	3.2E+3	days	CHEMFATE
Volatility:	1.2E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	3.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.5E+2	
Density:	1.2E+0	g/mL @ 55.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.0E+0	Torr	CHEMFATE
Henry's Law:	2.4E-3	atm-m3/mol	CHEMFATE
Water Solub:	7.9E+1	mg/L	CHEMFATE
Distrib Coef:	1.2E+0	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.4E+3		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	1.8E+3		ECOTOX
Salt BCF:			
Log Kow:	3.5E+0		CHEMFATE
Water Solub:	7.9E+1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	5.3E+1	C
Boiling Point:	1.7E+2	C
Formula:	C6 H4 Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-46-7 Name: P-DICHLOROBENZENE

```
*****************************************************************************
MELT    P-DICHLOROBENZENE                                    CAS#   106-46-7
  Melting Point  :  53.13       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      P-DICHLOROBENZENE                                    CAS#   106-46-7
  Vapor Pressure :  .1759E 01   TORR        CALCULATED
  Temperature (C):  25.
  Abbrev. Ref.   :  DREISBACH,RR (1955)
*****************************************************************************

VP      P-DICHLOROBENZENE                                    CAS#   106-46-7
  Vapor Pressure :  .10E 01     TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  MARTIN,H & WORTHING,CR (1977)
*****************************************************************************

VP      P-DICHLOROBENZENE                                    CAS#   106-46-7
  Vapor Pressure :  1.0         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WALSH,PN & SMITH,NO (1961)
*****************************************************************************
```

DREISBACH,RR (1955)
DREISBACH,R.R.; PHYSICAL PROPERTIES OF CHEMICAL COMPOUNDS. I.; ADVANCES IN CHEMISTRY SERIES NO. 15.; WASHINGTON, DC: AMERICAN CHEMICAL SOCIETY.; 1955

MARTIN,H & WORTHING,CR (1977)
MARTIN,H.; WORTHING,C.R.; PESTICIDE MANUAL. FIFTH EDITION, BRITISH CROP PROTECTION COUNCIL. 563 PP.; 1977

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

WALSH,PN & SMITH,NO (1961)
WALSH,P.N.; SMITH,N.O.; SUBLIMATION PRESSURE OF ALPHA-P-DICHLORO-, BETA-P-DICHLORO-, P-DIBROMO-, AND P-BROMOCHLOROBENZENE.; CHEM. ENG. DATA.; 6:33-5.; 1961

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-47-8 Name: P-CHLOROANILINE

```
*****************************************************************************
VP      P-CHLOROANILINE                                    CAS#   106-47-8
  Vapor Pressure :  .11E-01     .25E-01     TORR        MEASURED
  Temperature (C):  20.         25.
  Remarks        :  FROM VERSCHUEREN,K. (1977)
  Abbrev. Ref.   :  KILZER,L ET AL. (1979)
*****************************************************************************

VP      P-CHLOROANILINE                                    CAS#   106-47-8
  Vapor Pressure :  .15E-01     .5E-01      TORR        MEASURED
  Temperature (C):  20.         30.
  Abbrev. Ref.   :  VERSCHUEREN,K (1977)
*****************************************************************************

VP      P-CHLOROANILINE                                    CAS#   106-47-8
  Vapor Pressure :  .0123       MM HG       M
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  PIACENTE,V ET AL. (1985)
*****************************************************************************
```

KILZER,L ET AL. (1979)
KILZER,L.; SCHEUNERT,I.; GEYER,H.; KLEIN,W.; KORTE,F.; LABORATORY SCREENING OF THE VOLATILIZATION RATES OF ORGANIC CHEMICALS FROM WATER AND SOIL.; CHEMOSPHERE.; 8:751-61.; 1979

PIACENTE,V ET AL. (1985)
PIACENTE,V.; SCARDALA,P.; FERRO,C.; GIGLI,R.; VAPORIZATION STUDY OF O-, M-, AND P-CHLOROANILENE BY TORSION-WEIGHING EFFUSION VAPOR PRESSURE MEASUREMENT J. CHEM. ENG. DATA; 30:372-6; 1985

VERSCHUEREN,K (1977)
VERSCHUEREN,K.; HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS.; NEW YORK, NY: VAN NOSTRAND REINHOLD COMPANY.; 1977

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000106-47-8
Chem Name  : 4-CHLOROANILINE
Mol Formula: C6H6ClN
Mol Weight : 127.57
Melting Pt : 72.5 deg C
Boiling Pt : 232 deg C
Water Solubility:
   Value : 3900 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KILZER,L ET AL. (1979)  @2ND
Log P (octanol-water):
   Value : 1.83
   Type  : EXP
   Ref   : SANGSTER (1994)
Vapor Pressure:
   Value : 0.027 mm Hg
   Temp  : 26 deg C
   Type  : EXP
   Ref   : PIACENTE,V ET AL. (1985)
pKa Dissociation Constant:
   Value : 3.98
   Temp  : 25 deg C
   Type  : EXP
   Ref   : PERRIN,DD (1972)
Henry's Law Constant:
   Value : 1.16E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 4.3E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000106-49-0
Chem Name  : P-TOLUIDINE
Mol Formula: C7H9N
Mol Weight : 107.16
Melting Pt : 43.7 deg C
Boiling Pt : 200.4 deg C
Water Solubility:
   Value : 6500 mg/L
   Temp  : 15 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.39
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.286 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : CHAO,J ET AL. (1983)
pKa Dissociation Constant:
   Value : 5.1
   Temp  : 25 deg C
   Type  : EXP
   Ref   : PERRIN,DD (1965)
Henry's Law Constant:
   Value : 2.02E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : JAYASINGHE,DS ET AL. (1992)
Atmospheric OH Rate Constant:
   Value : 1.32E-010 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000108-39-4 Name: M-CRESOL

```
*****************************************************************************
MELT    M-CRESOL                                            CAS#   108-39-4
  Melting Point  :  12.22       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      M-CRESOL                                            CAS#   108-39-4
  Vapor Pressure :  0.138       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000108-67-8
Chem Name  : 1,3,5-TRIMETHYLBENZENE
Mol Formula: C9H12
Mol Weight : 120.20
Melting Pt : -44.7 deg C
Boiling Pt : 164.7 deg C
Water Solubility:
   Value : 48.2 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 3.42
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2.48 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00877 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SANEMASA,I ET AL. (1982)
Atmospheric OH Rate Constant:
   Value : 5.75E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000108-86-1
Chem Name  : BROMOBENZENE
Mol Formula: C6H5Br
Mol Weight : 157.01
Melting Pt : -30.6 deg C
Boiling Pt : 156 deg C
Water Solubility:
   Value : 446 mg/L
   Temp  : 30 deg C
   Type  : EXP
   Ref   : CHIOU,CT ET AL. (1977)
Log P (octanol-water):
   Value : 2.99
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 4.18 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00247 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SHIU,WY & MACKAY,D (1997)
Atmospheric OH Rate Constant:
   Value : 7.7E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Chlorobenzene
CAS Number: 000108-90-7

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-2	mg/kg/day	IRIS
Inhal RfD:	5.7E-3	mg/kg/day	HEAST
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	4.0E+2	mg/kg	ACGIH
Dermal LD50:	1.1E+4	mg/kg	RTECS
Gas Inhal LC50:	3.0E+3	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.0E+1	µg/L	ECOTOX
Salt Ecol LC50:	6.9E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	3.2E+3	days	CHEMFATE
Volatility:	9.3E+1	days	THOMAS
Photolysis:	4.9E-2	days	CHEMFATE
Biodeg:	1.5E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	3.2E+3	days	CHEMFATE
Volatility:	1.0E+0	days	THOMAS
Photolysis:	4.9E-2	days	CHEMFATE
Biodeg:	1.5E+2	days	FATERATE
Radio:		days	
Log Kow:	2.8E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.1E+2	
Density:	1.1E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.2E+1	Torr	CHEMFATE
Henry's Law:	3.7E-3	atm-m3/mol	CHEMFATE
Water Solub:	4.7E+2	mg/L	CHEMFATE
Distrib Coef:	4.4E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	4.2E+3		ECOTOX
Salt BCF:			
Log Kow:	2.8E+0		CHEMFATE
Water Solub:	4.7E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-4.5E+1	C
Boiling Point:	1.3E+2	C
Formula:	C6 H5 Cl	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000108-90-7 Name: CHLOROBENZENE

```
*****************************************************************************
MELT    CHLOROBENZENE                                          CAS#   108-90-7
  Melting Point  :  -45.58      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      CHLOROBENZENE                                          CAS#   108-90-7
  Vapor Pressure :  11.97       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Phenol
CAS Number: 000108-95-2

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-1	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	5.3E+2	mg/kg	ACGIH
Dermal LD50:	6.3E+2	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.8E+0	µg/L	ECOTOX
Salt Ecol LC50:	1.0E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.6E+2	days	THOMAS
Photolysis:	7.2E+0	days	FATERATE
Biodeg:	1.3E-1	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	7.2E+1	days	THOMAS
Photolysis:	7.2E+0	days	FATERATE
Biodeg:	1.3E-1	days	CHEMFATE
Radio:		days	
Log Kow:	1.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	9.4E+1	
Density:	1.1E+0	g/mL @ 45.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.8E-1	Torr	CHEMFATE
Henry's Law:	4.0E-7	atm-m3/mol	CHEMFATE
Water Solub:	8.3E+4	mg/L	CHEMFATE
Distrib Coef:	4.4E+0	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	3.9E+1		ECOTOX
Salt BCF:	8.8E+0		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	5.3E+4		ECOTOX
Salt BCF:	8.8E+0		ECOTOX
Log Kow:	1.5E+0		CHEMFATE
Water Solub:	8.3E+4		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	4.1E+1	C
Boiling Point:	1.8E+2	C
Formula:	C6 H6 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000108-95-2 Name: PHENOL

```
*****************************************************************************
MELT    PHENOL                                                  CAS#   108-95-2
  Melting Point  :  40.90       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      PHENOL                                                  CAS#   108-95-2
  Vapor Pressure :  0.35        MM HG       MEAS
  Temperature (C):  25
  Abbrev. Ref.   :  JONES,AH (1960)
*****************************************************************************

VP      PHENOL                                                  CAS#   108-95-2
  Vapor Pressure :  0.276       MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA OBTAINED FROM THE SUPERCOOLED LIQUI
                    IN THE RANGE 107-181 DEG C AND CONVERTED TO THE VAPOR
                    PRESSURE FOR THE SOLID MATERIAL. SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  OHE,S (1976)
*****************************************************************************
```

JONES,AH (1960)
JONES,A.H.; SUBLIMATION-PRESSURE DATA FOR ORGANIC COMPOUNDS.; J. CHEM. ENG. DATA.; 5:196-200.; 1960

OHE,S (1976)
OHE,S.; COMPUTER AIDED DATA BOOK OF VAPOR PRESSURE.; DATA BOOK PUBL. CO., TOKYO, JAPAN.; 1976

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Trichlorobenzene, 1,2,4-
CAS Number: 000120-82-1

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-2	mg/kg/day	IRIS
Inhal RfD:	5.7E-2	mg/kg/day	HEAST
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	3.0E+2	mg/kg	ACGIH
Dermal LD50:	6.1E+3	mg/kg	ACGIH
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	7.6E+2	µg/L	ECOTOX
Salt Ecol LC50:	8.0E+1	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.2E+3	days	CHEMFATE
Volatility:	1.2E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.2E+3	days	CHEMFATE
Volatility:	1.3E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	4.0E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.8E+2	
Density:	1.5E+0	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.3E-1	Torr	CHEMFATE
Henry's Law:	1.4E-3	atm-m3/mol	CHEMFATE
Water Solub:	3.5E+1	mg/L	LIVECHEM
Distrib Coef:	3.6E+0	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	5.6E+3		ECOTOX
Salt BCF:	2.6E+2		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	5.6E+3		ECOTOX
Salt BCF:	2.6E+2		ECOTOX
Log Kow:	4.0E+0		CHEMFATE
Water Solub:	3.5E+1		LIVECHEM
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.7E+1	C
Boiling Point:	2.1E+2	C
Formula:	C6 H3 Cl3	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000120-82-1 Name: 1,2,4-TRICHLOROBENZENE

```
*****************************************************************************
MELT    1,2,4-TRICHLOROBENZENE                                  CAS#   120-82-1
  Melting Point  :  17          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1,2,4-TRICHLOROBENZENE                                  CAS#   120-82-1
  Vapor Pressure :  .42E 00     TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  US EPA (1981)
*****************************************************************************

VP      1,2,4-TRICHLOROBENZENE                                  CAS#   120-82-1
  Vapor Pressure :  0.29        MM HG       MEAS
  Temperature (C):  25
  Abbrev. Ref.   :  SEARS,GW & HOPKE,ER (1949A)
*****************************************************************************

VP      1,2,4-TRICHLOROBENZENE                                  CAS#   120-82-1
  Vapor Pressure :  0.4305      MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

SEARS,GW & HOPKE,ER (1949A)
SEARS,G.W.; HOPKE,E.R.; VAPOR PRESSURE OF THE ISOMERIC TRICHLOROBENZENES IN THE LOW-PRESSURE REGION.; J. AM. CHEM. SOC.; 71:2575-6; 1949A

US EPA (1981)
U.S. EPA; TREATABILITY MANUAL I. TREATABILITY DATA.; EPA-600/2-82-001A. WASHINGTON,DC: U.S. EPA.; 1981

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dichlorophenol, 2,4-
CAS Number: 000120-83-2

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-3	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	1.3E+3	mg/kg	RTECS
Dermal LD50:	3.2E+3	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.6E+0	µg/L	ECOTOX
Salt Ecol LC50:	5.1E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.2E+2	days	THOMAS
Photolysis:	1.3E-1	days	FATERATE
Biodeg:	6.0E+0	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	6.9E+0	days	THOMAS
Photolysis:	1.3E-1	days	FATERATE
Biodeg:	6.0E+0	days	CHEMFATE
Radio:		days	
Log Kow:	2.9E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	1.6E+2		
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.7E-2	Torr	CHEMFATE
Henry's Law:	3.2E-6	atm-m3/mol	CHEMFATE
Water Solub:	4.5E+3	mg/L	CHEMFATE
Distrib Coef:	2.9E-1	ml/g	RTI_ION
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	9.8E+2		ECOTOX
Salt BCF:			
Log Kow:	2.9E+0		CHEMFATE
Water Solub:	4.5E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	4.5E+1	C
Boiling Point:	2.1E+2	C
Formula:	C6 H4 Cl2 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000120-83-2 Name: 2,4-DICHLOROPHENOL

```
*****************************************************************************
MELT    2,4-DICHLOROPHENOL                                    CAS#   120-83-2
  Melting Point  :  42-43       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      2,4-DICHLOROPHENOL                                    CAS#   120-83-2
  Vapor Pressure :  .12E 00     TORR        CALCULATED
  Temperature (C):  20.
  Abbrev. Ref.   :  US EPA (1981)
*****************************************************************************

VP      2,4-DICHLOROPHENOL                                    CAS#   120-83-2
  Vapor Pressure :  0.067       MM HG
  Temperature (C):  25
  Remarks        :  THIS VALUE IS FOR THE SOLID WHICH HAS CONVERTED FROM THE
                    MEASURED SUPERCOOLED LIQUID-PHASE OF 15.4 PA @ 25 DEG C, S
                    RSCOMMENDED VALUE
  Abbrev. Ref.   :  BIDLEMAN,TF & RENBERG,L (1985)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

BIDLEMAN,TF & RENBERG,L (1985)
BIDLEMAN,T.F.; RENBERG,L.; DETERMINATION OF VAPOR PRESSURES FOR CHLOROGUAIACOLS, CHLOROVERATROLES, AND NONYLPHENOL BY GAS CHROMATOGRAPHY.; CHEMOSPHERE; 14:1475-81; 1985

US EPA (1981)
U.S. EPA; TREATABILITY MANUAL I. TREATABILITY DATA.; EPA-600/2-82-001A. WASHINGTON,DC: U.S. EPA.; 1981

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000121-14-2 Name: 2,4-DINITROTOLUENE

```
*****************************************************************************
MELT    2,4-DINITROTOLUENE                                    CAS#   121-14-2
  Melting Point  :  67-70       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      2,4-DINITROTOLUENE                                    CAS#   121-14-2
  Vapor Pressure :  .1298E-02   TORR        MEASURED
  Temperature (C):  58.8
  Remarks        :  KNUDSEN EFFUSION METHOD
  Abbrev. Ref.   :  LENCHITZ,C & VELICKY,RW (1970)
*****************************************************************************

VP      2,4-DINITROTOLUENE                                    CAS#   121-14-2
  Vapor Pressure :  1.47E-4     MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  PELLA,PA (1977)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

LENCHITZ,C & VELICKY,RW (1970)
LENCHITZ,C.; VELICKY,R.W.; VAPOR PRESSURE AND HEAT OF SUBLIMATION OF THREE NITROTOLUENES.; J. CHEM. ENG. DATA.; 15:401-3.; 1970

PELLA,PA (1977)
PELLA,P.A.; MEASUREMENT OF THE VAPOR PRESSURES OF TNT, 2,4-DNT, AND EGDN.; CHEM. THERMODYN.; 9:301-5.; 1977

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000135-98-8
Chem Name  : SEC-BUTYLBENZENE
Mol Formula: C10H14
Mol Weight : 134.22
Melting Pt : -82.7 deg C
Boiling Pt : 173.5 deg C
Water Solubility:
   Value : 17.6 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 4.57
   Type  : EXP
   Ref   : SHERBLOM,PM & EGANHOUSE,RP (1988)
Vapor Pressure:
   Value : 1.75 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YAWS,CL (1994B)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0176 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 8.5E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 025551-13-7
Chem Name  : TRIMETHYLBENZENES
Mol Formula: C27H36
Mol Weight : 360.59
Melting Pt :
Boiling Pt :
Water Solubility:
   Value : 75 mg/L
   Temp  : 25 deg C
   Type  : EXT
   Ref   : MACKAY,D & SHIU,WY (1981); isomer avg
Log P (octanol-water):
   Value : 3.63
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 2.1 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BANERJEE,S ET AL. (1990)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00724 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 3.51E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000051-28-5 Name: 2,4-DINITROPHENOL

```
*****************************************************************************
MELT    2,4-DINITROPHENOL                                    CAS#    51-28-5
  Melting Point  :  112-114     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      2,4-DINITROPHENOL                                    CAS#    51-28-5
  Vapor Pressure :  5.1E-3      MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCHWARZENBACH,RP ET AL. (1988)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

SCHWARZENBACH,RP ET AL. (1988)
SCHWARZENBACH,R.P.; STIERLI,R.; FOLSOM,B.R.; ZEYER,J.; COMPOUND PROPERTIES RELEVANT FOR ASSESSING THE ENVIRONMENTAL PARTITIONING OF NITROPHENOLS.; ENVIRON. SCI. TECHNOL.; 22:83-92; 1988

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000528-29-0
Chem Name  : O-DINITROBENZENE
Mol Formula: C6H4N2O4
Mol Weight : 168.11
Melting Pt : 118.5 deg C
Boiling Pt : 318 deg C
Water Solubility:
   Value : 133 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.69
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 4.55E-005 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : YAWS,CL (1994A)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 5.33E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 2.13E-014 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000534-52-1 Name: 4,6-DINITRO-0-CRESOL

```
*****************************************************************************
MELT    4,6-DINITRO-0-CRESOL                                  CAS#   534-52-1
  Melting Point  :  84-86       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCHWARZENBACH,RP ET AL. (1988)
*****************************************************************************

VP      4,6-DINITRO-0-CRESOL                                  CAS#   534-52-1
  Vapor Pressure :  3.24E-4     MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCHWARZENBACH,RP ET AL. (1988)
*****************************************************************************
```

SCHWARZENBACH,RP ET AL. (1988)
SCHWARZENBACH,R.P.; STIERLI,R.; FOLSOM,B.R.; ZEYER,J.; COMPOUND PROPERTIES RELEVANT FOR ASSESSING THE ENVIRONMENTAL PARTITIONING OF NITROPHENOLS.; ENVIRON. SCI. TECHNOL.; 22:83-92; 1988

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000541-73-1 Name: 1,3-DICHLOROBENZENE

```
*****************************************************************************
MELT    1,3-DICHLOROBENZENE                                   CAS#   541-73-1
  Melting Point  :  -24.76      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      1,3-DICHLOROBENZENE                                   CAS#   541-73-1
  Vapor Pressure :  2.15        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000606-20-2 Name: 2,6-DINITROTOLUENE

```
*****************************************************************************
MELT    2,6-DINITROTOLUENE                                    CAS#   606-20-2
  Melting Point  :  71          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP      2,6-DINITROTOLUENE                                    CAS#   606-20-2
  Vapor Pressure :  .35E-03     TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  SPANGGORD,RJ ET AL. (1980)
*****************************************************************************

VP      2,6-DINITROTOLUENE                                    CAS#   606-20-2
  Vapor Pressure :  5.67E-4     MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  PELLA,PA (1977)
*****************************************************************************
```

PELLA,PA (1977)
PELLA,P.A.; MEASUREMENT OF THE VAPOR PRESSURES OF TNT, 2,4-DNT, AND EGDN.; CHEM. THERMODYN.; 9:301-5.; 1977

SPANGGORD,RJ ET AL. (1980)
SPANGGORD,R.J.; MILL,T.; CHOU,T.W.; MABEY,W.R.; SMITH,J.H.; LEE,S.; ENVIRONMENTAL FATE STUDIES ON CERTAIN MUNITIONS WASTEWATER CONSTITUENTS. FINAL REPORT, PHASE I - LITERATURE REVIEW.; SRI PROJECT NO. LSU-7934. CONTRACT NO. DAMD 17-78-C-8081. FORT DETRICK,MD: U.S. ARMY MEDICAL RES. & DEVELOP. COMMAND.; 1980

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Aniline
CAS Number: 000062-53-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:	2.9E-4	mg/kg/day	IRIS
Oral Slope:	5.7E-3	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	4.4E+2	mg/kg	ACGIH
Dermal LD50:	8.4E+2	mg/kg	RTECS
Gas Inhal LC50:	1.8E+2	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.5E+1	µg/L	ECOTOX
Salt Ecol LC50:	2.9E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	9.7E+1	days	THOMAS
Photolysis:	2.6E+0	days	CHEMFATE
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.3E+1	days	THOMAS
Photolysis:	2.6E+0	days	CHEMFATE
Biodeg:		days	
Radio:		days	
Log Kow:	9.0E-1		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	9.3E+1	
Density:	1.0E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.9E-1	Torr	CHEMFATE
Henry's Law:	1.9E-6	atm-m3/mol	CHEMFATE
Water Solub:	3.6E+4	mg/L	CHEMFATE
Distrib Coef:	1.2E+0	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	2.0E+1		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	2.8E+2		ECOTOX
Salt BCF:			
Log Kow:	9.0E-1		CHEMFATE
Water Solub:	3.6E+4		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-6.0E+0	C
Boiling Point:	1.8E+2	C
Formula:	C6H7N	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000062-53-3 Name: ANILINE

```
*****************************************************************************
MELT    ANILINE                                              CAS#    62-53-3
  Melting Point  :  -5.98       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ANILINE                                              CAS#    62-53-3
  Vapor Pressure :  0.49        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000823-40-5 Name: 2,6-DIAMINOTOLUENE

```
*****************************************************************************
MELT    2,6-DIAMINOTOLUENE                                  CAS#   823-40-5
  Melting Point  :  105          DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MILLIGAN,B & GILBERT,KE (1978)
*****************************************************************************

VP      2,6-DIAMINOTOLUENE                                  CAS#   823-40-5
  Vapor Pressure :  2.46E-3      MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED BY ANTOINES EQUATION WITH 3 DATA POINTS BETWE
                    150 AND 180 DEG C, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MILLIGAN,B & GILBERT,KE (1978)
*****************************************************************************
```

MILLIGAN,B & GILBERT,KE (1978)
MILLIGAN,B.; GILBERT,K.E.; DIAMINOTOLUENES; IN:KIRK-OTHMER ENCYCLO CHEM TE
3RD ED NY,NY: WILEY INTERSCI 2:321-9; 1978

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000087-61-6 Name: 1,2,3-TRICHLOROBENZENE

```
*****************************************************************************
MELT    1,2,3-TRICHLOROBENZENE                              CAS#    87-61-6
  Melting Point  :  52.6        DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1,2,3-TRICHLOROBENZENE                              CAS#    87-61-6
  Vapor Pressure :  0.210       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MACKAY,D ET AL. (1982)
*****************************************************************************
```

MACKAY,D ET AL. (1982)
MACKAY,D.; BOBRA,A.; CHAN,D.W.; SHIU,W.Y.; VAPOR PRESSURE CORRELATIONS FOR LOW-VOLATILITY ENVIRONMENTAL CHEMICALS.; ENVIRON. SCI. TECHNOL.; 16:645-9.; 1982

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Trichlorophenol, 2,4,6-
CAS Number: 000088-06-2

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	1.1E-2	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:	1.1E-2	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2		
Oral ED10:	1.3E+1	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	1.3E+1	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	8.2E+2	mg/kg	RTECS
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.0E+2	µg/L	ECOTOX
Salt Ecol LC50:	1.1E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.5E+4	days	CHEMFATE
Volatility:	1.4E+2	days	THOMAS
Photolysis:	4.0E+0	days	FATERATE
Biodeg:	7.0E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.5E+4	days	CHEMFATE
Volatility:	1.5E+1	days	THOMAS
Photolysis:	4.0E+0	days	FATERATE
Biodeg:	7.0E+1	days	FATERATE
Radio:		days	
Log Kow:	3.7E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.0E+2	
Density:	1.5E+0	g/mL @ 75.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.4E-2	Torr	CHEMFATE
Henry's Law:	7.8E-6	atm-m3/mol	CHEMFATE
Water Solub:	8.0E+2	mg/L	CHEMFATE
Distrib Coef:	7.6E-1	ml/g	RTI_ION
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.1E+3		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	1.2E+4		ECOTOX
Salt BCF:			
Log Kow:	3.7E+0		CHEMFATE
Water Solub:	8.0E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	6.9E+1	C
Boiling Point:	2.5E+2	C
Formula:	C6 H3 Cl3 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000088-06-2 Name: 2,4,6-TRICHLOROPHENOL

```
*****************************************************************************
VP      2,4,6-TRICHLOROPHENOL                                CAS#    88-06-2
  Vapor Pressure :  .3E-01      TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  FROM JORDAN,T.E. (1954)
  Abbrev. Ref.   :  KILZER,L ET AL. (1979)
*****************************************************************************

VP      2,4,6-TRICHLOROPHENOL                                CAS#    88-06-2
  Vapor Pressure :  0.024       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BIDLEMAN,TF & RENBERG,L (1985)
*****************************************************************************
```

BIDLEMAN,TF & RENBERG,L (1985)
BIDLEMAN,T.F.; RENBERG,L.; DETERMINATION OF VAPOR PRESSURES FOR CHLOROGUAIACOLS, CHLOROVERATROLES, AND NONYLPHENOL BY GAS CHROMATOGRAPHY.; CHEMOSPHERE; 14:1475-81; 1985

KILZER,L ET AL. (1979)
KILZER,L.; SCHEUNERT,I.; GEYER,H.; KLEIN,W.; KORTE,F.; LABORATORY SCREENING OF THE VOLATILIZATION RATES OF ORGANIC CHEMICALS FROM WATER AND SOIL.; CHEMOSPHERE.; 8:751-61.; 1979

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000088-74-4
Chem Name  : 2-NITROANILINE
Mol Formula: C6H6N2O2
Mol Weight : 138.13
Melting Pt : 71.2 deg C
Boiling Pt : 284 deg C
Water Solubility:
   Value : 1470 mg/L
   Temp  : 30 deg C
   Type  : EXP
   Ref   : GROSS,PM ET AL. (1933)
Log P (octanol-water):
   Value : 1.85
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.00277 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value : -0.28
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DEAN,JA (1985)
Henry's Law Constant:
   Value : 5.9E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ALTSCHUH,J ET AL. (1999)
Atmospheric OH Rate Constant:
   Value : 1.35E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000088-74-4 Name: 2-NITROANILINE

```
*****************************************************************************
VP      2-NITROANILINE                                    CAS#    88-74-4
  Vapor Pressure :  8.78E-4     MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  FERRO,D & PIACENTE,V (1985)
*****************************************************************************


   FERRO,D & PIACENTE,V (1985)
   FERRO,D.; PIACENTE,V.; HEAT OF VAPORIZATION OF O-, M-, P-NITROANILINE.;
   THERMOCHIM. ACTA; 90:387-9; 1985

End of Search
```

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000088-75-5
Chem Name  : 2-NITROPHENOL
Mol Formula: C6H5NO3
Mol Weight : 139.11
Melting Pt : 44.8 deg C
Boiling Pt : 216 deg C
Water Solubility:
   Value : 2500 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.79
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.113 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SCALA,AJ & BANERJEE,S (1982)
pKa Dissociation Constant:
   Value : 7.23
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 1.28E-005 atm-m3/mole
   Temp  : 20 deg C
   Type  : EXP
   Ref   : TREMP,J ET AL. (1993)
Atmospheric OH Rate Constant:
   Value : 9E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000088-75-5 Name: 2-NITROPHENOL

```
*****************************************************************************
VP      2-NITROPHENOL                                          CAS#    88-75-5
  Vapor Pressure :  .1E 01      TORR        MEASURED
  Temperature (C):  49.3
  Abbrev. Ref.   :  HOWARD,PH ET AL. (1976)
*****************************************************************************

VP      2-NITROPHENOL                                          CAS#    88-75-5
  Vapor Pressure :  0.113       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCALA,AJ & BANERJEE,S (1982)
*****************************************************************************
```

HOWARD,PH ET AL. (1976)
HOWARD,P.H.; SANTODONATO,J.; SAXENA,J.; MALLING,J.; GRENINGER,D.; INVESTIGATION OF SELECTED POTENTIAL ENVIRONMENTAL CONTAMINANTS: NITROAROMATICS (DRAFT).; EPA-560/2-76-010. RESEARCH TRIANGLE PARK,NC: U.S. EPA. PP.600.; 1976

SCALA,AJ & BANERJEE,S (1982)
SCALA,A.J.; BANERJEE,S.; VAPOR PRESSURE INTERLABORATORY REPORT.; SYRACUSE,NY: SYRACUSE RESEARCH CORPORATION. FINAL REPORT FOR NATIONAL BUREA OF STANDARDS. 8 PP. AND APPENDICES.; 1982

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000095-48-7 Name: O-CRESOL

```
*****************************************************************************
MELT    O-CRESOL                                          CAS#    95-48-7
  Melting Point  :  30.944      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      O-CRESOL                                          CAS#    95-48-7
  Vapor Pressure :  0.299       MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA BEGINNING AT 31 DEG C, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000095-49-8 Name: O-CHLOROTOLUENE

```
*****************************************************************************
MELT    O-CHLOROTOLUENE                                     CAS#    95-49-8
  Melting Point  :  -35.59      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      O-CHLOROTOLUENE                                     CAS#    95-49-8
  Vapor Pressure :  3.43        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000095-50-1 Name: O-DICHLOROBENZENE

```
*****************************************************************************
MELT    O-DICHLOROBENZENE                                    CAS#    95-50-1
  Melting Point  :  -17.01      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      O-DICHLOROBENZENE                                    CAS#    95-50-1
  Vapor Pressure :  1.47        MM HG       MEAS
  Temperature (C):  25
  Abbrev. Ref.   :  MACKAY,D ET AL. (1982)
*****************************************************************************

VP      O-DICHLOROBENZENE                                    CAS#    95-50-1
  Vapor Pressure :  1.360E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

MACKAY,D ET AL. (1982)
MACKAY,D.; BOBRA,A.; CHAN,D.W.; SHIU,W.Y.; VAPOR PRESSURE CORRELATIONS FOR LOW-VOLATILITY ENVIRONMENTAL CHEMICALS.; ENVIRON. SCI. TECHNOL.; 16:645-9.; 1982

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

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CAS #: 000095-53-4 Name: O-TOLUIDINE

```
*****************************************************************************
MELT    O-TOLUIDINE                                          CAS#    95-53-4
  Melting Point  :  -16.10      DEGC
  Remarks        :  STABLE VALUE, SRC RECOMMENDED VALUE, METASTABLE VALUE IS
                    -24.5 DEG C
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      O-TOLUIDINE                                          CAS#    95-53-4
  Vapor Pressure :  .5704E 02   .12376E 03  .76000E 03  TORR        MEASURED
  Temperature (C):  118.460     139.000     200.300
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1973)
*****************************************************************************

VP      O-TOLUIDINE                                          CAS#    95-53-4
  Vapor Pressure :  .31703E 00  TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  DREISBACH,RR (1955)
*****************************************************************************

VP      O-TOLUIDINE                                          CAS#    95-53-4
  Vapor Pressure :  0.32        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************

VP      O-TOLUIDINE                                          CAS#    95-53-4
  Vapor Pressure :  2.600E-01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1973)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOUR PRESSURES OF PURE SUBSTANCES.; N YORK, NY: ELSEVIER SCIENTIFIC PUB. CO. 626 PP.; 1973

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE

CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

DREISBACH,RR (1955)
DREISBACH,R.R.; PHYSICAL PROPERTIES OF CHEMICAL COMPOUNDS. I.; ADVANCES IN CHEMISTRY SERIES NO. 15.; WASHINGTON, DC: AMERICAN CHEMICAL SOCIETY.; 1955

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000095-57-8
Chem Name  : 2-CHLOROPHENOL
Mol Formula: C6H5ClO
Mol Weight : 128.56
Melting Pt : 9.8 deg C
Boiling Pt : 174.9 deg C
Water Solubility:
   Value : 1.13E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BANERJEE,S ET AL. (1980)
Log P (octanol-water):
   Value : 2.15
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2.53 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1991)
pKa Dissociation Constant:
   Value : 8.56
   Temp  :
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 1.12E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ABRAHAM,MH ET AL. (1994)
Atmospheric OH Rate Constant:
   Value : 9.87E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

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CAS #: 000095-57-8 Name: 2-CHLOROPHENOL

```
*****************************************************************************
VP      2-CHLOROPHENOL                                        CAS#    95-57-8
  Vapor Pressure :  .2340E+01   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.    :  ISHOW (NA--)
*****************************************************************************


   ISHOW (NA--)
   ISHOW.; INFORMATION SYSTEM FOR HAZARDOUS ORGANICS IN WATER.;  DULUTH, MN:
   DEPT. OF CHEM., UNIV. OF MINNESOTA.; NA--

End of Search
```

CHEMFATE Search Results

Return to EFDB page

CAS #: 000095-63-6 Name: 1,2,4-TRIMETHYLBENZENE

```
*****************************************************************************
MELT    1,2,4-TRIMETHYLBENZENE                                  CAS#    95-63-6
  Melting Point  :  -43.78      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1,2,4-TRIMETHYLBENZENE                                  CAS#    95-63-6
  Vapor Pressure :  2.10        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000095-95-4 Name: 2,4,5-TRICHLOROPHENOL

```
*****************************************************************************
MELT    2,4,5-TRICHLOROPHENOL                                   CAS#    95-95-4
  Melting Point  :  68          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  FREITER,ER (1978A)
*****************************************************************************

VP      2,4,5-TRICHLOROPHENOL                                   CAS#    95-95-4
  Vapor Pressure :  0.02        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BIDLEMAN,TF & RENBERG,L (1985)
*****************************************************************************
```

BIDLEMAN,TF & RENBERG,L (1985)
BIDLEMAN,T.F.; RENBERG,L.; DETERMINATION OF VAPOR PRESSURES FOR CHLOROGUAIACOLS, CHLOROVERATROLES, AND NONYLPHENOL BY GAS CHROMATOGRAPHY.; CHEMOSPHERE; 14:1475-81; 1985

FREITER,ER (1978A)
FREITER,E.R.; CHLOROPHENOLS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD NEW YORK,NY; WILEY INTERSCIENCE. 5:864-72; 1978A

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000098-06-6
Chem Name  : T-BUTYLBENZENE
Mol Formula: C10H14
Mol Weight : 134.22
Melting Pt : -57.8 deg C
Boiling Pt : 169.1 deg C
Water Solubility:
   Value : 29.5 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 4.11
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2.2 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : CHAO,J ET AL. (1983)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0132 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 4.6E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CAS #: 000098-07-7 Name: BENZOTRICHLORIDE

```
*****************************************************************************
MELT    BENZOTRICHLORIDE                                    CAS#    98-07-7
  Melting Point  :  -4.75       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  GELFAND,S (1979)
*****************************************************************************

VP      BENZOTRICHLORIDE                                    CAS#    98-07-7
  Vapor Pressure :  .98E 00     TORR        MEASURED
  Temperature (C):  45.8
  Abbrev. Ref.   :  GELFAND,S (1979)
*****************************************************************************

VP      BENZOTRICHLORIDE                                    CAS#    98-07-7
  Vapor Pressure :  0.20        MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA BEGINNING AT 45.8 DEG C
  Abbrev. Ref.   :  PERRY,RH & GREEN,D (1984)
*****************************************************************************

VP      BENZOTRICHLORIDE                                    CAS#    98-07-7
  Vapor Pressure :  0.470       MM HG
  Remarks        :  EVALUATED DATABASE - SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

GELFAND,S (1979)
GELFAND,S.; BENZYLCHLORIDE, BENZALCHLORIDE, AND BENZOTRICHLORIDE.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 5:828-38.; 1979

PERRY,RH & GREEN,D (1984)
PERRY,R.H.; GREEN,D.; PERRY'S CHEMICAL HANDBOOK. PHYSICAL AND CHEMICAL DATA NEW YORK,NY: MCGRAW HILL. 6TH ED.; 1984

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Cumene

CAS Number: 000098-82-8

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-1	mg/kg/day	IRIS
Inhal RfD:	1.1E-1	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	1.4E+3	mg/kg	ACGIH
Dermal LD50:	3.2E+3	mg/kg	ACGIH
Gas Inhal LC50:	2.0E+3	ppm	ACGIH
Dust Inhal LC50:	8.3E+0	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.7E+3	µg/L	ECOTOX
Salt Ecol LC50:	1.1E+5	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	9.6E+1	days	THOMAS
Photolysis:		days	
Biodeg:	1.9E+1	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.0E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.9E+1	days	CHEMFATE
Radio:		days	
Log Kow:	3.7E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.2E+2	
Density:	8.6E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.5E+0	Torr	CHEMFATE
Henry's Law:	1.2E+0	atm-m3/mol	CHEMFATE
Water Solub:	6.1E+1	mg/L	CHEMFATE
Distrib Coef:	6.0E+2	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	3.7E+0		CHEMFATE
Water Solub:	6.1E+1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-9.6E+1	C
Boiling Point:	1.5E+2	C
Formula:	C9 H12	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

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CAS #: 000098-82-8 Name: CUMENE

```
*****************************************************************************
MELT    CUMENE                                              CAS#    98-82-8
  Melting Point  :  -96.033     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      CUMENE                                              CAS#    98-82-8
  Vapor Pressure :  .1694E+01   .4583E+01   .1099E+02   TORR        CALCULATED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  CALC FROM ANTOINE EQN
  Abbrev. Ref.   :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP      CUMENE                                              CAS#    98-82-8
  Vapor Pressure :  4.50        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

ZWOLINSKI,BJ & WILHOIT,RC (1971)
ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000098-83-9
Chem Name  : ALPHA-METHYLSTYRENE
Mol Formula: C9H10
Mol Weight : 118.18
Melting Pt : -23.2 deg C
Boiling Pt : 165.4 deg C
Water Solubility:
   Value : 116 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 3.48
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 1.9 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : BOUBLIK,T ET AL. (1984)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00255 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 5.2E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000098-83-9 Name: ALPHA-METHYLSTYRENE

```
*****************************************************************************
VP      ALPHA-METHYLSTYRENE                                  CAS#    98-83-9
  Vapor Pressure :  .2500E 01   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  DREISBACH,RR (1955)
*****************************************************************************

VP      ALPHA-METHYLSTYRENE                                  CAS#    98-83-9
  Vapor Pressure :  .290E 01    .2335E 02   .13275E 03  TORR        MEASURED
  Temperature (C):  32.010      70.200      112.350
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1973)
*****************************************************************************

VP      ALPHA-METHYLSTYRENE                                  CAS#    98-83-9
  Vapor Pressure :  .1E 01      TORR        MEASURED
  Temperature (C):  7.4
  Abbrev. Ref.   :  DORIGAN,J ET AL. (1976)
*****************************************************************************
```

BOUBLIK,T ET AL. (1973)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOUR PRESSURES OF PURE SUBSTANCES.; N YORK, NY: ELSEVIER SCIENTIFIC PUB. CO. 626 PP.; 1973

DORIGAN,J ET AL. (1976)
DORIGAN,J.; FULLER,B.; DUFFY,R.; PRELIMINARY SCORING OF SELECTED ORGANIC AI POLLUTANTS. APPENDIX III-CHEMISTRY, PRODUCTION, AND TOXICITY OF CHEMICALS F THROUGH N.; EPA-450/3-77-008D. RESEARCH TRIANGLE PARK,NC: U.S. EPA. PP.303 1976

DREISBACH,RR (1955)
DREISBACH,R.R.; PHYSICAL PROPERTIES OF CHEMICAL COMPOUNDS. I.; ADVANCES IN CHEMISTRY SERIES NO. 15.; WASHINGTON, DC: AMERICAN CHEMICAL SOCIETY.; 1955

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000098-95-3 Name: NITROBENZENE

```
*****************************************************************************
MELT    NITROBENZENE                                          CAS#    98-95-3
  Melting Point  :  5.76        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      NITROBENZENE                                          CAS#    98-95-3
  Vapor Pressure :  0.245       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dinitrobenzene, 1,3-
CAS Number: 000099-65-0

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-4	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	5.0E+0	mg/kg	ACGIH
Dermal LD50:	1.9E+3	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.2E+3	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	2.6E+2	days	THOMAS
Photolysis:	2.3E+1	days	CHEMFATE
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.4E+2	days	THOMAS
Photolysis:	2.3E+1	days	CHEMFATE
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	1.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.7E+2	
Density:	1.6E+0	g/mL @ 18.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	9.0E-4	Torr	CHEMFATE
Henry's Law:	2.3E-7	atm-m3/mol	CHEMFATE
Water Solub:	8.6E+2	mg/L	CHEMFATE
Distrib Coef:	4.4E+0	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	1.5E+0		CHEMFATE
Water Solub:	8.6E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	9.0E+1	C
Boiling Point:	2.9E+2	C
Formula:	C6 H4 N2 O4	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000099-65-0 Name: 1,3-DINITROBENZENE

```
*****************************************************************************
MELT    1,3-DINITROBENZENE                                    CAS#    99-65-0
  Melting Point  :  89-90       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1,3-DINITROBENZENE                                    CAS#    99-65-0
  Vapor Pressure :  9.0E-4      MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM EXPERIMENTAL DATA BETWEEN 252 - 294 DEG
                    AND CONVERTED TO THE SOLID PHASE (SRC,1988), SRC RECOMMEND
                    VALUE
  Abbrev. Ref.   :  MAKSIMOV,YY (1968)
*****************************************************************************
```

MAKSIMOV,YY (1968)
MAKSIMOV,Y.Y.; VAPOR PRESSURES OF AROMATIC NITRO COMPOUNDS AT VARIOUS TEMPERATURES.; ZH. FIZ. KHIM.; 42:2921-5.; 1968

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Metals (Metal)

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 007723-14-0
Chem Name  : PHOSPHORUS
Mol Formula: H3P
Mol Weight : 34.00
Melting Pt : 44.1 deg C
Boiling Pt : 280 deg C
Water Solubility:
   Value : 2.05E+005 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : -0.27
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 6.78E-009 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0244 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Non-aromatic Halogenated Hydrocarbons (NAHH)

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 010061-01-5
Chem Name  : 1,3-DICHLOROPROPENE, (Z)
Mol Formula: C3H4Cl2
Mol Weight : 110.97
Melting Pt : -50 deg C
Boiling Pt : 104.3 deg C
Water Solubility:
   Value : 2180 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : TOMLIN,C (1997)
Log P (octanol-water):
   Value : 2.06
   Type  : EXP
   Ref   : TOMLIN,C (1997)
Vapor Pressure:
   Value : 26.3 mm Hg
   Temp  : 20 deg C
   Type  : EXP
   Ref   : TOMLIN,C (1997)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00271 atm-m3/mole
   Temp  : 20 deg C
   Type  : EXP
   Ref   : LEISTRA,M (1970)
Atmospheric OH Rate Constant:
   Value : 8.4E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KWOK,ESC & ATKINSON,R (1994)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 010061-02-6
Chem Name  : 1,3-DICHLOROPROPENE (TRANS)
Mol Formula: C3H4Cl2
Mol Weight : 110.97
Melting Pt :
Boiling Pt : 112 deg C
Water Solubility:
   Value : 2800 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : VERSCHUEREN,K (2001)
Log P (octanol-water):
   Value : 2.03
   Type  : EXP
   Ref   : TOMLIN,C (1997)
Vapor Pressure:
   Value : 34 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : VERSCHUEREN,K (2001)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000871 atm-m3/mole
   Temp  : 20 deg C
   Type  : EXP
   Ref   : LEISTRA,M (1970)
Atmospheric OH Rate Constant:
   Value : 1.4E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KWOK,ESC & ATKINSON,R (1994)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-05-1 Name: 3-CHLOROPROPENE

```
*****************************************************************************
MELT    3-CHLOROPROPENE                                        CAS#   107-05-1
  Melting Point  :  -134.5      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      3-CHLOROPROPENE                                        CAS#   107-05-1
  Vapor Pressure :  367.9       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000124-48-1 Name: CHLORODIBROMOMETHANE

```
*****************************************************************************
MELT    CHLORODIBROMOMETHANE                                  CAS#   124-48-1
  Melting Point  :  -22          DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      CHLORODIBROMOMETHANE                                  CAS#   124-48-1
  Vapor Pressure :  8.99         MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      CHLORODIBROMOMETHANE                                  CAS#   124-48-1
  Vapor Pressure :  4.9          MM HG
  Remarks        :  CALCULATED BY HENL X WSOL. SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (NA--)
*****************************************************************************


   ALDRICH (1988)
   ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989;  MILWAUKEE, WI:
   ALDRICH CHEM CO.; 1988

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

   SRC (NA--)
   SRC; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES.;   NA--

End of Search
```

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dichloroethane, 1,2-
CAS Number: 000107-06-2

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	9.1E-2	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:	9.1E-2	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2		
Oral ED10:	7.7E+0	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	7.7E+0	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	7.7E+2	mg/kg	ACGIH
Dermal LD50:	2.8E+3	mg/kg	RTECS
Gas Inhal LC50:	1.0E+3	ppm	RTECS
Dust Inhal LC50:	5.0E+0	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.0E+5	µg/L	ECOTOX
Salt Ecol LC50:	1.1E+5	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.8E+7	days	CHEMFATE
Volatility:	8.7E+1	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.8E+7	days	CHEMFATE
Volatility:	9.6E-1	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	1.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	9.9E+1	
Density:	1.2E+0	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	7.9E+1	Torr	CHEMFATE
Henry's Law:	9.8E-4	atm-m3/mol	CHEMFATE
Water Solub:	8.5E+3	mg/L	CHEMFATE
Distrib Coef:	3.5E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	2.0E+0		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	2.0E+0		ECOTOX
Salt BCF:			
Log Kow:	1.5E+0		CHEMFATE
Water Solub:	8.5E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-3.6E+1	C
Boiling Point:	8.4E+1	C
Formula:	C2 H4 Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-06-2 Name: 1,2-DICHLOROETHANE

```
*****************************************************************************
MELT    1,2-DICHLOROETHANE                                  CAS#   107-06-2
  Melting Point  :  -35.66      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      1,2-DICHLOROETHANE                                  CAS#   107-06-2
  Vapor Pressure :  .3900E+02   .8200E+02   .1550E+03   TORR        MEASURED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  GALLANT,RW (1966A)
*****************************************************************************

VP      1,2-DICHLOROETHANE                                  CAS#   107-06-2
  Vapor Pressure :  78.9        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER;RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

GALLANT,RW (1966A)
GALLANT,R.W.; PHYSICAL PROPERTIES OF HYDROCARBONS. VII.CHLORINATED ALIPHATICS.; HYDROCARBON PROCESS.; 45:111-18.; 1966A

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Tetrachloroethylene
CAS Number: 000127-18-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:	5.2E-2	(mg/kg/day)^-1	LIVECHEM
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:	3.4E+0	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	3.4E+0	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	3.0E+3	mg/kg	ACGIH
Dermal LD50:	3.2E+3	mg/kg	RTECS
Gas Inhal LC50:	4.0E+3	ppm	ACGIH
Dust Inhal LC50:	3.4E+1	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.1E+2	days	THOMAS
Photolysis:	8.4E+1	days	CHEMFATE
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.2E+0	days	THOMAS
Photolysis:	8.4E+1	days	CHEMFATE
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
Log Kow:	3.4E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.7E+2	
Density:	1.6E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.9E+1	Torr	CHEMFATE
Henry's Law:	1.8E-2	atm-m3/mol	CHEMFATE
Water Solub:	2.0E+2	mg/L	CHEMFATE
Distrib Coef:	3.1E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	4.9E+1		VER_BCF
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	4.9E+1		VER_BCF
Salt BCF:			
Log Kow:	3.4E+0		CHEMFATE
Water Solub:	2.0E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-2.2E+1	C
Boiling Point:	1.2E+2	C
Formula:	C2 Cl4	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000127-18-4 Name: TETRACHLOROETHYLENE

```
*****************************************************************************
MELT    TETRACHLOROETHYLENE                                  CAS#   127-18-4
  Melting Point  :  -22.35      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      TETRACHLOROETHYLENE                                  CAS#   127-18-4
  Vapor Pressure :  .8100E+01   .1860E+02   .4000E+02   TORR        MEASURED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  GALLANT,RW (1966)
*****************************************************************************

VP      TETRACHLOROETHYLENE                                  CAS#   127-18-4
  Vapor Pressure :  18.55       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

GALLANT,RW (1966)
GALLANT,R.W.; PHYSICAL PROPERTIES OF HYDROCARBONS. VI. CHLORINATED ETHYLENE HYDROCARBON PROCESS.; 45:153-60.; 1966

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dichloroethylene, cis-1,2-
CAS Number: 000156-59-2

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-2	mg/kg/day	HEAST
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:	1.4E+4	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	8.7E+1	days	THOMAS
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.4E-1	days	THOMAS
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:	1.9E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	9.7E+1	
Density:	1.3E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.0E+2	Torr	CHEMFATE
Henry's Law:	4.1E-3	atm-m3/mol	CHEMFATE
Water Solub:	3.5E+3	mg/L	CHEMFATE
Distrib Coef:	7.1E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	1.9E+0		CHEMFATE
Water Solub:	3.5E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-8.0E+1	C
Boiling Point:	6.0E+1	C
Formula:	C2 H2 Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000156-59-2 Name: 1,2-DICHLOROETHYLENE (CIS)

```
*****************************************************************************
MELT    1,2-DICHLOROETHYLENE (CIS)                          CAS#   156-59-2
  Melting Point  :  -80.1       DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DEAN,JA (1985)
*****************************************************************************

VP      1,2-DICHLOROETHYLENE (CIS)                          CAS#   156-59-2
  Vapor Pressure :  201         MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM THE TEMPERATURE RANGE 19.2 TO 62 DEG C,
                    SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      1,2-DICHLOROETHYLENE (CIS)                          CAS#   156-59-2
  Vapor Pressure :  202.886     MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

DEAN,JA (1985)
DEAN,J.A.; LANGE'S HANDBOOK OF CHEMISTRY 13TH ED.; NY, NY: MCGRAW-HILL BOO CO.; 1985

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dichloroethylene, trans-1,2-
CAS Number: 000156-60-5

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	1.3E+3	mg/kg	ACGIH
Dermal LD50:	5.0E+3	mg/kg	RTECS
Gas Inhal LC50:	2.2E+4	ppm	ACGIH
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.7E+5	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	8.7E+1	days	THOMAS
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.3E-1	days	THOMAS
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:	2.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	9.7E+1	
Density:	1.3E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	3.3E+2	Torr	CHEMFATE
Henry's Law:	9.4E-3	atm-m3/mol	CHEMFATE
Water Solub:	6.3E+3	mg/L	CHEMFATE
Distrib Coef:	1.0E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.1E+0		CHEMFATE
Water Solub:	6.3E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-5.0E+1	C
Boiling Point:	4.9E+1	C
Formula:	C2 H2 Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000156-60-5 Name: 1,2-DICHLOROETHYLENE (TRANS)

```
*****************************************************************************
MELT    1,2-DICHLOROETHYLENE (TRANS)                        CAS#   156-60-5
  Melting Point  :  -49.8       DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DEAN,JA (1985)
*****************************************************************************

VP      1,2-DICHLOROETHYLENE (TRANS)                        CAS#   156-60-5
  Vapor Pressure :  331         MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM TEMP RANGE 0.7 TO 46.7 DEG C, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      1,2-DICHLOROETHYLENE (TRANS)                        CAS#   156-60-5
  Vapor Pressure :  333.24      MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

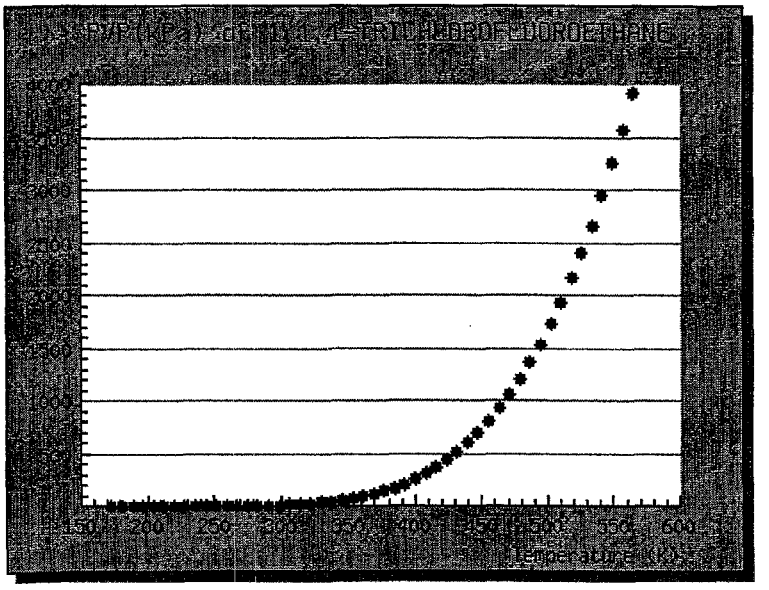
DEAN,JA (1985)
DEAN,J.A.; LANGE'S HANDBOOK OF CHEMISTRY 13TH ED.; NY, NY: MCGRAW-HILL BOO CO.; 1985

End of Search

Temperature Dependent Properties

CAS: 27154-33-2

[PVP] Vapor pressure of 1,1,1-TRICHLOROFLUOROETHANE



Equation Name	KDB Correlation Equation	
Equation	ln(Pvp) = A*ln(T) + B/T + C + D*T^2 where Pvp in kPa, T in K	
Coefficient A	-5.953147E+00	
Coefficient B	-5.846863E+03	
Coefficient C	5.526425E+01	
Coefficient D	3.384266E-06	
Coefficient E		
Coefficient F		
Coefficient G		
T range , from	173.00	K
T range , to	565.00	K

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000506-68-3
Chem Name  : CYANOGEN BROMIDE
Mol Formula: CBrN
Mol Weight : 105.93
Melting Pt : 52 deg C
Boiling Pt : 61.5 deg C
Water Solubility:
   Value : 1.08E+005 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : -0.29
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 122 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : OHE,S (1976)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000506-77-4 Name: CYANOGEN CHLORIDE

```
*****************************************************************************
VP      CYANOGEN CHLORIDE                                    CAS#   506-77-4
  Vapor Pressure :  1.225E+03   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000506-77-4
Chem Name  : CYANOGEN CHLORIDE
Mol Formula: CClN
Mol Weight : 61.47
Melting Pt : -6.5 deg C
Boiling Pt : 13 deg C
Water Solubility:
   Value : 6E+004 mg/L
   Temp  : 0 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : -0.38
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 1230 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0245 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000540-59-0 Name: 1,2-DICHLOROETHYLENE

```
*****************************************************************************
MELT    1,2-DICHLOROETHYLENE                                CAS#   540-59-0
  Melting Point  :  -57         DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      1,2-DICHLOROETHYLENE                                CAS#   540-59-0
  Vapor Pressure :  201-331     MM HG
  Temperature (C):  25
  Remarks        :  RANGE DEFINED BY VALUES FOR CIS & TRANS ISOMERS, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dichloropropene, 1,3-
CAS Number: 000542-75-6

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-2	mg/kg/day	IRIS
Inhal RfD:	5.7E-3	mg/kg/day	IRIS
Oral Slope:	1.0E-1	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:	1.4E-2	(mg/kg/day)^-1	HEAST
Inhal Wt-of-Evid:	B2		
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	4.7E+2	mg/kg	ACGIH
Dermal LD50:	5.0E+2	mg/kg	ACGIH
Gas Inhal LC50:	1.0E+3	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.1E+2	µg/L	ECOTOX
Salt Ecol LC50:	7.0E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.1E+1	days	FATERATE
Volatility:	9.3E+1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.1E+1	days	FATERATE
Volatility:	1.0E+0	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
Log Kow:	1.6E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.1E+2	
Density:	1.2E+0	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	3.4E+1	Torr	CHEMFATE
Henry's Law:	1.8E-2	atm-m3/mol	CHEMFATE
Water Solub:	2.8E+3	mg/L	CHEMFATE
Distrib Coef:	9.1E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	1.6E+0		CHEMFATE
Water Solub:	2.8E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:		C
Boiling Point:	1.1E+2	C
Formula:	C3 H4 Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000542-75-6 Name: 1,3-DICHLOROPROPYLENE

```
*****************************************************************************
MELT    1,3-DICHLOROPROPYLENE                                CAS#   542-75-6
  Melting Point  :  -48          DEGC
  Remarks        :  ESTIMATED BY EQUATION 20 IN NEELY,WB & BLAU,GE (1985), SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      1,3-DICHLOROPROPYLENE                                CAS#   542-75-6
  Vapor Pressure :  34           MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DILLING,WL (1977)
*****************************************************************************
```

DILLING,WL (1977)
DILLING,W.L.; INTERPHASE TRANSFER PROCESSES. II. EVAPORATION RATES OF CHLOROMETHANES, ETHANES, ETHYLENES, PROPANES, AND PROPYLENES FROM DILUTE AQUEOUS SOLUTIONS. COMPARISONS WITH THEORETICAL PREDICTIONS.; ENVIRON. SCI. TECHNOL.; 11:405-9.; 1977

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Carbon tetrachloride
CAS Number: 000056-23-5

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	7.0E-4	mg/kg/day	IRIS
Inhal RfD:	5.7E-3	mg/kg/day	STSC
Oral Slope:	1.3E-1	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:	5.2E-2	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2		
Oral ED10:	1.7E-2	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	1.7E-2	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	2.3E+3	mg/kg	ACGIH
Dermal LD50:	1.5E+4	mg/kg	ACGIH
Gas Inhal LC50:	7.3E+3	ppm	ACGIH
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.0E+3	µg/L	ECOTOX
Salt Ecol LC50:	5.0E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	2.6E+6	days	CHEMFATE
Volatility:	1.1E+2	days	THOMAS
Photolysis:	1.1E+3	days	CHEMFATE
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	2.6E+6	days	CHEMFATE
Volatility:	1.2E+0	days	THOMAS
Photolysis:	1.1E+3	days	CHEMFATE
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
Log Kow:	2.8E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.5E+2	
Density:	1.6E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.2E+2	Torr	CHEMFATE
Henry's Law:	3.0E-2	atm-m3/mol	CHEMFATE
Water Solub:	7.9E+2	mg/L	CHEMFATE
Distrib Coef:	3.5E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	3.0E+1		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	3.0E+2		ECOTOX
Salt BCF:			
Log Kow:	2.8E+0		CHEMFATE
Water Solub:	7.9E+2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-2.3E+1	C
Boiling Point:	7.7E+1	C
Formula:	C Cl4	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000056-23-5 Name: CARBON TETRACHLORIDE

```
*****************************************************************************
MELT    CARBON TETRACHLORIDE                                  CAS#    56-23-5
  Melting Point  :  -23          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      CARBON TETRACHLORIDE                                  CAS#    56-23-5
  Vapor Pressure :  .115E 03     TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  FROM JOHN,R. (1976)
  Abbrev. Ref.   :  ROGERS,RD & MCFARLANE,JC (1981)
*****************************************************************************

VP      CARBON TETRACHLORIDE                                  CAS#    56-23-5
  Vapor Pressure :  .5200E+02    .1090E+03    .1990E+03   TORR        MEASURED
  Temperature (C):  10.0         25.0         40.0
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  GALLANT,RW (1966B)
*****************************************************************************

VP      CARBON TETRACHLORIDE                                  CAS#    56-23-5
  Vapor Pressure :  115          MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      CARBON TETRACHLORIDE                                  CAS#    56-23-5
  Vapor Pressure :  114          MM HG        MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA,

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

GALLANT,RW (1966B)
GALLANT,R.W.; PHYSICAL PROPERTIES OF HYDROCARBONS. V. CHLORINATED METHANES. HYDROCARBON PROCESS.; 45:161-9.; 1966B

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

ROGERS,RD & MCFARLANE,JC (1981)
ROGERS,R.D.; MCFARLANE,J.C.; SORPTION OF CARBON TETRACHLORIDE, ETHYLENE DIBROMIDE AND TRICHLOROETHYLENE IN SOIL AND CLAY.; ENVIRON. MONIT. ASSESS.; 1:155-8.; 1981

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000593-60-2 Name: BROMOETHYLENE

```
*****************************************************************************
MELT    BROMOETHYLENE                                          CAS#   593-60-2
  Melting Point  :  -139.54     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC (1972)
*****************************************************************************

VP      BROMOETHYLENE                                          CAS#   593-60-2
  Vapor Pressure :  1033        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************
```

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

WEAST,RC (1972)
WEAST,R.C.; HANDBOOK OF CHEMISTRY AND PHYSICS, 53RD ED.; CLEVELAND, OH: TH CHEMICAL RUBBER COMPANY.; 1972

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000630-20-6 Name: 1,1,1,2-TETRACHLOROETHANE

```
*****************************************************************************
MELT    1,1,1,2-TETRACHLOROETHANE                          CAS#   630-20-6
  Melting Point  :  -68.7       DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ARCHER,WL (1979)
*****************************************************************************

VP      1,1,1,2-TETRACHLOROETHANE                          CAS#   630-20-6
  Vapor Pressure :  12.03       MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM TEMP RANGE 59.3-130.2 DEG C
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      1,1,1,2-TETRACHLOROETHANE                          CAS#   630-20-6
  Vapor Pressure :  1.203E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

ARCHER,WL (1979)
ARCHER,W.L.; OTHER CHLOROETHANES.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 5:722-42.; 1979

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Chloroform
CAS Number: 000067-66-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:	8.1E-2	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2		
Oral ED10:	5.1E-1	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	5.1E-1	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	3.6E+1	mg/kg	RTECS
Dermal LD50:	2.0E+4	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:	4.9E+4	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	8.5E+3	µg/L	ECOTOX
Salt Ecol LC50:	2.8E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.3E+6	days	CHEMFATE
Volatility:	9.6E+1	days	THOMAS
Photolysis:	1.6E+2	days	CHEMFATE
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.3E+6	days	CHEMFATE
Volatility:	1.0E+0	days	THOMAS
Photolysis:	1.6E+2	days	CHEMFATE
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	2.0E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value
Metal Contain:	No
Organic:	Yes
Gas:	Yes
Particulate:	No
Radionuclide:	No
Rad. Element:	No
Molecular Weight:	1.2E+2
Density:	1.5E+0 g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.0E+2	Torr	CHEMFATE
Henry's Law:	3.7E-3	atm-m3/mol	CHEMFATE
Water Solub:	7.9E+3	mg/L	CHEMFATE
Distrib Coef:	8.0E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	6.0E+0		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	6.9E+2		ECOTOX
Salt BCF:			
Log Kow:	2.0E+0		CHEMFATE
Water Solub:	7.9E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-6.4E+1	C
Boiling Point:	6.1E+1	C
Formula:	C H Cl3	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000067-66-3 Name: CHLOROFORM

```
*****************************************************************************
MELT    CHLOROFORM                                          CAS#    67-66-3
  Melting Point  :  -63.52      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      CHLOROFORM                                          CAS#    67-66-3
  Vapor Pressure :  .9700E+02   .2460E+03   .3620E+03   TORR        MEASURED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  GALLANT,RW (1966B)
*****************************************************************************

VP      CHLOROFORM                                          CAS#    67-66-3
  Vapor Pressure :  .200E 03    TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  THIBODEAUX,LJ (1981)
*****************************************************************************

VP      CHLOROFORM                                          CAS#    67-66-3
  Vapor Pressure :  197         MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      CHLOROFORM                                          CAS#    67-66-3
  Vapor Pressure :  197.3       MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

GALLANT,RW (1966B)
GALLANT,R.W.; PHYSICAL PROPERTIES OF HYDROCARBONS. V. CHLORINATED METHANES. HYDROCARBON PROCESS.; 45:161-9.; 1966B

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

THIBODEAUX,LJ (1981)
THIBODEAUX,L.J.; ESTIMATING THE AIR EMISSIONS OF CHEMICALS FROM HAZARDOUS WASTE LANDFILLS.; J. HAZARDOUS MATERIALS; 4:235-44.; 1981

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000684-16-2 Name: HEXAFLUORO-2-PROPANONE

```
*****************************************************************************
VP      HEXAFLUORO-2-PROPANONE                                  CAS#   684-16-2
  Vapor Pressure :  5.000E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000684-16-2
Chem Name  : HEXAFLUORO-2-PROPANONE
Mol Formula: C3F6O
Mol Weight : 166.02
Melting Pt : -125 deg C
Boiling Pt : -27.4 deg C
Water Solubility:
   Value : 3640 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 1.46
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2230 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00307 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Trichloroethane, 1,1,1-
CAS Number: 000071-55-6

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:	6.3E-1	mg/kg/day	STSC
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	5.7E+3	mg/kg	ACGIH
Dermal LD50:	1.6E+4	mg/kg	ACGIH
Gas Inhal LC50:	3.9E+3	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	3.5E+4	µg/L	ECOTOX
Salt Ecol LC50:	3.1E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.8E+2	days	CHEMFATE
Volatility:	1.0E+2	days	THOMAS
Photolysis:		days	
Biodeg:	2.7E+2	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.8E+2	days	CHEMFATE
Volatility:	1.1E+0	days	THOMAS
Photolysis:		days	
Biodeg:	2.7E+2	days	CHEMFATE
Radio:		days	
Log Kow:	2.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.3E+2	
Density:	1.3E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.2E+2	Torr	CHEMFATE
Henry's Law:	1.7E-2	atm-m3/mol	CHEMFATE
Water Solub:	1.3E+3	mg/L	CHEMFATE
Distrib Coef:	2.2E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	9.0E+0		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	9.0E+0		ECOTOX
Salt BCF:			
Log Kow:	2.5E+0		CHEMFATE
Water Solub:	1.3E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-3.0E+1	C
Boiling Point:	7.4E+1	C
Formula:	C2 H3 Cl3	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000071-55-6 Name: 1,1,1-TRICHLOROETHANE

```
*****************************************************************************
MELT    1,1,1-TRICHLOROETHANE                                CAS#    71-55-6
  Melting Point  :  -30.4       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      1,1,1-TRICHLOROETHANE                                CAS#    71-55-6
  Vapor Pressure :  .1000E+03   .2380E+03   TORR        MEASURED
  Temperature (C):  20.0        40.0
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  ARCHER,WL (1979)
*****************************************************************************

VP      1,1,1-TRICHLOROETHANE                                CAS#    71-55-6
  Vapor Pressure :  124         MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      1,1,1-TRICHLOROETHANE                                CAS#    71-55-6
  Vapor Pressure :  123.733     MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

ARCHER,WL (1979)
ARCHER,W.L.; OTHER CHLOROETHANES.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 5:722-42.; 1979

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)

RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000074-83-9 Name: METHYL BROMIDE

```
*****************************************************************************
MELT    METHYL BROMIDE                                          CAS#    74-83-9
  Melting Point  :  -94.07      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      METHYL BROMIDE                                          CAS#    74-83-9
  Vapor Pressure :  .1400E 04   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  NEELY,WB (1976)
*****************************************************************************

VP      METHYL BROMIDE                                          CAS#    74-83-9
  Vapor Pressure :  .9495E 03   .1615E 04   TORR        MEASURED
  Temperature (C):  10.         25.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  DAELEMANS,A & SIEBERING,H (1977)
*****************************************************************************

VP      METHYL BROMIDE                                          CAS#    74-83-9
  Vapor Pressure :  1616        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAELEMANS,A & SIEBERING,H (1977)
DAELEMANS,A.; SIEBERING,H.; DISTRIBUTION OF METHYL BROMIDE OVER THE PHASES SOIL.; MEDED. FAC. LANDBOUWWET., RIJKSUNIV. GENT.; 42:1729-38.; 1977

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

NEELY,WB (1976)
NEELY,W.B.; PREDICTING THE FLUX OF ORGANICS ACROSS THE AIR/WATER INTERFACE. CONTROL HAZARD MATER. SPILLS, PROC. NAT. CONF. 3RD. PP 197-200.; 1976

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000074-87-3 Name: METHYL CHLORIDE

```
*****************************************************************************
MELT    METHYL CHLORIDE                                        CAS#    74-87-3
  Melting Point  :  -97.70      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      METHYL CHLORIDE                                        CAS#    74-87-3
  Vapor Pressure :  .1918E 04   .3670E 04   .6387E 04   TORR        MEASURED
  Temperature (C):  0.          20.         40.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  AHLSTROM,RCJR & STEELE,JM (1979)
*****************************************************************************

VP      METHYL CHLORIDE                                        CAS#    74-87-3
  Vapor Pressure :  4300        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

AHLSTROM,RCJR & STEELE,JM (1979)
AHLSTROM,R.C. JR.; STEELE,J.M.; METHYL CHLORIDE.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 5:677-85.; 1979

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000074-88-4 Name: METHYL IODIDE

```
*****************************************************************************
MELT    METHYL IODIDE                                          CAS#    74-88-4
  Melting Point  :  -66.45      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      METHYL IODIDE                                          CAS#    74-88-4
  Vapor Pressure :  405         MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      METHYL IODIDE                                          CAS#    74-88-4
  Vapor Pressure :  404.46      MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000074-95-3 Name: DIBROMOMETHANE

```
*****************************************************************************
MELT    DIBROMOMETHANE                                        CAS#    74-95-3
  Melting Point  :  -52.7        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      DIBROMOMETHANE                                        CAS#    74-95-3
  Vapor Pressure :  44.4         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  KUDCHADKER,AP ET AL. (1979)
*****************************************************************************
```

KUDCHADKER,AP ET AL. (1979)
KUDCHADKER,A.P.; KUDCHADKER,S.A.; SHUKLA,R.P.; PATNAIK,P.R.; VAPOR PRESSURE AND BOILING POINTS OD SELECTED HALOMETHANES.; J. PHYS. CHEM. REF. DATA.; 8:499-517.; 1979

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000074-97-5
Chem Name  : CHLOROBROMOMETHANE
Mol Formula: CH2BrCl
Mol Weight : 129.38
Melting Pt : -87.9 deg C
Boiling Pt : 68 deg C
Water Solubility:
   Value : 1.67E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.41
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 143 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00146 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 8.8E-014 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DEMORE,WB (1996)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Ethyl chloride
CAS Number: 000075-00-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:	2.9E+0	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:	6.1E+4	ppm	ACGIH
Dust Inhal LC50:	1.2E+5	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	3.8E+1	days	FATERATE
Volatility:	1.8E-1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	3.8E+1	days	FATERATE
Volatility:	1.8E-1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
Log Kow:	1.4E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	6.5E+1	
Density:	8.9E-1	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.0E+3	Torr	CHEMFATE
Henry's Law:	8.8E-3	atm-m3/mol	CHEMFATE
Water Solub:	5.7E+3	mg/L	CHEMFATE
Distrib Coef:	3.2E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	1.4E+0		CHEMFATE
Water Solub:	5.7E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-1.4E+2	C
Boiling Point:	1.2E+1	C
Formula:	C2 H5 Cl	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-00-3 Name: CHLOROETHANE

```
*****************************************************************************
MELT    CHLOROETHANE                                          CAS#    75-00-3
  Melting Point  :  -136.4      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      CHLOROETHANE                                          CAS#    75-00-3
  Vapor Pressure :  1008        MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Vinyl chloride
CAS Number: 000075-01-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-3	mg/kg/day	IRIS
Inhal RfD:	2.9E-2	mg/kg/day	IRIS
Oral Slope:	1.5E+0	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	A		
Inhal Slope:	3.1E-2	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	A		
Oral ED10:	5.5E-2	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	A		
Inhal ED10:	5.5E-2	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	A		
Oral LD50:	5.0E+2	mg/kg	RTECS
Dermal LD50:		mg/kg	
Gas Inhal LC50:	1.8E+1	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.7E-1	days	THOMAS
Photolysis:	7.5E-1	days	CHEMFATE
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.7E-1	days	THOMAS
Photolysis:	7.5E-1	days	CHEMFATE
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	1.4E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	6.3E+1	
Density:	9.1E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	3.0E+3	Torr	CHEMFATE
Henry's Law:	2.7E-2	atm-m3/mol	CHEMFATE
Water Solub:	8.8E+3	mg/L	CHEMFATE
Distrib Coef:	3.7E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	1.4E+0		CHEMFATE
Water Solub:	8.8E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-1.5E+2	C
Boiling Point:	-1.3E+1	C
Formula:	C2 H3 Cl	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-01-4 Name: VINYL CHLORIDE

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*****************************************************************************
MELT    VINYL CHLORIDE                                          CAS#    75-01-4
  Melting Point  :  -153.8      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      VINYL CHLORIDE                                          CAS#    75-01-4
  Vapor Pressure :  .2660E 04   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  VERSCHUEREN,K (1983)
*****************************************************************************

VP      VINYL CHLORIDE                                          CAS#    75-01-4
  Vapor Pressure :  2958        TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  EXTRAPULATED FROM MEASURED DATA USING ANTOINE EQUATION
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      VINYL CHLORIDE                                          CAS#    75-01-4
  Vapor Pressure :  .2320E 04   TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  PEARSON,CR & MCCONNELL,G (1975)
*****************************************************************************

VP      VINYL CHLORIDE                                          CAS#    75-01-4
  Vapor Pressure :  2981.6      MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

MERCK INDEX (1983)

MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

PEARSON,CR & MCCONNELL,G (1975)
PEARSON,C.R.; MCCONNELL,G.; CHLORINATED C1 AND C2 HYDROCARBONS IN THE MARIN ENVIRONMENT.; PROC. ROY. SOC. LONDON SER. B.; 189:305-32.; 1975

VERSCHUEREN,K (1983)
VERSCHUEREN,K.; HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS. 2ND ED NEW YORK,NY: VAN NOSTRAND REINHOLD CO. INC.; 1983

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Methylene chloride (dichloromethane) **CAS Number:** 000075-09-2

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	6.0E-2	mg/kg/day	IRIS
Inhal RfD:	8.6E-1	mg/kg/day	HEAST
Oral Slope:	7.5E-3	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:	1.6E-3	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2		
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	2.0E+3	mg/kg	ACGIH
Dermal LD50:		mg/kg	
Gas Inhal LC50:	1.2E+4	ppm	ACGIH
Dust Inhal LC50:	7.3E+4	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.4E+5	µg/L	ECOTOX
Salt Ecol LC50:	8.9E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	2.6E+5	days	CHEMFATE
Volatility:	8.1E+1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	2.6E+5	days	CHEMFATE
Volatility:	8.8E-1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
Log Kow:	1.3E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	8.5E+1	
Density:	1.3E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.3E+2	Torr	CHEMFATE
Henry's Law:	2.2E-3	atm-m3/mol	CHEMFATE
Water Solub:	1.3E+4	mg/L	CHEMFATE
Distrib Coef:	2.4E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	5.8E+2		ECOTOX
Salt BCF:			
Log Kow:	1.3E+0		CHEMFATE
Water Solub:	1.3E+4		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-9.5E+1	C
Boiling Point:	4.0E+1	C
Formula:	C H2 Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-09-2 Name: METHYLENE DICHLORIDE

```
*****************************************************************************
MELT    METHYLENE DICHLORIDE                                  CAS#    75-09-2
  Melting Point  :  -94.92      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      METHYLENE DICHLORIDE                                  CAS#    75-09-2
  Vapor Pressure :  .2250E+03   .4090E+03   .7600E+03   TORR        MEASURED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  GALLANT,RW (1966B)
*****************************************************************************

VP      METHYLENE DICHLORIDE                                  CAS#    75-09-2
  Vapor Pressure :  435         MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      METHYLENE DICHLORIDE                                  CAS#    75-09-2
  Vapor Pressure :  433.14      MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

GALLANT,RW (1966B)
GALLANT,R.W.; PHYSICAL PROPERTIES OF HYDROCARBONS. V. CHLORINATED METHANES. HYDROCARBON PROCESS.; 45:161-9.; 1966B

RIDDICK,JA ET AL. (1986)

RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-25-2 Name: BROMOFORM

```
*****************************************************************************
MELT    BROMOFORM                                          CAS#    75-25-2
  Melting Point  :  8.05        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      BROMOFORM                                          CAS#    75-25-2
  Vapor Pressure :  5.4         MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA RANGE 30.000 TO 100.800 DEG C
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      BROMOFORM                                          CAS#    75-25-2
  Vapor Pressure :  5.51        MM HG       MEAS
  Temperature (C):  25
  Remarks        :  INTERPOLATED FROM DATA OBTAINED IN THE RANGE 8-423 DEG C,
                    SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Bromodichloromethane
CAS Number: 000075-27-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:	6.2E-2	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	4.3E+2	mg/kg	RTECS
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	5.0E+4	days	CHEMFATE
Volatility:	1.1E+2	days	THOMAS
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:	5.0E+4	days	CHEMFATE
Volatility:	1.2E+0	days	THOMAS
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:	2.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.6E+2	
Density:	2.0E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	5.0E+1	Torr	CHEMFATE
Henry's Law:	1.6E-3	atm-m3/mol	CHEMFATE
Water Solub:	6.7E+3	mg/L	CHEMFATE
Distrib Coef:	1.1E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.1E+0		CHEMFATE
Water Solub:	6.7E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-5.7E+1	C
Boiling Point:	9.0E+1	C
Formula:	C H Br Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-27-4 Name: BROMODICHLOROMETHANE

```
*****************************************************************************
MELT    BROMODICHLOROMETHANE                                CAS#    75-27-4
  Melting Point  :  -55          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      BROMODICHLOROMETHANE                                CAS#    75-27-4
  Vapor Pressure :  .50E 02      TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  US EPA (1981)
*****************************************************************************

VP      BROMODICHLOROMETHANE                                CAS#    75-27-4
  Vapor Pressure :  50           MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979A)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

CALLAHAN,MA ET AL. (1979A)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS-VOLUME II.; EPA-440/4-79-029 WASHINGTON,DC: U.S. EPA.; 1979A

US EPA (1981)
U.S. EPA; TREATABILITY MANUAL I. TREATABILITY DATA.; EPA-600/2-82-001A. WASHINGTON,DC: U.S. EPA.; 1981

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000075-29-6
Chem Name  : 2-CHLOROPROPANE
Mol Formula: C3H7Cl
Mol Weight : 78.54
Melting Pt : -117.2 deg C
Boiling Pt : 35.7 deg C
Water Solubility:
   Value : 3100 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.90
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 515 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0175 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 9.2E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DONAGHY,T ET AL. (1993)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dichloroethane, 1,1-
CAS Number: 000075-34-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-1	mg/kg/day	LIVECHEM
Inhal RfD:	1.4E-1	mg/kg/day	HEAST
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:	1.3E+4	ppm	ACGIH
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	8.7E+1	days	THOMAS
Photolysis:		days	
Biodeg:	1.5E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.4E-1	days	THOMAS
Photolysis:		days	
Biodeg:	1.5E+2	days	FATERATE
Radio:		days	
Log Kow:	1.8E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	9.9E+1	
Density:	1.2E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.3E+2	Torr	CHEMFATE
Henry's Law:	5.6E-3	atm-m3/mol	CHEMFATE
Water Solub:	5.1E+3	mg/L	CHEMFATE
Distrib Coef:	6.3E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	1.8E+0		CHEMFATE
Water Solub:	5.1E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-9.7E+1	C
Boiling Point:	5.7E+1	C
Formula:	C2 H4 Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-34-3 Name: 1,1-DICHLOROETHANE

```
*****************************************************************************
MELT    1,1-DICHLOROETHANE                                    CAS#    75-34-3
  Melting Point  :  -96.96      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      1,1-DICHLOROETHANE                                    CAS#    75-34-3
  Vapor Pressure :  227.3       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dichloroethylene, 1,1-
CAS Number: 000075-35-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	5.0E-2	mg/kg/day	IRIS
Inhal RfD:	5.7E-2	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:	1.2E+0	(mg/kg/day)^-1	HEAST
Inhal Wt-of-Evid:	C		
Oral ED10:	1.9E-1	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	C		
Inhal ED10:	1.9E-1	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	C		
Oral LD50:	1.9E+2	mg/kg	RTECS
Dermal LD50:	2.4E+3	mg/kg	RTECS
Gas Inhal LC50:	6.4E+3	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	9.0E+3	µg/L	ECOTOX
Salt Ecol LC50:	2.0E+5	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	8.7E+1	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	9.3E-1	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	2.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	9.7E+1	
Density:	1.2E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.0E+2	Torr	CHEMFATE
Henry's Law:	2.6E-2	atm-m3/mol	CHEMFATE
Water Solub:	2.3E+3	mg/L	CHEMFATE
Distrib Coef:	1.2E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.1E+0		CHEMFATE
Water Solub:	2.3E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-1.2E+2	C
Boiling Point:	3.2E+1	C
Formula:	C2 H2 Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-35-4 Name: 1,1-DICHLOROETHYLENE

```
*****************************************************************************
MELT    1,1-DICHLOROETHYLENE                                  CAS#    75-35-4
  Melting Point  :  -122.56     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      1,1-DICHLOROETHYLENE                                  CAS#    75-35-4
  Vapor Pressure :  600         MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      1,1-DICHLOROETHYLENE                                  CAS#    75-35-4
  Vapor Pressure :  599.97      MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-43-4 Name: DICHLOROFLUOROMETHANE

```
*****************************************************************************
VP      DICHLOROFLUOROMETHANE                                  CAS#    75-43-4
  Vapor Pressure :  1.362E+03   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000075-43-4
Chem Name  : DICHLOROFLUOROMETHANE
Mol Formula: CHCl2F
Mol Weight : 102.92
Melting Pt : -135 deg C
Boiling Pt : 8.9 deg C
Water Solubility:
   Value : 1.88E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HORVATH,AL (1982)
Log P (octanol-water):
   Value : 1.55
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 1360 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0108 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 3.03E-014 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000075-45-6
Chem Name  : CHLORODIFLUOROMETHANE
Mol Formula: CHClF2
Mol Weight : 86.47
Melting Pt : -157.4 deg C
Boiling Pt : -40.7 deg C
Water Solubility:
   Value : 2770 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HORVATH,AL (1982)
Log P (octanol-water):
   Value : 1.08
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 7250 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : PERRY,RH & GREEN,D (1984)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0406 atm-m3/mole
   Temp  : 22 deg C
   Type  : EXP
   Ref   : CHANG,W & CRIDDLE,CS (1995)
Atmospheric OH Rate Constant:
   Value : 4.68E-015 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-61-6 Name: DIBROMODIFLUOROMETHANE

```
*****************************************************************************
VP      DIBROMODIFLUOROMETHANE                                  CAS#    75-61-6
  Vapor Pressure :  8.200E+02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000075-61-6
Chem Name  : DIBROMODIFLUOROMETHANE
Mol Formula: CBr2F2
Mol Weight : 209.82
Melting Pt : -110.1 deg C
Boiling Pt : 25 deg C
Water Solubility:
   Value : 313 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 1.99
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 820 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0308 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 5.9E-016 cm3/molecule-sec
   Temp  : 24 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1994);<5.9E-16
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000075-63-8
Chem Name  : BROMOTRIFLUOROMETHANE
Mol Formula: CBrF3
Mol Weight : 148.91
Melting Pt : -172 deg C
Boiling Pt : -57.8 deg C
Water Solubility:
   Value : 320 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HORVATH,AL (1982)
Log P (octanol-water):
   Value : 1.86
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 1.22E+004 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.499 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HINE,J & MOOKERJEE,PK (1975)
Atmospheric OH Rate Constant:
   Value : 1E-016 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1994);<1.0E-16
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Trichlorofluoromethane
CAS Number: 000075-69-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-1	mg/kg/day	IRIS
Inhal RfD:	2.0E-1	mg/kg/day	HEAST
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	3.7E+3	mg/kg	ACGIH
Dermal LD50:		mg/kg	
Gas Inhal LC50:	1.3E+5	ppm	ACGIH
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.0E+2	days	THOMAS
Photolysis:		days	
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.1E+0	days	THOMAS
Photolysis:		days	
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
Log Kow:	2.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.4E+2	
Density:	1.5E+0	g/mL @ 17.20 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	8.0E+2	Torr	CHEMFATE
Henry's Law:	9.7E-2	atm-m3/mol	CHEMFATE
Water Solub:	1.1E+3	mg/L	CHEMFATE
Distrib Coef:	2.4E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.5E+0		CHEMFATE
Water Solub:	1.1E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-1.1E+2	C
Boiling Point:	2.4E+1	C
Formula:	C Cl3 F	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-69-4 Name: TRICHLOROFLUOROMETHANE

```
*****************************************************************************
MELT    TRICHLOROFLUOROMETHANE                                  CAS#    75-69-4
  Melting Point  :  -110.48     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      TRICHLOROFLUOROMETHANE                                  CAS#    75-69-4
  Vapor Pressure :  .1455E 04   TORR        MEASURED
  Temperature (C):  21.
  Remarks        :  GAS
  Abbrev. Ref.   :  KAWAM,A & FLYNN,JB (1978)
*****************************************************************************

VP      TRICHLOROFLUOROMETHANE                                  CAS#    75-69-4
  Vapor Pressure :  802.8       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

KAWAM,A & FLYNN,JB (1978)
KAWAM,A.; FLYNN,J.B.; AEROSOLS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD. ED. 1:582-9.; 1978

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-71-8 Name: DICHLORODIFLUOROMETHANE

```
*****************************************************************************
MELT    DICHLORODIFLUOROMETHANE                          CAS#    75-71-8
  Melting Point  :  -158        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SMART,BE (1980)
*****************************************************************************

VP      DICHLORODIFLUOROMETHANE                          CAS#    75-71-8
  Vapor Pressure :  4847.8      MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

SMART,BE (1980)
SMART,B.E.; FLUORINATED ALIPHATIC COMPOUNDS.; IN: KIRK-OTHMER ENCYCL. CHEM TECH. 3RD ED. 10:856-70.; 1980

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000076-01-7 Name: PENTACHLOROETHANE

```
*****************************************************************************
MELT    PENTACHLOROETHANE                                    CAS#    76-01-7
  Melting Point  :  -29.0       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      PENTACHLOROETHANE                                    CAS#    76-01-7
  Vapor Pressure :  3.5         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ENGINEERING SCIENCES DATA UNIT (1976)
*****************************************************************************
```

ENGINEERING SCIENCES DATA UNIT (1976)
ENGINEERING SCIENCES DATA UNIT.; VAPOR PRESSURES AND CRITICAL POINTS OF LIQUIDS. VII. HALOGENATED ETHANES AND ETHYLENES.; ENG. SCI. DATA ITEM. 76004. PP.43.; 1976

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000076-03-9 Name: TRICHLOROACETIC ACID

```
*****************************************************************************
VP      TRICHLOROACETIC ACID                                    CAS#    76-03-9
  Vapor Pressure :  .1E 01      TORR        MEASURED
  Temperature (C):  51.
  Abbrev. Ref.   :  VERSCHUEREN,K (1977)
*****************************************************************************
```

VERSCHUEREN,K (1977)
VERSCHUEREN,K.; HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS.; NEW YORK, NY: VAN NOSTRAND REINHOLD COMPANY.; 1977

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000076-03-9
Chem Name  : TRICHLOROACETIC ACID
Mol Formula: C2HCl3O2
Mol Weight : 163.39
Melting Pt : 57.5 deg C
Boiling Pt : 196.5 deg C
Water Solubility:
   Value : 4.4E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.33
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.06 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : PERRY,RH & GREEN, D (1984)
pKa Dissociation Constant:
   Value : 0.51
   Temp  :
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 1.35E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BOWDEN,DJ ET AL. (1998)
Atmospheric OH Rate Constant:
   Value : 5.2E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000076-11-9
Chem Name  : 1,1,1,2-TETRACHLORO-2,2-DIFLUOROETHANE
Mol Formula: C2Cl4F2
Mol Weight : 203.83
Melting Pt : 40.6 deg C
Boiling Pt : 91.5 deg C
Water Solubility:
   Value : 100 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ROY,WR & GRIFFIN,RA (1985)
Log P (octanol-water):
   Value : 3.41
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 60 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1998)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.161 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000076-12-0 Name: 1,1,2,2,-TETRACHLORODIFLUOROETHANE

```
*****************************************************************************
VP      1,1,2,2,-TETRACHLORODIFLUOROETHANE                CAS#    76-12-0
  Vapor Pressure :  2.202E+04   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000076-12-0
Chem Name  : 1,1,2,2,-TETRACHLORODIFLUOROETHANE
Mol Formula: C2Cl4F2
Mol Weight : 203.83
Melting Pt : 26 deg C
Boiling Pt : 93 deg C
Water Solubility:
   Value : 120 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : 3.41
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 50.5 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.113 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000076-13-1 Name: 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

```
*****************************************************************************
MELT    1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE              CAS#    76-13-1
  Melting Point  :  -36.4       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE              CAS#    76-13-1
  Vapor Pressure :  362.5       MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE              CAS#    76-13-1
  Vapor Pressure :  331.622     MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000076-14-2 Name: 1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE

```
*****************************************************************************
MELT    1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE            CAS#    76-14-2
  Melting Point  :  -94          DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE            CAS#    76-14-2
  Vapor Pressure :  2014         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000076-15-3 Name: CHLOROPENTAFLUOROETHANE

```
*****************************************************************************
VP      CHLOROPENTAFLUOROETHANE                          CAS#    76-15-3
  Vapor Pressure :  .7598E 03   TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  SMART,BE (1980)
*****************************************************************************
```

SMART,BE (1980)
SMART,B.E.; FLUORINATED ALIPHATIC COMPOUNDS.; IN: KIRK-OTHMER ENCYCL. CHEM TECH. 3RD ED. 10:856-70.; 1980

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000076-15-3
Chem Name  : CHLOROPENTAFLUOROETHANE
Mol Formula: C2ClF5
Mol Weight : 154.47
Melting Pt : -99.4 deg C
Boiling Pt : -37.9 deg C
Water Solubility:
   Value : 58 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HORVATH,AL (1982)
Log P (octanol-water):
   Value : 2.47
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 6860 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 5.58 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000764-41-0
Chem Name  : 1,4-DICHLORO-2-BUTENE
Mol Formula: C4H6Cl2
Mol Weight : 125.00
Melting Pt : 3.5 deg C
Boiling Pt : 158 deg C
Water Solubility:
   Value : 580 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ALBANESE,V ET AL. (1987)
Log P (octanol-water):
   Value : 2.60
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 3 mm Hg
   Temp  :
   Type  : EXP
   Ref   : ALBANESE,V ET AL. (1987)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00851 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 3.33E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dichloropropane, 1,2-
CAS Number: 000078-87-5

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:	1.1E-3	mg/kg/day	IRIS
Oral Slope:	6.8E-2	(mg/kg/day)^-1	HEAST
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	2.0E+3	mg/kg	ACGIH
Dermal LD50:	8.8E+3	mg/kg	RTECS
Gas Inhal LC50:	7.2E+2	ppm	ACGIH
Dust Inhal LC50:	1.2E+4	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	4.2E+4	µg/L	ECOTOX
Salt Ecol LC50:	5.3E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	6.7E+6	days	CHEMFATE
Volatility:	9.3E+1	days	THOMAS
Photolysis:		days	
Biodeg:	1.3E+3	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	6.7E+6	days	CHEMFATE
Volatility:	1.0E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.3E+3	days	FATERATE
Radio:		days	
Log Kow:	2.0E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.1E+2	
Density:	1.2E+0	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	5.2E+1	Torr	CHEMFATE
Henry's Law:	2.8E-3	atm-m3/mol	CHEMFATE
Water Solub:	2.8E+3	mg/L	CHEMFATE
Distrib Coef:	8.7E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.0E+0		CHEMFATE
Water Solub:	2.8E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-7.0E+1	C
Boiling Point:	9.6E+1	C
Formula:	C3 H6 Cl2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000078-87-5 Name: 1,2-DICHLOROPROPANE

```
*****************************************************************************
MELT    1,2-DICHLOROPROPANE                                  CAS#    78-87-5
  Melting Point  :  -100        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      1,2-DICHLOROPROPANE                                  CAS#    78-87-5
  Vapor Pressure :  .42E 02     TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  US EPA (1981)
*****************************************************************************

VP      1,2-DICHLOROPROPANE                                  CAS#    78-87-5
  Vapor Pressure :  .3000E+02   .5200E+02   .1030E+03   TORR        MEASURED
  Temperature (C):  10.0        25.0        40.0
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  GALLANT,RW (1966A)
*****************************************************************************

VP      1,2-DICHLOROPROPANE                                  CAS#    78-87-5
  Vapor Pressure :  53.3        MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      1,2-DICHLOROPROPANE                                  CAS#    78-87-5
  Vapor Pressure :  51.989      MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)

DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

GALLANT,RW (1966A)
GALLANT,R.W.; PHYSICAL PROPERTIES OF HYDROCARBONS. VII.CHLORINATED ALIPHATICS.; HYDROCARBON PROCESS.; 45:111-18.; 1966A

US EPA (1981)
U.S. EPA; TREATABILITY MANUAL I. TREATABILITY DATA.; EPA-600/2-82-001A. WASHINGTON,DC: U.S. EPA.; 1981

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Trichloroethane, 1,1,2- **CAS Number: 000079-00-5**

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	4.0E-3	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:	5.7E-2	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	C		
Inhal Slope:	5.7E-2	(mg/kg/day)^-1	HEAST
Inhal Wt-of-Evid:	C		
Oral ED10:	2.8E+0	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	C		
Inhal ED10:	2.8E+0	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	C		
Oral LD50:	3.8E+2	mg/kg	ACGIH
Dermal LD50:	5.4E+3	mg/kg	RTECS
Gas Inhal LC50:	5.0E+2	ppm	RTECS
Dust Inhal LC50:	1.3E+1	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	4.2E+3	µg/L	ECOTOX
Salt Ecol LC50:	3.4E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.4E+4	days	FATERATE
Volatility:	1.0E+2	days	THOMAS
Photolysis:		days	
Biodeg:	3.7E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.4E+4	days	FATERATE
Volatility:	1.1E+0	days	THOMAS
Photolysis:		days	
Biodeg:	3.7E+2	days	FATERATE
Radio:		days	
Log Kow:	2.0E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.3E+2	
Density:	1.4E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.3E+1	Torr	CHEMFATE
Henry's Law:	9.1E-4	atm-m3/mol	CHEMFATE
Water Solub:	4.4E+3	mg/L	CHEMFATE
Distrib Coef:	1.0E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.0E+0		CHEMFATE
Water Solub:	4.4E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-3.7E+1	C
Boiling Point:	1.1E+2	C
Formula:	C2 H3 Cl3	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000079-00-5 Name: 1,1,2-TRICHLOROETHANE

```
*****************************************************************************
MELT    1,1,2-TRICHLOROETHANE                                CAS#    79-00-5
  Melting Point  :  -35          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1,1,2-TRICHLOROETHANE                                CAS#    79-00-5
  Vapor Pressure :  23           MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  ENGINEERING SCIENCES DATA UNIT (1976)
*****************************************************************************

VP      1,1,2-TRICHLOROETHANE                                CAS#    79-00-5
  Vapor Pressure :  23.25        MM HG        MEASE
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

ENGINEERING SCIENCES DATA UNIT (1976)
ENGINEERING SCIENCES DATA UNIT.; VAPOR PRESSURES AND CRITICAL POINTS OF LIQUIDS. VII. HALOGENATED ETHANES AND ETHYLENES.; ENG. SCI. DATA ITEM. 76004. PP.43.; 1976

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Trichloroethylene (TCE)
CAS Number: 000079-01-6

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	1.1E-2	(mg/kg/day)^-1	LIVECHEM
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:	1.0E+1	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	1.0E+1	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	6.0E+3	mg/kg	ACGIH
Dermal LD50:	2.0E+4	mg/kg	RTECS
Gas Inhal LC50:	4.8E+3	ppm	RTECS
Dust Inhal LC50:	3.3E+1	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.9E+3	µg/L	ECOTOX
Salt Ecol LC50:	1.2E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	3.2E+2	days	FATERATE
Volatility:	1.0E+2	days	THOMAS
Photolysis:		days	
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	3.2E+2	days	FATERATE
Volatility:	1.1E+0	days	THOMAS
Photolysis:		days	
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
Log Kow:	2.4E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.3E+2	
Density:	1.5E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	7.3E+1	Torr	CHEMFATE
Henry's Law:	1.0E-2	atm-m3/mol	CHEMFATE
Water Solub:	1.5E+3	mg/L	CHEMFATE
Distrib Coef:	3.3E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.7E+1		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	1.7E+1		ECOTOX
Salt BCF:			
Log Kow:	2.4E+0		CHEMFATE
Water Solub:	1.5E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-8.5E+1	C
Boiling Point:	8.7E+1	C
Formula:	C2 H Cl3	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000079-01-6 Name: TRICHLOROETHYLENE

```
*****************************************************************************
MELT    TRICHLOROETHYLENE                                    CAS#    79-01-6
  Melting Point  :  -84.8       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      TRICHLOROETHYLENE                                    CAS#    79-01-6
  Vapor Pressure :  .58E 02     TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  FROM JOHN,R. (1976)
  Abbrev. Ref.   :  ROGERS,RD & MCFARLANE,JC (1981)
*****************************************************************************

VP      TRICHLOROETHYLENE                                    CAS#    79-01-6
  Vapor Pressure :  69          MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      TRICHLOROETHYLENE                                    CAS#    79-01-6
  Vapor Pressure :  73.46       MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

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ROGERS,RD & MCFARLANE,JC (1981)

ROGERS,R.D.; MCFARLANE,J.C.; SORPTION OF CARBON TETRACHLORIDE, ETHYLENE DIBROMIDE AND TRICHLOROETHYLENE IN SOIL AND CLAY.; ENVIRON. MONIT. ASSESS.; 1:155-8.; 1981

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Tetrachloroethane, 1,1,2,2-
CAS Number: 000079-34-5

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	2.0E-1	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	C		
Inhal Slope:	2.0E-1	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	C		
Oral ED10:	6.0E-1	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	C		
Inhal ED10:	6.0E-1	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	C		
Oral LD50:	3.2E+2	mg/kg	ACGIH
Dermal LD50:	6.3E+3	mg/kg	ACGIH
Gas Inhal LC50:	1.0E+3	ppm	ACGIH
Dust Inhal LC50:	3.7E+3	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	4.4E+1	days	FATERATE
Volatility:	1.1E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	4.4E+1	days	FATERATE
Volatility:	1.3E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	2.4E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.7E+2	
Density:	1.6E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.6E+0	Torr	CHEMFATE
Henry's Law:	3.4E-4	atm-m3/mol	CHEMFATE
Water Solub:	3.0E+3	mg/L	CHEMFATE
Distrib Coef:	1.9E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	8.0E+0		VER_BCF
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	8.0E+0		VER_BCF
Salt BCF:			
Log Kow:	2.4E+0		CHEMFATE
Water Solub:	3.0E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-4.4E+1	C
Boiling Point:	1.5E+2	C
Formula:	C2 H2 Cl4	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000079-34-5 Name: 1,1,2,2-TETRACHLOROETHANE

```
*****************************************************************************
MELT    1,1,2,2-TETRACHLOROETHANE                          CAS#    79-34-5
  Melting Point  :  -44          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1,1,2,2-TETRACHLOROETHANE                          CAS#    79-34-5
  Vapor Pressure :  6.1          MM HG       MEAS
  Temperature (C):  25
  Abbrev. Ref.   :  ENGINEERING SCIENCES DATA UNIT (1976)
*****************************************************************************

VP      1,1,2,2-TETRACHLOROETHANE                          CAS#    79-34-5
  Vapor Pressure :  4.620E+00    MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************

VP      1,1,2,2-TETRACHLOROETHANE                          CAS#    79-34-5
  Vapor Pressure :  4.62         MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

ENGINEERING SCIENCES DATA UNIT (1976)
ENGINEERING SCIENCES DATA UNIT.; VAPOR PRESSURES AND CRITICAL POINTS OF LIQUIDS. VII. HALOGENATED ETHANES AND ETHYLENES.; ENG. SCI. DATA ITEM. 76004. PP.43.; 1976

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH

ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dibromo-3-chloropropane, 1,2-
CAS Number: 000096-12-8

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:	5.7E-5	mg/kg/day	IRIS
Oral Slope:	1.4E+0	(mg/kg/day)^-1	HEAST
Oral Wt-of-Evid:	B2		
Inhal Slope:	2.4E-3	(mg/kg/day)^-1	HEAST
Inhal Wt-of-Evid:	B2		
Oral ED10:	8.1E-4	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	8.1E-4	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	1.5E+2	mg/kg	RTECS
Dermal LD50:	1.4E+3	mg/kg	RTECS
Gas Inhal LC50:	1.0E+2	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.0E+4	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.4E+2	days	CHEMFATE
Volatility:	1.4E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.4E+2	days	CHEMFATE
Volatility:	1.7E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	2.3E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.4E+2	
Density:	2.1E+0	g/mL @ 14.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	5.8E-1	Torr	CHEMFATE
Henry's Law:	1.5E-4	atm-m3/mol	CHEMFATE
Water Solub:	1.2E+3	mg/L	CHEMFATE
Distrib Coef:	1.7E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.3E+0		CHEMFATE
Water Solub:	1.2E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:		C
Boiling Point:	2.0E+2	C
Formula:	C3 H5 Br2 Cl	

CLASS INFORMATION

Class	Parent Substance

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About SRC Locations Business Areas Career Center Training

CHEMFATE Search Results

Return to EFDB page

CAS #: 000096-12-8 Name: 1,2-DIBROMO-3-CHLOROPROPANE

```
*****************************************************************************
MELT    1,2-DIBROMO-3-CHLOROPROPANE                          CAS#    96-12-8
  Melting Point  :  6           DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  STENGER,VA (1978)
*****************************************************************************

VP      1,2-DIBROMO-3-CHLOROPROPANE                          CAS#    96-12-8
  Vapor Pressure :  0.58        MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MUNNECKE,DE & VANGUNDY,SD (1979)
*****************************************************************************
```

MUNNECKE,DE & VANGUNDY,SD (1979)
MUNNECKE,D.E.; VANGUNDY,S.D.; MOVEMENT OF FUMIGANTS IN SOIL, DOSAGE, RESPONSES, AND DIFFERENTIAL EFFECTS.; ANNU. REV. PHYTOPATHOL.; 17:405-29; 1979

STENGER,VA (1978)
STENGER,V.A.; BROMINE COMPOUNDS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECHNOL. 3 ED. NEW YORK,NY: WILEY-INTERSCIENCE. 4:243-63; 1978

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Trichloropropane, 1,2,3-
CAS Number: 000096-18-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	6.0E-3	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:	7.0E+0	(mg/kg/day)^-1	HEAST
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	3.4E+2	mg/kg	ACGIH
Dermal LD50:	5.2E+2	mg/kg	RTECS
Gas Inhal LC50:	5.0E+2	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.6E+4	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.6E+4	days	CHEMFATE
Volatility:	1.1E+2	days	THOMAS
Photolysis:		days	
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.6E+4	days	CHEMFATE
Volatility:	1.2E+0	days	THOMAS
Photolysis:		days	
Biodeg:	3.6E+2	days	FATERATE
Radio:		days	
Log Kow:	2.0E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.5E+2	
Density:	1.4E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	3.7E+0	Torr	CHEMFATE
Henry's Law:	4.1E-4	atm-m3/mol	CHEMFATE
Water Solub:	1.8E+3	mg/L	CHEMFATE
Distrib Coef:	1.4E-1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.0E+0		CHEMFATE
Water Solub:	1.8E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-1.5E+1	C
Boiling Point:	1.6E+2	C
Formula:	C3 H5 Cl3	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000096-18-4 Name: 1,2,3-TRICHLOROPROPANE

```
*****************************************************************************
MELT    1,2,3-TRICHLOROPROPANE                                CAS#    96-18-4
  Melting Point  :  -14.7       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      1,2,3-TRICHLOROPROPANE                                CAS#    96-18-4
  Vapor Pressure :  3.1         MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  MACKAY,D ET AL. (1982)
*****************************************************************************

VP      1,2,3-TRICHLOROPROPANE                                CAS#    96-18-4
  Vapor Pressure :  3.687E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

MACKAY,D ET AL. (1982)
MACKAY,D.; BOBRA,A.; CHAN,D.W.; SHIU,W.Y.; VAPOR PRESSURE CORRELATIONS FOR LOW-VOLATILITY ENVIRONMENTAL CHEMICALS.; ENVIRON. SCI. TECHNOL.; 16:645-9.; 1982

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Non-aromatic Nonhalogenated Hydrocarbons (NANHH)

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000106-35-4
Chem Name  : 3-HEPTANONE
Mol Formula: C7H14O
Mol Weight : 114.19
Melting Pt : -39 deg C
Boiling Pt : 147 deg C
Water Solubility:
   Value : 4300 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : FLICK,EW (1991)
Log P (octanol-water):
   Value : 1.73
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 2.6 mm Hg
   Temp  : 20 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1993)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 9.08E-005 atm-m3/mole
   Temp  : 20 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 7.89E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-88-7 Name: 1-BUTENE OXIDE

```
*****************************************************************************
MELT    1-BUTENE OXIDE                                          CAS#   106-88-7
  Melting Point  :  -150        DEGC
  Remarks        :  SETS TO A GLASS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  HAWLEY,GG (1981)
*****************************************************************************

VP      1-BUTENE OXIDE                                          CAS#   106-88-7
  Vapor Pressure :  .176E 03    TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  BOGYO,DA ET AL. (1980)
*****************************************************************************

VP      1-BUTENE OXIDE                                          CAS#   106-88-7
  Vapor Pressure :  180         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  OSBORN,AG & SCOTT,DW (1980)
*****************************************************************************
```

BOGYO,DA ET AL. (1980)
BOGYO,D.A.; LANDE,S.S.; MEYLEN,W.M.; HOWARD,P.H.; SANTODONATO,J.;
INVESTIGATION OF SELECTED ENVIRONMENTAL CONTAMINANTS: EPOXIDES.;
EPA-560/11-80-005. WASHINGTON,D.C.:US EPA. PP.202.; 1980

HAWLEY,GG (1981)
HAWLEY,G.G.; THE CONDENSED CHEMICAL DISTIONARY. 10TH ED.; NEW YORK,NY: VAN
NOSTRAND REINHOLD CO. PP.1135.; 1981

OSBORN,AG & SCOTT,DW (1980)
OSBORN,A.G.; SCOTT,D.W.; VAPOR PRESSURE OF 17 MISCELLANEOUS ORGANIC COMPOUN
J CHEM THERMODYNAMIC; 12:429-38; 1980

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-97-8 Name: BUTANE

```
*****************************************************************************
MELT    BUTANE                                                CAS#   106-97-8
  Melting Point  :  -138.4      DEG C
  Remarks        :
             1   :  LIDE (1991)
             2   :   HPV: LOW 1,3-BUTADIENE C4 STREAMS
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      BUTANE                                                CAS#   106-97-8
  Vapor Pressure :  2800        MM HG       MEASURED
  Temperature (C):  40
  Remarks        :
             1   :  GAS PRODUCERS ASSOCIATION (1996)
             2   :   HPV: LOW 1,3-BUTADIENE C4 STREAMS
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000106-97-8
Chem Name  : N-BUTANE
Mol Formula: C4H10
Mol Weight : 58.12
Melting Pt : -138.2 deg C
Boiling Pt : -0.5 deg C
Water Solubility:
   Value : 61.2 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : MCAULIFFE,C (1966)
Log P (octanol-water):
   Value : 2.89
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 1820 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.95 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 2.54E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-99-0 Name: 1,3-BUTADIENE

```
*****************************************************************************
MELT    1,3-BUTADIENE                                          CAS#   106-99-0
  Melting Point  :  -108.966    DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1,3-BUTADIENE                                          CAS#   106-99-0
  Vapor Pressure :  2107        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Acrolein
CAS Number: 000107-02-8

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	5.0E-4	mg/kg/day	IRIS
Inhal RfD:	5.7E-6	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	4.6E+1	mg/kg	ACGIH
Dermal LD50:	5.6E+2	mg/kg	ACGIH
Gas Inhal LC50:	6.6E+1	ppm	RTECS
Dust Inhal LC50:	1.5E+1	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	6.0E+0	µg/L	ECOTOX
Salt Ecol LC50:	2.7E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	5.0E-1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	5.0E-1	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
Log Kow:	-1.0E-2		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	5.6E+1	
Density:	8.4E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.7E+2	Torr	CHEMFATE
Henry's Law:	1.2E-4	atm-m3/mol	CHEMFATE
Water Solub:	2.1E+5	mg/L	CHEMFATE
Distrib Coef:	1.5E-1	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	3.4E+2		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	3.4E+2		ECOTOX
Salt BCF:			
Log Kow:	-1.0E-2		CHEMFATE
Water Solub:	2.1E+5		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-8.8E+1	C
Boiling Point:	5.3E+1	C
Formula:	C3 H4 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-02-8 Name: ACROLEIN

```
*****************************************************************************
MELT    ACROLEIN                                          CAS#   107-02-8
  Melting Point  :  -86.95      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ACROLEIN                                          CAS#   107-02-8
  Vapor Pressure :  .220E 03    TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  HESS,LG ET AL. (1978)
*****************************************************************************

VP      ACROLEIN                                          CAS#   107-02-8
  Vapor Pressure :  273         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  STULL,DR (1947)
*****************************************************************************

VP      ACROLEIN                                          CAS#   107-02-8
  Vapor Pressure :  2.741E+02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

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HESS,L.G.; KURTZ,A.N.; STANTON,D.B.; ACROLEIN AND DERIVATIVES.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 1:277-97.; 1978

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

STULL,DR (1947)
STULL,D.R.; VAPOR PRESSURE OF PURE SUBSTANCES-ORGANIC COMPOUNDS.; IND. ENG. CHEM.; 39:517-50.; 1947

End of Search

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-12-0 Name: PROPIONITRILE

```
*****************************************************************************
MELT    PROPIONITRILE                                        CAS#   107-12-0
  Melting Point  :  -91.8       DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      PROPIONITRILE                                        CAS#   107-12-0
  Vapor Pressure :  40          MM HG
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      PROPIONITRILE                                        CAS#   107-12-0
  Vapor Pressure :  4.739E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-13-1 Name: ACRYLONITRILE

```
*****************************************************************************
MELT    ACRYLONITRILE                                          CAS#   107-13-1
  Melting Point  :  -83.55      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ACRYLONITRILE                                          CAS#   107-13-1
  Vapor Pressure :  .5000E+02   .1000E+03   .1100E+03   TORR        MEASURED
  Temperature (C):  8.7         23.6        25.0
  Abbrev. Ref.   :  NORRIS,MV (1967)
*****************************************************************************

VP      ACRYLONITRILE                                          CAS#   107-13-1
  Vapor Pressure :  108.5       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

NORRIS,MV (1967)
NORRIS,M.V.; ACRYLONITRILE.; ENCYCL. IND. CHEM. ANAL.; 4:368-81.; 1967

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-18-6 Name: ALLYL ALCOHOL

```
*****************************************************************************
MELT    ALLYL ALCOHOL                                          CAS#   107-18-6
  Melting Point  :  -129        DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      ALLYL ALCOHOL                                          CAS#   107-18-6
  Vapor Pressure :  28.1        MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      ALLYL ALCOHOL                                          CAS#   107-18-6
  Vapor Pressure :  2.610E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

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ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

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DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-19-7 Name: PROPARGYLIC ALCOHOL

```
*****************************************************************************
MELT    PROPARGYLIC ALCOHOL                                   CAS#   107-19-7
  Melting Point  :  -51.8       DEG C
  Remarks        :
            1    :  CRC HNDBK CHEM PHYS 81ST ED. (2000)
            2    :   HPV: PROPARGYL ALCOHOL
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      PROPARGYLIC ALCOHOL                                   CAS#   107-19-7
  Vapor Pressure :  1.560E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************

VP      PROPARGYLIC ALCOHOL                                   CAS#   107-19-7
  Vapor Pressure :  15.6        MM HG       CALCULATED
  Temperature (C):  25
  Remarks        :
            1    :  DAUBERT AND DANNER (1989)
            2    :   HPV: PROPARGYL ALCOHOL
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-31-3 Name: METHYL FORMATE

```
*****************************************************************************
VP      METHYL FORMATE                                        CAS#   107-31-3
  Vapor Pressure :  5.857E+02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
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End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000107-31-3
Chem Name  : METHYLFORMATE
Mol Formula: C2H4O2
Mol Weight : 60.05
Melting Pt : -99 deg C
Boiling Pt : 31.7 deg C
Water Solubility:
   Value : 2.3E+005 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : 0.03
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 586 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000223 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HINE,J & MOOKERJEE,PK (1975)
Atmospheric OH Rate Constant:
   Value : 2.27E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KWOK,ESC & ATKINSON,R (1994)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-87-9 Name: METHYL PROPYL KETONE

```
*****************************************************************************
MELT    METHYL PROPYL KETONE                                  CAS#   107-87-9
  Melting Point  :  -78         DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

MELT    METHYL PROPYL KETONE                                  CAS#   107-87-9
  Melting Point  :  -78         DEG C
  Remarks        :
             1   :  MERCK INDEX (1996)
             2   :   HPV: METHYL N-PROPYL KETONE
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      METHYL PROPYL KETONE                                  CAS#   107-87-9
  Vapor Pressure :  35.4        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      METHYL PROPYL KETONE                                  CAS#   107-87-9
  Vapor Pressure :  35.4        MM HG       MEASURED
  Temperature (C):  25
  Remarks        :
             1   :  RIDDICK ET AL. (1985)
             2   :   HPV: METHYL N-PROPYL KETONE
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE

HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-98-2 Name: 1-METHOXY-2-PROPANOL

```
*****************************************************************************
MELT    1-METHOXY-2-PROPANOL                                  CAS#   107-98-2
  Melting Point  :  -142        DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DOW CHEMICAL COMPANY (1981)
*****************************************************************************

VP      1-METHOXY-2-PROPANOL                                  CAS#   107-98-2
  Vapor Pressure :  12.5        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DOW CHEMICAL COMPANY (1981)
*****************************************************************************
```

DOW CHEMICAL COMPANY (1981)
DOW CHEMICAL COMPANY.; THE GLYCOL ETHERS HANDBOOK.; MIDLAND, MI: DOW CHEMICAL CO.; 1981

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000108-03-2
Chem Name  : 1-NITROPROPANE
Mol Formula: C3H7NO2
Mol Weight : 89.10
Melting Pt : -108 deg C
Boiling Pt : 131.1 deg C
Water Solubility:
   Value : 1.5E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : 0.87
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 10.1 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value : 8.98
   Temp  :
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Henry's Law Constant:
   Value : 8.7E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HINE,J & MOOKERJEE,PK (1975)
Atmospheric OH Rate Constant:
   Value : 4.4E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KWOK,ESC & ATKINSON,R (1994)
```

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SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Vinyl acetate
CAS Number: 000108-05-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E+0	mg/kg/day	HEAST
Inhal RfD:	5.7E-2	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	1.6E+3	mg/kg	ACGIH
Dermal LD50:	2.3E+3	mg/kg	ACGIH
Gas Inhal LC50:	2.5E+3	ppm	ACGIH
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.4E+4	µg/L	ECOTOX
Salt Ecol LC50:	1.0E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	7.3E+0	days	CHEMFATE
Volatility:	8.2E+1	days	THOMAS
Photolysis:	2.7E-1	days	CHEMFATE
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:	7.3E+0	days	CHEMFATE
Volatility:	9.2E-1	days	THOMAS
Photolysis:	2.7E-1	days	CHEMFATE
Biodeg:		days	
Radio:		days	
Log Kow:	7.3E-1		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	8.6E+1	
Density:	9.3E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	9.0E+1	Torr	CHEMFATE
Henry's Law:	5.1E-4	atm-m3/mol	CHEMFATE
Water Solub:	2.0E+4	mg/L	CHEMFATE
Distrib Coef:	7.9E-1	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	7.3E-1		CHEMFATE
Water Solub:	2.0E+4		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-9.3E+1	C
Boiling Point:	7.3E+1	C
Formula:	C4 H6 O2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000108-05-4 Name: VINYL ACETATE

```
*****************************************************************************
MELT    VINYL ACETATE                                        CAS#   108-05-4
  Melting Point  :  -92.8       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      VINYL ACETATE                                        CAS#   108-05-4
  Vapor Pressure :  90.16       MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Methyl isobutyl ketone
CAS Number: 000108-10-1

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	8.0E-2	mg/kg/day	HEAST
Inhal RfD:	8.6E-1	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	2.1E+3	mg/kg	ACGIH
Dermal LD50:	3.0E+3	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:	8.3E+4	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	4.6E+5	µg/L	ECOTOX
Salt Ecol LC50:	1.2E+6	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	8.8E+1	days	THOMAS
Photolysis:		days	
Biodeg:	7.0E+0	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.1E+0	days	THOMAS
Photolysis:		days	
Biodeg:	7.0E+0	days	FATERATE
Radio:		days	
Log Kow:	1.2E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.0E+2	
Density:	8.0E-1	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.0E+1	Torr	CHEMFATE
Henry's Law:	1.4E-4	atm-m3/mol	CHEMFATE
Water Solub:	1.9E+4	mg/L	CHEMFATE
Distrib Coef:	2.2E+0	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	1.2E+0		CHEMFATE
Water Solub:	1.9E+4		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-8.4E+1	C
Boiling Point:	1.2E+2	C
Formula:	C6 H12 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000108-10-1 Name: METHYL ISOBUTYL KETONE

```
*****************************************************************************
MELT    METHYL ISOBUTYL KETONE                                  CAS#   108-10-1
  Melting Point  :  -84          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      METHYL ISOBUTYL KETONE                                  CAS#   108-10-1
  Vapor Pressure :  .188E 02     TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1975)
*****************************************************************************

VP      METHYL ISOBUTYL KETONE                                  CAS#   108-10-1
  Vapor Pressure :  .16E 02      TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  HANN,RWJR & JENSEN,PA (1977)
*****************************************************************************

VP      METHYL ISOBUTYL KETONE                                  CAS#   108-10-1
  Vapor Pressure :  19.86        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

AMBROSE,D ET AL. (1975)
AMBROSE,D.; ELLENDER,J.H.; LEES,E.B.; SPRAKE,C.H.S.; TOWNSEND,R.; THERMODYNAMIC PROPERTIES OF ORGANIC OXYGEN COMPOUNDS. XXXVIII. VAPOUR PRESSURES OF SOME ALIPHATIC KETONES.; J. CHEM. THERM.; 7:453-72.; 1975

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

HANN,RWJR & JENSEN,PA (1977)
HANN,R.W. JR.; JENSEN,P.A.; WATER QUALITY CHARACTERISTICS OF HAZARDOUS MATERIALS.; NTIS-PB-285946. TEXAS A&M UNIV., COLLEGE STATION ENVIRONMENTAL ENGINEERING DIV. 1751 PP.; 1977

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

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CAS #: 000108-20-3 Name: DIISOPROPYL ETHER

```
*****************************************************************************
VP      DIISOPROPYL ETHER                                   CAS#   108-20-3
  Vapor Pressure :  .130E 03    TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  VERSCHUEREN,K (1977)
*****************************************************************************

VP      DIISOPROPYL ETHER                                   CAS#   108-20-3
  Vapor Pressure :  .1491E 03   TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1976)
*****************************************************************************
```

AMBROSE,D ET AL. (1976)
AMBROSE,D.; ELLENDER,J.H.; SPRAKE, C.H.S.; TOWNSEND, R.; THERMODYNAMIC PROPERTIES OF ORGANIC OXYGEN COMPOUNDS. XLIII. VAPOR PRESSURES OF SOME ETHERS.; J. CHEM. THERMODYN.; 8:165-78.; 1976

VERSCHUEREN,K (1977)
VERSCHUEREN,K.; HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS.; NEW YORK, NY: VAN NOSTRAND REINHOLD COMPANY.; 1977

End of Search

Data From SRC PhysProp Database:

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```
CAS Number : 000108-20-3
Chem Name  : DI-ISOPROPYL ETHER
Mol Formula: C6H14O
Mol Weight : 102.18
Melting Pt : -86.8 deg C
Boiling Pt : 68.5 deg C
Water Solubility:
   Value : 8800 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : HEITMANN,W ET AL (1987)
Log P (octanol-water):
   Value : 1.52
   Type  : EXP
   Ref   : FUNASAKI,N ET AL. (1985)
Vapor Pressure:
   Value : 149 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1995)
pKa Dissociation Constant:
   Value : -4.3
   Temp  :
   Type  : EXP
   Ref   : PERRIN,DD (1965)
Henry's Law Constant:
   Value : 0.00228 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 1.02E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KWOK,ESC & ATKINSON,R (1994)
```

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000108-87-2
Chem Name  : 1-METHYLCYCLOHEXANE
Mol Formula: C7H14
Mol Weight : 98.19
Melting Pt : -126.6 deg C
Boiling Pt : 100.9 deg C
Water Solubility:
   Value : 14 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 3.61
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 46 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.43 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HINE,J & MOOKERJEE,PK (1975)
Atmospheric OH Rate Constant:
   Value : 1.04E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000108-94-1 Name: CYCLOHEXANONE

```
*****************************************************************************
VP      CYCLOHEXANONE                                          CAS#   108-94-1
  Vapor Pressure :  .45E 01     TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  HANN,RWJR & JENSEN,PA (1977)
*****************************************************************************

VP      CYCLOHEXANONE                                          CAS#   108-94-1
  Vapor Pressure :  4.330E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

HANN,RWJR & JENSEN,PA (1977)
HANN,R.W. JR.; JENSEN,P.A.; WATER QUALITY CHARACTERISTICS OF HAZARDOUS MATERIALS.; NTIS-PB-285946. TEXAS A&M UNIV., COLLEGE STATION ENVIRONMENTAL ENGINEERING DIV. 1751 PP.; 1977

End of Search

Data From SRC PhysProp Database:

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```
CAS Number : 000108-94-1
Chem Name  : CYCLOHEXANONE
Mol Formula: C6H10O
Mol Weight : 98.15
Melting Pt : -31 deg C
Boiling Pt : 155.4 deg C
Water Solubility:
   Value : 2.5E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 0.81
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 4.33 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1985)
pKa Dissociation Constant:
   Value : 11.3
   Temp  :
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 9E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HAWTHORNE,SB ET AL. (1985)
Atmospheric OH Rate Constant:
   Value : 6.39E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000109-66-0 Name: N-PENTANE

```
*****************************************************************************
MELT    N-PENTANE                                            CAS#   109-66-0
  Melting Point  :  -130        DEG C
  Remarks        :
             1   :  LIDE (1991)
             2   :   HPV: PETROLEUM GAS
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      N-PENTANE                                            CAS#   109-66-0
  Vapor Pressure :  860         MM HG       MEASURED
  Temperature (C):  40
  Remarks        :
             1   :  GAS PRODUCERS ASSOCIATION (1996)
             2   :   HPV: PETROLEUM GAS
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

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```
CAS Number : 000109-66-0
Chem Name  : N-PENTANE
Mol Formula: C5H12
Mol Weight : 72.15
Melting Pt : -129.7 deg C
Boiling Pt : 36 deg C
Water Solubility:
   Value : 38 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : 3.39
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 514 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.25 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HINE,J & MOOKERJEE,PK (1975)
Atmospheric OH Rate Constant:
   Value : 3.94E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000109-86-4 Name: 2-METHOXYETHANOL

```
*****************************************************************************
MELT    2-METHOXYETHANOL                                        CAS#   109-86-4
  Melting Point  :  -85.1        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      2-METHOXYETHANOL                                        CAS#   109-86-4
  Vapor Pressure :  9.5          MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  DOW CHEMICAL COMPANY (1981)
*****************************************************************************

VP      2-METHOXYETHANOL                                        CAS#   109-86-4
  Vapor Pressure :  9.01         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

DOW CHEMICAL COMPANY (1981)
DOW CHEMICAL COMPANY.; THE GLYCOL ETHERS HANDBOOK.; MIDLAND, MI: DOW CHEMICAL CO.; 1981

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000110-12-3 Name: 5-METHYL-2-HEXANONE

```
*****************************************************************************
MELT    5-METHYL-2-HEXANONE                                  CAS#   110-12-3
  Melting Point  :  -73.9       DEG C
  Remarks        :
             1   :  LEWIS (1993)
             2   :   HPV: METHYL ISOMYL KETONE
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      5-METHYL-2-HEXANONE                                  CAS#   110-12-3
  Vapor Pressure :  5.200E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************

VP      5-METHYL-2-HEXANONE                                  CAS#   110-12-3
  Vapor Pressure :  5.77        MM HG       MEASURED
  Temperature (C):  25
  Remarks        :
             1   :  ALARIE (1995)
             2   :   HPV: METHYL ISOMYL KETONE
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

CHEMFATE Search Results

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CAS #: 000110-43-0 Name: 2-HEPTANONE

```
*****************************************************************************
MELT    2-HEPTANONE                                          CAS#   110-43-0
  Melting Point  :  -35.5        DEG C
  Remarks        :
             1   :  LIDE (1993)
             2   :   HPV: METHYL N-AMYL KETONE
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      2-HEPTANONE                                          CAS#   110-43-0
  Vapor Pressure :  2.73         MM HG        MEASURED
  Temperature (C):  25
  Remarks        :
             1   :  RANGE OF VALUES, 1.6 TO 3.86 MM HG
             2   :   HSDB (2001)
             3   :   HPV: METHYL N-AMYL KETONE
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

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CAS #: 000110-54-3 Name: N-HEXANE

```
*****************************************************************************
VP      N-HEXANE                                          CAS#   110-54-3
  Vapor Pressure :  .5900E+02   .9700E+02   .1520E+03   .2310E+03   TORR
                    MEASURED
  Temperature (C):  5.0         15.0        25.0        35.0
  Abbrev. Ref.    :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP      N-HEXANE                                          CAS#   110-54-3
  Vapor Pressure :  1.513E+02   MM HG       MEASURED
  Temperature (C):  25
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  BOUBLIK,T ET AL. (1984)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

ZWOLINSKI,BJ & WILHOIT,RC (1971)
ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

End of Search

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```
CAS Number : 000110-54-3
Chem Name  : N-HEXANE
Mol Formula: C6H14
Mol Weight : 86.18
Melting Pt : -95.3 deg C
Boiling Pt : 68.7 deg C
Water Solubility:
   Value : 9.5 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : MCAULIFFE,C (1966)
Log P (octanol-water):
   Value : 3.90
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 151 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BOUBLIK,T ET AL. (1984)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.8 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 5.61E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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```
CAS Number : 000110-62-3
Chem Name  : 1-PENTANAL
Mol Formula: C5H10O
Mol Weight : 86.14
Melting Pt : -91.5 deg C
Boiling Pt : 103 deg C
Water Solubility:
   Value : 1.17E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.31
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 26 mm Hg
   Temp  : 20 deg C
   Type  : EXP
   Ref   : FLICK,EW (1991)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000147 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BUTTERY,RG ET AL. (1969)
Atmospheric OH Rate Constant:
   Value : 2.85E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000110-80-5 Name: 2-ETHOXYETHANOL

```
*****************************************************************************
MELT    2-ETHOXYETHANOL                                        CAS#   110-80-5
  Melting Point  :  -100        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DOW CHEMICAL COMPANY (1981)
*****************************************************************************

VP      2-ETHOXYETHANOL                                        CAS#   110-80-5
  Vapor Pressure :  .18E 01     .55E 01     .10E 02     TORR        MEASURED
  Temperature (C):  10.         25.         37.
  Remarks        :  TAKEN FROM GRAPHS
  Abbrev. Ref.   :  DOW CHEMICAL COMPANY (1981)
*****************************************************************************

VP      2-ETHOXYETHANOL                                        CAS#   110-80-5
  Vapor Pressure :  .4E 01      TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  HANN,RWJR & JENSEN,PA (1977)
*****************************************************************************

VP      2-ETHOXYETHANOL                                        CAS#   110-80-5
  Vapor Pressure :  5.63        MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  KELLOMAEKI,A (1985)
*****************************************************************************

VP      2-ETHOXYETHANOL                                        CAS#   110-80-5
  Vapor Pressure :  5.310E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

DOW CHEMICAL COMPANY (1981)
DOW CHEMICAL COMPANY.; THE GLYCOL ETHERS HANDBOOK.; MIDLAND, MI: DOW CHEMICAL CO.; 1981

HANN,RWJR & JENSEN,PA (1977)

HANN,R.W. JR.; JENSEN,P.A.; WATER QUALITY CHARACTERISTICS OF HAZARDOUS MATERIALS.; NTIS-PB-285946. TEXAS A&M UNIV., COLLEGE STATION ENVIRONMENTAL ENGINEERING DIV. 1751 PP.; 1977

KELLOMAEKI,A (1985)
KELLOMAEKI,A.; VAPOR PRESSURE OF ETHYLENE GLYCOL MONOETHYL ETHER AND SOME O ITS CHLORIDE SOLVATES.; ACTA CHEM. SCAND. SER. A.; 39:77-8.; 1985

End of Search

CHEMFATE Search Results

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CAS #: 000110-82-7 Name: CYCLOHEXANE

```
*****************************************************************************
MELT     CYCLOHEXANE                                          CAS#   110-82-7
  Melting Point   :  6.554        DEGC
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  CAMPBELL,ML (1980)
*****************************************************************************

VP       CYCLOHEXANE                                          CAS#   110-82-7
  Vapor Pressure  :  .4750E+02    .9761E+02    .1848E+03   TORR        CALCULATED
  Temperature (C) :  10.0         25.0         40.0
  Remarks         :  CALC FROM ANTOINE EQN
  Abbrev. Ref.    :  ZWOLINSKI,BJ & WILHOIT,RC (1971)
*****************************************************************************

VP       CYCLOHEXANE                                          CAS#   110-82-7
  Vapor Pressure  :  96.86        MM HG
  Temperature (C) :  25
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  CHAO,J ET AL. (1983)
*****************************************************************************
```

CAMPBELL,ML (1980)
CAMPBELL,M.L.; HYDROCARBONS C1-C6 (CYLCOHEXANE); KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. NY,NY: WILEY-INTERSCIENCE. 12:931-7.; 1980

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

ZWOLINSKI,BJ & WILHOIT,RC (1971)
ZWOLINSKI,B.J.; WILHOIT,R.C.; HANDBOOK OF VAPOR PRESSURES AND HEATS OF VAPORIZATON OF HYDROCARBONS AND RELATED COMPOUNDS.; API44-TRC101. COLLEGE STATION,TX: THERMODYNAMCS RESEARCH CENTER.; 1971

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References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000110-83-8
Chem Name  : CYCLOHEXENE
Mol Formula: C6H10
Mol Weight : 82.15
Melting Pt : -103.5 deg C
Boiling Pt : 82.9 deg C
Water Solubility:
   Value : 213 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 2.86
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 89 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0455 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HINE,J & MOOKERJEE,PK (1975)
Atmospheric OH Rate Constant:
   Value : 6.77E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000111-65-9
Chem Name  : OCTANE
Mol Formula: C8H18
Mol Weight : 114.23
Melting Pt : -56.8 deg C
Boiling Pt : 125.6 deg C
Water Solubility:
   Value : 0.66 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 5.18
   Type  : EXP
   Ref   : MILLER,MM ET AL. (1985)
Vapor Pressure:
   Value : 14.1 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YAWS,CL (1994)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 3.21 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 8.68E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000111-84-2 Name: NONANE

```
*****************************************************************************
VP      NONANE                                                  CAS#   111-84-2
  Vapor Pressure :  4.450E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000111-84-2
Chem Name  : N-NONANE
Mol Formula: C9H20
Mol Weight : 128.26
Melting Pt : -53.5 deg C
Boiling Pt : 150.8 deg C
Water Solubility:
   Value : 220 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : 4.76
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 4.45 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 3.4 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 1.02E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000121-44-8 Name: TRIETHYLAMINE

```
*****************************************************************************
MELT    TRIETHYLAMINE                                          CAS#   121-44-8
  Melting Point  :  -115        DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      TRIETHYLAMINE                                          CAS#   121-44-8
  Vapor Pressure :  57.07       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000123-19-3
Chem Name  : DI(N-PROPYL) KETONE
Mol Formula: C7H14O
Mol Weight : 114.19
Melting Pt : -33 deg C
Boiling Pt : 144 deg C
Water Solubility:
   Value : 3200 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.73
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 6.12 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 5.49E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 9.34E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

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CAS #: 000123-38-6 Name: PROPIONALDEHYDE

```
*****************************************************************************
MELT    PROPIONALDEHYDE                                        CAS#   123-38-6
  Melting Point  :  -80          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      PROPIONALDEHYDE                                        CAS#   123-38-6
  Vapor Pressure :  316.8        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

Data From SRC PhysProp Database:

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```
CAS Number : 000123-51-3
Chem Name  : ISOPENTANOL
Mol Formula: C5H12O
Mol Weight : 88.15
Melting Pt : -117.2 deg C
Boiling Pt : 131.1 deg C
Water Solubility:
   Value : 2.67E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : 1.16
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2.37 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.41E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BUTLER,JAV ET AL. (1935)
Atmospheric OH Rate Constant:
   Value : 1.31E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SAUNDERS,SM ET AL. (1993)
```

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CHEMFATE Search Results

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CAS #: 000123-86-4 Name: N-BUTYL ACETATE

```
*****************************************************************************
VP      N-BUTYL ACETATE                                        CAS#   123-86-4
  Vapor Pressure :  .15E 02     TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  SYRACUSE RESEARCH CORP (1979)
*****************************************************************************

VP      N-BUTYL ACETATE                                        CAS#   123-86-4
  Vapor Pressure :  .10E 02     .15E 02     TORR        MEASURED
  Temperature (C):  20.         25.
  Abbrev. Ref.   :  VERSCHUEREN,K (1977)
*****************************************************************************

VP      N-BUTYL ACETATE                                        CAS#   123-86-4
  Vapor Pressure :  1.151E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

SYRACUSE RESEARCH CORP (1979)
SYRACUSE RESEARCH CORP.; INFORMATION PROFILES ON POTENTIAL OCCUPATIONAL HAZARDS. VOLUME I. SINGLE CHEMICALS.; CONTRACT NO. 210-78-0019. PREPARED F NIOSH. SYRACUSE,NY: SYRACUSE RESEARCH CORP.; 1979

VERSCHUEREN,K (1977)
VERSCHUEREN,K.; HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS.; NEW YORK, NY: VAN NOSTRAND REINHOLD COMPANY.; 1977

End of Search

Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000123-86-4
Chem Name  : N-BUTYL ACETATE
Mol Formula: C6H12O2
Mol Weight : 116.16
Melting Pt : -78 deg C
Boiling Pt : 126.1 deg C
Water Solubility:
   Value : 8400 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.78
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 11.5 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000281 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KIECKBUSCH,TG & KING,CJ (1979)
Atmospheric OH Rate Constant:
   Value : 4.9E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KWOK,ESC & ATKINSON,R (1994)
```

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CHEMFATE Search Results

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CAS #: 000123-91-1 Name: 1,4-DIOXANE

```
*****************************************************************************
MELT    1,4-DIOXANE                                          CAS#   123-91-1
  Melting Point  :  11.80       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      1,4-DIOXANE                                          CAS#   123-91-1
  Vapor Pressure :  38.09       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

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CAS #: 000126-98-7 Name: METHACRYLONITRILE

```
*****************************************************************************
VP      METHACRYLONITRILE                                    CAS#   126-98-7
  Vapor Pressure :  7.120E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000126-98-7
Chem Name  : METHACRYLONITRILE
Mol Formula: C4H5N
Mol Weight : 67.09
Melting Pt : -35.8 deg C
Boiling Pt : 90.3 deg C
Water Solubility:
   Value : 2.54E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 0.68
   Type  : EXP
   Ref   : TANII,H & HASHIMOTO,K (1984)
Vapor Pressure:
   Value : 71.2 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000247 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 8.36E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000127-19-5
Chem Name  : N,N'-DIMETHYLACETAMIDE
Mol Formula: C4H9NO
Mol Weight : 87.12
Melting Pt : -20 deg C
Boiling Pt : 165 deg C
Water Solubility:
   Value : 1E+006 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : -0.77
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value : 10.8
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Henry's Law Constant:
   Value : 1.31E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : TAFT,RW ET AL. (1985)
Atmospheric OH Rate Constant:
   Value : 1.36E-011 cm3/molecule-sec
   Temp  : 27 deg C
   Type  : EXP
   Ref   : KOCH,R ET AL. (1997)
```

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CAS #: 000141-78-6 Name: ETHYL ACETATE

```
*****************************************************************************
MELT    ETHYL ACETATE                                          CAS#   141-78-6
  Melting Point  :  -83.6       DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP      ETHYL ACETATE                                          CAS#   141-78-6
  Vapor Pressure :  .243E 02    .689E 02    .9450E 02   .1652E 03   TORR
                    MEASURED
  Temperature (C):  -.11        18.67       25.         37.06
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1981)
*****************************************************************************

VP      ETHYL ACETATE                                          CAS#   141-78-6
  Vapor Pressure :  93.66       MM HG
  Temperature (C):  25
  Remarks        :  CALCULATED FROM T-RANGE OF -83.4 TO 250.25 DEG C, SRC
                    RECOMMEDNED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

AMBROSE,D ET AL. (1981)
AMBROSE,D.; ELLENDER,J.H.; GUNDRY,H.A.; LEE,D.A.; TOWNSEND,R.; THERMODYNAMI PROPERTIES OF ORGANIC OXYGEN COMPOUNDS. LI. THE VAPOUR PRESSURES OF SOME ESTERS AND FATTY ACIDS.; J. CHEM. THERM.; 13:795-802.; 1981

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

CHEMFATE Search Results

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CAS #: 000141-79-7 Name: MESITYL OXIDE

```
*****************************************************************************
VP      MESITYL OXIDE                                        CAS#   141-79-7
  Vapor Pressure :  1.102E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000141-79-7
Chem Name  : MESITYL OXIDE
Mol Formula: C6H10O
Mol Weight : 98.15
Melting Pt : -59 deg C
Boiling Pt : 130 deg C
Water Solubility:
   Value : 2.89E+004 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.37
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 8.21 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 3.67E-005 atm-m3/mole
   Temp  : 20 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 7.86E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000142-82-5
Chem Name  : N-HEPTANE
Mol Formula: C7H16
Mol Weight : 100.21
Melting Pt : -90.6 deg C
Boiling Pt : 98.5 deg C
Water Solubility:
   Value : 3.4 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 4.66
   Type  : EXP
   Ref   : MILLER,MM ET AL. (1985)
Vapor Pressure:
   Value : 46 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 2 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 7.15E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 001634-04-4 Name: METHYL TERT-BUTYL ETHER

```
*****************************************************************************
MELT    METHYL TERT-BUTYL ETHER                              CAS#  1634-04-4
  Melting Point  :  -109        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      METHYL TERT-BUTYL ETHER                              CAS#  1634-04-4
  Vapor Pressure :  .251E 03    TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1976)
*****************************************************************************

VP      METHYL TERT-BUTYL ETHER                              CAS#  1634-04-4
  Vapor Pressure :  249         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

AMBROSE,D ET AL. (1976)
AMBROSE,D.; ELLENDER,J.H.; SPRAKE, C.H.S.; TOWNSEND, R.; THERMODYNAMIC PROPERTIES OF ORGANIC OXYGEN COMPOUNDS. XLIII. VAPOR PRESSURES OF SOME ETHERS.; J. CHEM. THERMODYN.; 8:165-78.; 1976

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000287-92-3 Name: CYCLOPENTANE

```
*****************************************************************************
VP      CYCLOPENTANE                                          CAS#   287-92-3
  Vapor Pressure :  3.178E+02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000287-92-3
Chem Name  : CYCLOPENTANE
Mol Formula: C5H10
Mol Weight : 70.14
Melting Pt : -93.8 deg C
Boiling Pt : 49.3 deg C
Water Solubility:
   Value : 156 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 3.00
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 318 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.188 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 5.16E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 004170-30-3
Chem Name  : CROTONALDEHYDE
Mol Formula: C4H6O
Mol Weight : 70.09
Melting Pt : -76.5 deg C
Boiling Pt : 104 deg C
Water Solubility:
   Value : 1.81E+005 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : BAXTER,WFJR (1979)
Log P (octanol-water):
   Value : 0.60
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 30 mm Hg
   Temp  : 20 deg C
   Type  : EXP
   Ref   : WEBER,RC ET AL. (1981)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 9.68E-006 atm-m3/mole
   Temp  : 20 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 3.62E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

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CAS #: 000460-19-5 Name: CYANOGEN

```
*****************************************************************************
VP      CYANOGEN                                              CAS#   460-19-5
  Vapor Pressure :  4.302E+03   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000460-19-5
Chem Name  : CYANOGEN
Mol Formula: C2N2
Mol Weight : 52.04
Melting Pt : -27.9 deg C
Boiling Pt : -21.1 deg C
Water Solubility:
   Value : 1.51E+005 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 0.07
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 4300 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0054 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000050-00-0 Name: FORMALDEHYDE

```
*****************************************************************************
MELT    FORMALDEHYDE                                          CAS#    50-00-0
  Melting Point  :  -92          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP      FORMALDEHYDE                                          CAS#    50-00-0
  Vapor Pressure :  5.24E 03     MM HG        MEAS
  Temperature (C):  25
  Remarks        :  INTERPOLATED FROM DATA OBTAINED IN THE RANGE -92 TO 135 DE
                    C, SRC RECOMMENDED VALUE.
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000540-84-1
Chem Name  : 2,2,4-TRIMETHYLPENTANE
Mol Formula: C8H18
Mol Weight : 114.23
Melting Pt : -107.3 deg C
Boiling Pt : 99.2 deg C
Water Solubility:
   Value : 2.44 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 4.09
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 49.3 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1991)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 3.04 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 3.68E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000563-80-4 Name: 3-METHYL-2-BUTANONE

```
*****************************************************************************
VP      3-METHYL-2-BUTANONE                                  CAS#   563-80-4
  Vapor Pressure :  5.220E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************

VP      3-METHYL-2-BUTANONE                                  CAS#   563-80-4
  Vapor Pressure :  52.2        MM HG       MEASURED
  Temperature (C):  25
  Remarks        :
             1   :  DAUBERT AND DANNER (1989)
             2   :   HPV: 2-BUTANONE, 3-METHYL
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000563-80-4
Chem Name  : 3-METHYL-2-BUTANONE
Mol Formula: C5H10O
Mol Weight : 86.14
Melting Pt : -92 deg C
Boiling Pt : 94.3 deg C
Water Solubility:
   Value : 6.08E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 0.84
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 52.2 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 9.73E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 2.87E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : LECALVE,S ET AL. (1998)
```

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CHEMFATE Search Results

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CAS #: 000591-78-6 Name: METHYL N-BUTYL KETONE

```
*****************************************************************************
VP      METHYL N-BUTYL KETONE                                  CAS#   591-78-6
  Vapor Pressure :  .1162E 02   .199E 02    .672E 02    TORR        MEASURED
  Temperature (C):  25.0        34.6        59.4
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1975)
*****************************************************************************
```

AMBROSE,D ET AL. (1975)
AMBROSE,D.; ELLENDER,J.H.; LEES,E.B.; SPRAKE,C.H.S.; TOWNSEND,R.;
THERMODYNAMIC PROPERTIES OF ORGANIC OXYGEN COMPOUNDS. XXXVIII. VAPOUR
PRESSURES OF SOME ALIPHATIC KETONES.; J. CHEM. THERM.; 7:453-72.; 1975

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000591-78-6
Chem Name  : 2-HEXANONE
Mol Formula: C6H12O
Mol Weight : 100.16
Melting Pt : -55.5 deg C
Boiling Pt : 127.6 deg C
Water Solubility:
   Value : 1.75E+004 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : PAPA,AJ & SHERMAN,PDJR (1981)
Log P (octanol-water):
   Value : 1.38
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 11.6 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : AMBROSE,D ET AL. (1975)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 9.32E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 9.1E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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CHEMFATE Search Results

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CAS #: 000060-29-7 Name: ETHYL ETHER

```
*****************************************************************************
VP      ETHYL ETHER                                          CAS#    60-29-7
  Vapor Pressure :  .4420E 03   TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  HANN,RWJR & JENSEN,PA (1977)
*****************************************************************************

VP      ETHYL ETHER                                          CAS#    60-29-7
  Vapor Pressure :  .442E 03    .921E 03    TORR        MEASURED
  Temperature (C):  20.         40.
  Abbrev. Ref.   :  VERSCHUEREN,K (1977)
*****************************************************************************

VP      ETHYL ETHER                                          CAS#    60-29-7
  Vapor Pressure :  5.371E+02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

HANN,RWJR & JENSEN,PA (1977)
HANN,R.W. JR.; JENSEN,P.A.; WATER QUALITY CHARACTERISTICS OF HAZARDOUS MATERIALS.; NTIS-PB-285946. TEXAS A&M UNIV., COLLEGE STATION ENVIRONMENTAL ENGINEERING DIV. 1751 PP.; 1977

VERSCHUEREN,K (1977)
VERSCHUEREN,K.; HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS.; NEW YORK, NY: VAN NOSTRAND REINHOLD COMPANY.; 1977

End of Search

Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000060-29-7
Chem Name  : DIETHYL ETHER
Mol Formula: C4H10O
Mol Weight : 74.12
Melting Pt : -116.3 deg C
Boiling Pt : 34.5 deg C
Water Solubility:
   Value : 6.04E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : 0.89
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 538 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1995)
pKa Dissociation Constant:
   Value : -3.59
   Temp  :
   Type  : EXP
   Ref   : KULEVSKY,N ET AL. (1969)
Henry's Law Constant:
   Value : 0.00123 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BOCEK,K (1976)
Atmospheric OH Rate Constant:
   Value : 1.31E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1994)
```

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CHEMFATE Search Results

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CAS #: 000060-35-5 Name: ACETAMIDE

```
*****************************************************************************
MELT    ACETAMIDE                                            CAS#    60-35-5
  Melting Point  :  69.5        DEGC
  Remarks        :  SRC RECOMMENDED VALUE, 80 DEG C FREEZING POINT (RIDDICK,J
                    AL. (1986)
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ACETAMIDE                                            CAS#    60-35-5
  Vapor Pressure :  0.11        MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED USING PCCHEM, BASED ON BP = 221 DEG C FROM MERCK
                    INDEX (1983), SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************
```

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000624-83-9 Name: METHYLISOCYANATE

```
*****************************************************************************
MELT    METHYLISOCYANATE                                        CAS#   624-83-9
  Melting Point  :  -45          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP      METHYLISOCYANATE                                        CAS#   624-83-9
  Vapor Pressure :  221          MM HG
  Temperature (C):  25
  Remarks        :  EST USING METHOD IN NEELY,WB & BLAU,GE (1985), SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      METHYLISOCYANATE                                        CAS#   624-83-9
  Vapor Pressure :  3.480E+02    MM HG       MEASURED
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  UNION CARBIDE (1979)
*****************************************************************************


   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

   UNION CARBIDE (1979)
   UNION CARBIDE; 1979-1980 CHEMICALS AND PLASTICS PHYSICAL PROPERTIES.;  UNIO
   CARBIDE CORP., NEW YORK. P. 17.; 1979

   WEAST,RC ET AL. (1985)
   WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS
   66TH ED;  CRC PRESS; BOCA RATON, FLA; 1985

End of Search
```

CHEMFATE Search Results

Return to EFDB page

CAS #: 000064-17-5 Name: ETHANOL

```
*****************************************************************************
MELT    ETHANOL                                                CAS#    64-17-5
  Melting Point  :  -114.49      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

MELT    ETHANOL                                                CAS#    64-17-5
  Melting Point  :  -114         DEG C
  Remarks        :
             1   :  VERSCHUEREN (1996)
             2   :   HPV: ETHANOL
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      ETHANOL                                                CAS#    64-17-5
  Vapor Pressure :  59.26        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************

VP      ETHANOL                                                CAS#    64-17-5
  Vapor Pressure :  59.03        MM HG        MEASURED
  Temperature (C):  25
  Remarks        :
             1   :  USED EQUILIBRIUM STILL OF SCATCHARD ET AL. METHOD
             2   :   KRETSCHMER ET AL. (1948)
             3   :   HPV: ETHANOL
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC:

USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

CHEMFATE Search Results

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CAS #: 000064-18-6 Name: FORMIC ACID

```
*****************************************************************************
MELT     FORMIC ACID                                          CAS#     64-18-6
  Melting Point  :  8.27        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP       FORMIC ACID                                          CAS#     64-18-6
  Vapor Pressure :  42.59       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

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CHEMFATE Search Results

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CAS #: 000064-19-7 Name: ACETIC ACID

```
*****************************************************************************
VP      ACETIC ACID                                          CAS#    64-19-7
  Vapor Pressure :  .156E 02    .2168E 02   .3780E 02   .6635E 02   TORR
                    MEASURED
  Temperature (C):  25.0        30.9        41.5        53.1
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1977)
*****************************************************************************

VP      ACETIC ACID                                          CAS#    64-19-7
  Vapor Pressure :  .114E 02    .20E 02     TORR        MEASURED
  Temperature (C):  20.         30.
  Abbrev. Ref.   :  VERSCHUEREN,K (1977)
*****************************************************************************

VP      ACETIC ACID                                          CAS#    64-19-7
  Vapor Pressure :  1.573E+01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************

VP      ACETIC ACID                                          CAS#    64-19-7
  Vapor Pressure :  11.4        MM HG       MEASURED
  Temperature (C):  20
  Remarks        :
            1    :  VERSCHUEREN (1996)
            2    :   HPV: ACETIC ACID AND SALTS.
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

AMBROSE,D ET AL. (1977)
AMBROSE,D.; ELLENDER,J.H.; SPRAKE,C.H.S.; TOWNSEND,R.; THERMODYNAMIC PROPERTIES OF ORGANIC OXYGEN COMPOUNDS. XLV. THE VAPOUR PRESSURE OF ACETIC ACID.; J. CHEM. THERM.; 9:735-41.; 1977

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DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE

HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

VERSCHUEREN,K (1977)
VERSCHUEREN,K.; HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS.; NEW YORK, NY: VAN NOSTRAND REINHOLD COMPANY.; 1977

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000064-19-7
Chem Name  : ACETIC ACID
Mol Formula: C2H4O2
Mol Weight : 60.05
Melting Pt : 16.6 deg C
Boiling Pt : 117.9 deg C
Water Solubility:
   Value : 1E+006 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : MERCK INDEX (1996)
Log P (octanol-water):
   Value : -0.17
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 15.7 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1985)
pKa Dissociation Constant:
   Value : 4.76
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 1E-007 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : GAFFNEY,JS ET AL. (1987)
Atmospheric OH Rate Constant:
   Value : 7.4E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000067-56-1 Name: METHANOL

```
*****************************************************************************
MELT    METHANOL                                            CAS#    67-56-1
  Melting Point  :  -97.68      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

MELT    METHANOL                                            CAS#    67-56-1
  Melting Point  :  -97.8       DEG C
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      METHANOL                                            CAS#    67-56-1
  Vapor Pressure :  127         MM HG       MEAS
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      METHANOL                                            CAS#    67-56-1
  Vapor Pressure :  126         MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************

VP      METHANOL                                            CAS#    67-56-1
  Vapor Pressure :  95          MM HG       MEASURED
  Temperature (C):  25
  Remarks        :
            1    :  BOUBLICK ET AL. (1984)
            2    :   HPV: METHANOL.
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************


   BOUBLIK,T ET AL. (1984)
   BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES:
   SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO
   PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.;  AMSTERDAM
   NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

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   DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE
   CHEMICALS: DATA COMPILATION.;  DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA,
   AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK,
```

NY., 4 VOL.; 1989

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

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US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000067-63-0 Name: ISOPROPANOL

```
*****************************************************************************
MELT    ISOPROPANOL                                          CAS#    67-63-0
  Melting Point  :  -88.0       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ISOPROPANOL                                          CAS#    67-63-0
  Vapor Pressure :  45.42       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Acetone
CAS Number: 000067-64-1

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	9.0E-1	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	5.3E+3	mg/kg	ACGIH
Dermal LD50:	2.0E+4	mg/kg	ACGIH
Gas Inhal LC50:		ppm	
Dust Inhal LC50:	3.7E+1	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.0E+4	µg/L	ECOTOX
Salt Ecol LC50:	1.9E+6	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.2E+0	days	THOMAS
Photolysis:	5.7E-1	days	CHEMFATE
Biodeg:	7.0E+0	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.2E+0	days	THOMAS
Photolysis:	5.7E-1	days	CHEMFATE
Biodeg:	7.0E+0	days	FATERATE
Radio:		days	
Log Kow:	-2.4E-1		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	5.8E+1	
Density:	7.9E-1	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.3E+2	Torr	CHEMFATE
Henry's Law:	3.9E-5	atm-m3/mol	CHEMFATE
Water Solub:	1.0E+6	mg/L	CHEMFATE
Distrib Coef:	8.7E-2	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	-2.4E-1		CHEMFATE
Water Solub:	1.0E+6		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-9.5E+1	C
Boiling Point:	5.6E+1	C
Formula:	C3 H6 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000067-64-1 Name: ACETONE

```
*****************************************************************************
MELT    ACETONE                                                CAS#    67-64-1
  Melting Point  :  -94.7       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ACETONE                                                CAS#    67-64-1
  Vapor Pressure :  231.5       MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      ACETONE                                                CAS#    67-64-1
  Vapor Pressure :  230.0       MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
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End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000071-23-8 Name: N-PROPANOL

```
*****************************************************************************
MELT    N-PROPANOL                                          CAS#    71-23-8
  Melting Point  :  -127        DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      N-PROPANOL                                          CAS#    71-23-8
  Vapor Pressure :  20.99       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000071-36-3 Name: 1-BUTANOL

```
*****************************************************************************
MELT    1-BUTANOL                                          CAS#    71-36-3
  Melting Point  :  -88.62      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      1-BUTANOL                                          CAS#    71-36-3
  Vapor Pressure :  .103E 01    .234E 01    .502E 01    .1006E 02   .1933E 02
                    .3539E 02   TORR        MEASURED
  Temperature (C):  0.0         10.0        20.0        30.0        40.0
                    50.2
  Abbrev. Ref.   :  MUNDAY,EB ET AL. (1980)
*****************************************************************************

VP      1-BUTANOL                                          CAS#    71-36-3
  Vapor Pressure :  .471E 01    TORR        MEASURED
  Temperature (C):  20.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  SHERMAN,PDJR (1978)
*****************************************************************************

VP      1-BUTANOL                                          CAS#    71-36-3
  Vapor Pressure :  6.7         MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      1-BUTANOL                                          CAS#    71-36-3
  Vapor Pressure :  7.00        MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
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AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

MUNDAY,EB ET AL. (1980)
MUNDAY,E.B.; MULLINS,J.C.; EDIE,D.D.; VAPOR PRESSURE DATA FOR TOLUENE, 1-PENTANOL, 1-BUTANOL, WATER, AND 1-PROPANOL AND FOR THE WATER AND 1-PROPAN SYSTEM FROM 273.15 TO 323.15.; J. CHEM. ENG. DATA.; 25:191-4.; 1980

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SHERMAN,PDJR (1978)
SHERMAN,P.D. JR.; BUTYL ALCOHOLS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECHNOL. 3RD ED. 4:338-45.; 1978

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000074-99-7
Chem Name  : PROPYNE
Mol Formula: C3H4
Mol Weight : 40.07
Melting Pt : -102.7 deg C
Boiling Pt : -23.2 deg C
Water Solubility:
   Value : 3640 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : MCAULIFFE,C (1966)
Log P (octanol-water):
   Value : 0.94
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 4310 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.011 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 5.9E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-05-8 Name: ACETONITRILE

```
*****************************************************************************
MELT    ACETONITRILE                                          CAS#    75-05-8
  Melting Point  :  -45          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      ACETONITRILE                                          CAS#    75-05-8
  Vapor Pressure :  .5490E+02    .7090E+02    .1106E+03   TORR        MEASURED
  Temperature (C):  15.5         20.          30.
  Abbrev. Ref.   :  BEILSTEIN (NA--)
*****************************************************************************

VP      ACETONITRILE                                          CAS#    75-05-8
  Vapor Pressure :  88.8         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      ACETONITRILE                                          CAS#    75-05-8
  Vapor Pressure :  91.1         MM HG        MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BEILSTEIN (NA--)
BEILSTEIN; BEILSTEIN ONLINE. BEILSTEIN'S HANDBUCH DER ORGANISCHEN CHEMIE.; FRANKFORT, GERMANY: MDL INFORMATION SYSTEMS GMBH. AVAILABLE THROUGH HTTP://LIBRARY.DIALOG.COM/BLUESHEETS/HTML/BL0390.HTML AS OF 2003.; NA--

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-07-0 Name: ACETALDEHYDE

```
*****************************************************************************
MELT    ACETALDEHYDE                                          CAS#    75-07-0
  Melting Point  :  -123        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ACETALDEHYDE                                          CAS#    75-07-0
  Vapor Pressure :  .3300E+03   .5080E+03   .7545E+03   TORR        MEASURED
  Temperature (C):  0.0         10.0        20.0
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  HAGEMEYER,HJ (1978)
*****************************************************************************

VP      ACETALDEHYDE                                          CAS#    75-07-0
  Vapor Pressure :  902         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

HAGEMEYER,HJ (1978)
HAGEMEYER,H.J.; ACETALDEHYDE.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 1:97-112.; 1978

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-12-7 Name: FORMAMIDE

```
*****************************************************************************
MELT    FORMAMIDE                                          CAS#    75-12-7
  Melting Point  :  2.55        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  EBERLING,CL (1980)
*****************************************************************************

VP      FORMAMIDE                                          CAS#    75-12-7
  Vapor Pressure :  .98E 00     .200E 02    .9998E 02   TORR        MEASURED
  Temperature (C):  70.5        122.5       157.5
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  EBERLING,CL (1981)
*****************************************************************************

VP      FORMAMIDE                                          CAS#    75-12-7
  Vapor Pressure :  0.023       MM HG
  Temperature (C):  25
  Remarks        :
            1    :  EXTRAPOLATED FROM REPORTED ANTOINNE'S EQUATION IN RIDDICK,
                    ET AL (1986)
            2    :   EXPERIMENTAL TEMPERATURE RANGE OF EQUATION NOT REPORTED,
                    SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      FORMAMIDE                                          CAS#    75-12-7
  Vapor Pressure :  6.100E-02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

EBERLING,CL (1980)
EBERLING,C.L.; FORMAMIDE; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 11:258-63.; 1980

EBERLING,CL (1981)
EBERLING,C.L.; FORMAMIDE.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED.

11:258-63; 1981

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Carbon disulfide
CAS Number: 000075-15-0

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-1	mg/kg/day	IRIS
Inhal RfD:	2.0E-1	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	1.2E+3	mg/kg	RTECS
Dermal LD50:		mg/kg	
Gas Inhal LC50:	2.0E+3	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.9E+3	µg/L	ECOTOX
Salt Ecol LC50:	4.5E+4	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	4.0E+2	days	CHEMFATE
Volatility:	7.7E+1	days	THOMAS
Photolysis:	1.1E+1	days	CHEMFATE
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:	4.0E+2	days	CHEMFATE
Volatility:	8.3E-1	days	THOMAS
Photolysis:	1.1E+1	days	CHEMFATE
Biodeg:		days	
Radio:		days	
Log Kow:	2.2E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	No	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	7.6E+1	
Density:	1.3E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	3.6E+2	Torr	CHEMFATE
Henry's Law:	3.0E-2	atm-m3/mol	CHEMFATE
Water Solub:	1.2E+3	mg/L	CHEMFATE
Distrib Coef:	9.1E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.2E+0		CHEMFATE
Water Solub:	1.2E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-1.2E+2	C
Boiling Point:	4.6E+1	C
Formula:	C S2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-15-0 Name: CARBON DISULFIDE

```
*****************************************************************************
MELT    CARBON DISULFIDE                                        CAS#    75-15-0
  Melting Point  :  46.2        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      CARBON DISULFIDE                                        CAS#    75-15-0
  Vapor Pressure :  .1270E+03   .2970E+03   .7580E+03   TORR        MEASURED
  Temperature (C):  0.0         20.0        46.3
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  TIMMERMAN,RW (1978)
*****************************************************************************

VP      CARBON DISULFIDE                                        CAS#    75-15-0
  Vapor Pressure :  358         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      CARBON DISULFIDE                                        CAS#    75-15-0
  Vapor Pressure :  359         MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

TIMMERMAN,RW (1978)
TIMMERMAN,R.W.; CARBON DISULFIDE.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 4:742-57.; 1978

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-21-8 Name: ETHYLENE OXIDE

```
*****************************************************************************
MELT    ETHYLENE OXIDE                                          CAS#    75-21-8
  Melting Point  :  -111        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      ETHYLENE OXIDE                                          CAS#    75-21-8
  Vapor Pressure :  .1095E 04   TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  MARTIN,H & WORTHING,CR (1977)
*****************************************************************************

VP      ETHYLENE OXIDE                                          CAS#    75-21-8
  Vapor Pressure :  .116E 04    TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  GALLANT,RW (1967)
*****************************************************************************

VP      ETHYLENE OXIDE                                          CAS#    75-21-8
  Vapor Pressure :  .1305E 04   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  BOGYO,DA ET AL. (1980)
*****************************************************************************

VP      ETHYLENE OXIDE                                          CAS#    75-21-8
  Vapor Pressure :  .7791E 03   TORR        MEASURED
  Temperature (C):  11.06
  Abbrev. Ref.   :  MCDONALD,RA ET AL. (1959)
*****************************************************************************

VP      ETHYLENE OXIDE                                          CAS#    75-21-8
  Vapor Pressure :  1314        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

BOGYO,DA ET AL. (1980)
BOGYO,D.A.; LANDE,S.S.; MEYLEN,W.M.; HOWARD,P.H.; SANTODONATO,J.;
INVESTIGATION OF SELECTED ENVIRONMENTAL CONTAMINANTS: EPOXIDES.;
EPA-560/11-80-005. WASHINGTON,D.C.:US EPA. PP.202.; 1980

DAUBERT,TE & DANNER,RP (1985)

DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

GALLANT,RW (1967)
GALLANT,R.W.; PHYSICAL PROPERTIES OF HYDROCARBONS. XII. C2-C4 OXIDES.; HYDROCARBON PROCESS.; 46:143-150.; 1967

MARTIN,H & WORTHING,CR (1977)
MARTIN,H.; WORTHING,C.R.; PESTICIDE MANUAL. FIFTH EDITION, BRITISH CROP PROTECTION COUNCIL. 563 PP.; 1977

MCDONALD,RA ET AL. (1959)
MCDONALD,R.A.; SHRADER,S.A.; STULL,D.R.; VAPOR PRESSURES AND FREEZING POINT OF 30 ORGANICS.; J. CHEM. ENG. DATA.; 4:311-13.; 1959

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-44-5 Name: PHOSGENE

```
*****************************************************************************
MELT    PHOSGENE                                          CAS#    75-44-5
  Melting Point  :  -118        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      PHOSGENE                                          CAS#    75-44-5
  Vapor Pressure :  0.5566E 03  0.8155E 03  0.9940E 03  0.1222E 04  0.1485E 04
                    TORR        MEASURED
  Temperature (C):  0.0         9.6         15.0        20.9        26.7
  Abbrev. Ref.   :  GERMANN,AFO & TAYLOR,QW (1926)
*****************************************************************************

VP      PHOSGENE                                          CAS#    75-44-5
  Vapor Pressure :  1418        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

GERMANN,AFO & TAYLOR,QW (1926)
GERMANN,A.F.O.; TAYLOR,Q.W.; THE CRITICAL CONSTANTS AND VAPOR TENSION OF PHOSSGENE.; J. AM. CHEM. SOC.; 48:11554-9.; 1926

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-50-3 Name: TRIMETHYL AMINE

```
*****************************************************************************
MELT    TRIMETHYL AMINE                                        CAS#    75-50-3
  Melting Point  :  -124        DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      TRIMETHYL AMINE                                        CAS#    75-50-3
  Vapor Pressure :  .1432E 04   TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  SCHWEIZER,AE ET AL. (1978)
*****************************************************************************

VP      TRIMETHYL AMINE                                        CAS#    75-50-3
  Vapor Pressure :  1607        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

SCHWEIZER,AE ET AL. (1978)
SCHWEIZER,A.E.; FOWLKES,R.L.; MCMAKIN,J.H.; WHYTE,T.E. JR.; AMINES (LOWER ALIPHATIC).; IN: KIRK-OTHMER ENCYCL. CHEM. TECHNOL. 3RD ED. 2:272-83.; 197

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000075-52-5
Chem Name  : NITROMETHANE
Mol Formula: CH3NO2
Mol Weight : 61.04
Melting Pt : -28.5 deg C
Boiling Pt : 101.1 deg C
Water Solubility:
   Value : 1.11E+005 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : -0.35
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 35.8 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value : 10.2
   Temp  : 25 deg C
   Type  :
   Ref   : RIDDICK,JA ET AL. (1986)
Henry's Law Constant:
   Value : 2.86E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : GAFFNEY,JS ET AL. (1987)
Atmospheric OH Rate Constant:
   Value : 1.3E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KWOK,ESC & ATKINSON,R (1994)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-55-8 Name: 2-METHYLAZIRIDINE

```
*****************************************************************************
MELT    2-METHYLAZIRIDINE                                    CAS#    75-55-8
  Melting Point  :  -65.00      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  HAM,GE (1981)
*****************************************************************************

VP      2-METHYLAZIRIDINE                                    CAS#    75-55-8
  Vapor Pressure :  111.8       MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  HAM,GE (1981)
*****************************************************************************


   HAM,GE (1981)
   HAM,GE; IMINES, CYCLIC.;  KIRK-OTHMER ENCYCL CHEM TECH 3RD ED. NY,NY:
   WILEY-INTERSCIENCE. 13:142-66; 1981

End of Search
```

CHEMFATE Search Results

Return to EFDB page

CAS #: 000075-65-0 Name: TERT-BUTANOL

```
*****************************************************************************
MELT    TERT-BUTANOL                                          CAS#    75-65-0
  Melting Point  :  25.62       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      TERT-BUTANOL                                          CAS#    75-65-0
  Vapor Pressure :  .306E 02    TORR        MEASURED
  Temperature (C):  20.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  SHERMAN,PDJR (1978)
*****************************************************************************

VP      TERT-BUTANOL                                          CAS#    75-65-0
  Vapor Pressure :  41.7        MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA BEGINNING AT 39.15 DEG C, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

SHERMAN,PDJR (1978)
SHERMAN,P.D. JR.; BUTYL ALCOHOLS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECHNOL. 3RD ED. 4:338-45.; 1978

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000765-34-4 Name: GLYCIDYLALDEHYDE

```
*******************************************************************************
MELT    GLYCIDYLALDEHYDE                                        CAS#   765-34-4
  Melting Point  :  -62          DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DEAN,JA (1985)
*******************************************************************************

VP      GLYCIDYLALDEHYDE                                        CAS#   765-34-4
  Vapor Pressure :  27           MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*******************************************************************************


   DEAN,JA (1985)
   DEAN,J.A.; LANGE'S HANDBOOK OF CHEMISTRY 13TH ED.;  NY, NY: MCGRAW-HILL BOO
   CO.; 1985

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

CHEMFATE Search Results

Return to EFDB page

CAS #: 000078-83-1 Name: ISOBUTYL ALCOHOL

```
*****************************************************************************
MELT    ISOBUTYL ALCOHOL                                        CAS#    78-83-1
  Melting Point  :  -108        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ISOBUTYL ALCOHOL                                        CAS#    78-83-1
  Vapor Pressure :  .126E 02    TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  DORIGAN,J ET AL. (1976)
*****************************************************************************

VP      ISOBUTYL ALCOHOL                                        CAS#    78-83-1
  Vapor Pressure :  .880E 01    TORR        MEASURED
  Temperature (C):  20.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  SHERMAN,PDJR (1978)
*****************************************************************************

VP      ISOBUTYL ALCOHOL                                        CAS#    78-83-1
  Vapor Pressure :  10.45       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

DORIGAN,J ET AL. (1976)
DORIGAN,J.; FULLER,B.; DUFFY,R.; PRELIMINARY SCORING OF SELECTED ORGANIC AI POLLUTANTS. APPENDIX III-CHEMISTRY, PRODUCTION, AND TOXICITY OF CHEMICALS F THROUGH N.; EPA-450/3-77-008D. RESEARCH TRIANGLE PARK,NC: U.S. EPA. PP.303 1976

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

SHERMAN,PDJR (1978)
SHERMAN,P.D. JR.; BUTYL ALCOHOLS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECHNOL.

3RD ED. 4:338-45.; 1978

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000078-92-2 Name: 2-BUTANOL

```
*****************************************************************************
MELT    2-BUTANOL                                          CAS#    78-92-2
  Melting Point  :  -114.7      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      2-BUTANOL                                          CAS#    78-92-2
  Vapor Pressure :  18.33       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Methyl ethyl ketone
CAS Number: 000078-93-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	6.0E-1	mg/kg/day	IRIS
Inhal RfD:	1.4E+0	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	5.5E+3	mg/kg	ACGIH
Dermal LD50:	6.5E+3	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:	2.7E+4	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	5.2E+5	µg/L	ECOTOX
Salt Ecol LC50:	4.0E+5	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	1.8E+4	days	FATERATE
Volatility:	7.5E+1	days	THOMAS
Photolysis:		days	
Biodeg:	7.0E+0	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	1.8E+4	days	FATERATE
Volatility:	1.2E+0	days	THOMAS
Photolysis:		days	
Biodeg:	7.0E+0	days	FATERATE
Radio:		days	
Log Kow:	2.9E-1		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	7.2E+1	
Density:	8.0E-1	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	9.5E+1	Torr	CHEMFATE
Henry's Law:	5.6E-5	atm-m3/mol	CHEMFATE
Water Solub:	2.2E+5	mg/L	CHEMFATE
Distrib Coef:	2.9E-1	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.9E-1		CHEMFATE
Water Solub:	2.2E+5		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-8.7E+1	C
Boiling Point:	8.0E+1	C
Formula:	C4 H8 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000078-93-3 Name: METHYL ETHYL KETONE

```
*****************************************************************************
MELT    METHYL ETHYL KETONE                                   CAS#    78-93-3
  Melting Point  :  -86          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      METHYL ETHYL KETONE                                   CAS#    78-93-3
  Vapor Pressure :  95.3         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000079-09-4 Name: PROPIONIC ACID

```
*****************************************************************************
MELT    PROPIONIC ACID                                          CAS#    79-09-4
  Melting Point  :  -20.8       DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SAX,NI & LEWIS,RJSR (1987)
*****************************************************************************

VP      PROPIONIC ACID                                          CAS#    79-09-4
  Vapor Pressure :  .29E 01     TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  VERSCHUEREN,K (1977)
*****************************************************************************

VP      PROPIONIC ACID                                          CAS#    79-09-4
  Vapor Pressure :  .338E 01    .2168E 02   TORR        MEASURED
  Temperature (C):  25.0        55.1
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1981)
*****************************************************************************

VP      PROPIONIC ACID                                          CAS#    79-09-4
  Vapor Pressure :  3.53        MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

AMBROSE,D ET AL. (1981)
AMBROSE,D.; ELLENDER,J.H.; GUNDRY,H.A.; LEE,D.A.; TOWNSEND,R.; THERMODYNAMI PROPERTIES OF ORGANIC OXYGEN COMPOUNDS. LI. THE VAPOUR PRESSURES OF SOME ESTERS AND FATTY ACIDS.; J. CHEM. THERM.; 13:795-802.; 1981

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

SAX,NI & LEWIS,RJSR (1987)
SAX,N.I.; LEWIS,R.J.S.R.; HAWLEY'S CONDENSED CHEMICAL DICTIONARY 11TH ED; VANNOSTRAND REINHOLD CO.; N.Y.,N.Y.:P496; 1987

VERSCHUEREN,K (1977)
VERSCHUEREN,K.; HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS.; NEW YORK, NY: VAN NOSTRAND REINHOLD COMPANY.; 1977

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000079-20-9 Name: METHYL ACETATE

```
*****************************************************************************
MELT    METHYL ACETATE                                          CAS#    79-20-9
  Melting Point  :  -98.1       DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1988)
*****************************************************************************

VP      METHYL ACETATE                                          CAS#    79-20-9
  Vapor Pressure :  216.2       MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  AMBROSE,D ET AL. (1981)
*****************************************************************************
```

AMBROSE,D ET AL. (1981)
AMBROSE,D.; ELLENDER,J.H.; GUNDRY,H.A.; LEE,D.A.; TOWNSEND,R.; THERMODYNAMI PROPERTIES OF ORGANIC OXYGEN COMPOUNDS. LI. THE VAPOUR PRESSURES OF SOME ESTERS AND FATTY ACIDS.; J. CHEM. THERM.; 13:795-802.; 1981

WEAST,RC ET AL. (1988)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS. 69TH ED.; BOCA RATON, FL: CRC PRESS INC.; 1988

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000080-62-6 Name: METHYL METHACRYLATE

```
*****************************************************************************
VP      METHYL METHACRYLATE                                  CAS#    80-62-6
  Vapor Pressure :  .83E 01     .293E 02    .810E 02    TORR        MEASURED
  Temperature (C):  0.          20.         40.
  Abbrev. Ref.   :  NEMEC,JW & KIRSCH,LS (1981)
*****************************************************************************

VP      METHYL METHACRYLATE                                  CAS#    80-62-6
  Vapor Pressure :  38.4        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

NEMEC,JW & KIRSCH,LS (1981)
NEMEC,J.W.; KIRSCH,L.S.; METHACRYLIC ACID AND DERIVATIVES.; IN: KIRK-OTHME ENCYCL. CHEM. TECHNOL. 3RD. ED. 15:346-76.; 1981

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000080-62-6
Chem Name  : METHYL METHACRYLATE
Mol Formula: C5H8O2
Mol Weight : 100.12
Melting Pt : -48 deg C
Boiling Pt : 100.5 deg C
Water Solubility:
   Value : 1.5E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : NEMEC,JW & KIRSCH,LS (1981)
Log P (octanol-water):
   Value : 1.38
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 38.5 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000319 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 2.6E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SAUNDERS,SM ET AL. (1993)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000096-22-0
Chem Name  : 3-PENTANONE
Mol Formula: C5H10O
Mol Weight : 86.14
Melting Pt : -39 deg C
Boiling Pt : 101.9 deg C
Water Solubility:
   Value : 4.81E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 0.99
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 37.7 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 8.88E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 2E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000097-63-2 Name: ETHYL METHACRYLATE

```
*****************************************************************************
MELT    ETHYL METHACRYLATE                                    CAS#    97-63-2
  Melting Point  :  -44.7       DEGC
  Remarks        :  ESTIMATED BY EQUATION 20 IN NEELY,WB & BLAU,GE (1985), SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      ETHYL METHACRYLATE                                    CAS#    97-63-2
  Vapor Pressure :  20.59       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************


   DAUBERT,TE & DANNER,RP (1985)
   DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE
   COMPOUNDS.;  AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

CHEMFATE Search Results

Return to EFDB page

CAS #: 000098-51-1 Name: P-TERT-BUTYLTOLUENE

```
*****************************************************************************
VP      P-TERT-BUTYLTOLUENE                                  CAS#    98-51-1
  Vapor Pressure :  .6710E 00   TORR        CALCULATED
  Temperature (C):  25.
  Abbrev. Ref.   :  DREISBACH,RR (1955)
*****************************************************************************
```

DREISBACH,RR (1955)
DREISBACH,R.R.; PHYSICAL PROPERTIES OF CHEMICAL COMPOUNDS. I.; ADVANCES IN CHEMISTRY SERIES NO. 15.; WASHINGTON, DC: AMERICAN CHEMICAL SOCIETY.; 1955

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000098-51-1
Chem Name  : P-(T-BUTYL)TOLUENE
Mol Formula: C11H16
Mol Weight : 148.25
Melting Pt : -52 deg C
Boiling Pt : 190 deg C
Water Solubility:
   Value : 5.5 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : AMOORE,JE & HAUTALA,E (1983)
Log P (octanol-water):
   Value : 5.17
   Type  : EXP
   Ref   : CHEM INSPECT TEST INST (1992)
Vapor Pressure:
   Value : 0.671 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : DREISBACH,RR (1955)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0154 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.4E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BOLZACCHINI,E ET AL. (1997)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000099-87-6 Name: P-CYMENE

```
*****************************************************************************
VP      P-CYMENE                                          CAS#    99-87-6
  Vapor Pressure :  1.460E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000099-87-6
Chem Name  : P-CYMENE
Mol Formula: C10H14
Mol Weight : 134.22
Melting Pt : -68.9 deg C
Boiling Pt : 177.1 deg C
Water Solubility:
   Value : 23.4 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BANERJEE,S ET AL (1980)
Log P (octanol-water):
   Value : 4.10
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 1.46 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.011 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 1.51E-011 cm3/molecule-sec
   Temp  : 22 deg C
   Type  : EXP
   Ref   : CORCHNOY,SB & ATKINSON,R (1990)
```

Back To PhysProp Demo Page

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Non-metals and Anions (NMA)

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 024959-67-9
Chem Name  : BROMIDE
Mol Formula: HBr
Mol Weight : 80.92
Melting Pt :
Boiling Pt :
Water Solubility:
   Value : 3.8E+004 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 0.63
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 7.94E-009 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0245 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000057-12-5
Chem Name  : CYANIDE ION
Mol Formula: CN
Mol Weight : 26.02
Melting Pt :
Boiling Pt :
Water Solubility:
   Value : 9.54E+004 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : -0.69
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 308 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0242 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 3E-014 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 007553-56-2
Chem Name  : IODINE
Mol Formula: I2
Mol Weight : 253.81
Melting Pt : 113.6 deg C
Boiling Pt : 185.24 deg C
Water Solubility:
   Value : 330 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : CLAYTON,GD & CLAYTON,FE (1994)
Log P (octanol-water):
   Value : 2.49
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.233 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : LYDAY,PA (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0245 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 007647-01-0 Name: HYDROCHLORIC ACID

```
*****************************************************************************
VP      HYDROCHLORIC ACID                                   CAS#  7647-01-0
  Vapor Pressure :  3.540E+04   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 007664-39-3 Name: HYDROGEN FLUORIDE

```
*****************************************************************************
VP      HYDROGEN FLUORIDE                                    CAS#  7664-39-3
  Vapor Pressure :  9.172E+02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 007664-39-3
Chem Name  : HYDROGEN FLUORIDE
Mol Formula: HF
Mol Weight : 20.01
Melting Pt : -83.36 deg C
Boiling Pt : 20 deg C
Water Solubility:
   Value : 922 mg/L
   Temp  : 0 deg C
   Type  : EXP
   Ref   : DEAN,JA (1985)
Log P (octanol-water):
   Value : 0.23
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 917 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value : 3.19
   Temp  :
   Type  : EXP
   Ref   : BUDAVARI,S ET AL. (1996)
Henry's Law Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 007664-41-7 Name: AMMONIA

```
*****************************************************************************
VP      AMMONIA                                                CAS#  7664-41-7
  Vapor Pressure :  7.508E+03   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 007664-41-7
Chem Name  : AMMONIA
Mol Formula: H3N
Mol Weight : 17.03
Melting Pt : -77.7 deg C
Boiling Pt : -33.35 deg C
Water Solubility:
   Value : 4.82E+005 mg/L
   Temp  : 24 deg C
   Type  : EXP
   Ref   : DEAN,JA (1985)
Log P (octanol-water):
   Value : 0.23
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 7510 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value : 9.25
   Temp  : 25 deg C
   Type  : EXP
   Ref   : LIDE,DR (1996)
Henry's Law Constant:
   Value : 1.61E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BETTERTON,EA (1992A)
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 007782-50-5 Name: CHLORINE

```
*****************************************************************************
VP      CHLORINE                                              CAS#  7782-50-5
  Vapor Pressure :  5.854E+03   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 007782-50-5
Chem Name  : CHLORINE
Mol Formula: Cl2
Mol Weight : 70.91
Melting Pt : -101 deg C
Boiling Pt : -34.05 deg C
Water Solubility:
   Value : 6300 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : AMOORE,JE & HAUTALA,E (1983)
Log P (octanol-water):
   Value : 0.85
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 5850 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0117 atm-m3/mole
   Temp  :
   Type  : EXP
   Ref   : STAUDINGER,J & ROBERTS,PV (1996)
Atmospheric OH Rate Constant:
   Value : 0 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED
CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Other Heavy Semivolatile Compounds (molecular weight >200 g/mole) (OSHVOL)

CHEMFATE Search Results

Return to EFDB page

CAS #: 000101-55-3 Name: 4-BROMOPHENYL PHENYL ETHER

```
*****************************************************************************
MELT    4-BROMOPHENYL PHENYL ETHER                          CAS#   101-55-3
  Melting Point  :  18.7        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP      4-BROMOPHENYL PHENYL ETHER                          CAS#   101-55-3
  Vapor Pressure :  0.0015      TORR
  Temperature (C):  20
  Remarks        :  EXTRAPOLATED DATA, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979A)
*****************************************************************************

VP      4-BROMOPHENYL PHENYL ETHER                          CAS#   101-55-3
  Vapor Pressure :  1.500E-03   MM HG       EXTRAPOLATED
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979)
*****************************************************************************
```

CALLAHAN,MA ET AL. (1979)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS.; EPA-440/4-79-029A. WASHINGTON,DC: U.S.EPA.; 1979

CALLAHAN,MA ET AL. (1979A)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS-VOLUME II.; EPA-440/4-79-029 WASHINGTON,DC: U.S. EPA.; 1979A

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
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```
CAS Number : 000103-33-3
Chem Name  : AZOBENZENE
Mol Formula: C12H10N2
Mol Weight : 182.23
Melting Pt : 68 deg C
Boiling Pt : 293 deg C
Water Solubility:
   Value : 6.4 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : TAKAGISHI,T ET AL (1969)
Log P (octanol-water):
   Value : 3.82
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.000361 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : JONES,AH (1960)
pKa Dissociation Constant:
   Value : -2.95
   Temp  :
   Type  : EXP
   Ref   : HOEFNAGEL,MA ET AL. (1969)
Henry's Law Constant:
   Value : 1.35E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 1.55E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000107-66-4
Chem Name  : DI-N-BUTYL PHOSPHATE
Mol Formula: C8H19O4P
Mol Weight : 210.21
Melting Pt :
Boiling Pt :
Water Solubility:
   Value : 1.72E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BEILSTEIN
Log P (octanol-water):
   Value : 2.29
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 9.6E-005 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : HL X  WSOL
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 4.26E-009 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 5.27E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Hexachlorobenzene
CAS Number: 000118-74-1

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	8.0E-4	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:	1.6E+0	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:	1.6E+0	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2		
Oral ED10:	2.6E-2	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	2.6E-2	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	1.7E+3	mg/kg	ACGIH
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:	3.3E+3	mg/L	RTECS
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	3.0E+1	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.5E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.5E+3	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.6E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.5E+3	days	CHEMFATE
Radio:		days	
Log Kow:	5.3E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.8E+2	
Density:	2.0E+0	g/mL @ 23.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.8E-5	Torr	CHEMFATE
Henry's Law:	1.3E-3	atm-m3/mol	CHEMFATE
Water Solub:	6.2E-6	mg/L	CHEMFATE
Distrib Coef:	1.1E+2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.8E+5		ECOTOX
Salt BCF:	5.1E+5		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	9.2E+5		ECOTOX
Salt BCF:	5.1E+5		ECOTOX
Log Kow:	5.3E+0		CHEMFATE
Water Solub:	6.2E-6		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	2.3E+2	C
Boiling Point:	3.3E+2	C
Formula:	C6 Cl6	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000118-74-1 Name: HEXACHLOROBENZENE

```
*****************************************************************************
MELT    HEXACHLOROBENZENE                                    CAS#   118-74-1
  Melting Point  :  228.7       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  KAO,CI & POFFENBERGER,N (1979)
*****************************************************************************

VP      HEXACHLOROBENZENE                                    CAS#   118-74-1
  Vapor Pressure :  .1089E-04   TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  LEONI,V & DARCA,SU (1976)
*****************************************************************************

VP      HEXACHLOROBENZENE                                    CAS#   118-74-1
  Vapor Pressure :  .110E-04    TORR        MEASURED
  Temperature (C):  20.
  Remarks        :  FROM PERKOW,W. (1976)
  Abbrev. Ref.   :  KILZER,L ET AL. (1979)
*****************************************************************************

VP      HEXACHLOROBENZENE                                    CAS#   118-74-1
  Vapor Pressure :  .168E-04    TORR        CALCULATED
  Temperature (C):  25.
  Remarks        :  CALC FROM ANTOINE EQN
  Abbrev. Ref.   :  FARMER,WJ ET AL. (1980)
*****************************************************************************

VP      HEXACHLOROBENZENE                                    CAS#   118-74-1
  Vapor Pressure :  1.80E-5     MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCHOENE,K ET AL. (1984)
*****************************************************************************
```

FARMER,WJ ET AL. (1980)
FARMER,W.J.; YANG,M.S.; LETEY,J.; SPENCER,W.F.; HEXACHLOROBENZNE: ITS VAPOR PRESSURE AND VAPOR PHASE DIFFUSION IN SOIL.; SOIL SCI. SOC. AM.; 44:676-80. 1980

KAO,CI & POFFENBERGER,N (1979)
KAO,C.I.; POFFENBERGER,N.; CHLORINATED BENZENE; IN: KIRK-OTHMER ENCYL CHEM TECH 3RD., NY,NY: WILEY INTRSCI PUBL:5:797-808; 1979

KILZER,L ET AL. (1979)

KILZER,L.; SCHEUNERT,I.; GEYER,H.; KLEIN,W.; KORTE,F.; LABORATORY SCREENING OF THE VOLATILIZATION RATES OF ORGANIC CHEMICALS FROM WATER AND SOIL.; CHEMOSPHERE.; 8:751-61.; 1979

LEONI,V & DARCA,SU (1976)
LEONI,V.; DARCA,S.U.; EXPERIMENTAL DATA AND CRITICAL REVIEW OF THE OCCURREN OF HEXACHLOROBENZENE IN THE ITALIAN ENVIRONMENT.; SCI. TOTAL ENVIRON.; 5:253-72.; 1976

SCHOENE,K ET AL. (1984)
SCHOENE,K.; BOEHMER,W.; STEINHANSES,J.; DETERMINATION OF VAPOR PRESSURES DO TO 0.01 PA BY HEADSPACE GAS-CHROMATOGRAPHY.; FRESENIUS' Z. ANAL. CHEM.; 319:903-6.; 1984

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000119-90-4 Name: 3,3'-DIMETHOXYBENZIDINE

```
*****************************************************************************
MELT    3,3'-DIMETHOXYBENZIDINE                                CAS#   119-90-4
  Melting Point  :  137-138     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      3,3'-DIMETHOXYBENZIDINE                                CAS#   119-90-4
  Vapor Pressure :  2.12E-7     MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED BY PCCHEM, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************


   MERCK INDEX (1983)
   MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH
   ED.;  WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

CHEMFATE Search Results

Return to EFDB page

CAS #: 000126-73-8 Name: TRI-N-BUTYL PHOSPHATE

```
*****************************************************************************
MELT    TRI-N-BUTYL PHOSPHATE                                CAS#   126-73-8
  Melting Point  :  -79         DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      TRI-N-BUTYL PHOSPHATE                                CAS#   126-73-8
  Vapor Pressure :  1.20E-04    MM HG       CALC
  Temperature (C):  25
  Remarks        :
             1   :  SRC RECOMMENDED VALUE
             2   :   EXTRAPOLATED FROM TEMP RANGE 114 DEG C(0.8 MMHG) - 160-16
                    DEG C(15 MMHG)
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI:
ALDRICH CHEM CO.; 1988

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI
AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY
WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

Data From SRC PhysProp Database:

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```
CAS Number : 000128-37-0
Chem Name  : 2,6-DI-T-BUTYL-4-METHYLPHENOL (BHT)
Mol Formula: C15H24O
Mol Weight : 220.36
Melting Pt : 71 deg C
Boiling Pt : 265 deg C
Water Solubility:
   Value : 0.6 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : INUI,H ET AL. (1979A)
Log P (octanol-water):
   Value : 5.10
   Type  : EXP
   Ref   : TSCATS
Vapor Pressure:
   Value : 0.00516 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : PERRY,RH & GREEN,D (1984)
pKa Dissociation Constant:
   Value : 12.2
   Temp  :
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 4.12E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.83E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000131-89-5
Chem Name  : 2-CYCLOHEXYL-4,6-DINITROPHENOL
Mol Formula: C12H14N2O5
Mol Weight : 266.26
Melting Pt : 107 deg C
Boiling Pt :
Water Solubility:
   Value : 15 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 4.12
   Type  : EXP
   Ref   : ELLINGTON,JT & STANCIL,FE (1988)
Vapor Pressure:
   Value : 4.19E-008 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value : 4.52
   Temp  : 25 deg C
   Type  : EST
   Ref   : LIPNICK,RL ET AL. (1986)
Henry's Law Constant:
   Value : 5.54E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.02E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000133-06-2 Name: CAPTAN

```
*****************************************************************************
MELT     CAPTAN                                                CAS#   133-06-2
  Melting Point   :  178          DEGC
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  WORTHING,CR & WALKER,SB (1983)
*****************************************************************************

VP       CAPTAN                                                CAS#   133-06-2
  Vapor Pressure  :  .1E-04       TORR        MEASURED
  Temperature (C) :  25.
  Remarks         :  UPPER LIM
  Abbrev. Ref.    :  MARTIN,H & WORTHING,CR (1977)
*****************************************************************************

VP       CAPTAN                                                CAS#   133-06-2
  Vapor Pressure  :  6.0E-5       MM HG
  Temperature (C) :  25.25
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  GILE,JD & GILLETT,JW (1979)
*****************************************************************************
```

GILE,JD & GILLETT,JW (1979)
GILE,J.D.; GILLETT,J.W.; FATE OF SELECTED FUNGICIDES IN A TERRESTRIAL LABORATORY ECOSYSTEM.; J. AGRIC. FOOD CHEM.; 27:1159-64.; 1979

MARTIN,H & WORTHING,CR (1977)
MARTIN,H.; WORTHING,C.R.; PESTICIDE MANUAL. FIFTH EDITION, BRITISH CROP PROTECTION COUNCIL. 563 PP.; 1977

WORTHING,CR & WALKER,SB (1983)
WORTHING,C.R.; WALKER,S.B.; PESTICIDE MANUAL 7TH ED; BRITISH CROP PROTECTIO COUNCIL. LAVENHAM SUFFOLK, ENGLAND: LAVENHAM PRESS LTD; 1983

End of Search

Data From SRC PhysProp Database:

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```
CAS Number : 023950-58-5
Chem Name  : PRONAMIDE
Mol Formula: C12H11Cl2NO
Mol Weight : 256.13
Melting Pt : 155 deg C
Boiling Pt :
Water Solubility:
   Value : 15 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 3.43
   Type  : EXP
   Ref   : ELLINGTON,JT & STANCIL,FE (1988)
Vapor Pressure:
   Value : 4.35E-007 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : TOMLIN,C (1994)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 9.77E-009 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 1.32E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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```
CAS Number : 026140-60-3
Chem Name  : TERPHENYL
Mol Formula: C18H14
Mol Weight : 230.31
Melting Pt :
Boiling Pt :
Water Solubility:
   Value : 0.215 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 5.52
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 3.09E-006 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 3.18E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 9.19E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000510-15-6 Name: CHLOROBENZILATE

```
*****************************************************************************
MELT    CHLOROBENZILATE                                        CAS#   510-15-6
  Melting Point   :  35-37       DEGC
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  MARTIN,H & WORTHING,CR (1977)
*****************************************************************************

VP      CHLOROBENZILATE                                        CAS#   510-15-6
  Vapor Pressure :  2.2E-6       MM HG
  Temperature (C):  20
  Remarks         :  SRC RECOMMENDED VALUE
  Abbrev. Ref.    :  MARTIN,H & WORTHING,CR (1977)
*****************************************************************************
```

MARTIN,H & WORTHING,CR (1977)
MARTIN,H.; WORTHING,C.R.; PESTICIDE MANUAL. FIFTH EDITION, BRITISH CROP PROTECTION COUNCIL. 563 PP.; 1977

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000057-24-9 Name: STRYCHNIDIN-10-ONE

```
*****************************************************************************
MELT    STRYCHNIDIN-10-ONE                                  CAS#    57-24-9
  Melting Point  :  268-290     DEGC
  Remarks        :  DEPENDS ON SPEED OF HEATING, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      STRYCHNIDIN-10-ONE                                  CAS#    57-24-9
  Vapor Pressure :  9.43E-12    MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************


   MERCK INDEX (1983)
   MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH
   ED.;  WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

CHEMFATE Search Results

Return to EFDB page

CAS #: 000060-11-7 Name: 4-(DIMETHLAMINO)AZOBENZENE

```
*****************************************************************************
MELT    4-(DIMETHLAMINO)AZOBENZENE                          CAS#    60-11-7
  Melting Point  :  114-117     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      4-(DIMETHLAMINO)AZOBENZENE                          CAS#    60-11-7
  Vapor Pressure :  7E-8        MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA RANGE 356-407 DEG K, SRC RECOMMENDE
                    VALUE
  Abbrev. Ref.   :  CAMPANELLI,AR ET AL. (1985)
*****************************************************************************
```

CAMPANELLI,AR ET AL. (1985)
CAMPANELLI,A.R.; FERRO,D.; PAVEL,N.V.; STUDY OF THE 4:1 INCLUSION COMPOUND BETWEEN DEOXYCHOLIC ACID AND (E)-P-DIMETHYLAMINOAZOBENZENE BY VAPOR PRESSUR MEASUREMENTS.; THERMOCHIM. ACTA; 87:231-8; 1985

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000603-34-9
Chem Name  : TRIPHENYLAMINE
Mol Formula: C18H15N
Mol Weight : 245.33
Melting Pt : 127 deg C
Boiling Pt : 365 deg C
Water Solubility:
   Value : 0.315 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 5.74
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.000392 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : FORWARD,MV ET AL. (1949)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 5.41E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 2E-010 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000608-93-5 Name: PENTACHLOROBENZENE

```
*****************************************************************************
MELT    PENTACHLOROBENZENE                                    CAS#   608-93-5
  Melting Point  :  86          DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEAST,RC ET AL. (1985)
*****************************************************************************

VP      PENTACHLOROBENZENE                                    CAS#   608-93-5
  Vapor Pressure :  2.19E-3     MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM A LIQUID STATE FROM A T-RANGE OF
                    98.6-276.0 DEG C WITH FUGACITY RATIO CORRECTION,
                    EXPERIMENTAL DATA FROM PERRY,RH & GREEN (1984), SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  MACKAY,D & SHIU,WY (1981)
*****************************************************************************
```

MACKAY,D & SHIU,WY (1981)
MACKAY,D.; SHIU,W.Y.; A CRITICAL REVIEW OF HENRY'S LAW CONSTANTS FOR CHEMICALS OF ENVIRONMENTAL INTEREST.; J. PHYS. CHEM. REF. DATA.; 19:1175-99 1981

WEAST,RC ET AL. (1985)
WEAST,R.C.; ASTLE,M.J.; BEYER,W.H.; CRC HANDBOOK OF CHEMISTRY AND PHYSICS 66TH ED; CRC PRESS; BOCA RATON, FLA; 1985

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000067-72-1 Name: HEXACHLOROETHANE

```
*****************************************************************************
MELT    HEXACHLOROETHANE                                        CAS#    67-72-1
  Melting Point  :  186.8       DEGC
  Remarks        :  SUBLIMES, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      HEXACHLOROETHANE                                        CAS#    67-72-1
  Vapor Pressure :  0.21        MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ARCHER,WL (1979)
*****************************************************************************
```

ARCHER,WL (1979)
ARCHER,W.L.; OTHER CHLOROETHANES.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 5:722-42.; 1979

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000070-30-4 Name: HEXACHLOROPHENE

```
*****************************************************************************
MELT    HEXACHLOROPHENE                                        CAS#    70-30-4
  Melting Point  :  164-165     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      HEXACHLOROPHENE                                        CAS#    70-30-4
  Vapor Pressure :  1.5E-10     MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATION BASED ON MEASURED WATER SOLUBILITY AND ESTIMATE
                    HENRY'S LAW CONSTANT, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000077-47-4 Name: HEXACHLOROCYCLOPENTADIENE

```
*****************************************************************************
MELT    HEXACHLOROCYCLOPENTADIENE                          CAS#    77-47-4
  Melting Point  :  11.34       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  STEVENS,JE (1979)
*****************************************************************************

VP      HEXACHLOROCYCLOPENTADIENE                          CAS#    77-47-4
  Vapor Pressure :  .6300E-01   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  BELL,MA ET AL. (1978)
*****************************************************************************

VP      HEXACHLOROCYCLOPENTADIENE                          CAS#    77-47-4
  Vapor Pressure :  .81E-01     TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  FROM VERSCHUEREN,K. (1977)
  Abbrev. Ref.   :  KILZER,L ET AL. (1979)
*****************************************************************************

VP      HEXACHLOROCYCLOPENTADIENE                          CAS#    77-47-4
  Vapor Pressure :  .8E-01      TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  WOLFE,NL ET AL. (1982)
*****************************************************************************

VP      HEXACHLOROCYCLOPENTADIENE                          CAS#    77-47-4
  Vapor Pressure :  0.10        MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  ATALLAH,YH ET AL. (1980)
*****************************************************************************

VP      HEXACHLOROCYCLOPENTADIENE                          CAS#    77-47-4
  Vapor Pressure :  6.000E-02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************

VP      HEXACHLOROCYCLOPENTADIENE                          CAS#    77-47-4
  Vapor Pressure :  5.96E-2     MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

ATALLAH,YH ET AL. (1980)
ATALLAH,Y.H.; WHITACRE,D.M.; BUTZ,R.G.; FATE OF HEXACHLOROCYCLOPENTADIENE I THE ENVIRONMENT.; PRESENTED BEFORE THE DIV. OF ENVIRON. CHEM., AMERICAN CHEMICAL SOCIETY, AUGUST 24-29, 1980. SAN FRANCISCO, CA.; 1980

BELL,MA ET AL. (1978)
BELL,M.A.; EWING,R.A.; LUTZ,G.A.; REVIEWS OF THE ENVIRONMENTAL EFFECTS OF POLLUTANTS: XII. HEXACHLOROCYCLOPENTADIENE.; EPA-600/1-78-047. COLUMBUS, O U.S. EPA. PP.94.; 1978

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

KILZER,L ET AL. (1979)
KILZER,L.; SCHEUNERT,I.; GEYER,H.; KLEIN,W.; KORTE,F.; LABORATORY SCREENING OF THE VOLATILIZATION RATES OF ORGANIC CHEMICALS FROM WATER AND SOIL.; CHEMOSPHERE.; 8:751-61.; 1979

STEVENS,JE (1979)
STEVENS,J.E.; CHLORINATED DERIVATIVES OF CYCLOPENTADIENES; IN: KIRK-OTHMER ENCYCL CHEM TECH 3RD ED NY,NY: WILEY 5:791-7; 1979

WOLFE,NL ET AL. (1982)
WOLFE,N.L.; ZEPP,R.G.; SCHLOTZHAUER,P.; SINK,M.; TRANSFORMATION PATHWAYS OF HEXACHLOROCYCLOPENTADIENE IN THE AQUATIC ENVIRONMENT.; CHEMOSPHERE.; 11:91-101.; 1982

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000822-06-0 Name: 1,6-DIISOCYANATOHEXANE

```
*****************************************************************************
VP      1,6-DIISOCYANATOHEXANE                              CAS#   822-06-0
  Vapor Pressure :  0.03        MM HG       EST
  Temperature (C):  25
  Abbrev. Ref.   :  GOLDBERG,NA & KUCHERYAVYI,VI (1960)
*****************************************************************************
```

GOLDBERG,NA & KUCHERYAVYI,VI (1960)
GOLDBERG,N.A.; KUCHERYAVYI,V.I.; SOME PHYSICOCHEMICAL PROPERTIES OF HEXAMETHYLENE DIISOCYNATE.; PRIKLAD. KHIM.; 33:1912-13.; 1960

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000822-06-0
Chem Name  : HEXAMETHYLENE DIISOCYANATE
Mol Formula: C8H12N2O2
Mol Weight : 168.20
Melting Pt : -67 deg C
Boiling Pt : 255 deg C
Water Solubility:
   Value : 117 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 3.20
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 0.03 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : GOLDBERG,NA & KUCHERYAVYI,VI (1960)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 4.8E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 7.74E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1988)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000082-68-8 Name: PENTACHLORONITROBENZENE

```
*****************************************************************************
VP      PENTACHLORONITROBENZENE                                CAS#    82-68-8
  Vapor Pressure :  .5E-04      .113E-03    .113E-03    TORR        MEASURED
  Temperature (C):  20.25       25.00       25.25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  GILE,JD & GILLETT,JW (1979)
*****************************************************************************
```

GILE,JD & GILLETT,JW (1979)
GILE,J.D.; GILLETT,J.W.; FATE OF SELECTED FUNGICIDES IN A TERRESTRIAL LABORATORY ECOSYSTEM.; J. AGRIC. FOOD CHEM.; 27:1159-64.; 1979

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000082-68-8
Chem Name  : PENTACHLORONITROBENZENE
Mol Formula: C6Cl5NO2
Mol Weight : 295.34
Melting Pt : 144 deg C
Boiling Pt : 328 deg C
Water Solubility:
   Value : 0.44 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 4.64
   Type  : EXP
   Ref   : SANGSTER (1994)
Vapor Pressure:
   Value : 5E-005 mm Hg
   Temp  : 20 deg C
   Type  : EXP
   Ref   : GILE,JD & GILLETT,JW (1979)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 4.42E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 7.23E-015 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000082-68-8 Name: PENTACHLORONITROBENZENE

```
*****************************************************************************
VP      PENTACHLORONITROBENZENE                              CAS#    82-68-8
  Vapor Pressure :  .5E-04      .113E-03    .113E-03    TORR        MEASURED
  Temperature (C):  20.25       25.00       25.25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  GILE,JD & GILLETT,JW (1979)
*****************************************************************************
```

GILE,JD & GILLETT,JW (1979)
GILE,J.D.; GILLETT,J.W.; FATE OF SELECTED FUNGICIDES IN A TERRESTRIAL LABORATORY ECOSYSTEM.; J. AGRIC. FOOD CHEM.; 27:1159-64.; 1979

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Hexachlorobutadiene
CAS Number: 000087-68-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-4	mg/kg/day	HEAST
Inhal RfD:		mg/kg/day	
Oral Slope:	7.8E-2	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	C		
Inhal Slope:	7.7E-2	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	C		
Oral ED10:	1.7E+0	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	C		
Inhal ED10:	1.7E+0	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	C		
Oral LD50:	4.6E+1	mg/kg	ACGIH
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	6.0E+1	µg/L	ECOTOX
Salt Ecol LC50:	4.5E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.4E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	1.5E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	4.8E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.6E+2	
Density:	1.6E+0	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.2E-1	Torr	CHEMFATE
Henry's Law:	8.1E-3	atm-m3/mol	CHEMFATE
Water Solub:	3.2E+0	mg/L	CHEMFATE
Distrib Coef:	7.6E+3	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	6.0E+1		VER_BCF
Salt BCF:	1.0E+4		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	2.3E+3		VER_BCF
Salt BCF:	1.0E+4		ECOTOX
Log Kow:	4.8E+0		CHEMFATE
Water Solub:	3.2E+0		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-2.1E+1	C
Boiling Point:	2.2E+2	C
Formula:	C4 Cl6	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000087-68-3 Name: HEXACHLOROBUTADIENE

```
*****************************************************************************
VP      HEXACHLOROBUTADIENE                                  CAS#    87-68-3
  Vapor Pressure :  0.076       MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM EXPERIMENTAL DATA BEGINNING AT 70 DEG C
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************

VP      HEXACHLOROBUTADIENE                                  CAS#    87-68-3
  Vapor Pressure :  2.213E-01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Pentachlorophenol (PCP)
CAS Number: 000087-86-5

TOXICITY

Parameter	Value		Unit	Source
Oral RfD:	3.0E-2		mg/kg/day	IRIS
Inhal RfD:			mg/kg/day	
Oral Slope:	1.2E-1		(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2			
Inhal Slope:			(mg/kg/day)^-1	
Inhal Wt-of-Evid:				
Oral ED10:			mg/kg/day	
Oral ED10 Wgt:				
Inhal ED10:			mg/kg/day	
Inhal ED10 Wgt:				
Oral LD50:	1.5E+2		mg/kg	ACGIH
Dermal LD50:	9.6E+1		mg/kg	ACGIH
Gas Inhal LC50:			ppm	
Dust Inhal LC50:			mg/L	
ACUTE				
Fresh CMC:	1.9E+1	F, K	µg/L	WATCRIT
Salt CMC:	1.3E+1	bb	µg/L	WATCRIT
CHRONIC				
Fresh CCC:	1.5E+1	F, K	µg/L	WATCRIT
Salt CCC:	7.9E+0	bb	µg/L	WATCRIT
Fresh Ecol LC50:	4.0E-1		µg/L	ECOTOX
Salt Ecol LC50:	3.7E+1		µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:	4.2E+0	days	CHEMFATE
Biodeg:	4.8E+1	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:	4.2E+0	days	CHEMFATE
Biodeg:	4.8E+1	days	CHEMFATE
Radio:		days	
Log Kow:	5.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.7E+2	
Density:	2.0E+0	g/mL @ 22.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	3.2E-5	Torr	CHEMFATE
Henry's Law:	2.4E-8	atm-m3/mol	CHEMFATE
Water Solub:	2.0E+3	mg/L	CHEMFATE
Distrib Coef:	1.2E+0	ml/g	RTI_ION
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	4.5E+4		ECOTOX
Salt BCF:	1.3E+3		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	4.5E+4		ECOTOX
Salt BCF:	3.8E+3		ECOTOX
Log Kow:	5.1E+0		CHEMFATE
Water Solub:	2.0E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.7E+2	C
Boiling Point:		C
Formula:	C6 H Cl5 O	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000087-86-5 Name: PENTACHLOROPHENOL

```
*****************************************************************************
VP      PENTACHLOROPHENOL                                    CAS#    87-86-5
  Vapor Pressure :  1.1E-4      MM HG       MEAS
  Temperature (C):  20
  Abbrev. Ref.   :  SCOW,K ET AL. (1980)
*****************************************************************************

VP      PENTACHLOROPHENOL                                    CAS#    87-86-5
  Vapor Pressure :  3.17E-5     MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA FOR THE LIQUID MATERIAL OBTAINED IN
                    THE RANGE 192.2-309.3 DEG C AND CONVERTED TO VAPOR PRESSUR
                    FOR THE SOLID. SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

SCOW,K ET AL. (1980)
SCOW,K.; GOYER,M.; PAYNE,E.; PERWACK,J.; THOMAS,R.; WALLACE, . ; WALKER,P.; WOOD,M.; AN EXPOSURE AND RISK ASSESSMENT FOR PENTACHLOROPHENOL.; EPA-440/4-81-021. (NTIS PB85-211944). CAMBRIDGE,MA: ARTHUR D. LITTLE INC. PP.195.; 1980

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000091-94-1 Name: 3,3'-DICHLOROBENZIDINE

```
*****************************************************************************
MELT    3,3'-DICHLOROBENZIDINE                              CAS#    91-94-1
  Melting Point  :  131-132     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SIKKA,HC ET AL. (1978)
*****************************************************************************

VP      3,3'-DICHLOROBENZIDINE                              CAS#    91-94-1
  Vapor Pressure :  3.71E-8     MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED USING PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************
```

SIKKA,HC ET AL. (1978)
SIKKA,H.C.; APPLETON,H.T.; BANERJEE,S.; FATE OF 3,3'-DICHLOROBENZIDINE IN AQUATIC ENVIRONMENTS.; EPA-600/3-78-068. SYRACUSE,NY: SYRACUSE RES. CORP.; 1978

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Tetrachlorobenzene, 1,2,4,5-
CAS Number: 000095-94-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-4	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	8.9E+1	µg/L	ECOTOX
Salt Ecol LC50:	1.2E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	3.2E+3	days	CHEMFATE
Volatility:	1.3E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	3.2E+3	days	CHEMFATE
Volatility:	1.4E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	4.8E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.2E+2	
Density:	1.9E+0	g/mL @ 22.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	5.4E-3	Torr	CHEMFATE
Henry's Law:	2.6E-3	atm-m3/mol	CHEMFATE
Water Solub:	5.9E-1	mg/L	CHEMFATE
Distrib Coef:	1.1E+1	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	4.1E+3		ECOTOX
Salt BCF:			
Log Kow:	4.8E+0		CHEMFATE
Water Solub:	5.9E-1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.4E+2	C
Boiling Point:	2.4E+2	C
Formula:	C6 H2 Cl4	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000095-94-3 Name: 1,2,4,5-TETRACHLOROBENZENE

```
*****************************************************************************
MELT    1,2,4,5-TETRACHLOROBENZENE                          CAS#    95-94-3
  Melting Point  :  139.5       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  KAO,CI & POFFENBERGER,N (1979)
*****************************************************************************

VP      1,2,4,5-TETRACHLOROBENZENE                          CAS#    95-94-3
  Vapor Pressure :  0.0054      MM HG       CALC
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE, EXTRAPOLATED FROM HIGHER EXPERIMENT
                    TEMPERATURES (146-245 DEG C) AND CORRECTED FOR A VAPOR
                    PRESSURE FOR A SOLID USING A FUGACITY CORRECTION FACTOR
  Abbrev. Ref.   :  MACKAY,D ET AL. (1982)
*****************************************************************************
```

KAO,CI & POFFENBERGER,N (1979)
KAO,C.I.; POFFENBERGER,N.; CHLORINATED BENZENE; IN: KIRK-OTHMER ENCYL CHEM TECH 3RD., NY,NY: WILEY INTRSCI PUBL:5:797-808; 1979

MACKAY,D ET AL. (1982)
MACKAY,D.; BOBRA,A.; CHAN,D.W.; SHIU,W.Y.; VAPOR PRESSURE CORRELATIONS FOR LOW-VOLATILITY ENVIRONMENTAL CHEMICALS.; ENVIRON. SCI. TECHNOL.; 16:645-9.; 1982

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value. References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000096-69-5
Chem Name  : 4,4'-Thiobis(6-tert-butyl-3-cresol)
Mol Formula: C22H30O2S
Mol Weight : 358.55
Melting Pt : 162 deg C
Boiling Pt :
Water Solubility:
   Value : 0.00191 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 8.24
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 8.59E-011 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 2.76E-012 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.3E-010 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WN & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Trinitrobenzene, 1,3,5-
CAS Number: 000099-35-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	2.8E+2	mg/kg	RTECS
Dermal LD50:	2.0E+3	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	3.4E+2	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:	1.2E+0		PHYSPROP

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.1E+2	
Density:	1.5E+0	g/mL @ 152.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.4E-6	Torr	PHYSPROP
Henry's Law:	3.3E-10	atm-m3/mol	PHYSPROP
Water Solub:	2.8E+2	mg/L	PHYSPROP
Distrib Coef:	2.2E+0	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	1.2E+0		PHYSPROP
Water Solub:	2.8E+2		PHYSPROP
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.2E+2	C
Boiling Point:	3.2E+2	C
Formula:	C6 H3 N3 O6	

CLASS INFORMATION

Class	Parent Substance

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000099-35-4
Chem Name  : 1,3,5-TRINITROBENZENE
Mol Formula: C6H3N3O6
Mol Weight : 213.11
Melting Pt : 121.5 deg C
Boiling Pt : 315 deg C
Water Solubility:
   Value : 278 mg/L
   Temp  : 15 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.18
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 6.44E-006 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : OHE,S (1976)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 3.31E-010 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.3E-015 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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WTP RISK ASSESSMENT WORK PLAN IDENTIFIED
CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Other Light Semivolatile Compounds (molecular weight >200 g/mole) (OLSVOL)

CHEMFATE Search Results

Return to EFDB page

CAS #: 000100-21-0 Name: TEREPHTHALIC ACID

```
*****************************************************************************
MELT    TEREPHTHALIC ACID                                    CAS#   100-21-0
  Melting Point  :  >300        DEGC
  Remarks        :  WITH SUBLIMATION OCCURRING BEFORE MELTING, SRC RECOMMENDED
                    VALUE
  Abbrev. Ref.   :  BEMIS,AG ET AL. (1982)
*****************************************************************************

VP      TEREPHTHALIC ACID                                    CAS#   100-21-0
  Vapor Pressure :  9.2E-6      MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM 120 DEG C USING DATA FROM TOWLE ET AL
                    1968, SRC SUGGESTED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************
```

BEMIS,AG ET AL. (1982)
BEMIS,A.G.; DINDORF,J.A.; HORWOOD,B.; SAMANS,C.; PHTHALIC ACIDS, AND OTHER BENZENEPOLYCARBOXYLIC ACIDS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 17:732-77.; 1982

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000101-77-9 Name: 4,4'METHYLENEDIANILINE

```
*****************************************************************************
MELT    4,4'METHYLENEDIANILINE                              CAS#   101-77-9
  Melting Point  :  89.0        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MOORE,WM (1978)
*****************************************************************************

VP      4,4'METHYLENEDIANILINE                              CAS#   101-77-9
  Vapor Pressure :  .10E 02     TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  UPPER LIM
  Abbrev. Ref.   :  DORIGAN,J ET AL. (1976)
*****************************************************************************

VP      4,4'METHYLENEDIANILINE                              CAS#   101-77-9
  Vapor Pressure :  2.97        MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED VIA CLAUSIUS CLAPEYRON EQN USING A MEASURED VP O
                    7.5 MM HG AT 229 DEG C BOUBLIK ET AL 1984, SRC RECOMMENDED
                    VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************
```

DORIGAN,J ET AL. (1976)
DORIGAN,J.; FULLER,B.; DUFFY,R.; PRELIMINARY SCORING OF SELECTED ORGANIC AI POLLUTANTS. APPENDIX III-CHEMISTRY, PRODUCTION, AND TOXICITY OF CHEMICALS F THROUGH N.; EPA-450/3-77-008D. RESEARCH TRIANGLE PARK,NC: U.S. EPA. PP.303 1976

MOORE,WM (1978)
MOORE,W.M.; METHYLENEDIANILINE; IN: KIRK-OTHMER ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY. 3RD ED. NEW YORK: WILEY & SONS 2:338-48; 1978

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000101-84-8 Name: DIPHENYL ETHER

```
*****************************************************************************
MELT    DIPHENYL ETHER                                        CAS#   101-84-8
  Melting Point  :  28          DEG C
  Remarks        :
             1   :  HIGH PRODUCTION VOLUME SUBMISSION DATA
             2   :   HPV: DIPHENYL OXIDE
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      DIPHENYL ETHER                                        CAS#   101-84-8
  Vapor Pressure :  0.02        MM HG       MEASURED
  Temperature (C):  20
  Remarks        :
             1   :  HIGH PRODUCTION VOLUME SUBMISSION DATA
             2   :   HPV: DIPHENYL OXIDE
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************
```

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-51-4 Name: 1,4-BENZOQUINONE

```
*****************************************************************************
MELT    1,4-BENZOQUINONE                                    CAS#   106-51-4
  Melting Point  :  115.7       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      1,4-BENZOQUINONE                                    CAS#   106-51-4
  Vapor Pressure :  37.5        MM HG
  Temperature (C):  20
  Remarks        :  EXTRAPOLATED VALUE, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEBER,RC ET AL. (1981)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

WEBER,RC ET AL. (1981)
WEBER,R.C.; PARKER,P.A.; BOWSER,M.; VAPOR PRESSURE DISTRIBUTION OF SELECTED ORGANIC CHEMICALS.; EPA-600/2-81-021. CINCINNATI,OH: U.S.EPA. PP.39.; 1981

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-89-8 Name: EPICHLOROHYDRIN

```
*****************************************************************************
MELT    EPICHLOROHYDRIN                                        CAS#   106-89-8
  Melting Point  :  -57.2       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIESSER,GH (1979)
*****************************************************************************

VP      EPICHLOROHYDRIN                                        CAS#   106-89-8
  Vapor Pressure :  .1813E 02   TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  GALLANT,RW (1967)
*****************************************************************************

VP      EPICHLOROHYDRIN                                        CAS#   106-89-8
  Vapor Pressure :  16.44       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

GALLANT,RW (1967)
GALLANT,R.W.; PHYSICAL PROPERTIES OF HYDROCARBONS. XII. C2-C4 OXIDES.; HYDROCARBON PROCESS.; 46:143-150.; 1967

RIESSER,GH (1979)
RIESSER,G.H.; CHLOROHYDRINS.; KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. NY,N WILEY-INTERSCIENCE. 5:858.; 1979

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Dibromoethane, 1,2-
CAS Number: 000106-93-4

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:	5.7E-5	mg/kg/day	HEAST
Oral Slope:	8.5E+1	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:	7.7E-1	(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B2		
Oral ED10:	2.6E-3	mg/kg/day	SPHEM
Oral ED10 Wgt:	B2		
Inhal ED10:	2.6E-3	mg/kg/day	SPHEM
Inhal ED10 Wgt:	B2		
Oral LD50:	1.2E+2	mg/kg	ACGIH
Dermal LD50:	3.0E+2	mg/kg	RTECS
Gas Inhal LC50:	4.0E+2	ppm	RTECS
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.5E+4	µg/L	ECOTOX
Salt Ecol LC50:	4.8E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	2.9E+3	days	CHEMFATE
Volatility:	1.2E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	2.9E+3	days	CHEMFATE
Volatility:	1.3E+0	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	2.0E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	No	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.9E+2	
Density:	2.2E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.3E+1	Torr	CHEMFATE
Henry's Law:	7.4E-4	atm-m3/mol	CHEMFATE
Water Solub:	4.0E+3	mg/L	CHEMFATE
Distrib Coef:	8.5E-2	ml/g	SSG_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.0E+0		CHEMFATE
Water Solub:	4.0E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	9.9E+0	C
Boiling Point:	1.3E+2	C
Formula:	C2 H4 Br2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000106-93-4 Name: ETHANE, 1,2-DIBROMO-

```
*****************************************************************************
MELT    ETHANE, 1,2-DIBROMO-                                CAS#   106-93-4
  Melting Point  :  9.79        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

MELT    ETHANE, 1,2-DIBROMO-                                CAS#   106-93-4
  Melting Point  :  9.8         DEG C
  Remarks        :
            1    :  IARC V15: 195
            2    :   HPV: ETHANE, 1,2-DIBROMO
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      ETHANE, 1,2-DIBROMO-                                CAS#   106-93-4
  Vapor Pressure :  .8300E+01   .1420E+02   .3000E+02   TORR        MEASURED
  Temperature (C):  15.0        25.0        40.0
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  GALLANT,RW (1968)
*****************************************************************************

VP      ETHANE, 1,2-DIBROMO-                                CAS#   106-93-4
  Vapor Pressure :  11.2        MM HG       MEAS
  Temperature (C):  25
  Abbrev. Ref.   :  CALL,F (1957)
*****************************************************************************

VP      ETHANE, 1,2-DIBROMO-                                CAS#   106-93-4
  Vapor Pressure :  13.3        MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

CALL,F (1957)
CALL,F.; DETERMINATION OF THE VAPOUR PRESSURE OF ETHYLENE DIBROMIDE.; J. SC FOOD. AGRIC.; 8:81-5.; 1957

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

GALLANT,RW (1968)
GALLANT,R.W.; PHYSICAL PROPERTIES OF HYDROCARBONS. PART XXIII. BROMINATED HYDROCARBONS.; HYDROCARBON PROCESS.; 47:128-36.; 1968

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000107-21-1 Name: ETHYLENE GLYCOL

```
*****************************************************************************
MELT    ETHYLENE GLYCOL                                        CAS#   107-21-1
  Melting Point  :  -12.6       DEGC
  Remarks        :  THE FREEZING IS IN DOUBT BECAUSE OF THE TENDENCY TO
                    SUPERCOOL AND FORM A GLASS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ETHYLENE GLYCOL                                        CAS#   107-21-1
  Vapor Pressure :  .12E 00     TORR        MEASURED
  Temperature (C):  20.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  FAY,RH (1978)
*****************************************************************************

VP      ETHYLENE GLYCOL                                        CAS#   107-21-1
  Vapor Pressure :  0.092       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

FAY,RH (1978)
FAY,R.H.; ANTIFREEZES AND DEICING FLUIDS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 3:79-95.; 1978

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000108-60-1 Name: BIS(1-CHLOROISOPROPYL) ETHER

```
*****************************************************************************
MELT    BIS(1-CHLOROISOPROPYL) ETHER                        CAS#   108-60-1
  Melting Point  :  -97          DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979A)
*****************************************************************************

VP      BIS(1-CHLOROISOPROPYL) ETHER                        CAS#   108-60-1
  Vapor Pressure :  .78E 00      TORR        MEASURED
  Temperature (C):  20.
  Remarks        :  AV OF RANGE .71-.85 TORR
  Abbrev. Ref.   :  KIRWIN,CJJR & SANDMEYER,EE (1981)
*****************************************************************************

VP      BIS(1-CHLOROISOPROPYL) ETHER                        CAS#   108-60-1
  Vapor Pressure :  0.85         MM HG
  Temperature (C):  20
  Remarks        :
             1   :  REPORTED VALUE
             2   :   NOT KNOWN IF EXPERIMENTALLY DETERMINED
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979A)
*****************************************************************************

VP      BIS(1-CHLOROISOPROPYL) ETHER                        CAS#   108-60-1
  Vapor Pressure :  0.88         MM HG
  Temperature (C):  25
  Remarks        :  INTERPRETATED FROM EXPERIMENTAL DATA OVER THE TEMPERATURE
                    RANGE OF 20-97 DEG C. SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  KAWAMOTO,K & URANO,K (1989)
*****************************************************************************
```

CALLAHAN,MA ET AL. (1979A)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS-VOLUME II.; EPA-440/4-79-029 WASHINGTON,DC: U.S. EPA.; 1979A

KAWAMOTO,K & URANO,K (1989)
KAWAMOTO,K.;URANO,K.; PARAMETERS FOR PREDICTING FATE OF ORGANOCHLORINE PESTICIDES IN THE ENVIRONMENT. (I) OCTANOL-WATER AND AIR-WATER PARTITION COEFFICIENTS.; CHEMOSPHERE; 18:1987-96; 1989

KIRWIN,CJJR & SANDMEYER,EE (1981)
KIRWIN,C.J. JR.; SANDMEYER,E.E.; ETHERS.; IN: PATTY'S INDUSTRIAL HYGIENE AN

TOXICOLOGY. 3RD REV. ED.; 2A:2491-565.; 1981

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000108-93-0 Name: CYCLOHEXANOL

```
*****************************************************************************
MELT    CYCLOHEXANOL                                          CAS#   108-93-0
  Melting Point  :  24          DEG C
  Remarks        :
            1    :  BASF/AG (1993)
            2    :   HPV: CYCLOHEXANOL
  Abbrev. Ref.   :  US EPA (2004)
*****************************************************************************

VP      CYCLOHEXANOL                                          CAS#   108-93-0
  Vapor Pressure :  .1125E 01   TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  FISHER,WB & VANPEPPEN,JF (1978)
*****************************************************************************

VP      CYCLOHEXANOL                                          CAS#   108-93-0
  Vapor Pressure :  8.000E-01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

FISHER,WB & VANPEPPEN,JF (1978)
FISHER,W.B.; VANPEPPEN,J.F.; CYCLOHEXANOL AND CYCLOHEXANONE.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 7:410-6.; 1978

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC: USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000109-77-3
Chem Name  : MALONONITRILE
Mol Formula: C3H2N2
Mol Weight : 66.06
Melting Pt : 32 deg C
Boiling Pt : 218.5 deg C
Water Solubility:
   Value : 1.33E+005 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KIRK-OTHMER ENCYCL 4th ed 15:941 (1995)
Log P (octanol-water):
   Value : -0.60
   Type  : EXP
   Ref   : TANII,H & HASHIMOTO,K (1985)
Vapor Pressure:
   Value : 0.2 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value : 11.4
   Temp  :
   Type  : EXP
   Ref   : KIRK-OTHMER ENCYCL 4th ed 15:941 (1995)
Henry's Law Constant:
   Value : 1.31E-007 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 3.37E-014 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000109-99-9 Name: TETRAHYDROFURAN

```
*****************************************************************************
VP      TETRAHYDROFURAN                                        CAS#   109-99-9
  Vapor Pressure :  .8400E+02   .1320E+03   .1980E+03   TORR        MEASURED
  Temperature (C):  0.0         20.0        30.0
  Abbrev. Ref.   :  VERSCHUEREN,K (1977)
*****************************************************************************

VP      TETRAHYDROFURAN                                        CAS#   109-99-9
  Vapor Pressure :  1.622E+02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

VERSCHUEREN,K (1977)
VERSCHUEREN,K.; HANDBOOK OF ENVIRONMENTAL DATA ON ORGANIC CHEMICALS.; NEW YORK, NY: VAN NOSTRAND REINHOLD COMPANY.; 1977

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000109-99-9
Chem Name  : TETRAHYDROFURAN
Mol Formula: C4H8O
Mol Weight : 72.11
Melting Pt : -108.3 deg C
Boiling Pt : 65 deg C
Water Solubility:
   Value : 1E+006 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : DUNLOP,AP (1966)
Log P (octanol-water):
   Value : 0.46
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 162 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value : -2.08
   Temp  :
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Henry's Law Constant:
   Value : 7.05E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : CABANI,S ET AL. (1971A)
Atmospheric OH Rate Constant:
   Value : 1.61E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000110-86-1 Name: PYRIDINE

```
*****************************************************************************
MELT    PYRIDINE                                          CAS#   110-86-1
  Melting Point  :  -41.55      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      PYRIDINE                                          CAS#   110-86-1
  Vapor Pressure :  20.76       MM HG       MEAS
  Temperature (C):  25
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************

VP      PYRIDINE                                          CAS#   110-86-1
  Vapor Pressure :  20.8        MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000111-15-9 Name: ETHYLENE GLYCOL MONOETHYL ETHER ACETATE

```
*******************************************************************************
VP      ETHYLENE GLYCOL MONOETHYL ETHER ACETATE          CAS#   111-15-9
  Vapor Pressure :  2.340E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*******************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000111-15-9
Chem Name  : ETHOXYETHYLACETATE
Mol Formula: C6H12O3
Mol Weight : 132.16
Melting Pt : -61.7 deg C
Boiling Pt : 156.4 deg C
Water Solubility:
   Value : 2.47E+005 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 0.59
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 2.34 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 3.2E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : JOHANSON,G & DYNESIUS,B (1988)
Atmospheric OH Rate Constant:
   Value : 1.3E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

Return to EFDB page

CAS #: 000111-44-4 Name: BIS(2-CHLOROETHYL) ETHER

```
*****************************************************************************
MELT    BIS(2-CHLOROETHYL) ETHER                          CAS#   111-44-4
  Melting Point  :  -46.8       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      BIS(2-CHLOROETHYL) ETHER                          CAS#   111-44-4
  Vapor Pressure :  1.55        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************
```

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000111-44-4 Name: BIS(2-CHLOROETHYL) ETHER

```
*****************************************************************************
MELT    BIS(2-CHLOROETHYL) ETHER                          CAS#   111-44-4
  Melting Point  :  -46.8       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      BIS(2-CHLOROETHYL) ETHER                          CAS#   111-44-4
  Vapor Pressure :  1.55        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************
```

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000111-76-2 Name: 2-BUTOXYETHANOL

```
*****************************************************************************
MELT    2-BUTOXYETHANOL                                        CAS#   111-76-2
  Melting Point  :  -75          DEG C
  Remarks        :  MELTING POINT GIVEN IS REFERENCED AS FREEZING POINT, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      2-BUTOXYETHANOL                                        CAS#   111-76-2
  Vapor Pressure :  .88E 00      TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  DORIGAN,J ET AL. (1976B)
*****************************************************************************

VP      2-BUTOXYETHANOL                                        CAS#   111-76-2
  Vapor Pressure :  0.88         MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  DOW CHEMICAL COMPANY (1981)
*****************************************************************************

VP      2-BUTOXYETHANOL                                        CAS#   111-76-2
  Vapor Pressure :  0.867        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

DORIGAN,J ET AL. (1976B)
DORIGAN,J.; FULLER,B.; DUFFY,R.; PRELIMINARY SCORING OF SELECTED ORGANIC AI POLLUTANTS. APPENDIX I - CHEMISTRY, PRODUCTION, AND TOXICITY OF CHEMICALS A THROUGH C.; EPA-450/3-77-008B. RESEARCH TRIANGLE PARK,NC: U.S. EPA PP.331. 1976B

DOW CHEMICAL COMPANY (1981)
DOW CHEMICAL COMPANY.; THE GLYCOL ETHERS HANDBOOK.; MIDLAND, MI: DOW CHEMICAL CO.; 1981

RIDDICK,JA ET AL. (1986)

RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000111-91-1 Name: BIS(2-CHLOROETHOXY)METHANE

```
*****************************************************************************
MELT    BIS(2-CHLOROETHOXY)METHANE                          CAS#   111-91-1
  Melting Point  :  -32          DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SAX,NI & LEWIS,RJSR (1987)
*****************************************************************************

VP      BIS(2-CHLOROETHOXY)METHANE                          CAS#   111-91-1
  Vapor Pressure :  1.4E-4       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE, EXTRAPOLATED FROM DATA IN THE RANGE
                    58-215 DEG C
  Abbrev. Ref.   :  PERRY,RH ET AL. (1984)
*****************************************************************************
```

PERRY,RH ET AL. (1984)
PERRY,R.H.; GREEN,D.W.; MALONEY,J.O.; PERRY'S CHEMICAL ENGINEERS' HANDBOOK; MCGRAW HILL; CRAWFORD & ECKES EDS.; 1984

SAX,NI & LEWIS,RJSR (1987)
SAX,N.I.; LEWIS,R.J.S.R.; HAWLEY'S CONDENSED CHEMICAL DICTIONARY 11TH ED; VANNOSTRAND REINHOLD CO.; N.Y.,N.Y.:P496; 1987

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 001120-71-4 Name: 2,2-DIOXIDE-1,2-OXATHIOLANE

```
*****************************************************************************
MELT    2,2-DIOXIDE-1,2-OXATHIOLANE                        CAS#  1120-71-4
  Melting Point  :  95.68       DEGC
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      2,2-DIOXIDE-1,2-OXATHIOLANE                        CAS#  1120-71-4
  Vapor Pressure :  17          MM HG       CALC
  Temperature (C):  25
  Remarks        :  CALC USING ESTIMATED HENRY'S LAW CONSTANT X WSOL, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (NA--)
*****************************************************************************


   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

   SRC (NA--)
   SRC; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES.;   NA--

End of Search
```

CHEMFATE Search Results

Return to EFDB page

CAS #: 000121-69-7 Name: N,N-DIMETHYLANILINE

```
*****************************************************************************
MELT    N,N-DIMETHYLANILINE                                   CAS#   121-69-7
  Melting Point  :  2.45        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      N,N-DIMETHYLANILINE                                   CAS#   121-69-7
  Vapor Pressure :  0.518       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************

VP      N,N-DIMETHYLANILINE                                   CAS#   121-69-7
  Vapor Pressure :  7.000E-01   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000122-39-4 Name: DIPHENYLAMINE

```
*****************************************************************************
MELT    DIPHENYLAMINE                                          CAS#   122-39-4
  Melting Point  :  53-54       DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DEAN,JA (1985)
*****************************************************************************

VP      DIPHENYLAMINE                                          CAS#   122-39-4
  Vapor Pressure :  8.06E-4     MM HG       CALC
  Temperature (C):  20
  Remarks        :  EXTRAPOLATED FROM THE EXPERIMENTAL TEMPERATURE RANGE OF
                    62-397 DEG C
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************

VP      DIPHENYLAMINE                                          CAS#   122-39-4
  Vapor Pressure :  6.68E-4     MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  JONES,AH (1960)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

DEAN,JA (1985)
DEAN,J.A.; LANGE'S HANDBOOK OF CHEMISTRY 13TH ED.; NY, NY: MCGRAW-HILL BOO CO.; 1985

JONES,AH (1960)
JONES,A.H.; SUBLIMATION-PRESSURE DATA FOR ORGANIC COMPOUNDS.; J. CHEM. ENG. DATA.; 5:196-200.; 1960

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Diphenylhydrazine, 1,2-
CAS Number: 000122-66-7

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:		mg/kg/day	
Inhal RfD:		mg/kg/day	
Oral Slope:	8.0E-1	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:	8.0E-1	(mg/kg/day)^-1	HEAST
Inhal Wt-of-Evid:	B2		
Oral ED10:	2.3E-1	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B1		
Inhal ED10:	2.3E-1	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B1		
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.3E+2	µg/L	ECOTOX
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.4E+2	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	2.3E+1	days	THOMAS
Photolysis:		days	
Biodeg:	1.8E+2	days	FATERATE
Radio:		days	
Log Kow:	2.9E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.8E+2	
Density:	1.2E+0	g/mL @ 16.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	4.3E-4	Torr	CHEMFATE
Henry's Law:	1.5E-6	atm-m3/mol	CHEMFATE
Water Solub:	6.8E+1	mg/L	CHEMFATE
Distrib Coef:	1.2E+2	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:			
Log Kow:	2.9E+0		CHEMFATE
Water Solub:	6.8E+1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	1.3E+2	C
Boiling Point:		C
Formula:	C12 H12 N2	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000122-66-7 Name: 1,2-DIPHENYLHYDRAZINE

```
*****************************************************************************
MELT    1,2-DIPHENYLHYDRAZINE                                CAS#   122-66-7
  Melting Point  :  123-126     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************

VP      1,2-DIPHENYLHYDRAZINE                                CAS#   122-66-7
  Vapor Pressure :  3.63E-5     MM HG       CALC
  Temperature (C):  25
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      1,2-DIPHENYLHYDRAZINE                                CAS#   122-66-7
  Vapor Pressure :  4.31E-4     MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI: ALDRICH CHEM CO.; 1988

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

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CAS #: 000123-33-1 Name: MALEIC HYDRAZIDE

```
*****************************************************************************
MELT    MALEIC HYDRAZIDE                                        CAS#   123-33-1
  Melting Point  :  306-308     DEG C
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ALDRICH (1988)
*****************************************************************************
```

ALDRICH (1988)
ALDRICH.; CATALOG HANDBOOK OF FINE CHEMICALS 1988-1989; MILWAUKEE, WI:
ALDRICH CHEM CO.; 1988

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000123-33-1
Chem Name  : MALEIC HYDRAZIDE
Mol Formula: C4H4N2O2
Mol Weight : 112.09
Melting Pt : 306 deg C
Boiling Pt :
Water Solubility:
   Value : 4510 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : TOMLIN,C (1994)
Log P (octanol-water):
   Value : -0.84
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2.77E-006 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value : 5.67
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 2.65E-011 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.33E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000144-62-7
Chem Name  : OXALIC ACID
Mol Formula: C2H2O4
Mol Weight : 90.04
Melting Pt : 189.5 dec deg C
Boiling Pt :
Water Solubility:
   Value : 2.2E+005 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : -2.22
   Type  : EST
   Ref   : JABER,HM ET AL. (1984)
Vapor Pressure:
   Value : 0.000234 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BARNALES,CA ET AL. (1981)
pKa Dissociation Constant:
   Value : 1.25
   Temp  :
   Type  :
   Ref   : BUXTON,GV ET AL. (1988)
Henry's Law Constant:
   Value : 1.43E-010 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : GAFFNEY,JS ET AL. (1987)
Atmospheric OH Rate Constant:
   Value : 7.2E-014 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R ET AL. (1988)
```

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Data From SRC PhysProp Database:

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References below are abbreviated citations ... the full reference citations are NOT available here.
References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 025013-15-4
Chem Name  : VINYLTOLUENE
Mol Formula: C27H30
Mol Weight : 354.54
Melting Pt :
Boiling Pt :
Water Solubility:
   Value : 89 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : LEWIS,PJ ET AL. (1978)
Log P (octanol-water):
   Value : 3.44
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 1.5 mm Hg
   Temp  : 20 deg C
   Type  : EXP
   Ref   : WEBER,RC ET AL. (1981)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00262 atm-m3/mole
   Temp  : 20 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 5.34E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 041851-50-7
Chem Name  : 5-CHLORO-1,3-CYCLOPENTADIENE
Mol Formula: C5H5Cl
Mol Weight : 100.55
Melting Pt :
Boiling Pt :
Water Solubility:
   Value : 970 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 2.43
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 20.4 mm Hg
   Temp  : 25 deg C
   Type  : EST
   Ref   : NEELY,WB & BLAU,GE (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0224 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.42E-010 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

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CAS #: 000051-79-6 Name: ETHYL CARBAMATE

```
*****************************************************************************
MELT    ETHYL CARBAMATE                                        CAS#    51-79-6
  Melting Point  :  48-50       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      ETHYL CARBAMATE                                        CAS#    51-79-6
  Vapor Pressure :  0.76        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE, ESTIMATED USING PCCHEM BASED ON A
                    MP=49 DEG C & BP=183 DEG C
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000532-27-4 Name: 2-CHLORO-1-PHENYLETHANONE

```
*****************************************************************************
MELT    2-CHLORO-1-PHENYLETHANONE                          CAS#   532-27-4
  Melting Point  :  58-59       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      2-CHLORO-1-PHENYLETHANONE                          CAS#   532-27-4
  Vapor Pressure :  5.4E-3      MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

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CAS #: 000540-73-8 Name: 1,2-DIMETHYLHYDRAZINE

```
*****************************************************************************
MELT    1,2-DIMETHYLHYDRAZINE                                   CAS#   540-73-8
  Melting Point  :  -85         DEG C
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      1,2-DIMETHYLHYDRAZINE                                   CAS#   540-73-8
  Vapor Pressure :  69.9        MM HG       MEAS
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  ASTON,JG ET AL. (1951)
*****************************************************************************
```

ASTON,JG ET AL. (1951)
ASTON,J.G.; JANZ,G.J.; RUSSELL,K.E.; THE HEAT CAPACITY, HEATS OF FUSION AND VAPORIZATION, VAPOR PRESSURES, AND ENTROPY OF SYMMETRICAL DIMETHYLHYDRAZINE J. AM. CHEM. SOC.; 73:1943-5; 1951

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

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CAS #: 000542-88-1 Name: BIS(CHLOROMETHYL) ETHER

```
*****************************************************************************
MELT    BIS(CHLOROMETHYL) ETHER                              CAS#   542-88-1
  Melting Point  :  -41.5       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  HAWLEY,GG (1981)
*****************************************************************************

VP      BIS(CHLOROMETHYL) ETHER                              CAS#   542-88-1
  Vapor Pressure :  30          MM HG
  Temperature (C):  22
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979A)
*****************************************************************************
```

CALLAHAN,MA ET AL. (1979A)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS-VOLUME II.; EPA-440/4-79-029 WASHINGTON,DC: U.S. EPA.; 1979A

HAWLEY,GG (1981)
HAWLEY,G.G.; THE CONDENSED CHEMICAL DISTIONARY. 10TH ED.; NEW YORK,NY: VAN NOSTRAND REINHOLD CO. PP.1135.; 1981

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000057-14-7 Name: 1,1-DIMETHYLHYDRAZINE

```
*****************************************************************************
MELT    1,1-DIMETHYLHYDRAZINE                                CAS#    57-14-7
  Melting Point  :  -57.2       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCHIESSL,HW (1980)
*****************************************************************************

VP      1,1-DIMETHYLHYDRAZINE                                CAS#    57-14-7
  Vapor Pressure :  157         MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SCHIESSL,HW (1980)
*****************************************************************************
```

SCHIESSL,HW (1980)
SCHIESSL,H.W.; HYDRAZINE AND ITS DERIVATIVES.; KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. NY,NY: WILEY-INTERSCIENCE. 12:734-71; 1980

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CAS #: 000584-84-9 Name: 2,4-TOLUENE DIISOCYANATE

```
*****************************************************************************
MELT    2,4-TOLUENE DIISOCYANATE                          CAS#   584-84-9
  Melting Point  :  19.5-21.5   DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      2,4-TOLUENE DIISOCYANATE                          CAS#   584-84-9
  Vapor Pressure :  0.008       MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000059-89-2 Name: N-NITROSOMORPHOLINE

```
*****************************************************************************
MELT    N-NITROSOMORPHOLINE                                  CAS#    59-89-2
  Melting Point  :  29          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  IARC (1978)
*****************************************************************************

VP      N-NITROSOMORPHOLINE                                  CAS#    59-89-2
  Vapor Pressure :  3.6E-2      MM HG
  Temperature (C):  20
  Remarks        :  EXTRAPOLATED FROM 96 DEG C AT 6 MM HG, SRC RECOMMENDED VAL
  Abbrev. Ref.   :  KLEIN,RG (1982)
*****************************************************************************
```

IARC (1978)
IARC; MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK TO HUMANS. VOL.17. SOME N-NITROSO COMPOUNDS.; LYON,FRANCE: INTERNATIONAL AGENCY FOR RESEARCH ON CANCER.; 1978

KLEIN,RG (1982)
KLEIN,R.G.; CALCULATIONS AND MEASUREMENTS ON THE VOLATILITY OF N-NITROSAMIN AND THEIR AQUEOUS SOLUTIONS.; TOXICOLOGY; 23:135-47; 1982

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000060-34-4 Name: METHYLHYDRAZINE

```
*****************************************************************************
MELT    METHYLHYDRAZINE                                        CAS#    60-34-4
  Melting Point  :  -52.4       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      METHYLHYDRAZINE                                        CAS#    60-34-4
  Vapor Pressure :  .4906E 02   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  STONE,DA (1979)
*****************************************************************************

VP      METHYLHYDRAZINE                                        CAS#    60-34-4
  Vapor Pressure :  .496E 02    TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  SCHIESSL,HW (1980)
*****************************************************************************

VP      METHYLHYDRAZINE                                        CAS#    60-34-4
  Vapor Pressure :  50          MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BOUBLIK,T ET AL. (1984)
*****************************************************************************
```

BOUBLIK,T ET AL. (1984)
BOUBLIK,T.; FRIED,V.; HALA,E.; THE VAPOR PRESSURES OF PURE SUBSTANCES: SELECTED VALUES OF THE TEMPERATURE DEPENDENCE OF THE VAPOUR PRESSURES OF SO PURE SUBSTANCES IN THE NORMAL AND LOW PRESSURE REGION. VOL. 17.; AMSTERDAM NETHERLANDS: ELSEVIER SCI. PUBL.; 1984

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

SCHIESSL,HW (1980)
SCHIESSL,H.W.; HYDRAZINE AND ITS DERIVATIVES.; KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. NY,NY: WILEY-INTERSCIENCE. 12:734-71; 1980

STONE,DA (1979)
STONE,D.A.; THE AUTOOXIDATION OF MONOMETHYLHYDRAZINE VAPOR.; AFESC/ESL-TR-79-10. (NTIS AD-A069 173). TYNDALL AFB,FL: AIR FORCE ENG.

SERVICES CTR. PP.50.; 1979

End of Search

CHEMFATE Search Results

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CAS #: 000621-64-7 Name: N-NITROSO-DI-N-PROPYLAMINE

```
*****************************************************************************
MELT    N-NITROSO-DI-N-PROPYLAMINE                          CAS#   621-64-7
  Melting Point  :  7          DEGC
  Remarks        :  ESTIMATED BY EQUATION 20 IN NEELY,WB & BLAU,GE (1985), SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      N-NITROSO-DI-N-PROPYLAMINE                          CAS#   621-64-7
  Vapor Pressure :  0.13       MM HG
  Temperature (C):  25
  Remarks        :  ESTIMATED VALUE BASED ON A MEASURED VP OF 5 MM HG AT 81 DE
                    C, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  KLEIN,RG (1982)
*****************************************************************************
```

KLEIN,RG (1982)
KLEIN,R.G.; CALCULATIONS AND MEASUREMENTS ON THE VOLATILITY OF N-NITROSAMIN AND THEIR AQUEOUS SOLUTIONS.; TOXICOLOGY; 23:135-47; 1982

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

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CAS #: 000062-50-0 Name: ETHYL METHANESULFONATE

```
*****************************************************************************
MELT    ETHYL METHANESULFONATE                                  CAS#    62-50-0
  Melting Point  :  -0.41       DEGC
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      ETHYL METHANESULFONATE                                  CAS#    62-50-0
  Vapor Pressure :  0.206       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  JABER,HM ET AL. (1984B)
*****************************************************************************
```

JABER,HM ET AL. (1984B)
JABER,H.M.; MABEY,W.R.; LIU,A.T.; CHOU,T.W.; JOHNSON,H.L.; DATA AQUISITION FOR ENVIRONMENTAL TRANSPORT AND FATE SCREENING FOR COMPOUNDS OF INTEREST TO THE OFFICE OF EMERGENCY AND REMEDIAL RESPONCE.; EPA-600/6-84-011. (NTIS PB84-245281). MENLO PARK,CA: SRI INTERNATIONAL. PP.156.; 1984B

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000627-13-4
Chem Name  : 1-PROPYLNITRATE
Mol Formula: C3H7NO3
Mol Weight : 105.09
Melting Pt : -100 deg C
Boiling Pt : 110 deg C
Water Solubility:
   Value : 3290 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HAUFF,K ET AL. (1998)
Log P (octanol-water):
   Value : 1.74
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 23.5 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BOUBLIK,T ET AL. (1984)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.00127 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : HAUFF,K ET AL. (1998)
Atmospheric OH Rate Constant:
   Value : 7.3E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : KWOK,ESC & ATKINSON,R (1994)
```

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CHEMFATE Search Results

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CAS #: 000062-75-9 Name: DIMETHYLNITROSAMINE

```
*****************************************************************************
MELT    DIMETHYLNITROSAMINE                                  CAS#    62-75-9
  Melting Point  :  -50         DEGC
  Remarks        :  SRC RECOMMENDED VALUE, ESTIMATED BY PCCHEM-PCGEMS
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      DIMETHYLNITROSAMINE                                  CAS#    62-75-9
  Vapor Pressure :  2.7         MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  KLEIN,RG (1982)
*****************************************************************************
```

KLEIN,RG (1982)
KLEIN,R.G.; CALCULATIONS AND MEASUREMENTS ON THE VOLATILITY OF N-NITROSAMIN AND THEIR AQUEOUS SOLUTIONS.; TOXICOLOGY; 23:135-47; 1982

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000065-85-0
Chem Name  : BENZOIC ACID
Mol Formula: C7H6O2
Mol Weight : 122.12
Melting Pt : 122.4 deg C
Boiling Pt : 249.2 deg C
Water Solubility:
   Value : 3400 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.87
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.0007 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : MCEACHERN,DM & SANDOVAL,O (1973)
pKa Dissociation Constant:
   Value : 4.19
   Temp  : 25 deg C
   Type  : EXP
   Ref   : LIDE,DR (1996)
Henry's Law Constant:
   Value : 3.81E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 1.24E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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CHEMFATE Search Results

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CAS #: 000077-78-1 Name: DIMETHYL SULFATE

```
*****************************************************************************
MELT    DIMETHYL SULFATE                                        CAS#    77-78-1
  Melting Point  :  -27         DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      DIMETHYL SULFATE                                        CAS#    77-78-1
  Vapor Pressure :  0.68        MM HG
  Temperature (C):  20
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  WEBER,RC ET AL. (1981)
*****************************************************************************
```

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

WEBER,RC ET AL. (1981)
WEBER,R.C.; PARKER,P.A.; BOWSER,M.; VAPOR PRESSURE DISTRIBUTION OF SELECTED ORGANIC CHEMICALS.; EPA-600/2-81-021. CINCINNATI,OH: U.S.EPA. PP.39.; 1981

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000079-10-7 Name: ACRYLIC ACID

```
*****************************************************************************
MELT    ACRYLIC ACID                                          CAS#    79-10-7
  Melting Point  :  13.5        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ACRYLIC ACID                                          CAS#    79-10-7
  Vapor Pressure :  4.00        MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000085-44-9 Name: PHTHALIC ANHYDRIDE

```
*****************************************************************************
VP      PHTHALIC ANHYDRIDE                                    CAS#    85-44-9
  Vapor Pressure :  5.17E-4     MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM 30 DEG C, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  JONES,AH (1960)
*****************************************************************************


   JONES,AH (1960)
   JONES,A.H.; SUBLIMATION-PRESSURE DATA FOR ORGANIC COMPOUNDS.; J. CHEM. ENG.
   DATA.; 5:196-200.; 1960

End of Search
```

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000085-44-9
Chem Name  : PHTHALIC ANHYDRIDE
Mol Formula: C8H4O3
Mol Weight : 148.12
Melting Pt : 130.8 deg C
Boiling Pt : 295 deg C
Water Solubility:
   Value : 6200 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : TOWLE,PH ET AL. (1968)
Log P (octanol-water):
   Value : 1.60
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.000517 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : JONES,AH (1960)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.63E-008 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 7.49E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

Back To PhysProp Demo Page

CHEMFATE Search Results

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CAS #: 000090-04-0 Name: O-METHOXYANILINE

```
*****************************************************************************
MELT    O-METHOXYANILINE                                    CAS#    90-04-0
  Melting Point  :  5           DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      O-METHOXYANILINE                                    CAS#    90-04-0
  Vapor Pressure :  0.08        MM HG
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM PERRY, GREEN 1984 - 61 TO 132 DEG C, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      O-METHOXYANILINE                                    CAS#    90-04-0
  Vapor Pressure :  8.000E-02   MM HG       EXTRAPOLATED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  PERRY,RH & GREEN,D (1984)
*****************************************************************************


   MERCK INDEX (1983)
   MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH
   ED.;  WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

   PERRY,RH & GREEN,D (1984)
   PERRY,R.H.; GREEN,D.; PERRY'S CHEMICAL HANDBOOK. PHYSICAL AND CHEMICAL DATA
    NEW YORK,NY: MCGRAW HILL. 6TH ED.; 1984

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

CHEMFATE Search Results

Return to EFDB page

7 CAS #: 000091-22-5 Name: QUINOLINE

```
*****************************************************************************
MELT    QUINOLINE                                          CAS#    91-22-5
  Melting Point  :  -14.85      DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      QUINOLINE                                          CAS#    91-22-5
  Vapor Pressure :  0.096       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  CHAO,J ET AL. (1983)
*****************************************************************************

VP      QUINOLINE                                          CAS#    91-22-5
  Vapor Pressure :  6.000E-02   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

CHAO,J ET AL. (1983)
CHAO,J.; LIN,C.T.; CHUNG,T.H.; VAPOR PRESSURE OF COAL CHEMICALS.; J. PHYS. CHEM. REF. DATA.; 12:1033-63.; 1983

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000924-16-3 Name: DI(N-BUTYL)NITROSAMINE

```
*****************************************************************************
MELT    DI(N-BUTYL)NITROSAMINE                                  CAS#   924-16-3
  Melting Point  :  2.13        DEGC
  Remarks        :  ESTIMATED BY PCCHEM-PCGEMS, SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      DI(N-BUTYL)NITROSAMINE                                  CAS#   924-16-3
  Vapor Pressure :  3.0E-2      MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  KLEIN,RG (1982)
*****************************************************************************


   KLEIN,RG (1982)
   KLEIN,R.G.; CALCULATIONS AND MEASUREMENTS ON THE VOLATILITY OF N-NITROSAMIN
   AND THEIR AQUEOUS SOLUTIONS.; TOXICOLOGY; 23:135-47; 1982

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

End of Search
```

CHEMFATE Search Results

Return to EFDB page

CAS #: 000092-52-4 Name: BIPHENYL

```
*****************************************************************************
MELT    BIPHENYL                                              CAS#    92-52-4
  Melting Point  :  69-71       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      BIPHENYL                                              CAS#    92-52-4
  Vapor Pressure :  .975E-1     TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  UNITS CONVERTED
  Abbrev. Ref.   :  WEAVER,WC ET AL. (1979)
*****************************************************************************

VP      BIPHENYL                                              CAS#    92-52-4
  Vapor Pressure :  .58E-01     TORR        MEASURED
  Temperature (C):  25.
  Remarks        :  FROM MACKAY,D. & WOLKOFF,A.W. (1973)
  Abbrev. Ref.   :  KILZER,L ET AL. (1979)
*****************************************************************************

VP      BIPHENYL                                              CAS#    92-52-4
  Vapor Pressure :  8.93E-3     MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  BURKHARD,LP ET AL. (1984)
*****************************************************************************

VP      BIPHENYL                                              CAS#    92-52-4
  Vapor Pressure :  9.64E-03    MM HG
  Temperature (C):  25
  Remarks        :  VALUE EXTRAPOLATED FROM DATA FOR THE SOLID MATERIAL OVER
                    10-60 DEG C. SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  SASSE,K ET AL. (1989)
*****************************************************************************
```

BURKHARD,LP ET AL. (1984)
BURKHARD,L.P.; ARMSTRONG,D.E.; ANDREN,A.W.; VAPOR PRESSURES FOR BIPHENYL, 4-CHLOROBIPHENYL, 2,2',3,3',5,5',6,6'-OCTACHLOROBIPHENYL, AND DECACHLOROBIPHENYL.; J. CHEM. ENG. DATA.; 29:248-50.; 1984

KILZER,L ET AL. (1979)
KILZER,L.; SCHEUNERT,I.; GEYER,H.; KLEIN,W.; KORTE,F.; LABORATORY SCREENING OF THE VOLATILIZATION RATES OF ORGANIC CHEMICALS FROM WATER AND SOIL.; CHEMOSPHERE.; 8:751-61.; 1979

MERCK INDEX (1983)
MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH ED.; WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

SASSE,K ET AL. (1989)
SASSE,K.; N'GUIMBI,J.; JOSE,J.; MERLIN,J.C.; VAPOR PRESSURE OF POLYAROMATIC HYDROCARBONS IN THE 10 -3 TO 10 TORR RANGE.; THERMOCHIM. ACTA.; 146:53-61; 1989

WEAVER,WC ET AL. (1979)
WEAVER,W.C.; SIMMONS,P.B.; THOMPSON,Q.E.; DIPHENYL AND TERPHENYLS.; IN: KIRK-OTHMER ENCYL. CHEM. TOXICOL. 3RD ED. 7:782-93.; 1979

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000094-59-7 Name: SAFROLE

```
*****************************************************************************
MELT    SAFROLE                                                CAS#    94-59-7
  Melting Point  :  11.2        DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DEAN,JA (1985)
*****************************************************************************

VP      SAFROLE                                                CAS#    94-59-7
  Vapor Pressure :  1.09E-1     MM HG       CALC
  Temperature (C):  25
  Remarks        :  ESTIMATED BY PCCHEM
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      SAFROLE                                                CAS#    94-59-7
  Vapor Pressure :  7.06E-2     MM HG       CALC
  Temperature (C):  25
  Remarks        :  EXTRAPOLATED FROM DATA OBTAINED IN THE RANGE 63.8-233 DEG
                    DATA TAKEN FROM PERRY & GREEN (1984). SRC RECOMMENDED VALU
  Abbrev. Ref.   :  OHE,S (1976)
*****************************************************************************
```

DEAN,JA (1985)
DEAN,J.A.; LANGE'S HANDBOOK OF CHEMISTRY 13TH ED.; NY, NY: MCGRAW-HILL BOO
CO.; 1985

OHE,S (1976)
OHE,S.; COMPUTER AIDED DATA BOOK OF VAPOR PRESSURE.; DATA BOOK PUBL. CO.,
TOKYO, JAPAN.; 1976

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000096-45-7 Name: ETHYLENETHIOUREA

```
*****************************************************************************
MELT    ETHYLENETHIOUREA                                        CAS#    96-45-7
  Melting Point  :  203-204     DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  MERCK INDEX (1983)
*****************************************************************************

VP      ETHYLENETHIOUREA                                        CAS#    96-45-7
  Vapor Pressure :  5.85E-7     MM HG       CALC
  Temperature (C):  25
  Remarks        :  ACCURACY UNCERTAIN, ESTIMATED PCCHEM
  Abbrev. Ref.   :  SRC (1988)
*****************************************************************************

VP      ETHYLENETHIOUREA                                        CAS#    96-45-7
  Vapor Pressure :  1.4E-04     MM HG       CALC
  Temperature (C):  25
  Remarks        :  CALC FROM ESTIMATED HENRY'S LAW CONSTANT AND ESTIMATED WSO
                    SRC RECOMMENDED VALUE.
  Abbrev. Ref.   :  SRC (NA--)
*****************************************************************************


   MERCK INDEX (1983)
   MERCK INDEX.; THE MERCK INDEX. AN ENCYCLOPEDIA OF CHEMICALS AND DRUGS 10TH
   ED.;  WINDHOLZ,M ED. RAHWAY, N.J.: MERCK AND CO., INC.; 1983

   SRC (1988)
   SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES;   1988

   SRC (NA--)
   SRC; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES.;   NA--

End of Search
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000098-01-1 Name: FURFURAL

```
*****************************************************************************
VP      FURFURAL                                                CAS#    98-01-1
  Vapor Pressure :  2.210E+00   MM HG       MEASURED
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1989)
DAUBERT,T.E.; DANNER, R.P.; PHYSICAL AND THERMODYNAMIC PROPERTIES OF PURE CHEMICALS: DATA COMPILATION.; DESIGN INSTITUTE FOR PHYSICAL PROPERTY DATA, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. HEMISPHERE PUB. CORP., NEW YORK, NY., 4 VOL.; 1989

End of Search

Data From SRC PhysProp Database:

Abbreviations in the 'Type' field: EXP = Experimental Data, EST = Estimated Data, EXT = Extrapolated Data. Extrapolated data is based upon experimental measurement outside the temperature range of the reported value.
References below are abbreviated citations ... the full reference citations are NOT available here. References for Estimated data generally refer to the method used to make the estimate ... most estimates were made using SRC software.

```
CAS Number : 000098-01-1
Chem Name  : FUFURAL
Mol Formula: C5H4O2
Mol Weight : 96.09
Melting Pt : -36.5 deg C
Boiling Pt : 161.7 deg C
Water Solubility:
   Value : 7.7E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 0.41
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 2.21 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 3.37E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 3.51E-011 cm3/molecule-sec
   Temp  : 27 deg C
   Type  : EXP
   Ref   : BIERBACH,A ET AL. (1995)
```

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000098-86-2 Name: ACETOPHENONE

```
*****************************************************************************
MELT    ACETOPHENONE                                          CAS#    98-86-2
  Melting Point  :  19.62       DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      ACETOPHENONE                                          CAS#    98-86-2
  Vapor Pressure :  .3715E 00   TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  DREISBACH,RR (1955)
*****************************************************************************

VP      ACETOPHENONE                                          CAS#    98-86-2
  Vapor Pressure :  0.397       MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1985)
*****************************************************************************
```

DAUBERT,TE & DANNER,RP (1985)
DAUBERT,T.E.; DANNER,R.P.; DATA COMPILATION TABLES OF PROPERTIES OF PURE COMPOUNDS.; AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. PP.450; 1985

DREISBACH,RR (1955)
DREISBACH,R.R.; PHYSICAL PROPERTIES OF CHEMICAL COMPOUNDS. I.; ADVANCES IN CHEMISTRY SERIES NO. 15.; WASHINGTON, DC: AMERICAN CHEMICAL SOCIETY.; 1955

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

WTP RISK ASSESSMENT WORK PLAN IDENTIFIED CONSTITUENTS OF POTENTIAL CONCERN (COPC) SUPPORT DATA

Phthalates (PHT)

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Bis (2-ethylhexyl) phthalate
CAS Number: 000117-81-7

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-2	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:	1.4E-2	(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	B2		
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:	5.2E+0	mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B2		
Inhal ED10:	5.2E+0	mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B2		
Oral LD50:	2.6E+4	mg/kg	ACGIH
Dermal LD50:	2.5E+4	mg/kg	ACGIH
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.6E+2	µg/L	ECOTOX
Salt Ecol LC50:	1.0E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	7.3E+5	days	CHEMFATE
Volatility:	6.9E+2	days	THOMAS
Photolysis:	2.0E+2	days	FATERATE
Biodeg:	8.0E-1	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	7.3E+5	days	CHEMFATE
Volatility:	4.8E+2	days	THOMAS
Photolysis:	2.0E+2	days	FATERATE
Biodeg:	8.0E-1	days	CHEMFATE
Radio:		days	
Log Kow:	5.1E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	3.9E+2	
Density:	9.8E-1	g/mL @ 25.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	6.8E-8	Torr	CHEMFATE
Henry's Law:	1.0E-7	atm-m3/mol	CHEMFATE
Water Solub:	3.4E-1	mg/L	CHEMFATE
Distrib Coef:	2.3E+6	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	2.1E+4		ECOTOX
Salt BCF:	2.7E+2		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	1.1E+5		ECOTOX
Salt BCF:	6.5E+3		ECOTOX
Log Kow:	5.1E+0		CHEMFATE
Water Solub:	3.4E-1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-5.5E+1	C
Boiling Point:	3.8E+2	C
Formula:	C24 H38 O4	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000117-81-7 Name: DI(2-ETHYLHEXYL)PHTHALATE

```
*****************************************************************************
MELT    DI(2-ETHYLHEXYL)PHTHALATE                          CAS#   117-81-7
  Melting Point  :  -50         DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  RIDDICK,JA ET AL. (1986)
*****************************************************************************

VP      DI(2-ETHYLHEXYL)PHTHALATE                          CAS#   117-81-7
  Vapor Pressure :  .62E-07     TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  GIAM,CS ET AL. (1980)
*****************************************************************************

VP      DI(2-ETHYLHEXYL)PHTHALATE                          CAS#   117-81-7
  Vapor Pressure :  .2E-06      TORR        MEASURED
  Temperature (C):  20.
  Abbrev. Ref.   :  CALLAHAN,MA ET AL. (1979A)
*****************************************************************************

VP      DI(2-ETHYLHEXYL)PHTHALATE                          CAS#   117-81-7
  Vapor Pressure :  6.45E-6     MM HG
  Temperature (C):  25
  Abbrev. Ref.   :  HOWARD,PH ET AL. (1985)
*****************************************************************************

VP      DI(2-ETHYLHEXYL)PHTHALATE                          CAS#   117-81-7
  Vapor Pressure :  6.78E-08    MM HG
  Temperature (C):  25
  Remarks        :  VALUE EXTRAPOLATED FROM DATA FROM 25-88 DEG C. SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  DAUBERT,TE & DANNER,RP (1989)
*****************************************************************************
```

CALLAHAN,MA ET AL. (1979A)
CALLAHAN,M.A.; SLIMAK,M.W.; GABEL,N.W.; MAY,I.P.; FOWLER,C.F.; FREED,J.R.; JENNINGS,P.; DURFEE,R.L.; WHITMORE,F.C.; MAESTRI,B. ET AL.; WATER-RELATED ENVIRONMENTAL FATE OF 129 PRIORITY POLLUTANTS-VOLUME II.; EPA-440/4-79-029 WASHINGTON,DC: U.S. EPA.; 1979A

DAUBERT,TE & DANNER,RP (1989)
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GIAM,C.S.; ATLAS,E.; CHAN,H.S.; NEFF,G.S.; PHTHALATE ESTERS, PCB, AND DDT RESIDUES IN THE GULF OF MEXICO ATMOSPHERE.; ATMOS. ENVIRON.; 14:65-9.; 1980

HOWARD,PH ET AL. (1985)
HOWARD,P.H.; BANERJEE,S.; ROBRILLARD,K.H.; MEASUREMENT OF WATER SOLUBILITIE OCTANOL-WATER PARTITION COEFFICIENTS AND VAPOR PRESSURES OF COMMERCIAL PHTHALATE ESTERS.; ENVIRON. TOX. CHEM.; 4:653-61.; 1985

RIDDICK,JA ET AL. (1986)
RIDDICK,J.A.; BUNGER,W.B.; SAKANO,T.K.; ORGANIC SOLVENTS: PHYSICAL PROPERTI AND METHODS OF PURIFICATION.; TECHNIQUES OF CHEMISTRY. 4TH ED. NEW YORK,NY WILEY-INTERSCIENCE. 2:PP.1325; 1986

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Di-n-octyl phthalate
CAS Number: 000117-84-0

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-2	mg/kg/day	HEAST
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:		mg/kg	
Dermal LD50:	5.0E+3	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:		µg/L	
Salt Ecol LC50:		µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	3.9E+2	days	CHEMFATE
Volatility:	1.7E+2	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	3.9E+2	days	CHEMFATE
Volatility:	2.6E+0	days	THOMAS
Photolysis:		days	
Biodeg:	2.8E+1	days	FATERATE
Radio:		days	
Log Kow:	8.1E+0		PHYSPROP

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	3.9E+2		
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	2.6E-6	Torr	CHEMFATE
Henry's Law:	6.7E-5	atm-m3/mol	CHEMFATE
Water Solub:	2.0E-2	mg/L	CHEMFATE
Distrib Coef:	1.3E+7	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.1E+2		VER_BCF
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	2.9E+4		ECOTOX
Salt BCF:			
Log Kow:	8.1E+0		PHYSPROP
Water Solub:	2.0E-2		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	2.5E+1	C
Boiling Point:		C
Formula:	C24 H38 O4	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000117-84-0 Name: DI-N-OCTYL PHTHALATE

```
*******************************************************************************
MELT    DI-N-OCTYL PHTHALATE                                    CAS#   117-84-0
  Melting Point  :  -25          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BEMIS,AG ET AL. (1982)
*******************************************************************************

VP      DI-N-OCTYL PHTHALATE                                    CAS#   117-84-0
  Vapor Pressure :  2.6E-6       MM HG
  Temperature (C):  25
  Remarks        :  NOT CLEAR IF VALUE IS EXPERIMENTAL OR EXTRAPOLATED, SRC
                    RECOMMENDED VALUE
  Abbrev. Ref.   :  PERWAK,J ET AL. (1981)
*******************************************************************************
```

BEMIS,AG ET AL. (1982)
BEMIS,A.G.; DINDORF,J.A.; HORWOOD,B.; SAMANS,C.; PHTHALIC ACIDS, AND OTHER BENZENEPOLYCARBOXYLIC ACIDS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 17:732-77.; 1982

PERWAK,J ET AL. (1981)
PERWAK,J.; GOYER,M.; SCHIMKE,G.; ESCHENROEDER,A.; FIKSEL,J.; EXPOSURE AND RISK ASSESSMENT FOR PHTHALATE ESTERS (DI(2-ETHYLHEXYL)PHTHALATE, DI-N-BUTYL PHTHALATE, DIMETHYL PHTHALATE, DIETHYL PHTHALATE, DI-N-OCTYL PHTHALATE, BUT BENZYL PHTHALATE) (REVISED).; EPA-440/4-81-020. (NTIS PB85-211936). CAMBRIDGE,MA: ARTHUR D. LITTLE INC. PP.176.; 1981

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000131-11-3 Name: DIMETHYL PHTHALATE

```
*****************************************************************************
MELT    DIMETHYL PHTHALATE                                    CAS#   131-11-3
  Melting Point  :  0-2          DEGC
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  BEMIS,AG ET AL. (1982)
*****************************************************************************

VP      DIMETHYL PHTHALATE                                    CAS#   131-11-3
  Vapor Pressure :  0.00165      MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  HOWARD,PH ET AL. (1985)
*****************************************************************************
```

BEMIS,AG ET AL. (1982)
BEMIS,A.G.; DINDORF,J.A.; HORWOOD,B.; SAMANS,C.; PHTHALIC ACIDS, AND OTHER BENZENEPOLYCARBOXYLIC ACIDS.; IN: KIRK-OTHMER ENCYCL. CHEM. TECH. 3RD ED. 17:732-77.; 1982

HOWARD,PH ET AL. (1985)
HOWARD,P.H.; BANERJEE,S.; ROBRILLARD,K.H.; MEASUREMENT OF WATER SOLUBILITIE OCTANOL-WATER PARTITION COEFFICIENTS AND VAPOR PRESSURES OF COMMERCIAL PHTHALATE ESTERS.; ENVIRON. TOX. CHEM.; 4:653-61.; 1985

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Diethyl phthalate
CAS Number: 000084-66-2

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	8.0E-1	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	9.5E+3	mg/kg	ACGIH
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	1.2E+4	µg/L	ECOTOX
Salt Ecol LC50:	4.9E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	3.2E+3	days	FATERATE
Volatility:	2.2E+2	days	THOMAS
Photolysis:		days	
Biodeg:	5.6E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	3.2E+3	days	FATERATE
Volatility:	8.3E+1	days	THOMAS
Photolysis:		days	
Biodeg:	5.6E+1	days	FATERATE
Radio:		days	
Log Kow:	2.5E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.2E+2	
Density:	1.2E+0	g/mL @ 14.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	1.6E-3	Torr	CHEMFATE
Henry's Law:	4.5E-7	atm-m3/mol	CHEMFATE
Water Solub:	1.1E+3	mg/L	CHEMFATE
Distrib Coef:	4.4E+1	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.2E+2		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	2.1E+2		ECOTOX
Salt BCF:			
Log Kow:	2.5E+0		CHEMFATE
Water Solub:	1.1E+3		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-4.1E+1	C
Boiling Point:	3.0E+2	C
Formula:	C12 H14 O4	

CLASS INFORMATION

Class	Parent Substance

CHEMFATE Search Results

Return to EFDB page

CAS #: 000084-66-2 Name: DIETHYL PHTHALATE

```
*****************************************************************************
VP      DIETHYL PHTHALATE                                    CAS#    84-66-2
  Vapor Pressure :  .35E-03     TORR        MEASURED
  Temperature (C):  20.
  Remarks        :  EXTRAP, UNITS CONVERTED, RANGE OF MEASUREMENTS 34-61 DEGC
  Abbrev. Ref.   :  GRAYSON,BT & FOSBRAEY,LA (1982)
*****************************************************************************

VP      DIETHYL PHTHALATE                                    CAS#    84-66-2
  Vapor Pressure :  1.65E-3     MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  HOWARD,PH ET AL. (1985)
*****************************************************************************
```

GRAYSON,BT & FOSBRAEY,LA (1982)
GRAYSON,B.T.; FOSBRAEY,L.A.; DETERMINATION OF THE VAPOUR PRESSURE OF PESTICIDES.; PESTIC. SCI.; 13:269-78.; 1982

HOWARD,PH ET AL. (1985)
HOWARD,P.H.; BANERJEE,S.; ROBRILLARD,K.H.; MEASUREMENT OF WATER SOLUBILITIE OCTANOL-WATER PARTITION COEFFICIENTS AND VAPOR PRESSURES OF COMMERCIAL PHTHALATE ESTERS.; ENVIRON. TOX. CHEM.; 4:653-61.; 1985

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Di-n-butyl phthalate
CAS Number: 000084-74-2

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	1.0E-1	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	8.0E+0	mg/kg	RTECS
Dermal LD50:	2.1E+4	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.8E+2	µg/L	ECOTOX
Salt Ecol LC50:	2.0E+1	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:	3.7E+3	days	CHEMFATE
Volatility:	1.7E+2	days	THOMAS
Photolysis:	1.4E+2	days	FATERATE
Biodeg:	2.3E+1	days	FATERATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:	3.7E+3	days	CHEMFATE
Volatility:	2.4E+1	days	THOMAS
Photolysis:	1.4E+2	days	FATERATE
Biodeg:	2.3E+1	days	FATERATE
Radio:		days	
Log Kow:	4.7E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	No	
Organic:	Yes	
Gas:	Yes	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	2.8E+2	
Density:	1.0E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	7.3E-5	Torr	CHEMFATE
Henry's Law:	1.8E-6	atm-m3/mol	CHEMFATE
Water Solub:	1.1E+1	mg/L	CHEMFATE
Distrib Coef:	5.2E+3	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	6.7E+3		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	8.8E+3		ECOTOX
Salt BCF:	2.3E+3		ECOTOX
Log Kow:	4.7E+0		CHEMFATE
Water Solub:	1.1E+1		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:	-3.5E+1	C
Boiling Point:	3.4E+2	C
Formula:	C16 H22 O4	

CLASS INFORMATION

Class	Parent Substance

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CHEMFATE Search Results

Return to EFDB page

CAS #: 000084-74-2 Name: DIBUTYL PHTHALATE

```
*****************************************************************************
VP      DIBUTYL PHTHALATE                                   CAS#    84-74-2
  Vapor Pressure :  .14E-04     TORR        MEASURED
  Temperature (C):  25.
  Abbrev. Ref.   :  GIAM,CS ET AL. (1980)
*****************************************************************************

VP      DIBUTYL PHTHALATE                                   CAS#    84-74-2
  Vapor Pressure :  .1E-01      TORR        MEASURED
  Temperature (C):  20.
  Remarks        :  UPPER LIM
  Abbrev. Ref.   :  MARTIN,H & WORTHING,CR (1977)
*****************************************************************************

VP      DIBUTYL PHTHALATE                                   CAS#    84-74-2
  Vapor Pressure :  7.3E-5      MM HG
  Temperature (C):  25
  Remarks        :  SRC RECOMMENDED VALUE
  Abbrev. Ref.   :  HOWARD,PH ET AL. (1985)
*****************************************************************************
```

GIAM,CS ET AL. (1980)
GIAM,C.S.; ATLAS,E.; CHAN,H.S.; NEFF,G.S.; PHTHALATE ESTERS, PCB, AND DDT RESIDUES IN THE GULF OF MEXICO ATMOSPHERE.; ATMOS. ENVIRON.; 14:65-9.; 1980

HOWARD,PH ET AL. (1985)
HOWARD,P.H.; BANERJEE,S.; ROBRILLARD,K.H.; MEASUREMENT OF WATER SOLUBILITIE OCTANOL-WATER PARTITION COEFFICIENTS AND VAPOR PRESSURES OF COMMERCIAL PHTHALATE ESTERS.; ENVIRON. TOX. CHEM.; 4:653-61.; 1985

MARTIN,H & WORTHING,CR (1977)
MARTIN,H.; WORTHING,C.R.; PESTICIDE MANUAL. FIFTH EDITION, BRITISH CROP PROTECTION COUNCIL. 563 PP.; 1977

End of Search

CHEMFATE Search Results

Return to EFDB page

CAS #: 000085-68-7 Name: BUTYL BENZYL PHTHALATE

```
*****************************************************************************
MELT    BUTYL BENZYL PHTHALATE                                CAS#    85-68-7
  Remarks          :  NO APPROPRIATE ESTIMATION METHOD
  Abbrev. Ref.     :  SRC (1988)
*****************************************************************************

MELT    BUTYL BENZYL PHTHALATE                                CAS#    85-68-7
  Melting Point    :  -35          DEG C
  Remarks          :
              1    :  CRYSTALLIZING POINT, GIVEN AS < VALUE
              2    :   BAYER AG INTERNAL DATA
              3    :   HPV: PHTHALATE ESTERS
  Abbrev. Ref.     :  US EPA (2004)
*****************************************************************************

VP      BUTYL BENZYL PHTHALATE                                CAS#    85-68-7
  Vapor Pressure :  0.19E+01     TORR         MEASURED
  Temperature (C):  200.
  Abbrev. Ref.     :  GLEDHILL,WE ET AL. (1980)
*****************************************************************************

VP      BUTYL BENZYL PHTHALATE                                CAS#    85-68-7
  Vapor Pressure :  8.25E-6      MM HG
  Temperature (C):  25
  Remarks          :  SRC RECOMMENDED VALUE
  Abbrev. Ref.     :  HOWARD,PH ET AL. (1985)
*****************************************************************************
```

GLEDHILL,WE ET AL. (1980)
GLEDHILL,W.E.; KALEY,R.G.; ADAMS,W.J.; HICKS,O.; MICHAEL,P.R.; SAEGER,V.W.; LEBLANC,G.A.; AN ENVIRONMENTAL SAFETY ASSESSMENT OF BUTYL BENZYL PHTHALATE. ENVIRON. SCI. TECH.; 14:301-5.; 1980

HOWARD,PH ET AL. (1985)
HOWARD,P.H.; BANERJEE,S.; ROBRILLARD,K.H.; MEASUREMENT OF WATER SOLUBILITIE OCTANOL-WATER PARTITION COEFFICIENTS AND VAPOR PRESSURES OF COMMERCIAL PHTHALATE ESTERS.; ENVIRON. TOX. CHEM.; 4:653-61.; 1985

SRC (1988)
SRC.; SYRACUSE RESEARCH CORPORATION CALCULATED VALUES; 1988

US EPA (2004)
U.S. EPA; HIGH PRODUCTION VOLUME (HPV) CHALLENGE PROGRAM. THE HPV VOLUNTARY CHALLENGE CHEMICAL LIST. ROBUST SUMMARIES AND TEST PLANS.; WASHINGTON, DC:

USEPA, OFF. PREVENT. PEST. TOX. SUBST., POLLUT. PREVENT. TOXICS. AVAILABLE HTTP://WWW.EPA.GOV/OPPTINTR/CHEMRTK/HPVCHMLT.HTM AS OF MARCH, 2004.; 2004

End of Search

SUPERFUND CHEMICAL DATA MATRIX

Date: 1/28/2004
Chemical: Butylbenzyl phthalate
CAS Number: 000085-68-7

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	2.0E-1	mg/kg/day	IRIS
Inhal RfD:		mg/kg/day	
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	2.3E+3	mg/kg	RTECS
Dermal LD50:	1.0E+4	mg/kg	RTECS
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	6.8E+2	µg/L	ECOTOX
Salt Ecol LC50:	4.6E+2	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:	1.9E+2	days	THOMAS
Photolysis:	1.0E+2	days	CHEMFATE
Biodeg:	4.0E+0	days	CHEMFATE
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:	3.6E+1	days	THOMAS
Photolysis:	1.0E+2	days	CHEMFATE
Biodeg:	4.0E+0	days	CHEMFATE
Radio:		days	
Log Kow:	4.9E+0		CHEMFATE

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	No		
Organic:	Yes		
Gas:	Yes		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	3.1E+2		
Density:		g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:	8.3E-6	Torr	CHEMFATE
Henry's Law:	1.3E-6	atm-m3/mol	CHEMFATE
Water Solub:	2.7E+0	mg/L	CHEMFATE
Distrib Coef:	8.7E+3	ml/g	DITOR_KD
Geo Mean Sol:		mg/L	

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	7.7E+2		ECOTOX
Salt BCF:			
ENVIRONMENTAL			
Fresh BCF:	7.7E+2		ECOTOX
Salt BCF:			
Log Kow:	4.9E+0		CHEMFATE
Water Solub:	2.7E+0		CHEMFATE
Geo Mean Sol:		mg/L	

OTHER DATA

Melting Point:		C
Boiling Point:		C
Formula:	C19 H20 O4	

CLASS INFORMATION

Class	Parent Substance

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Appendix H

Organic Abatement DFs in Pretreatment PVP System

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Appendix H
Organic Abatement DFs in Pretreatment PVP System

Appendix H provides the methodology used to determine the organic constituents decontamination factors through the pretreatment vessel vent system thermal oxidizer and carbon beds. The numbers provided are conservative and provide bounding conditions for the emissions profile analysis.

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Appendix H

Pretreatment Vessel Vent Organic Constituents Decontamination Factor Analysis

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List of Acronyms

Acronym	Description
AIT	auto ignition temperature
CAS #	Chemical Abstract Service registry number
COPC	constituent of potential concern
DE	destruction efficiency
DF	decontamination factor
EPA	US Environmental Protection Agency
LFL	lower flammability limit
MSDS	material safety data sheet
MW	molecular weight
PCBs	poly-chlorinated biphenyls
ppmv	part per million by volume
PT	pretreatment
PVP	pretreatment vessel vent process system
RTO	regenerative thermal oxidizer
RE	removal efficiency
VLE	vapor-liquid equilibrium
VOC	volatile organic compound
WTP	Hanford Tank Waste Treatment and Immobilization Plant

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1 Objective

The objective of this analysis is to determine the decontamination factors (DFs) for abatement of potential organic constituents in the pretreatment (PT) vessel vent process (PVP) system.

2 Existing Design Inputs

2.1 RTO Design Criteria

Conditions of combustion within the regenerative thermal oxidizer (RTO) unit are 1.0 second residence time at 1600 °F according to the *System Description for Pretreatment Vessel Vent Process System, PVP* (24590-PTF-3YD-PVP-00001).

2.2 Carbon Adsorber Design Criteria

Carbon adsorbers are designed to contain the largest volume of carbon media possible within the limits of pressure drop and facility size limitations for exchanging spent adsorbers with freshly charged adsorbers (24590-PTF-M0C-PVP-00003).

3 Background

3.1 Origins of Organic Compounds in the PVP System

Historical characterization of Hanford tank waste shows various organic compounds in the solids, liquids, and headspace vapors of numerous double- and single-shelled tanks. Organic solvents and complexants were used in nuclear fuel processing and account for the bulk of the original organic material sent to the waste tanks. Since then, complex reactions have taken place where the original organic waste compounds have undergone radiolytic decomposition to form other compounds. The decomposition products can continuously change in composition since many of them are reactive with other organic decomposition products or may undergo further radiolytic decay. The sustained radioactive exposure to original organic waste material accounts for potentially thousands of different organic compounds present in the waste at trace quantities.

Waste batches will be sent from Hanford tank farms to the Hanford Tank Waste Treatment and Immobilization Plant (WTP) PT facility for processing prior to vitrification. While in PT, process vessels are swept with forced and passive air purges to ensure that radiolytically generated hydrogen does not concentrate in vessel headspaces to a flammable level. The sweeping of process vessel headspaces allows for the removal of organic compounds as governed by the vapor-liquid equilibrium (VLE) of each compound at the system conditions.

3.2 Organic Abatement in the PVP System

Air purges from PT process vessels are removed and treated through the PVP system prior to discharge to the environment. To ensure that the concentration of volatile organic compounds (VOCs) in the PT offgas is reduced before release to the environment, the stream is processed through an RTO and a carbon adsorber. In the RTO, organic compounds are destroyed via combustion. The combustion reaction is induced by the application of high temperature and the availability of excess oxygen. Destruction of

contaminants is followed by a polishing step in the adsorber where some removal of remaining organic compounds takes place. In the adsorber, organic contaminants are removed from the vent gas by capture on the surface of the activated carbon media.

3.3 Organic Characterization of Hanford Tank Wastes

Due to the difficulties associated with sample handling and analysis of radioactive tank waste, the organic characterization of waste liquid and solids remains largely incomplete with respect to the species and concentration of each organic compound. The most abundant organic characterization data comes from tank headspace analyses. A wide range of target organic compounds have been detected in various tank headspace samples on behalf of the relative ease of vapor phase sample handling during analysis. Over 1200 different organic compounds have been detected through historical sampling and analyses of Hanford tank wastes (Wiemers 1998 p 4.13). Nearly all 1200 of these compounds have been detected in the headspace samples of single-shell tanks (Stock 2000, p 2).

In spite of the organic analysis data available to date, there is still significant uncertainty in determining the potential concentrations of the individual and collective organic compounds within the PVP system vent stream. Arguably, organic concentrations will be appreciably lower in the PVP system vent gas than detected concentrations from historical headspace analysis. Most of the data was collected several years ago and since then the organic compounds have continued to be depleted by ventilation of the waste tanks. However, those compounds which have been detected at higher concentrations are generally the most credible in terms of their presence in multiple tanks. As such, the organic compounds most likely to be detectable in the PVP system vent gas are those which have been detected in some abundance in several different waste tanks.

3.4 Constituents of Potential Concern

In this integrated emissions baseline report, 219 organic constituents of potential concern (COPCs) were identified as being relevant to emissions estimates for permitting. These 219 COPCs were identified during development of the *Environmental Risk Assessment Work Plan for the Hanford Tank Waste Treatment and Immobilization Plant* (24590-WTP-RPT-ENS-03-006). These constituents have been included in emissions estimates used for permitting the WTP. As such, they are also considered in this analysis to establish conservative DFs to be included when determining future emissions estimates used in permitting activities.

Of the 219 COPCs, 14 are coplanar poly-chlorinated biphenyls (PCBs). These 14 PCBs are included individually in the list on due to the tendency for the coplanar molecules to exhibit dioxin-like properties. The specific PCBs are shown in addition to the generally identified compound, PCB (Chemical Abstract Service [CAS] # 1336-36-3), which is inclusive of the entire family of individual PCBs.

3.5 Organic Destruction via Combustion –Theory

Thermal oxidation of organic material is a combustion process. Combustion is defined as the burning of gases, liquids, or solids, in which the substance is oxidized, evolving heat and often light (Lewandowski 2000, p 1). For combustion to occur, three elements of the reaction need to be in place. These are fuel (the organic contaminant in this case), oxygen (present in the vent gas, which is mostly air), and an ignition source. The ignition source can be thought of as the source of activation energy to initiate the chemical (combustion) reaction. In general, combustion reactions are exothermic and under the correct conditions of oxygen and fuel, initiated combustion can release enough heat to sustain a continuous ignition source (the burning process or a "fire"). The following chemical equation shows the products of combustion for a typical hydrocarbon.

Equation H-1

$$C_xH_{2y} + \left(X + \frac{Y}{2}\right)O_2 + Q_{activation} \rightarrow XCO_2 + YH_2O + Q_{combustion}$$

where:

X and Y	= stoichiometric coefficients
C	= carbon
H	= hydrogen
CO_2	= carbon dioxide combustion product
H_2O	= water vapor combustion product
$Q_{activation}$	= activation energy to initiate the reaction
$Q_{combustion}$	= combustion energy released by forming the combustion products

Within a thermal oxidation system, the primary performance requirement is the extent of destruction or destruction efficiency (DE) of the organic contaminants. Important parameters which affect the DE of organics by thermal oxidation are sometimes called the "three T's" of combustion. The "T's" are time, temperature, and turbulence. The other most important parameter is availability of oxygen. The extent of oxygen present in a combustion system essentially determines the importance of time and turbulence. As the availability of oxygen increases, the need for time and turbulence (mixing) will decrease for the same DE since there is more likelihood for the same number of contaminants to contact and react with an oxygen molecule. Typically, thermal oxidizers use a fuel supply and burner system to maintain the system operating temperature. In such cases, the excess oxygen is usually managed to levels which are only slightly higher than the stoichiometric requirement. The reason for limiting the excess oxygen is a cost consideration which limits the fuel required to maintain the system temperature (fuel efficiency). In systems where oxygen is rigorously controlled, time and turbulence become a vital design consideration to ensure equivalent DE.

The PVP system will use an RTO which will maintain operating temperature by heat input from an electric element as opposed to a burner system. In this service, the extent of excess oxygen is very near 20.9 % (the oxygen concentration in ambient air) since the organic contaminants in the PVP system stream are expected to be extremely dilute. The RTO will recover energy from the high temperature exhaust by exchanging heat with (preheating) the feed gas via ceramic heat transfer beds. Oxidizers which use ceramic heat transfer beds in alternating flow cycles are known as *regenerative*. This manner of heat recovery will maximize the energy efficiency of the oxidizer and provide some additional residence time at temperatures very near the operating temperature.

The design parameters required for the PVP system oxidizer are 1.0 second residence time at 1600 °F. This is consistent with US Environmental Protection Agency (EPA) reported results of commercial incinerators (fuel-fired) where 0.75 seconds and 1600 °F have been shown to ensure DEs remain above 98 % for non-halogenated VOCs (EPA 1999, p 1). Additionally, electric heating elements used in existing RTOs have demonstrated proven reliability when operating at 1500 °F and the capability of operating as high as 1800 °F. It should be noted that the EPA reference which states destruction performance for this operating temperature has derived the information from historical performance of fired oxidizers (as opposed to electric). The reference states the importance of mixing and residence time in this type of system since the availability of oxygen is limited by the system's operationally practical fuel efficiency.

3.6 Organic Removal via Adsorption – Theory

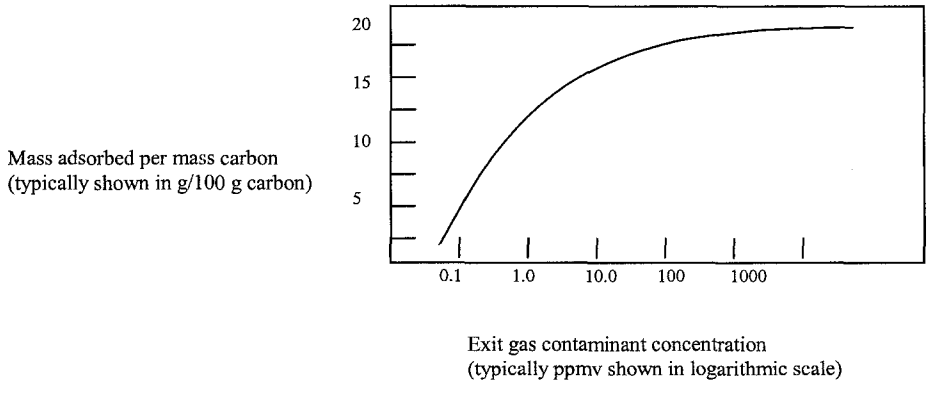
The adsorption of VOCs on activated carbon media occurs by a physical adsorption mechanism in which weak attractive forces, resulting from Van der Waals forces between the contaminant and the carbon adsorbent (also known as Hydrogen bonding forces or London dispersion forces) adhere the contaminant to the surface of the carbon. The process is exothermic and usually evolves slightly more energy than the heat of vaporization of the adsorbed compound (Cooper 1994, p 381). The contaminant essentially moves out of the vapor phase to behave like a liquid or solid phase trapped on the solid surface of the adsorbent media. Adsorption is usually reversible. Under appropriate sustained conditions of temperature, pressure, and concentration, most adsorbed compounds can re-enter the vapor phase as governed by thermodynamic equilibrium.

In general, the potential for activated carbon to adsorb a particular contaminant depends primarily on the boiling point and molecular weight (MW) of that compound. The reason is that some molecules tend to have more potential for intermolecular attraction via London dispersion forces. A generally predictive measure of intermolecular forces is normal boiling point since the change of phase requires enough energy to break the intermolecular forces which hold the compound together in its liquid phase. A higher boiling point corresponds with a higher intermolecular attraction (Brown 1994, p 374) and hence more potential for strong adsorption. Consequently, boiling point is the strongest indicator for the "adsorbability" of a particular VOC. Boiling point is followed closely by MW as an indicator of adsorption potential. Large molecules with large MWs tend to have more atoms and therefore more potential to be polarized. The polar characteristic of a molecule adds to the attractive forces due to the pull between dissimilar charges. The more "polarizable" a molecule is, the more intermolecular force it exhibits and hence the more adsorbable it may be.

3.6.1 Adsorption Isotherms

Adsorption is governed by thermodynamics of chemical equilibrium; therefore, contaminant concentration in the treated gas is an important factor in determining the capacity of the carbon to collect or load a particular constituent. Temperature and pressure conditions also affect the extent of adsorption so that higher pressure and lower temperature favor a higher adsorption capacity. This is consistent with the observation that gas phase adsorption is exothermic at essentially the latent heat of vaporization. The adsorption behaves like a phase change; both high pressure and low temperature favor this transition. At constant pressure and temperature, the relationship between contaminant concentration in the exit gas and the equilibrium capacity of the adsorbent is known as an adsorption isotherm.
, below, depicts a generalized relationship between carbon loading capacity and equilibrium exit gas concentration.

Figure H-1



Isotherms are empirically created from experimental or industrial data and are commonly available for numerous VOCs on adsorbents developed for several types of gas cleaning services. However, at extremely dilute concentrations, the predictive capability of empirically developed isotherms becomes unreliable. The reason is that adsorption data is not widely available at extremely low concentrations since there is not normally a regulatory driver to apply adsorption technology to significantly dilute streams. Industrial experience suggests that adsorption capacities for dilute contaminant concentrations should be determined through pilot testing of each adsorbent media considered for the service. The performance or removal efficiency (RE) of activated carbon will vary depending on media particle size, type of activation processing (internal pore size, pore distribution, or void fraction), and carbon source material.

3.6.2 Multi-Component Adsorption

In multi-component adsorption, the adsorption capacity of any particular compound may no longer follow its particular single compound isotherm. Complex and unpredictable component-to-component interactions may take place. This can change the thermodynamic equilibrium of the collective adsorption system. It is known, however, that in systems where a weakly attracted compound has been adsorbed, it can later be displaced by a more strongly adsorbed compound if the relative concentrations favor the exchange. This "selective" behavior greatly adds to the complexity and unpredictability of multi-component adsorption.

Processing of each batch of Hanford tank waste is likely to evolve multiple species of VOCs at dilute concentrations, each with its own unique organic signature. In the case where potentially hundreds of different organic compounds may be present at different concentrations, the contaminants will be competing for the same adsorption sites. The prediction of equilibrium for any given compound becomes virtually impossible. Given the unpredictable mix of compounds and concentrations in the PVP system vent gas, those compounds which are only slightly adsorbable are not likely to exhibit any appreciable removal from the stream.

3.7 Compound Physical Property Sources

The list of contaminants considered by this analysis includes compounds detected through various historical analyses of Hanford tank wastes and those considered due to regulatory concern. These compounds exhibit a wide range of physical properties. Not all of the relevant physical property values were found to be readily available. For the most part, chemistry and engineering handbooks and texts have been referenced to supply the important physical properties used in this analysis. In addition, several Internet databases containing information on chemical compounds, chemistry, and chemical safety were used to further complete the collection of physical properties. In some cases, manufacturer's material safety data sheets (MSDS) were used to provide the auto-ignition temperatures (AITs), solubilities, and/or boiling points of certain compounds.

This group of sources, however, did not provide all of the required information for every compound. To fill the remaining gaps, comparisons were made to similar compounds for which data was found. The missing physical property information was then conservatively estimated. Primarily, chemical structure was used to assign AITs and normal boiling points. To a lesser extent, molecular weight, solubility, and National Fire Prevention Association hazard rankings were taken into consideration. General chemical trends were accounted for when assessing the conservatism of each estimated value. Examples of trends include: 1) the polarity of a compound with respect to estimated boiling point and 2) the number of halogen substitutions, chemical resonance, or length of alkane chain with respect to estimated AIT.

3.8 Representative Organic Compounds

Given the total number of historically detected organic compounds which could be considered for tracking through the PVP system, a criteria was needed to select a smaller and more manageable number of representative compounds. The "representative" compounds will include organic COPCs identified by the *Environmental Risk Assessment Work Plan for the Hanford Tank Waste Treatment and Immobilization Plant*. The organic COPCs contain numerous halogenated and aromatic compounds which appear at the extreme ends of the range of physical property values used to assign DFs. The representative compounds can then bound the behavior of those which may not be tracked in the PVP system. By including several compounds which are difficult to destroy or remove from the PVP system vent gas, future emissions estimates can establish bounding conservatism by assigning higher concentrations to these low abated compounds.

Since the compounds under consideration are those which may be present within the PVP system vent gas, the considerable data collected from headspace (vapor) samples of the single-shell tanks was considered to be the widest and most representative information. A single source document containing the maximum detected concentration of nearly 1200 compounds (Stock 2000) was used to set the selection criteria for some of the representative compounds. It is appropriate to include the organic COPCs in this analysis because of their inclusion in emissions estimates which affect WTP air permitting. The criteria for selecting the remaining compounds was decided to be a maximum detected concentration of 0.1 part per million by volume (ppmv) or higher.

Some of the compounds detected at 0.1 ppmv or higher are COPCs[1]. However, all tabular data presented in this analysis are shown as two lists: 1) the COPCs and 2) those detected over the concentration threshold. This is done to make it easier to locate particular compound information based on the different end uses expected from this analysis. The total number of individual compounds considered in this analysis is 405. Tables 1-1 and 1-2 of Attachment 1 show the COPCs and detected compounds in tank headspace, respectively.

All organic COPCs identified in the *Environmental Risk Assessment Work Plan for the Hanford Tank Waste Treatment and Immobilization Plant* will be included in this analysis with the exception of the individual coplanar PCBs. Due to the similarity of PCBs across all the various specific structures and physical properties, the 14 listed coplanar PCBs will not be treated individually in this analysis. Those compounds are assigned a single DF identified by the descriptive name (PCBs) and CAS # 1336-36-3.

3.9 Compound Physical Properties

Tables 1-1 and 1-2 show a CAS #, MW, chemical formula, boiling point, and AIT for each compound. A two-dimensional structure is also shown for each compound where the structure is not obvious by its compound name and/or where it is significant to the determination of any estimated physical property value. Values which could not be found in available references have been estimated as described in Section 3.7 of this analysis. Source information and notes concerning particular physical property values are included at the end of each table. As can be expected with such a large collection of data from several different sources, some values may be inconsistent with other sources. However, since conservatism has been exercised at each occurrence of estimation or enabling assumption, the individual and collective physical property inputs are considered to be bounding as supported by the best available information. As

[1] Not all of the COPCs have been detected in analysis of headspace samples of Hanford tank waste.

such, their effect on the analysis result with respect to the accuracy of assigned DFs is expected to be conservatively bounding.

3.10 Destruction Criteria

Section 2.1 gives the design conditions of residence time and operating temperature of the RTO. For a given constituent, the availability of oxygen and its AIT are the other important factors for determining DE in the RTO system.

3.10.1 Oxygen Concentration

Final vapor-liquid equilibrium (VLE) for organic compounds in the PVP system vent gas will take place in the caustic scrubber, which is controlled to near standard conditions. These conditions are essentially the same as waste tank storage conditions at the Hanford Site. Therefore, the expected concentration of organic compounds will be much less than 1 % since most volatile compounds have already been depleted from the waste. As such, the oxygen concentration of the vent gas is essentially that of saturated ambient air (>20 %) and is well in excess of typical combustion systems where excess oxygen is controlled for fuel efficiency.

3.10.2 Basis of Destruction

Given the design criteria of the RTO and the extent of available oxygen for combustion, the DF for destruction of each compound will be determined by its AIT. See Section 5.4 for a detailed explanation of AIT and the relationship of destruction efficiency in the RTO.

3.11 Removal Criteria

For assigning DFs across the carbon adsorber, normal boiling point, MW, and concentration are considered. It is understood that the concentration of any given constituent in the PVP system vent gas cannot be accurately predicted. However, some constituents are known to be extensively destroyed in the oxidizer, leaving a very small concentration in the feed gas to the downstream adsorber. This qualitative behavior is taken into consideration on those compounds which have high DFs across the RTO. For a detailed explanation of how boiling point, MW, and concentration are used to assign adsorber DFs, see Section 5.5.

4 Methodology

4.1 Definition of Decontamination Factor

The mathematical definition of decontamination factor (DF) is generally the ratio of mass flow in the feed to mass flow in the treated stream. DFs will be calculated by using the DE or RE in the following relationship.

Equation H-2

$$DF = \frac{1}{\left[1 - \frac{eff}{100}\right]}$$

where:

eff = the contaminant DE or RE in %

4.2 Destruction DF

Each compound's referenced or estimated AIT will be compared with the operating temperature of the RTO. The difference in these two temperatures will be used to assign a destruction DF based on the criteria from Table H-2.

4.3 Removal DF

Compound removal DFs across carbon adsorption will be assigned based on the estimated adsorption capacity of each compound. The estimated adsorption capacities are based on normal boiling point, molecular weight, and available calculated adsorption capacities (Yaws 1995) for certain compounds which are included in this analysis. Where the capacity estimation via molecular weight and normal boiling point differs from the calculated prediction for a specific compound, the lower value is used to ensure conservatism. For the 35 instances where the correlation gives the lower capacity estimate, the correlation value was rounded down to the nearest graduated capacity from Table H-3. The selected adsorption capacity is then used to assign the removal DFs according to Table H-4.

4.4 Combined DF

The carbon adsorption system normally treats gas that has been processed in the RTO. As such, the inlet concentration of certain constituents has the potential of being extremely low (<<0.1 ppmv for compounds which are readily combustible). The potential for extremely low contaminant concentrations will be accounted for by applying a reduction scalar on compounds which have a DF of 50 or higher across the RTO. For these compounds, the adsorption DF used to calculate the combined DF will be reduced by a factor of 10 (not to decrease below 1.0). The combined DF will then be determined by multiplication of the DFs for the RTO and carbon adsorber.

5 Assumptions

5.1 Physical Property Sources

Due to the number and species of the organic compounds considered by this analysis, not all physical property values were readily available. In addition, certain sources contradicted each other regarding AIT and normal boiling point. A good example of this is the chemical compound pyridine (CAS # 110-86-1). Physical property sources #1 and #6 from Table 1-2 show the normal boiling points to be 115.2 °C and 208 °C respectively. Another example is naphthalene (CAS # 91-20-3). Sources #1 and #23 from Table 1-2 show the AITs as 568 °C and 526 °C respectively. Likewise, numerous AIT temperatures were found by searching MSDS and chemical safety databases, and in some cases, two available sources showed different AITs. In all instances where differing values were found, the more conservative (high AIT and low boiling point) were used. However, due to the number of discrepancies found and the apparent potential for inaccuracy, the physical data has been treated with conservatism in determining the destruction and removal DFs. The physical property data as assembled in Tables 1-1 and 1-2 is assumed to be best available information and appropriate to determine combined DFs. This assumption (and any specific physical property value) is not unreasonable since the inaccuracy of the physical property data is not likely to significantly affect the combined DF of any compound. In addition, the DFs determined by this analysis are likely to be used with a very conservative estimation of unabated organic emissions due

to the uncertainty of organic content in the tank waste. In this manner, an estimation of abated organic emissions from the PT PVP system can be considered bounding.

5.2 Physical Property Values

Numerous uncommon organic species are contained within the collective compounds considered by this analysis. As not all physical properties were found for several of these compounds, the AIT and normal boiling point were estimated in some cases to enable the DFs to be assigned. As discussed in Section 3.7, the compound physical structures were used to estimate the AIT and/or boiling point by comparison to similar compounds for which the values were known. When estimating the AITs, certain trends related to elemental composition and chemical structure were recognized. In general, the following patterns are reflected in the reference AITs:

- Aromatics tend to have higher AITs due to resonance stability.
- Halogenated compounds have higher AITs.
- Higher carbon to halogen atomic ratios have lower AITs.
- Methyl or alkane substitutions of otherwise identical structures lowers the AIT.
- Compounds with longer alkane chains tend to have lower AITs.
- Carbon, nitrogen, or oxygen double bonds tend to raise AIT in most compounds.
- Higher hydrogen to carbon ratios tend to lower AIT temperature.

All of these trends were taken into consideration to ensure that the estimated AITs were bounded by conservatism. When estimating normal boiling point, more extreme conservatism was exercised to ensure that the lower boiling point compounds were reflected as lower than the actual value (resulting in conservative adsorption DF). At higher values of boiling point, the accuracy of the estimates becomes less important as the graduated categories for adsorption capacities are associated with wide ranges of boiling points. In many cases, the molecular weight of compounds with unknown boiling points were so high that the boiling points of similar structures were far in excess of the maximum criteria for assigning adsorption DF. On behalf of these measures of conservatism, the estimated physical properties which affect the destruction or removal are assumed to be bounding and their criteria will not contribute any non-conservative error to the assigned DFs.

5.3 Unidentified and Non-included Organic Compounds

It is assumed that previously unidentified or lesser detected compounds will behave similarly to the 400+ compounds considered by this analysis. The COPCs include an abundance of halogenated compounds which are most difficult to destroy in the thermal oxidizer. In addition, several of the halogenated compounds are methanes and ethanes (refrigerants) which have little or no adsorption potential. For this reason, the individual compounds considered by this analysis are assumed to conservatively represent the potential organic compounds which could be evolved from the waste. In order for an emissions estimate to establish a conservative bound for emissions, both the implementation of the DFs established by this analysis and a conservative estimate of organic compounds in the feed are required.

5.4 Destruction Efficiency

Time, turbulence, and temperature are commonly referred to as the most important factors on the extent of complete combustion in thermal oxidation or incineration abatement systems. The three "T's", however, do not specifically address the availability of oxygen (one of the components of the combustion

triangle). The reason is that most commonly the systems under consideration are fired with auxiliary fuel in some type of burner arrangement. In such cases, the oxygen content is usually regulated at a concentration slightly in excess of stoichiometric for the sake of fuel efficiency. Stoichiometric oxygen is typically limited at 3.0 volume percent in the exhaust gas of fired systems. Predictions of destruction efficiency in systems with limited oxygen are not based purely on temperature. The following sections discuss the basis for assigning combustion DFs in the PVP system.

5.4.1 Excess Oxygen

A general relationship between operating temperature, contaminant AIT, residence time, turbulence, percent excess oxygen in the exhaust gas, and DE has been developed and used in the design of incineration systems. Data showing the dependency of DE on temperature and residence time is shown in the table below (Lewandowski 2000 p 27).

Table H-1

Destruction Efficiency (%)	Degrees Above AIT (°F)	Residence Time (s)
95	300	0.5
98	400	0.5
99	475	0.75
99.9	550	1.0
99.99	650	2.0

The table shows DE as a function of the operating temperature in excess of contaminant AIT. This relationship assumes that a threshold turbulence (Reynolds number ≥10,000) and 3.0 % excess oxygen are achieved. The upper bound values given in the table suggest that not all of a contaminant is completely destroyed. Even at a temperature of 650 °F above the AIT of a contaminant, 0.01 % of the compound is shown to remain undestroyed in the stream.

Oxygen-starved pathways are presumed to be responsible for the un-combusted residual (Lewandowski 2000 p 26). A study of destruction mechanisms to help predict the DEs in oxygen-deficient systems was conducted by the EPA. The resulting EPA Incinerability Ranking was developed to provide relative destruction of compounds under oxygen-deficient conditions. The study and its results were published in an Environmental Science and Technology article entitled *Development of a Thermal Stability Based Ranking of Hazardous Organic Compound Incinerability* (Dellinger 1990). Various relationships were discussed in the article suggesting factors such as elemental composition of the contaminants and the potential for formation of reactive radicals are primary indicators of thermal stability (or instability). Figure 9 of the article shows a two-dimensional plot of temperature vs. the remaining fraction of contaminant (see Attachment 5) illustrating the effect of varying excess oxygen. Numerous data sets are plotted, each representing a different extent of excess oxygen (shown as oxygen equivalence ratio {stoichiometric oxygen/actual oxygen}). A dramatic separation occurs between the plots of oxygen equivalence ratios 1.0 and 1.001. With only the additional 1/1000 of stoichiometric oxygen provided when moving from the equivalence ratio of 1.001 to 1.0, equal destruction is achieved at a significantly lower temperature (more than 100 °C lower). In general, the plots all follow the trend of higher available oxygen equating to a lower temperature of equal destruction. However, the differences are subtle until the ratio drops below a value of 1.01. This established trend is a clear indication that oxygen content is the most significant variable to account for when determining destruction efficiency at temperatures above the AIT. As oxygen availability increases, the required temperature for equivalent destruction decreases toward the AIT.

5.4.2 Basis of Destruction

Based on the results shown in Figure 9 of Dellinger 1990, and the expected concentration of oxygen in the treated gas of the RTO, the contaminant AIT is assumed to be the single determining variable in assigning organic DFs. Considering the design residence time of 1.0 second under the conditions of excess oxygen in the PVP system vent gas (see Section 3.10.1), the DEs shown in Table H-1 are considered to be conservatively bounding and valid for assigning DFs in the PVP system RTO. In order to assign DFs at lower extents than what is shown in Table H-1, data points were extrapolated and fitted to a well-behaved plotted function (see trendline of Figure H-2 below). Table H-2 shows the data points for the DFs associated with each predicted destruction efficiency.

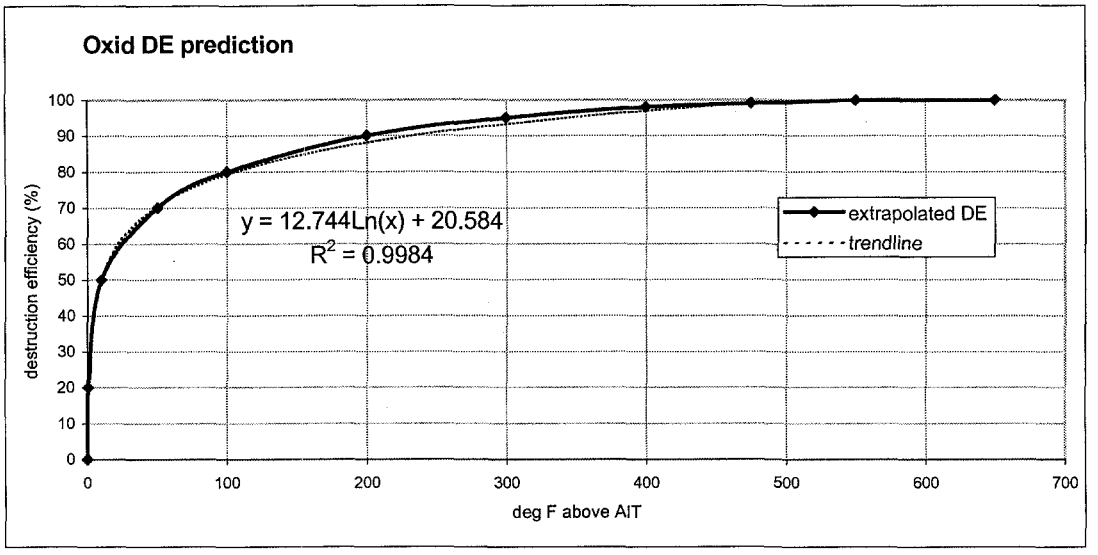
Table H-2

Degrees Above AIT (°F)	Destruction Efficiency (%)	DF (massflow in/massflow out)
<0.2	0	1
1	20	1.25
10	50	2
50	70	3.33
100	80	5
200	90	10
300	95	20
400	98	50
475	99	100
550	99.9	1000
≥650	99.99	10000

The data point for 0.2 °F at zero destruction efficiency is included for the sake of fitting the extrapolated data to the trend line on the plot and for establishing the lower boundary of DE at a conservative fixed point. Given the 1.0 second residence time at operating temperature, some destruction can be expected to take place at the AIT threshold. However, to remain conservative the DF assigned to compounds with AITs of higher than 1599 °F (operating temperature is 1600 °F) will be 1.0.

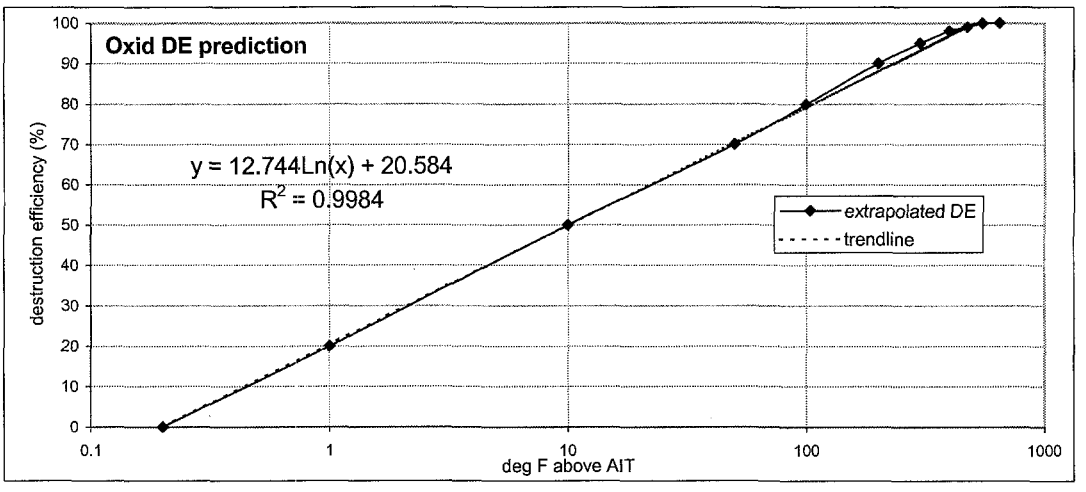
Figure H-2 shows the plotted data points on normal scale and Figure H-3 show the data on a logarithmic scale to better resolve the DE at temperatures just above the AIT.

Figure H-2



General behavior of the plot is reasonable for DE since one would expect the efficiency to be near zero at the initial occurrence of the AIT and then become appreciable rapidly as the temperature increases.

Figure H-3



The plot shown on logarithmic scale indicates that the prediction for destruction efficiency decreases to zero before the operating temperature decreases below the AIT.

While the extrapolation is not expected to be perfectly accurate for each compound, it does reflect reasonable behavior under the combustion conditions of the electric RTO. Given the conservatism applied in assigning AITs and the maximum extent of available oxygen in the treated stream, the DFs are assumed to be both appropriate and achievable.

5.4.3 Residence Time

The design residence time of 1.0 second is assumed to be adequate for all of the above AITs and associated DFs to be valid. This assumption is made while taking into consideration the data shown in

Table H-1. The DE of 99.99 % is shown for 650 °F above the AIT and a 2.0 second residence time. The extra second of residence time (2.0 seconds compared to 1.0 in this system) can be thought of as increasing the likelihood of small remaining amounts of contaminant finding available oxygen and reacting. Given that the data was derived from systems operating with 3.0 % excess oxygen, the increase to nearly 21 % oxygen (in this system) should more than compensate for the shortened residence time at equal predicted DE.

5.5 Removal Efficiency

The extent of removal for a contaminant depends on its adsorption potential and concentration. Adsorption potential can be estimated for individual compounds based on physical properties, provided the concentration of the contaminant is not dilute beyond the limits of isotherm data. Multi-component adsorption is much more difficult since contaminant interactions can be unpredictable. The organic signature of the PVP system vent gas will change throughout the operation of the WTP. As such, enabling assumptions are needed to assign individual adsorption potentials. Given that the adsorbers will be designed within the recommended gas loading rate of 10 to 100 ft/min (24590-PTF-M0C-PVP-00003), the following assumptions are conservatively bounding with respect to adsorption potential and removal DFs.

5.5.1 Equilibrium Gas Concentrations

No definitive information exists which can predict the concentration of an individual contaminant in the feed to the carbon adsorber. Arguably, the more volatile compounds may already be depleted from the waste due to the continuous removal by the ventilation systems of the waste tanks in the tank farm. Those which are not volatile enough to have already escaped from the tank waste are not likely to be volatile enough to be appreciably present in the PVP system due to the comparable conditions of temperature and pressure. Overall, the probability of any single constituent to exceed 0.1 ppmv in the adsorber feed is quite low. This presents difficulty when assigning adsorption capacity for any compound since adsorption technology is not traditionally applied to such dilute concentrations of contaminants. As such, little or no isotherm data are available for compounds at or below 0.1 ppmv.

To enable adsorption assignments, the exit gas concentration will be assumed to be 0.1 ppmv for each compound. This concentration is the lowest for which reference data can be reasonably extrapolated. Selecting this reference point will establish the best available comparison for use in assigning a conservative adsorption capacity for each contaminant from Tables 1-1 and 1-2.

5.5.2 Adsorption Capacity Estimate Methodology

As a starting point to consider the different adsorption potentials in this analysis, molecular weight and boiling point criteria from a technology paper on vapor phase carbon adsorption were used to set graduated thresholds of capacity. The paper, *Activated Carbon Adsorption for Treatment of VOC Emissions* (Shepherd 2001), provides relative adsorption capacities of several common organic compounds (see Attachment 6). The capacities exhibit the governing behavior of adsorption potential based primarily on boiling point and MW of each compound. From the relative capacities and trends shown by the compounds included in this source, the following table was developed to assign the graduated capacities for the same criteria of PVP system contaminants:

Table H-3

Contaminant Normal Boiling Point	Contaminant Molecular Weight	Estimated Adsorption Capacity
°C	g/mol	g adsorbed/100g carbon
<25	-	0
-	<50	0
25-50	<150	0.5
<50	-	1
50-100	<150	1
50-100	-	2
100-150	<150	2
100-150	-	5
>150	<150	10
150-200	-	20
>200	-	40

*Note: The dash (-) indicates all values are applicable, given that the compound is not classified by criteria from a previous row.

This graduated assignment of capacity may be too general with respect to compounds in a given classification of boiling point and MW since the property value ranges are large. Additionally, no reference is made to compound concentration within the relative capacities presented by the technology paper.

To qualify the values of Table H-3, the assigned capacities of several compounds were compared to the corresponding predicted results of a correlation equation. The equation was developed from available isotherm data of numerous organic compounds (Yaws 1995). The results for common organic compounds having four or fewer carbon atoms were obtained from a quadratic equation as a function each contaminant's assumed concentration and compound-specific quadratic coefficients (see Attachment 7). The logarithmic series expansion equation is shown below:

Equation H-3

$$\log_{10} Q = A + B \log_{10} y + C[\log_{10} y]^2$$

where:

Q = adsorption capacity at equilibrium (g/100 g carbon)
y = contaminant concentration in ppmv
A, B, and C = quadratic coefficients (contaminant specific)

Of the 405 compounds considered by this analysis, 95 were found to have coefficients for prediction of their adsorption capacity by this correlation. In general, the predicted results were in alignment with the estimated capacities assigned from Table H-3 criteria. However, the correlation capacity results were lower than the estimated capacities for 35 of the 95 compounds. The differences in predicted capacities (difference = correlation results – estimated capacity) ranged from –1.9 to 16 (g/100 g carbon). This

shows that the graduated capacities determined by the estimation method are generally conservative and in agreement with the correlation. For most compounds, the estimation method is well below the correlation result. It is assumed that the lower predicted capacity from either Table H-3 criteria or the correlation equation (where contaminant constants are available) is achievable by carbon in the PVP adsorption system.

Lastly, it is recognized that some contaminants will be extensively destroyed in the thermal oxidizer and will appear in the adsorption system at extremely dilute concentrations. These low concentrations may be considerably lower than the valid lower limit of either predictive method for capacity. To account for this uncertainty, the estimated adsorption DF of those compounds which show a high DF in the RTO will be reduced by a safety factor. It is assumed that a reduction factor of 10 for adsorption DFs on compounds which have an assigned DF of ≥ 50 in the RTO will adequately compensate for uncertainties in the predicted value based on low concentration. This assumption is incorporated in the analysis methodology (Section 4.4). However, since the combustion DFs have been assigned conservatively, it is recognized that some compounds may achieve a DF of greater than 50 in the RTO even though they have been assigned a lower DF. In these cases, or where the originating evolved contaminant concentrations are appreciably lower than 0.1 ppmv, it is possible that the conservatism of each assigned removal efficiency (adsorption DF) may no longer be conservatively bounding. While this may be the case for numerous identified (or unidentified) compounds, the effect of introduced error on predictions made using the estimated removal DFs will be insignificant. In those cases where the adsorption removal efficiencies may not be bounding due to low concentration, the effect on a mass balance or emissions estimate will be negligible.

5.6 Adsorption RE and DF relationship

As discussed in Section 3.6, removal of a contaminant from a gas stream via adsorption is dependant on the attraction between the contaminant and the adsorbent, the concentration of the contaminant, and the physical properties of the contaminant. These factors are used with empirical data to generate carbon loading capacities and adsorption isotherms. However, the generated (or calculated) isotherms are typically valid for gas phase concentrations above 0.1 or 1.0 ppmv. Extrapolations of equations or relationships which predict loading capacity or isotherm data to concentrations below 0.1 ppmv may become quite inexact. Historical process knowledge would suggest that pilot scale tests should be conducted to determine exact adsorption performance. This is impractical for the PVP adsorption system since wastes processed in PT contain numerous trace organic compounds and each waste has a different organic signature. Information from pilot testing of a single waste may not be applicable to a different waste source. Therefore, the relationship between removal efficiency and DF will be estimated on a more general basis by the following table.

Table H-4

Adsorption Capacity (g adsorbed/100 g carbon)	Removal Efficiency (RE) %	DF mass flow in / mass flow out
0	0	1
0.5	20	1.25
1	50	2
2	80	5
5	90	10
10	95	20
≥20	98	50

This relationship takes into account the conservatism which has been placed on the assignment of each adsorption capacity. Each assigned adsorption capacity has taken into account the potential for selective adsorption (replacement of a weakly attracted contaminant by a strongly attracted compound) and the potential for compounds to be present in much lower than reference concentrations (<0.1 ppmv).

The relationship between estimated adsorption capacity and DF is an enabling assumption. While every attempt has been made to add reasonable conservatism, the above DFs are only a generalized estimate. Any other more accurate means of assigning DFs would require both of two virtually non-attainable pieces of information: 1) the specific compounds and concentrations of adsorbable contaminants in the post oxidizer PVP system vent gas, and 2) the specific multi-component isotherm for each compound. Once the adsorption system is in service with offgas evolved from PT waste processing, it will be possible to take upstream and downstream samples and establish the extent to which this assumption is conservatively bounding.

6 Analysis

In order to handle data for the numerous compounds maintained in each of the separate lists, the computations were performed on Microsoft Excel spreadsheets. Example compounds are shown in the remainder of this section to illustrate how the compound physical property data and analysis methodology are used in the computations to assign the DFs. Trans-1,3-dichloropropene, ethylene dibromide, (compound numbers 7 and 14 from Table 1-1) and 1-heptanol (compound number 95 from Table 1-2), are examples which show the various considerations underpinning the assigned DF methodology.

6.1 Trans-1,3-Dichloropropene

The AIT of trans-1,3-dichloropropene is shown as 1130 °F (an estimated value; see source 29 at the end of Table 1-1). This value is subtracted from the operating temperature of the RTO (1600 °F) to establish the extent of destruction temperature above the AIT.

1600 – 1130 = 470 °F

The difference is then compared to the criteria of Table H-2. The difference of 470 °F is higher than 400 °F but not higher than 475 °F. The assigned destruction DE for this compound in the RTO is 98 % as

associated with compounds having AITs of at least 400 °F below the operating temperature. This value is shown in Table 2-1 of Attachment 2 (compound no. 7).

The DF is calculated using the DE of 98 % and Equation H-2 as follows:

$$DF = \frac{1}{\left(1 - \frac{98}{100}\right)} = 50$$

The DF is shown in Table 2-1 beside the DE value.

Next, the boiling point and molecular weight are compared with the criteria from Table H-3 to assign an adsorption capacity. Trans-1,3-dichloropropene shows a molecular weight of 111 g/mol and a normal boiling point of 112 °C. The uppermost row of Table H-3 for which this compound fits is the boiling range of 100 to 150 °C and molecular weight of <150. The estimated capacity is 2.0 g/100 g carbon. No quadratic constants for this compound are provided in the prediction correlation from Yaws 1995; therefore, the assigned capacity is 2.0 g/100 g carbon. This capacity is compared to the criteria from Table H-4, which shows the corresponding RE of 80 %. Equation H-2 applied to this RE gives a DF of 5. The adsorption RE and DF are shown in Table 3-1.

The final consideration for trans-1,3-dichloropropene is the potential for extremely low concentration in the feed gas to the adsorption process on behalf of extensive destruction in the RTO. Table 4-1 shows the assigned DFs for combustion and adsorption (see compound no. 7). Since the oxidizer DF is at least 50, the adsorption DF is reduced by a factor of 10. The reduced adsorption DF becomes 5/10 or 0.5 but the minimum DF as defined in Equation H-2 is 1.0. The reduced DF for trans-1,3-dichloropropene is shown as 1.0 in Table 4-1. This DF will result in a more conservative combined DF since credit is no longer being taken for removal via adsorption. The combined DF is:

oxidation DF x reduced adsorption DF = combined DF = 50 x 1 = 50 (as shown in Attachment 4, Table 4-1)

6.2 Ethylene Dibromide

The AIT of ethylene dibromide is shown as 1600 °F (an estimated value). According to the cited physical property source, the compound is considered nonflammable. Given that brominated methanes and ethanes (commonly classified as halons) are used as fire suppression agents and no other information was found available, the AIT value was assigned to be 1600 °F. This ensures that no credit for destruction will be taken in the RTO since the difference between AIT and operating temperature is zero. Criteria from Table H-2 shows that no credit for destruction is taken unless the operating temperature is at least 1.0 degree higher than the AIT. The corresponding DE is 0 % and so the DF has been assigned as 1.0 in accordance with Equation H-2. The DF is shown in Attachment 2, Table 2-1, beside the DE value (compound no. 14).

Next, the boiling point and molecular weight are compared with the criteria from Table H-3 to assign an adsorption capacity. Ethylene dibromide shows a molecular weight of ~188 g/mol and a normal boiling point of 131.7 °C. The uppermost row of Table H-3 for which this compound fits is the boiling range of 100 to 150 °C and molecular weight of at least 150. The corresponding estimated adsorption capacity is 5.0 g/100 g carbon.

Quadratic constants were found for using the capacity prediction correlation from Yaws 1995. The constants cited are:

A = 1.4423
B = 0.255
C= -0.0267

The predicted capacity by Equation H-3 is:

$$\log_{10} Q = A + B\log_{10} y + C[\log_{10} y]^2 = 1.4423 + 0.255\log_{10}(0.1) + (^{-}0.0267)[\log_{10}(0.1)]^2 = 1.16$$

$Q = 10^{1.16} = 14.5$ g ads/100 g carbon

This predicted value is higher than the estimated value using the graduated criteria from Table H-3, and so the estimated adsorption capacity of 5.0 (g /100 g carbon) is selected for this compound.

This capacity is compared to the criteria from Table H-4, which shows the corresponding RE of 90 %. Equation H-2 applied to this RE gives a DF of 10. The adsorption RE and DF are shown in Table 4-1.

The final consideration for ethylene dibromide is the potential for extremely low concentration in the feed gas to the adsorption process on behalf of extensive destruction in the RTO. Since no credit is taken for combustion of this compound, it does not have a destruction DF of 50 or higher. The combined DF and adsorption DF are the same for ethylene dibromide as shown in Table 4-1.

6.3 1-Heptanol

The AIT of 1-heptanol is shown as 320 °C (608 °F). This is a conservatively estimated value which is based on a referenced compound and the recognized trend of longer alkane chains associated with lower AITs (see source 34 at the end of Table 1-2). This value is subtracted from the operating temperature of the RTO (1600 °F) to establish the extent of combustion temperature above the AIT.

1600 – 608 = 992 °F

This difference is then compared to the criteria of Table H-2. The difference of 992 °F is higher than the maximum DE temperature criteria of 650 °F. The assigned destruction DE for this compound in the RTO is 99.99 % as associated with compounds having AITs of at least 650 °F below the operating temperature. This value is shown in Table 2-2 of Appendix 2 (compound no. 95).

The DF is calculated using the DE of 99.99 % and Equation H-2 as follows:

$$DF = \frac{1}{\left(1 - \frac{99.99}{100}\right)} = 10{,}000$$

The DF is shown in Table 2-2 beside the DE value.

Next, the boiling point and molecular weight are compared with the criteria from Table H-3 to assign an estimated adsorption capacity. 1-Heptanol shows a molecular weight of 116 g/mol and a normal boiling

point of 176 °C. The uppermost row of Table H-3 for which this compound fits is the boiling range of >150 °C and molecular weight of <150. The assigned capacity is 10.0 g/100 g carbon. This capacity is compared to the criteria from Table H-4, which shows the corresponding RE of 95 %. Equation H-2 applied to this RE gives a DF of 20. The adsorption RE and DF are shown in Table 3-2.

The final consideration for 1-heptanol is the potential for extremely low concentration in the feed gas to the adsorption process on behalf of extensive destruction in the RTO. Table 4-2 shows the assigned DFs for combustion and adsorption (see compound no. 95). Since the oxidizer DF for 1-heptanol (10,000) is at least 50, the adsorption DF is reduced by a factor of 10. The reduced adsorption DF becomes 20/10 or 2.0 as shown in Table 4-2.

Each of the compounds from Tables 1-1 and 1-2 are assigned DFs by the same methodology as these example compounds and are shown in Attachments 2, 3, and 4 in their respective tables.

7 Results and Conclusion

Results of this analysis as defined in the objective are shown in Tables 4-1 and 4-2 of Attachment 4. Without the correct identification of exact species and concentrations of organic contaminants in the PVP system offgas, a more sophisticated method for estimating adsorption performance cannot be used. For contaminants which may be present at less than measurable quantities in the adsorber feed gas, the extent of adsorption capacity may be significantly lower than what would be shown by criteria from Table H-3. However, at concentrations which may be relevant to environmental emissions estimates (near 0.1 ppmv), the analysis methodology can be considered conservative with respect to oxidation DFs. For adsorption DFs, every effort has been made to ensure that the methodology is reasonable and conservative. Pending the operational confirmation that criteria in Table H-4 is bounding behavior for the organic contaminants, the methodology for RE can be considered reasonable for contaminant concentrations near 0.1 ppmv.

The reduction of adsorption DF for use in calculating the combined DF of compounds with high DEs has been implemented to provide additional conservatism. Although the specific adsorption behavior of contaminants at ultra low concentrations is not known, the cumulative effect of compounds at trace quantities is negligible in terms of regulatory importance. As such, the assigned adsorption DFs from this analysis do not present any special requirements for the design of the adsorption system. The adsorption system can be considered complimentary to the oxidation abatement system as exemplified by ethylene dibromide (Section 6.2).

8 References

Project Documents

24590-WTP-RPT-ENS-03-006, Rev 0, *Environmental Risk Assessment Work Plan for the Hanford Tank Waste Treatment and Immobilization Plant.*

24590-PTF-3YD-PVP-00001, Rev 0, *System Description for Pretreatment Vessel Vent Process System, PVP.*

24590-PTF-M0C-PVP-00003, Rev B, *Sizing of Pretreatment Vessel Vent Carbon Adsorbers (PVP-ABS-00001A/B).*

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Cooper, D and Alley, F. 1994. *Air Pollution Control – A Design Approach*, second edition, Waveland Press, Inc., Prospect Heights Illinois.

Dellinger, B, Taylor P, and Lee, C. 1990. "Development of a Thermal Stability Based Ranking of Hazardous Organic Compound Incinerability", *Environmental Science and Technology*, Vol. 24, No. 3.

EPA-CICA. 1999. Environmental Protection Agency, *Air Pollution Technology Fact Sheet, Incinerator-Recuperative Type.*

Lewandowski, D. 2000. *Design of Thermal Oxidation Systems for Volatile Organic Compounds*, CRC Press LLC, Boca Raton, Florida.

Shepherd, A. 2001. Technology Paper: *Activated Carbon Adsorption for Treatment of VOC Emissions*, presented at the 13th EnviroExpo, Boston, Massachusetts, May 2001, Carbtrol Corporation, Bridgeport Connecticut.

Stock, L and Huckaby J. 2000. *A survey of Vapors in the Headspaces of Single-Shell Waste Tanks*, PNNL-13366, Pacific Northwest Nation Laboratory, Richland, WA. October 2000.

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Yaws, C, Bu, L, and Nijhawan, S. 1995. *Determining VOC Adsorption Capacity,* Pollution Engineering. February 1995.

9 Attachments

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Attachment 1	Tables of Contaminants and Physical Properties
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Table 1-2	Compounds detected >0.1 ppmv
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Attachment 3	Tables of Removal DFs
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Attachment 4	Tables of DF Analysis Results
Table 4-1	COPCs
Table 4-2	Compounds detected >0.1 ppmv
Attachment 5	Thermal Stability Ranking Study: Figure 9 of Technical Article *Development of a Thermal Stability Based Ranking of Hazardous Organic Compound Incinerability* (Dellinger 2000)
Attachment 6	VOC Properties and Adsorption Potential: Technology Paper *Activated Carbon Adsorption for Treatment of VOC Emissions* (Shepherd 2001)
Attachment 7	Prediction of VOC Adsorption Capacity: Technical Article *Determining VOC Adsorption Capacity* (Yaws 1995)

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Attachment 1 Tables of Contaminants and Physical Properties

Table 1-1 COPCs
Table 1-2 Compounds detected >0.1 ppmv

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Table 1-1 COPCs

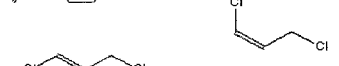
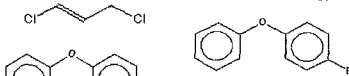
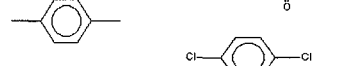
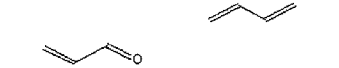
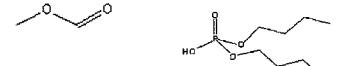
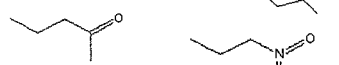
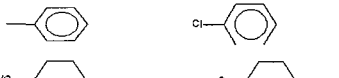
Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		
	1	100-00-5	p-Nitrochlorobenzene	157.56	C6H4ClNO2		242	0.01	510	950	47	
	2	100-21-0	p-Phthalic acid	166.13	C8H6O4	300	sublimes	0.6	677	1250	51	
	3	100-41-4	Ethyl benzene	106.16	C8H10		136.2	0.026	432	810	1	
	4	100-42-5	Styrene	104.14	C8H8		145.2	0.032	490	915	22	
	5	10061-01-5	cis-1,3-Dichloropropene	110.97	C3H4Cl2		104.3	0.1	600	1112	27	
	6	10061-02-6	trans-1,3-Dichloropropene	110.97	C3H4Cl2		112	0.1	610	1130	29	
	7	101-55-3	4-Bromophenylphenyl ether	249.11	C12H9BrO		310.14	0.000001	839	1542.02	none	4
	8	101-84-8	Diphenyl ether	170.21	C12H10O	26.8	498	insoluble	618	1144	5	
	9	106-35-4	3-Heptanone	114.19	C7H14O		147	0.43	390	734	47	
	10	106-42-3	p-Xylene (Dimethyl benzene)	106.16	C8H10		138.3	0.02	530	986	1	
	11	106-46-7	1,4-Dichlorobenzene	147.01	C6H4Cl2	53.1	173.4	0.00813	640	1184	47	
	12	106-88-7	1,2-Epoxybutane	72.12	C4H8O		63.3	6	479	894.2	17	
	13	106-93-4	Ethylene dibromide (Dibromoethane)	187.88	C2H4Br2		131.7	0.41	871	1600	31	1
	14	106-97-8	Butane (R-600)	58.123	C4H10		-0.45	0.0061	405	761	1	
	15	106-99-0	1,3-Butadiene	54.091	C4H6		-4.4	0.05	449	840.2	22	
	16	107-02-8	Acrolein	56.06	C3H4O		52.7	21.25	235	455	1	
	17	107-05-1	3-Chloropropene (Allyl chloride)	76.526	C3H5Cl		44	0.337	485	905	1	
	18	107-06-2	1,2-Dichloroethane (Ethylene chloride) (freon 150	98.96	C2H4Cl2		83.5	0.86	412	773.6	1	
	19	107-12-0	Propionitrile	55.079	C3H5N		97.2	decomposes	510	950	7	
	20	107-13-1	Acrylonitrile	53.06	C3H3N		77.3	7.45	481	897.8	1	
	21	107-18-6	2-Propene-1-ol	58.08	C3H6O		97	32	378	712.4	1	
	22	107-31-3	Formic acid, methyl ester	60.05	C2H4O2		32	10	465	869	1	
	23	107-66-4	Dibutylphosphate	210.21	C8H19O4P		100	slightly	510	950	26	
	24	107-87-9	2-Pentanone	86.133	C5H10O		100	4.3	505	941	1	
	25	108-03-2	1-Nitropropane	89.09	C3H7NO2		131	1.4	420	788	1	
	26	108-05-4	Vinyl acetate	86.09	C4H6O2		72.3	2	427	800.6	1	
	27	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	100.16	C6H12O		117.4	1.9	459	858	1	
	28	108-20-3	Bis(isopropyl)ether	102.18	C6H14O		68.5	0.2	443	829	9	
	29	108-38-3	m-Xylene (Dimethyl benzene)	106.16	C8H10		139.1	0.02	530	986	1	
	30	108-39-4	m-Cresol	108.13	C7H8O		202	1	559	1038.2	5	
	31	108-87-2	Methylcyclohexane	98.188	C7H14		101	insoluble	250	482	1	
	32	108-88-3	Toluene	92.13	C7H8		110.6	0.053	480	896	1	
	33	108-90-7	Chlorobenzene	112.56	C6H5Cl		130	0.05	674	1245	22	
	34	108-93-0	Cyclohexanol	100.16	C6H12O		161	3.6	300	572	5	
	35	108-94-1	Cyclohexanone	98.2	C6H10O		155.6	5	420	788	1	

Table 1-1 COPCs

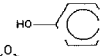
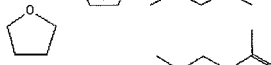
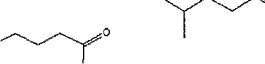
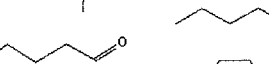
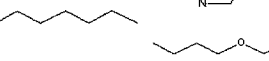
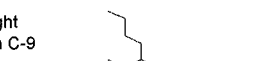
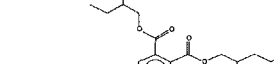
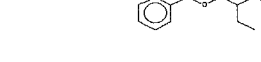
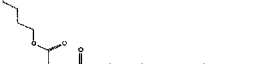
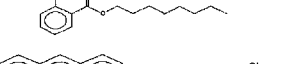
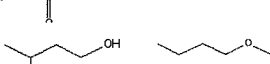
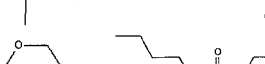
Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		
	36	108-95-2	Phenol	94.11	C6H6O		181.7	8.3	715	1319	21	
	37	109-66-0	n-Pentane	72.15	C5H12		36.1	0.04	260	500	1	
	38	109-99-9	Tetrahydrofuran	72.1	C4H8O		66	30	321	609.8	1	
	39	110-12-3	5-Methyl-2-hexanone	114.19	C7H14O		144	0.5	191	376	6	
	40	110-43-0	2-Heptanone	114.19	C7H14O		150	0.43	393	739	5	
	41	110-54-3	n-Hexane	86.177	C6H14		69	0.00095	225	437	1	
	42	110-62-3	n-Valeraldehyde	86.13	C5H10O		103	0.1	260	500	3	
	43	110-82-7	Cyclohexane	84.161	C6H12		80.7	0.1	245	473	1	
	44	110-83-8	Cyclohexene	82.145	C6H10		83	0.02	310	590	1	
	45	110-86-1	Pyridine	79.1	C5H5N		115.2	miscible	482	899.6	1	
	46	111-65-9	n-Octane	114.23	C8H18		126	slightly	220	428	1	
	47	111-76-2	Ethylene glycol monobutyl ether	118	C6H14O2		171	5	238	460.4	5	
straight chain C-9	48	111-84-2	n-Nonane	128.26	C9H20		150.8	0.1	190	374	1	
	49	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	390.54	C24H38O4		386.9	0.000034	390	734	5	
	50	117-84-0	n-Dioctyl phthalate	390.56	C24H38O4		220	0.0003	391	735.08	55	
	51	120-12-7	Anthracene	178.22	C14H10		340	0.00000434	538	1000.4	55	
	52	120-82-1	1,2,4-Trichlorobenzene	181.46	C6H3Cl3		214.4	0.0049	571	1060	50	
	53	120-83-2	2,4-Dichlorophenol	163.01	C6H4Cl2O		210	0.45	839	1542.02	none	4
	54	121-44-8	Triethylamine	101.19	C6H15N		88.9	0.02	249	480	5	
	55	121-69-7	Dimethylaniline	121.18	C8H11N		194	1.6	371	699.8	5	
	56	122-39-4	N,N-Diphenylamine	169.23	C12H11N	52	302	0.03	634	1173	5	
	57	123-19-3	4-Heptanone	114.19	C7H14O		144	0.53	450	842	34	
	58	123-38-6	n-Propionaldehyde	58.08	C3H6O		49	5	207	404.6	1	
	59	123-51-3	3-Methyl-1-butanol	88.15	C5H12O		130	5.4	350	662	1	
	60	123-86-4	Acetic acid n-butyl ester	116.16	C6H12O2		126.1	0.68	425	797	1	
	61	123-91-1	1,4-Dioxane	88.1	C4H8O2		101.1	miscible	180	356	1	
	62	126-73-8	Tributyl phosphate	266.32	C12H27O4P		289	0.1	482	899.6	47	

Table 1-1 COPCs

Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		
	63	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	67.09	C4H5N		90.3	2.5	460	860	11	
	64	127-18-4	Perchloroethylene (tetrachloroethylene)	165.85	C2Cl4		121.1	0.015	871	1600	30	1
	65	127-19-5	N,N-Dimethylacetamide	87.12	C4H9NO		166	miscible	490	914	1	
	66	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	220.35	C15H24O		265	insoluble	470	878	47	
	67	129-00-0	Pyrene	202.24	C16H10	156	404	0.0000013	839	1542.02	none	4
	68	1321-64-8	Pentachloronaphthalene	300.4	C10H3Cl5		327	insoluble	839	1542.02	none	4
	69	1321-65-9	Trichloronaphthalene	231.51	C10H5Cl3		304	insoluble	839	1542.02	none	4
	70	132-64-9	Dibenzofuran	168.19	C12H8O		285	0.1	839	1542.02	none	4
	71	1335-87-1	Hexachloronaphthalene	334.84	C10H2Cl6		343	insoluble	839	1542.02	none	4
	72	1335-88-2	Tetrachloronaphthalene	265.95	C10 H4 Cl4		316	insoluble	839	1542.02	none	4
see note 5	73	1336-36-3	Polychlorinated biphenyls (PCBs)	322	C12HxCly (x+y=10		>195	slightly	839	1542.02	none	4 & 5
	74	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	88.1	C4H8O2		77.1	8	486	906.8	22	
	75	141-79-7	4-Methyl-3-penten-2-one	98.16	C6H10O		127	3	344	651	1	
	76	142-82-5	n-Heptane	100.2	C7H16		98.4	<0.01	223	433.4	1	
	77	144-62-7	Oxalic acid	90.035	C2H2O4		190	10	760	1400	39	
	78	156-60-5	trans-1,2-Dichloroethylene	96.95	C2H2Cl2		47.5	0.63	460	860	1	
	79	1634-04-4	Methyl tert-butyl ether	88.15	C5H12O		55.2	5.1	435	815	5	
	80	189-55-9	Dibenzo[a,i]pyrene	302.37	C24H14	308	404	0.0000013	839	1542.02	none	4
	81	189-64-0	Dibenzo[a,h]pyrene	302.37	C24H14	308	404	0.0000013	839	1542.02	none	4
	82	191-24-2	Benzo(g,h,i)perylene	276.34	C22H12		500	0.000000026	839	1542.02	none	4
	83	191-30-0	Benzo[a,l]pyrene	302.37	C24H14	162	404	0.0000013	839	1542.02	none	4
	84	192-65-4	Dibenzo[a,e]pyrene	302.37	C24H14	241	sublimes	0.0000013	839	1542.02	none	4
	85	193-39-5	Indeno(1,2,3-cd)pyrene	276.34	C22H12	162.5	536	0.0000062	839	1542.02	none	4
	86	206-44-0	Fluoranthene	202.26	C16H10	110.8	375	0.0000265	839	1542.02	none	4
	87	208-96-8	Acenaphthylene	152.21	C12H8	93.5	265	0.000393	839	1542.02	none	4
	88	2234-13-1	Octachloronaphthalene	403.73	C10Cl8	185	440	insoluble	839	1542.02	none	4
	89	224-42-0	Dibenz[a,j]acridine	279.34	C21H13N	216	>346	not found	839	1542.02	none	4
	90	226-36-8	Dibenz[a,h]acridine	279.34	C21H13N	228	>346	not found	839	1542.02	none	4

Table 1-1 COPCs

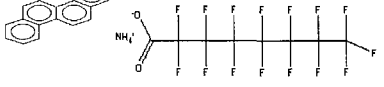
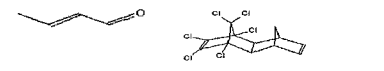
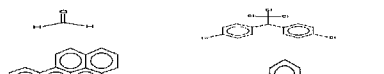
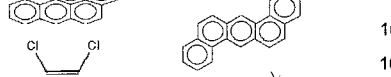
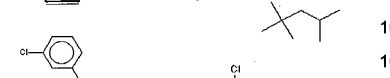
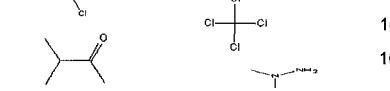
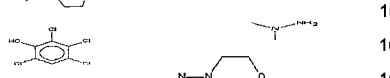
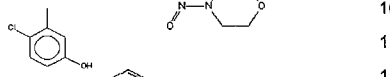
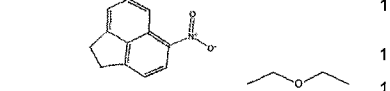
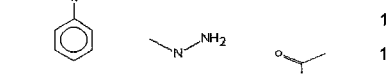
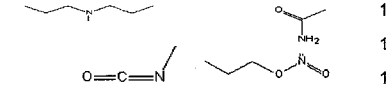
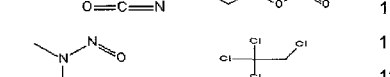
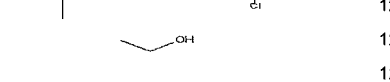
Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		
	91	25551-13-7	Trimethyl benzene	120.19	C9H12		164.7	insoluble	550	1022	1	
	92	26140-60-3	Terphenyls	230.31	C18H14	68	337	insoluble	839	1542.02	none	4
various isomers	93	27154-33-2	Trichlorofluoroethane	151.4	C2H2Cl3F		146.5	0.3	871	1600	36	2
	94	287-92-3	Cyclopentane	70.134	C5H10		49	insoluble	380	716	1	
	95	3697-24-3	5-Methylchrysene	242.32	C19H14	171	404	0.0000013	839	1542.02	none	4
	96	3825-26-1	Ammonium perfluorooctanoate	431.1	C8H4F15NO2	59	192	not found	839	1542.02	none	4
	97	4170-30-3	2-Butenaldehyde (2-Butenal)	70.091	C4H6O		102	18	230	446	16	
	98	50-00-0	Formaldehyde	30.03	CH2O		-19.5	55	430	806	1	
	99	50-32-8	Benzo(a)pyrene	252.3	C20H12	176.5	495	0.00000038	839	1542.02	none	4
	100	53-70-3	Dibenzo(a,h)anthracene	278.33	C22H14	266	524	0.00000005	839	1542.02	none	4
	101	540-59-0	1,2-Dichloroethylene	96.94	C2H2Cl2		48	0.5	460	860	21	
	102	540-84-1	2,2,4-Trimethylpentane	114.23	C8H18		99.2	insoluble	415	779	1	
	103	541-73-1	1,3-Dichlorobenzene	147.01	C6H4Cl2		173	0.0125	640	1184	47	
	104	56-23-5	Carbon tetrachloride (R-10)	153.84	CCl4		76.7	0.0805	871	1600	8	1
	105	563-80-4	3-Methyl-2-butanone	86.133	C5H10O		94	slightly	452	845.6	6	
	106	56-49-5	3-Methylcholanthrene	268.36	C21H16	179	280	0.0000013	839	1542.02	none	4
	107	57-14-7	1,1-Dimethylhydrazine	60.099	C2H8N2		63	decomposes	249	480.2	1	
	108	58-90-2	2,3,4,6-Tetrachlorophenol	231.9	C6H2Cl4O	70	150	slightly	839	1542.02	none	4
	109	591-78-6	2-Hexanone	100.16	C6H12O		127	1.4	533	991	1	
	110	59-50-7	4-Chloro-3-methylphenol	142.58	C7H7ClO	67	235	0.385	839	1542.02	none	4
	111	59-89-2	N-Nitrosomorpholine	116.12	C4H8N2O2	29	224	10	500	932	40	
	112	602-87-9	5-Nitroacenaphthene	199.21	C12H9NO2	102	279	0.1	839	1542.02	none	4
	113	60-29-7	Ethyl ether	74.12	C4H10O		34.6	6.9	160	320	1	
	114	603-34-9	Triphenylamine	245.32	C18H15N	127	347	0.1	839	1542.02	none	4
	115	60-34-4	Methylhydrazine	46.072	CH6N2		87.8	0.1	196	384.8	1	
	116	60-35-5	Acetamide	59.07	C2H5NO		221	10	480	896	15	
	117	621-64-7	Di-n-Propylnitrosamine	130.19	C6H14N2O		206	0.9894	275	527	43	
	118	624-83-9	Methyl isocyanate	57.052	C2H3NO		39	decomposes	535	995	13	
	119	627-13-4	Nitric acid, propyl ester	105.09	C3H7NO3		110	insoluble	420	788	28	
	120	62-75-9	N-Nitroso-N,N-dimethylamine	74.1	C2H6N2O		153	10	500	932	37	
	121	630-20-6	1,1,1,2-Tetrachloroethane	167.85	C2H2Cl4		130.5	0.1	871	1600	24	1
	122	64-17-5	Ethyl alcohol	46.069	C2H6O		78.3	10	426	798.8	22	

Table 1-1 COPCs

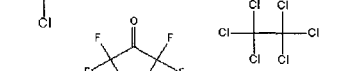
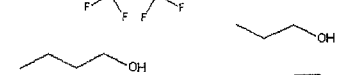
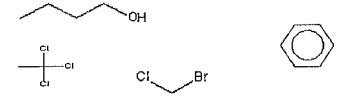
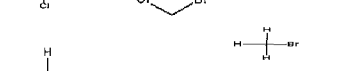
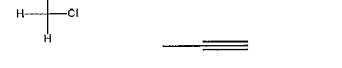
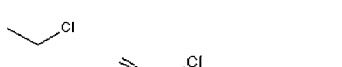
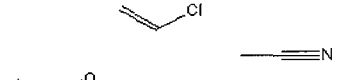
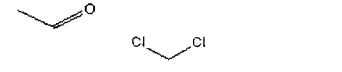
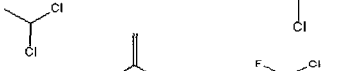
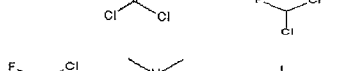
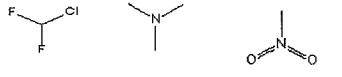
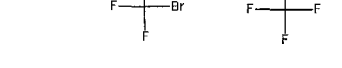
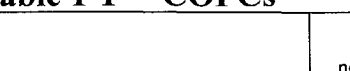
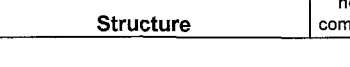
Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		
	123	64-18-6	Formic acid	46.03	CH2O2		100.7	miscible	434	813.2	1	
	124	64-19-7	Acetic acid	60.052	C2H4O2		118	miscible	465	869	1	
	125	67-56-1	Methyl alcohol (Methanol)	32.04	CH4O		64.6	miscible	470	878	1	
	126	67-63-0	2-Propyl alcohol (Isopropanol)	60.096	C3H8O		82.4	miscible	456	852.8	1	
	127	67-64-1	2-Propanone (Acetone)	58.08	C3H6O		56.2	miscible	465	869	1	
	128	67-66-3	Chloroform (R-20)	119.39	CHCl3		61.7	0.795	1000	1832	6	
	129	67-72-1	Hexachloroethane	236.74	C2Cl6	187	sublimes	0.005	871	1600	none	4
	130	684-16-2	Hexafluoroacetone	166.02	C3F6O		-26	miscible/reacts	871	1600	23	1
	131	71-23-8	n-Propyl alcohol	60.096	C3H8O		97.2	miscible	440	824	1	
	132	71-36-3	n-Butyl alcohol	74.1	C4H10O		117.6	6.32	367	692.6	22	
	133	71-43-2	Benzene	78.11	C6H6		80.1	0.18	592	1097.6	22	
	134	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	133.42	C2H3Cl3		74.1	0.1495	537	999	9	
	135	74-83-9	Bromomethane (Methyl bromide) (halon 1001)	94.95	CH3Br		3.56	1.5	537	998.6	9	
	136	74-87-3	Chloromethane (Methyl chloride) (R-40)	50.49	CH3Cl		-24.2	0.533	662	1223.6	22	
	137	74-97-5	Bromochloromethane (halon 1011)	129.39	CH2BrCl		67.8	0.1	871	1600	24	1
	138	74-99-7	Methylacetylene	40.07	C3H4		-23	not found	340	644	12	
	139	75-00-3	Chloroethane	64.52	C2H5Cl		12.3	0.574	519	966.2	8	
	140	75-01-4	Vinyl chloride (1-Chloroethene)	62.5	C2H3Cl		-13.9	0.11	472	881.6	9	
	141	75-05-8	Acetonitrile	41.05	C2H3N		81.6	miscible	524	975.2	1	
	142	75-07-0	Acetaldehyde	44.05	C2H4O		20.1	miscible	175	347	1	
	143	75-09-2	Dichloromethane (Methylene chloride) (R-30)	84.94	CH2Cl2		39.8	1.32	662	1223.6	58	
	144	75-12-7	Formamide	45.04	CH3NO		210	miscible	500	932	4	
	145	75-15-0	Carbon disulfide	76.14	CS2		46.2	0.12	125	257	1	
	146	75-21-8	Ethylene oxide (Oxirane)	44.05	C2H4O		10.7	miscible	429	804.2	1	
	147	75-27-4	Bromodichloromethane	163.83	CHBrCl2		90.1	0.674	871	1600	none	3
	148	75-34-3	1,1-Dichloroethane	98.97	C2H4Cl2		57.3	0.51	456	852.8	1	
	149	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	96.95	C2H2Cl2		31.7	0.23	457	854.6	9	
	150	75-43-4	Dichlorofluoromethane (R-21)	102.92	CHCl2F		9	insoluble	552	1026	56	2
	151	75-45-6	Chlorodifluoromethane (R-22)	86.47	CHClF2		-40.8	0.3	632	1170	9	
	152	75-50-3	Trimethylamine	59.11	C3H9N		2.87	miscible	190	374	6	
	153	75-52-5	Nitromethane	61.04	CH3NO2		101	9.5	418	784.4	1	
	154	75-55-8	2-Methylaziridine	57.1	C3H7N		66	miscible	490	914	14	
	155	75-61-6	Difluorodibromomethane (freon 12B2- halon 120	209.82	CBr2F2		24	0.1	871	1600	9	2
	156	75-63-8	Trifluorobromomethane (R-13B1)	148.91	CBrF3		-57.8	0.03	871	1600	9	1
	157	75-65-0	2-Methyl-2-propanol	74.122	C4H10O		82.2	miscible	478	892.4	5	

Table 1-1 COPCs

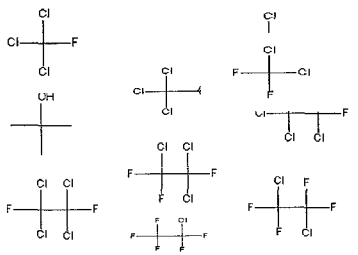
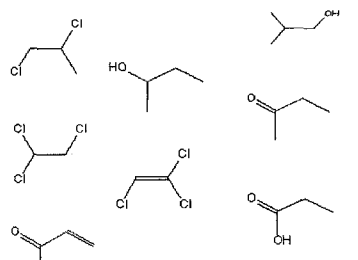
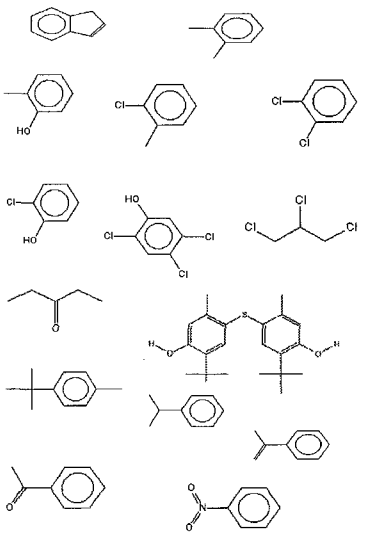
Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		
	158	75-69-4	Trichlorofluoromethane (R-11)	137.38	CCl3F		23.8	0.124	871	1600	8	2
	159	75-71-8	Dichlorodifluoromethane (R-12)	120.92	CCl2F2		-29.79	0.03	871	1600	9	2
	160	76-03-9	Trichloroacetic acid	163.39	C2HCl3O2	57	196	10	871	1600	5	2
	161	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane (R-112a)	203.83	C2Cl4F2	41	91	0.01	732	1350	25	
	162	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane (R-112)	203.83	C2Cl4F2	26	93	0.01	732	1350	25	
	163	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	187.38	C2Cl3F3		47.6	0.02	680	1256	9	
	164	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (R-114)	170.92	C2Cl2F4		3.8	slightly	871	1600	9	2
	165	76-15-3	Chloropentafluoroethane (R-115)	154.47	C2ClF5		-39.1	insoluble	871	1600	9	2
	166	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	74.12	C4H10O		107.9	9.5	415	779	9	
	167	78-87-5	1,2-Dichloropropane	112.99	C3H6Cl2		96.8	0.27	557	1034	1	
	168	78-92-2	1-Methylpropyl alcohol (2-Butanol)	74.122	C4H10O		99.5	15	406	762.8	1	
	169	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	72.1	C4H8O		79.6	25.6	516	960.8	2	
	170	79-00-5	1,1,2-Trichloroethane	133.42	C2H3Cl3		113.8	0.442	500	932	22	2
	171	79-01-6	Trichloroethylene	131.4	C2HCl3		86.7	0.11	420	788	5	
	172	79-09-4	Propionic acid	74.08	C3H6O2		140.7	37	490	914	18	
	173	79-10-7	2-Propenoic acid	72.06	C3H4O2	12	141.6	10	438	820.4	5	
	174	79-20-9	Methyl acetate	74.08	C3H6O2		56.9	24.5	502	935.6	1	
	175	79-34-5	1,1,2,2-Tetrachloroethane	167.86	C2H2Cl4		146.3	0.3	871	1600	9	2
	176	83-32-9	Acenaphthene	154.21	C12H10	95	279	0.00035	839	1542.02	none	4
	177	84-66-2	Diethyl phthalate	222.24	C12H14O4		298	0.09	457	855	5	
	178	84-74-2	Dibutyl phthalate	278.34	C16H22O4		340	0.0013	402	756	5	
	179	85-01-8	Phenanthrene	178.22	C14H10	99.5	340	0.00012	839	1542.02	none	4
	180	85-68-7	Butylbenzyl phthalate	312.39	C19H20O4		370	0.00027	233	451.4	52	
	181	86-73-7	Fluorene	166.22	C13H10	116	295	0.000019	839	1542.02	none	4
	182	87-68-3	Hexachlorobutadiene	260.76	C4Cl6		210	0.00032	610	1130	55	
	183	88-06-2	2,4,6-Trichlorophenol	197.46	C6H3Cl3O	69.5	244.5	0.08	839	1542.02	none	4
	184	88-72-2	2-Nitrotoluene	137.13	C7H7NO2		221	0.06	305	581	44	
	185	88-75-5	2-Nitrophenol	139.11	C6H5NO3	45.3	214.6	0.21	839	1542.02	none	4
	186	88-89-1	Picric acid	229.11	C6H3N3O7	122	>300	1.4	300	572	none	
	187	91-20-3	Naphthalene	128.16	C10H8	80.6	218	0.00031	568	1054	1	
	188	91-22-5	Quinoline	129.16	C9H7N		238	0.01	480	896	5	
	189	91-58-7	2-Chloronapthalene	162.61	C10H7Cl	59.5	256	0.000674	839	1542.02	none	4
	190	92-52-4	1,1`-Biphenyl	154.21	C12H10	70	255	insoluble	540	1004	55	

Table 1-1 COPCs

Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		
	191	92-93-3	4-Nitrobiphenyl	199.21	C12H9NO2	113.8	340	insoluble	839	1542.02	none	4
	192	95-13-6	Indene	116.16	C9H8	58	181.6	insoluble	526	979	41	
	193	95-47-6	o-Xylene	106.16	C8H10		144	0.017	465	869	1	
	194	95-48-7	o-Cresol (2-Methylphenol)	108.13	C7H8O	30.9	191	0.1	559	1038.2	5	
	195	95-49-8	2-Chlorotoluene	126.59	C7H7Cl		159	slightly	500	932	37	
	196	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	147.01	C6H4Cl2		180.5	0.0084	640	1184	47	
	197	95-57-8	2-Chlorophenol	128.56	C6H5ClO	7	175.6	2.85	415	779	53	
	198	95-95-4	2,4,5-Trichlorophenol	197.46	C6H3Cl3O	68	253	0.12	839	1542.02	none	4
	199	96-18-4	1,2,3-Trichloropropane	147.43	C3H5Cl3		156	0.18	500	932	37	
	200	96-22-0	3-Pentanone	86.133	C5H10O		101	4.7	450	842	1	
	201	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	358.54	C22H30O2S	150	316	<0.01	839	1542.02	none	4
	202	98-51-1	p-tert-Butyltoluene	148.25	C11H16		193	<0.1	510	950	47	
	203	98-82-8	Cumene	120.19	C9H12		151	0.005	424	795	1	
	204	98-83-9	alpha-Methylstyrene	118.18	C9H10		165.4	<0.1	574	1065.2	42	
	205	98-86-2	Acetophenone	120.5	C8H8O	19.6	201.7	0.55	571	1059.8	5	
	206	98-95-3	Nitrobenzene	123.11	C6H5NO2	5.7	210.8	0.19	482	899.6		

Notes:
General- Boiling points were taken from Chemfinder (http://chemfinder.cambridgesoft.com) or NIST (http://webbook.nist.gov/chemistry/) where lowest value is not found with the AIT source.
1- MSDS shows compound is non flammable. AIT shown is reported as 1600 deg F to ensure that minimal credit is taken for removal efficiency through thermal oxidizer.
2- MSDS shows no AIT information and reports neglible fire hazard. AIT shown is 1600 deg F for same reason as note 1.
3- No MSDS or AIT information can be found for this compound. Due to its single carbon and 3 halogen structure, it will be treated similar to chloroform.
4- compounds with normal boiling points above 200, contain aromatic rings, and contain numerous halogen substitutions are treated as PCB in terms of AIT - in cases where no AIT information could be found - an AIT of 1542 will be used in this case in accordance with TSCA guidlines for destruction of PCBs of 2192 deg F, 2 sec res time, and 3% excess air in combustion products (this is a back calculated AIT from the efficiency predicted in table 3-2 of Lewandowski - Design on Thermal Oxidation Systems. This will be used for non halogenated napthalenic compounds as well in order to be conservative (pyrene, perlene etc).
5- structure shown is 1-1'-biphenyl,3,3',4,4'-tetrachloro (CAS# 32598-13-3) and is shown under the general context of PCBs to present a typical structure for chlorine substitutions on the biphenyl structure. Numerous variations of chlorine substitutions exist with the broad group of PCBs, however within this calculation, the treatment of PCBs under one set of compound properties is appropriate since the important properties do not range across DF boundary threshold values.
6- All BHC compound structures are the same except for the cis/trans orientation of the chlorine substitutions. (see Alpha BHC - CAS#319-84-6)
7- Camphene is the root structure of toxaphene which has 8 chlorine substitutions - no structure was found for toxaphene

Table 1-1 COPCs

Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		

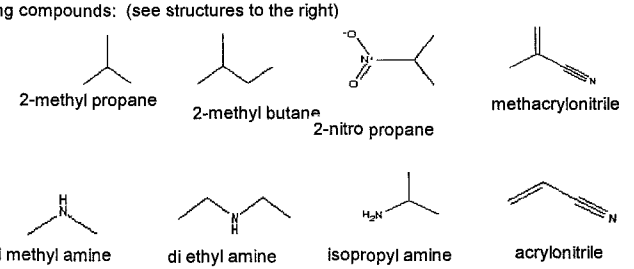
AIT Sources

1 Lange's Handbook of Chemistry - 14th edition
2 MSDS - EXXON CHEMICAL AMERICAS DIV. (http://www.temarry.com/MSDS/Methyl_Ethyl_Ketone_msds.htm)
3 n-Valeraldehyde is a synonym for pentanal. The AIT is estimated from the sequence of increasing carbon aldehydes: acetaldehyde (ethanal)-175 deg C, propionaldehyde (propanal)-207 deg C, butanal-230 deg C.
4 MSDS from Internation Programme on Chemical Safety (http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/_icsc08/icsc0891.pdf)
5 MSDS from JT Baker (http://www.jtbaker.com/msds/a0120.htm)
6 MSDS (http://www.bandj.com/MainWindowPages/MSDS/DimAcetaMSDS.htm#5)
7 estimated from MSDS of acetonitrile - precision pure solvents (http://www.purificationtech.com/techacmsds3.htm)-524 deg C and safety data of butyronitrile from Physical and Theoretical Chemistry Lab (http://physchem.ox.ac.uk/MSDS/BU/butyronitrile.html)-488 deg C.
8 MSDS - BOC Gases (http://www.vngas.com/pdf/g32.pdf)

9 MSDS - MATHESON TRI-GAS, INC (http://www.matheson-trigas.com/mathportal/msds/)

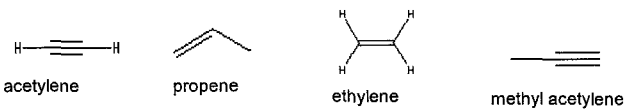
10 estimated from Langes Handbook of chemistry for 1,1-dichloroethylene - (570 deg C) instead of cis-1,2-dichloroethylene - (460 deg C)
11 AIT is estimated by comparison with the following compounds: (see structures to the right)

2-methyl propane - 462 deg C (source #1)
2-methyl butane - 420 deg C (source #9)
2-nitropropane - 428 deg C (source #1)
dimethylamine - 400 deg C (source #1)
diethylamine - 312 deg C (source #1)
acrylonitrile - 481 deg C (source #1)
isopropyl amine - 402 deg C (source #1)



12 AIT is estimated by comparison with the following compounds: (see structures to the right)

acetylene - 305 deg C (source # 1)
propene - 460 deg C (source # 1)
ethylene - 490 deg C (source # 1)



13 University of Akron Hazardous Chemical Database (http://ull.chemistry.uakron.edu/erd/)
14 AIT is estimated by comparison with the following compounds: (see structures to the right)

pyrrolidine - 345 deg C (source: BASF MSDS (http://www.basf.com/businesses/chemicals/pdfs/pyrrdine.pdf)
tetrahydrofuran - 321 deg C (source # 1)
propylene oxide - 449 deg C (source # 1)

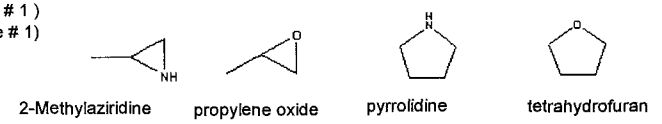
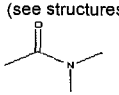


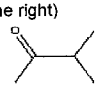
Table 1-1 COPCs

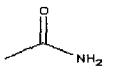
Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		

15 AIT is estimated by comparison with the following compounds: (see structures to the right)

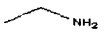
ethylamine - 385 deg C (source: #1)
propane - 450 deg C (source # 1)
acetone - 465 deg C (source # 1)
dimethylacetamide - 490 deg C (source #1)
methyl isopropyl ketone - 452 deg C (source #6)


dimethylacetamide


methyl isopropyl ketone


acetamide

acetone


ethylamine

propane

16 AIT is estimated by comparison with the following compounds: (see structures to the right)

butanal - 230 deg C (source #1)
butane - 405 deg C (source #1)
2-butene - 324 deg C (source #1)

2-butenal

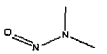
butanal

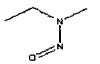
2-butene

butane

17 AIT is estimated from ethylene oxide (429 deg C) and propylene oxide (449 deg C) (CAS# 's 75-21-6 and 75-56-9 from AIT source #1)
18 AIT is estimated from formic acid (434 deg C) and acetic acid (465 deg C) CAS#'s 64-18-6 and 64-19-7 from AIT source #1
19 AIT is estimated by comparison with the following compounds: (see structures to the right)

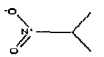
trimethyl amine - 249 deg C (source #1)
methyl isocyanate - 535 deg C (source #1)
2-nitropropane - 428 deg C (source #1)
dimethyl hydrazine - 249 deg C (source #1)


dimethyl-nitrosoamine


n-methyl-n-ethylnitrosoamine

trimethyl amine

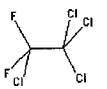
methyl isocyanate

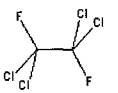

2-nitro propane

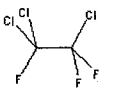
dimethyl

20 sigma chemical MSDS (http://msds.pdc.cornell.edu/msds/siri/msds/h/q427/q266.html)
21 occupational safety and health guideline for phenol (http://www.osha-slc.gov/SLTC/healthguidelines/phenol/)
22 "Optimized Design and Operating Parameters for Minimixing Emissions During VOC Thermal Oxidation", Edward Donley and David Lewandowski. 88th Annual Meeting of Air & Waste Mgmt Assoc., 1995
23 MSDS from P & M Scientific Industrial Assoc (http://www.fluorine.ru/products/msds/others/hexafluoroacetone_msds.html)
24 International Chemical safety cards (http://hazard.com/msds/mf/cards/list.html)
25 AIT is estimated from 1,1,2-trichloro-1,2,2-trifluoroethane (see structures to below)

1,1,2,-trichloro-1,2,2-trifluoroethane - 680 deg C
1,1,1,2-tetrachloro-2,2-difluoroethane - 732 deg C
1,1,2,2-tetrachloro-1,2-difluoroethane - 732 deg C


1,1,1,2-tetrachloro-2,2-difluoroethane


1,1,2,2-tetrachloro-1,2-difluoroethane

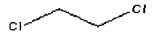

1,1,2,-trichloro-1,2,2-trifluoroethane

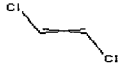
26 MSDS from OxyChem (http://new-www.oxychem.com/products/msds/m7623.pdf)
27 estimated from 1,2-dichloropropane (AIT is 557 deg C from source 1)

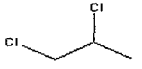
Table 1-1 COPCs

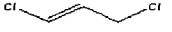
Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		

28 estimated from 1-nitropropane (AIT is 420 deg C from source 1)
29 AIT is estimated from 1,2 dichloropropane (see structures to below)
1,2-dichloroethane - 412 deg C
1,2-dichloroethylene - 460 deg C
1,2-dichloropropane - 557 deg C


1,2-dichloroethane


1,2-dichloroethylene

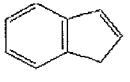

1,2-dichloropropane

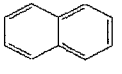

1,3-dichloropropene

30 Hill Brothers Chemical Co. MSDS (http://hillbrothers.com/msds/perchloro.htm)
31 OCCUPATIONAL SAFETY AND HEALTH GUIDELINE FOR ETHYLENE DIBROMIDE (http://www.osha-slc.gov/SLTC/healthguidelines/ethylenedibromide/recognition.html#healthhazard)
32 OCCUPATIONAL SAFETY AND HEALTH GUIDELINE FOR HEPTACHLOR (http://www.osha-slc.gov/SLTC/healthguidelines/heptachlor/)
33 Albaugh, INC. MSDS (http://www.cdms.net/ldat/mp4JE001.pdf)
34 AIT estimated from 2-heptanone - 393 deg C (source #5)
35 No AIT information was found available. Because this molecule has multiple unsaturated bonds and chlorine attachments, its AIT is estimated at 1542 deg F. This temperature fits the prediction table by back calculation when using TSCA guidelines on incineration of PCBs at minimum temperatures of 2192 deg F for achieving 99.99% destruction.

36 AIT is estimated by comparison with tetrachloroethanes from above (CAS#'s 630-20-6 and 79-34-5)
37 AIT is Conservatively estimated at 500 deg C since MSDS has no stated AIT but uses NFPA fire rating of 2 - compound is therefore assumed flammable at a reasonable AIT

38 AIT is estimated from N-Nitroso-N,N-dimethylamine (CAS# 62-75-9)
39 Compound is shown to decompose at high temperatures. AIT is estimated at 1400 deg F to be conservative
40 Compound is conservatively estimated to have AIT of less than 500 deg C based on its lack of halogens and double bonds (resonance stabilized structure)
41 AIT is estimated by Napthalene (see structures below)


indene


naphthalene

42 AMS MSDS (http://www.kpb.co.kr/eng/product/msds_AMS.htm)
43 Chemical Land 21.com Phys and Chem properties (http://www.chemicalland21.com/arokorhi/industrialchem/organic/DIPROPYLAMINE.htm)
44 Physical and Theoretical Chemistry Laboratory - Oxford University (http://physchem.ox.ac.uk/MSDS/)
45 AIT is conservatively estimated at 1600 deg F by comparison to Phenol with additional chlorine substitutions
46 AIT is conservatively estimated from Trans-1,3-dichloropropene (610 deg C) and 1,2 dichloropropane (557 deg C)
47 MSDS - Fisher Scientific Canada (http://www.fishersci.ca/homepage2.nsf/frmSearch?CreateDocument&lang=E&AID=waSearch&DB=msds.nsf) or by link at (http://www-woc.sci.kun.nl/cgi-bin/view?xylenol)
48 occupational safety and health guideline (http://www.osha-slc.gov/SLTC/healthguidelines)
49 No AIT information was found available - AIT is conservatively estimated at 1600 deg F since compound has multiple halogen substitutions
50 MSDS - Baxter Healthcare Burdick & Jackson Div. (http://www-woc.sci.kun.nl/cgi-bin/view?xylenol)
51 MSDS - Amoco (http://www-woc.sci.kun.nl/cgi-bin/view?xylenol)
52 MSDS from NPS chemical repository (http://ntp-support.niehs.nih.gov/ntp_reports/ntp_chem_h&s/ntp_chem8/radian85-68-7.txt)
53 AIT is estimated from 4-chlorophenol which is listed in source 5
54 AIT is estimated from 1-chloro-4-nitrobenzene (CAS# 100-00-5)
55 MSDS - NTP chemical repository (http://157.98.10.135/NTP_Reports/NTP_Chem_H&S/NTP_Chem1/Radian117-84-0.txt)
56 Chemical Properties Handbook, C. L. Yaws, 1999 McGraw-Hill Publishing

Table 1-1 COPCs

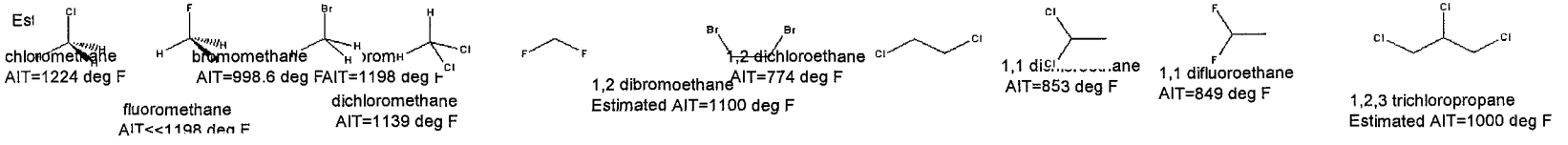
Structure	no. of compound	CAS #	COPCs	MW	formula	melting point (if above 0°C)	normal boiling point	water solubility	AIT	AIT	AIT source	Compound information Note
			Compound	g/mol		°C	°C	g/100mL	deg C	deg F		

57 estimated from the following sources and structural comparison:

Sources:
* 1,1 difluoroethane AIT of 849 deg F - from Dupont chemical MSDS (http://www.dupont.com/msds/40_37_3027fr.html)
* difluoromethane AIT of 986 deg F - from Mational Industrial Chemicals Notification and assessment Scheme Report: (http://www.nicnas.gov.au/publications/CAR/new/NA/NAFULLR/NA0500FR/NA563FR.pdf)
* No AIT for flouromethane could be found - however, the NFPA flammability rating for this compound is 4 and the AIT is assumed to be much less than difluoromethane.

*1,2 dichloromethane AIT of 1186 deg F is listed above
*chloromethane AIT of 1224 deg F is listed above
*1,2 dichloroethane AIT of 774 deg F is listed above
*1,1 dichloroethane AIT of 853 deg F is from Langes Handbook (source 1 from above)
* 1,2,3 trichloropropane AIT of 580 deg F - from NTP chemical repository MSDS: (http://ntp-server.niehs.nih.gov/htdocs/Chem_H&S/NTP_Chem9/Radian96-18-4.html)

*bromomethane AIT of 998.6 deg F is listed above



58 University of Akron - Chemical Database (http://ull.chemistry.uakron.edu/erd/)

Table 1-2 Compounds detected > 0.1 ppmv

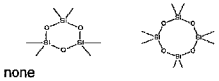
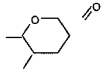
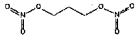
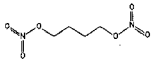
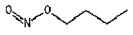
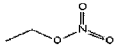
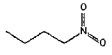
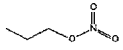
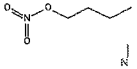
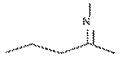
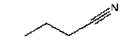
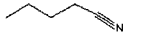
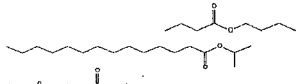
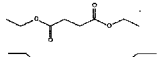
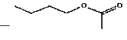
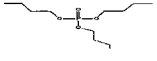
Structure (some obvious structures are not shown due to chain length)	no. of compounds	Chemical Name	Molecular Weight	Chemical Id	formula	melting pt	normal boiling pt	(water) solubility[1]	phys prop source	AIT	AIT source	NFPA flammability rating	Comments
		UNITS				°C	°C	g/100 ml		°C			
	1	Cyclotrisiloxane, hexamethyl-	222.5	541-05-9	C6H18O3Si3	65	134	"moisture sensitive"	1	400	53		
none	2	Cyclotetrasiloxane, octamethyl-	296.6	556-67-2	C8H24O4Si4	17.5	175	"insoluble"	6	400	42	2	typically found in adhesives and sealant materials
	3	tetramethylcyclotrisiloxane	194.0	USI000-06	C4H14O3Si3	-65	135	"insoluble"	3	250	2	3	msds for tetramethylcyclotetrasiloxane - also shows reactive with water
	4	Benzenesulfonamide, N-butyl-	213.3	3622-84-2	C10H15NO2S		314	practically insoluble	2	800	54	1	
	5	2(3H)-Furanone, dihydro-3,5-dimethyl-	114.1	5145-07-1	C6H10O2	-31	206	"completely"	4	425	13		
	6	Pyridine, 2,4-dimethyl-	107.2	108-47-4	C7H9N	-60	159		5	482	3		
	7	Furan, tetrahydro-	72.1	109-99-9	C4H8O		66	<0.1	1	321	1		
	8	Furan	68.1	110-00-9	C4H4O	-85.6	31.4	<0.1	1	360	42		
	9	Pyridine	79.1	110-86-1	C5H5N	-41.6	115.2	"miscible"	1	482	1		
	10	Furan, 2,5-dihydro-	70.1	1708-29-8	C4H6O		67		5	450	10		
	11	2H-Pyran-2-one, tetrahydro-5,6-dimethyl-, tra	128.2	24405-16-1	C7H12O2		180		7	350	12		
	12	Pyrimidine	80.1	289-95-2	C4H4N2	20	123		1	450	11		
	13	Pyrazine	80.1	290-37-9	C4H4N2	52	115		1	450	11		
	14	Furan, 2-methyl-	82.1	534-22-5	C5H6O	-88.7	63	<0.1	1	450	10		
	15	Oxirane, ethenyl-	70.1	930-22-3	C4H6O	-85.7	67	1-5	5	429	14		
	16	2(3H)-Furanone, dihydro- (gamma butyrolact	86.1	96-48-0	C4H6O2	-43	205	10	5	450	10		
	17	1,3-Propanediol, dinitrate	166.1	3457-90-7	C3H6N2O6		100		7	450	9		boiling pt estimated by nitric acid propyl ester
	18	1,4-Butanediol, dinitrate	180.1	3457-91-8	C4H8N2O6	12	130		5*	450	9		boiling pt estimated by nitric acid butyl ester
	19	Nitrous acid, butyl ester	103.1	544-16-1	C4H9NO2		78		5	450	7	3	
	20	Nitrous acid, methyl ester	61.0	624-91-9	CH3NO2	-83	64.6		6	500	8		
	21	Nitric acid, ethyl ester	91.1	625-58-1	C2H5NO3	-102	88	"decomposes"	5	90	1		
	22	Butane, 1-nitro-	103.1	627-05-4	C4H9NO2	-81	153	slightly	5	450	4		
	23	Nitric acid, propyl ester	105.1	627-13-4	C3H7NO3	-100	110	"insoluble"	1	175	1		reported as "insoluble"
	24	Methanamine, N-methyl-N-nitroso- and other	74.1	62-75-9	C2H6N2O		153		5	500	17		
	25	Nitric acid, butyl ester	119.1	928-45-0	C4H9NO3		136		5	400	5		
	26	Pyrrolidine	71.1	123-75-1	C4H9N	-61	87		5	450	6		
	27	Methanamine, N-(1-methylbutylidene)-	99.2	22431-09-0	C6H13N		130		7	350	16		boiling pt estimated from hexamethyleneimine
	28	2-Pyrrolidinone	85.1	616-45-5	C4H7NO	24	245		1	450	15		
	29	Methanamine, N,N-dimethyl-	59.1	75-50-3	C3H9N	-117	2.9	miscible	1	190	1		
	30	Propanenitrile	55.1	107-12-0	C3H5N	-93	97	5-10	5	510	17		reported to decompose in aqueous solution
	31	Butanenitrile	69.1	109-74-0	C4H7N	-112	118	slightly	1	488	18		
similar to above	32	Pentanenitrile	83.1	110-59-8	C5H9N	-96	139	0.1-0.5	1	475	19		
similar to above	33	Octanenitrile	125.2	124-12-9	C8H15N	-45	199		1	450	19		
similar to above	34	Nonanenitrile	139.2	2243-27-8	C9H17N	-35	224		1	440	19		
similar to above	35	Hexanenitrile	97.2	628-73-9	C6H11N	-80	162		5	470	19		
similar to above	36	Heptanenitrile	111.2	629-08-3	C7H13N	-63	180		5	460	19		
	37	Acetonitrile	41.1	75-05-8	C2H3N	-48	81	miscible	1	524	1		
	38	Butanoic acid, butyl ester	144.2	109-21-7	C8H16O2	-92	166		1	450	20		
	39	Tetradecanoic acid, 1-methylethyl ester	270.5	110-27-0	C17H27O2		300		1*	400	21		boiling pt estimated from Pentadecanoic acid
	40	Butanedioic acid, diethyl ester	174.2	123-25-1	C8H14O4	-20	217		1	350	24	1	
	41	Acetic acid, butyl ester	116.2	123-86-4	C6H12O2	-106	126	0.68	1	425	1		
	42	Phosphoric acid tributyl ester	266.3	126-73-8	C12H27O4P	-80	289	0.1	1	482	17		

Table 1-2 Compounds detected > 0.1 ppmv

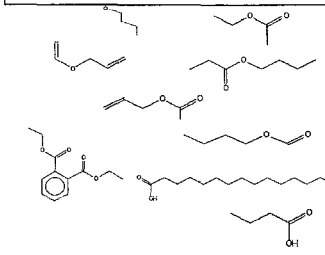
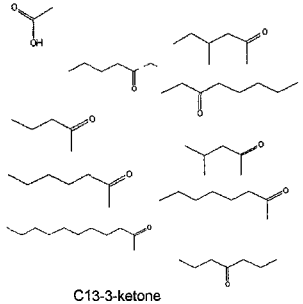
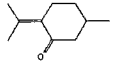
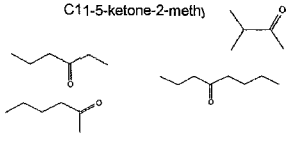
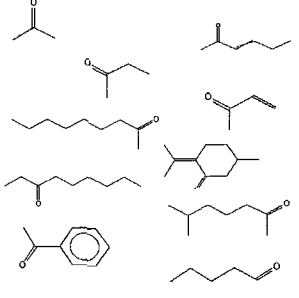
Structure (some obvious structures are not shown due to chain length)	no. of compounds	Chemical Name	Molecular Weight	Chemical Id	formula	melting pt	normal boiling pt	(water) solubility[1]	phys prop source	AIT	AIT source	NFPA flammability rating	Comments
		UNITS				°C	°C	g/100 ml		°C			
	43	Acetic acid ethyl ester	88.1	141-78-6	C4H8O2	-83	77.1	8	1	482	17		
	44	Formic acid, 2-propenyl ester	86.1	1838-59-1	C4H6O2		83		6	500	25		
	45	Propanoic acid, butyl ester	130.2	590-01-2	C7H14O2	-75	145		1	427	1		
	46	Acetic acid, 2-propenyl ester	100.1	591-87-7	C5H8O2		103	"slightly"	1	475	26		
	47	Formic acid, butyl ester	102.1	592-84-7	C5H10O2	-90	107	"slightly"	1	322	1		
	48	1,2-Benzenedicarboxylic acid, diethyl ester	222.2	84-66-2	C12H14O4	-3	298	0.0896	1	540	22		
	49	Pentadecanoic acid	242.4	1002-84-2	C15H30O2	52	339		1	400	27		
	50	Butanoic acid	88.1	107-92-6	C4H8O2	-7.9	163.5	soluble	1	450	1		
	51	9-Hexadecenoic acid	254.4	2091-29-4	C16H30O2		350		7	400	27		boiling pt estimated by hexadecanoic acid
similar to pentadecanoic acid	52	Tetradecanoic acid	228.4	544-63-8	C14H28O2	53.9	326		8	400	27		
similar to pentadecanoic acid	53	Hexadecanoic acid	256.4	57-10-3	C16H32O2	62	399		5	400	27		
	54	Acetic acid	60.1	64-19-7	C2H4O2	16.3	118	miscible	5	465	1		
	55	2-Hexanone, 4-methyl-	114.2	105-42-0	C7H14O		140		5	457	28		
	56	3-Heptanone	114.2	106-35-4	C7H14O		147		5	390	17		
	57	3-Octanone	128.2	106-68-3	C8H16O		166		5	525	28		
	58	2-Pentanone	86.1	107-87-9	C5H10O	-77	102		5	505	1		
	59	2-Pentanone, 4-methyl- (MIBK)	100.2	108-10-1	C6H12O	-80	117.4		1	457	13		
	60	2-Heptanone	114.2	110-43-0	C7H14O	-35	150		5	533	13		
	61	2-Octanone	128.2	111-13-7	C8H16O	-21	173		5	525	28		
	62	2-Undecanone	170.3	112-12-9	C11H22O	17	229		5	400	27		
	63	4-Heptanone	114.2	123-19-3	C7H14O	-33	144		5	533	28		
C13-3-ketone	64	3-Tridecanone	198.4	1534-26-5	C13H26O	31	263		5*	400	27		boiling pt estimated by 2-tridecanone
C12-3-ketone	65	3-Dodecanone	184.3	1534-27-6	C12H24O	20	250		5*	400	27		boiling pt estimated by 2-tridecanone
	66	Cyclohexanone, 5-methyl-2-(1-methylethylide	152.2	15932-80-6	C10H16O	<25	224		8	500	29		
C13-6-ketone	67	6-Tridecanone	198.4	22026-12-6	C13H26O		263		6*	400	27		boiling pt estimated from 2-tridecanone (phys prop ref 6)
C11-3-ketone	68	3-Undecanone	170.3	2216-87-7	C11H22O	12	227		5	400	27		
C11-5-ketone-2-meth	69	5-Undecanone, 2-methyl-	184.3	50639-02-6	C12H24O		210		7	400	27		
	70	2-Butanone, 3-methyl-	86.1	563-80-4	C5H10O	-93	94		5	500	30		
	71	3-Hexanone	100.2	589-38-8	C6H12O	-55.6	123		5	533	28		
	72	4-Octanone	128.2	589-63-9	C8H16O		166		5	525	28		
	73	2-Hexanone	100.2	591-78-6	C6H12O	-57	127		5	533	23		
C13-2-ketone	74	2-Tridecanone	198.4	593-08-8	C13H26O		255		5	400	27		
C14-3-ketone	75	3-Tetradecanone	212.4	629-23-2	C14H28O		263		5*	400	27		boiling pt estimated by 2-tridecanone
	76	2-Propanone	58.1	67-64-1	C3H6O	-95	56		5	465	1		
	77	3-Hexen-2-one	98.1	763-93-9	C6H10O		140		8	550	28		
	78	2-Butanone	72.1	78-93-3	C4H8O	-86	80	25.6	1	516	1		
	79	3-Buten-2-one	70.1	78-94-4	C4H6O		82		5	550	31		
	80	2-Nonanone	142.2	821-55-6	C9H18O	-67	195		5	500	32		
	81	Cyclohexanone, 5-methyl-2-(1-methylethylide	152.2	89-82-7	C10H16O	<25	224		8	500	29		
	82	3-Nonanone	142.2	925-78-0	C9H18O	-8	188		1	500	32		
	83	2-Heptanone, 6-methyl-	128.2	928-68-7	C8H16O		165		5	525	28		
	84	Ethanone, 1-phenyl-	120.2	98-86-2	C8H8O	19.6	201.7	0.55	1	571	1		
	85	Pentanal	86.1	110-62-3	C5H10O	-91.5	103	0.1	1	222	23		

Table 1-2 Compounds detected > 0.1 ppmv

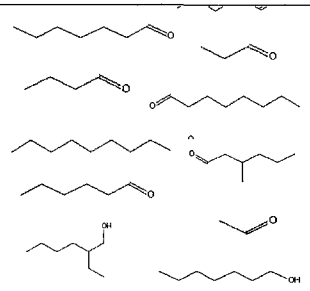
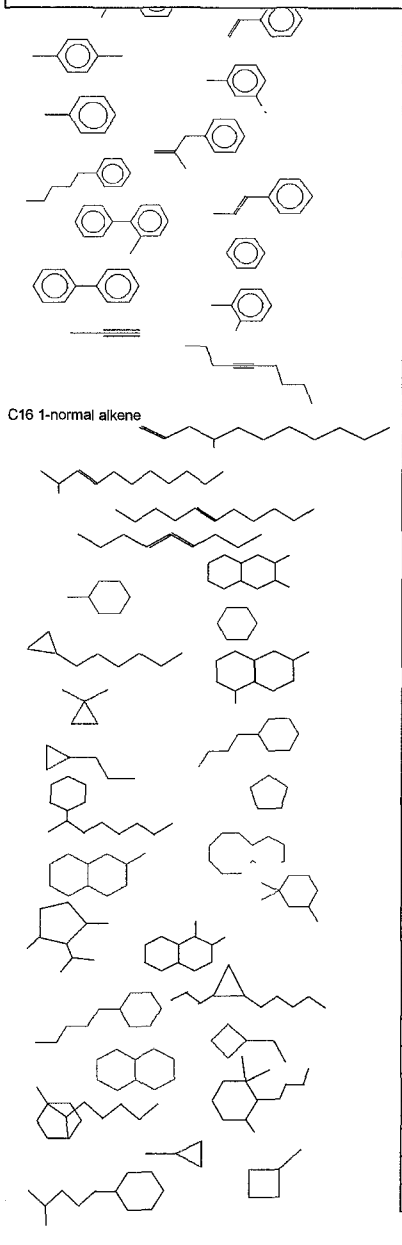
Structure (some obvious structures are not shown due to chain length)	no. of compounds	Chemical Name	Molecular Weight	Chemical Id	formula	melting pt	normal boiling pt	(water) solubility[1]	phys prop source	AIT	AIT source	NFPA flammability rating	Comments
		UNITS				°C	°C	g/100 ml		°C			
	86	Heptanal	114.2	111-71-7	C7H14O	-43	153	<0.1	1	300	33		
	87	Propanal	58.1	123-38-6	C3H6O	-81	49	10	1	207	1		
	88	Butanal	72.1	123-72-8	C4H8O	-96	76	<0.1	1	230	1		
	89	Octanal	128.2	124-13-0	C8H16O	12	171		1	300	33		
	90	Nonanal	142.2	124-19-6	C9H18O	63	191	<0.1	8	300	33		
	91	Hexanal, 3-methyl-	114.2	19269-28-4	C7H14O		143		8	200	33		
	92	Hexanal	100.2	66-25-1	C6H12O	-56	131		1	300	33		
	93	Acetaldehyde	44.1	75-07-0	C2H4O	-124	20.1	miscible	1	175	1		
	94	1-Hexanol, 2-ethyl-	130.2	104-76-7	C8H18O	-76	183	0.1	1	300	34		
	95	1-Heptanol	116.2	111-70-6	C7H16O	-36	176		1	320	34		
C18 N-alcohol	96	1-Octadecanol	270.5	112-92-5	C18H38O	61	336		1	300	34		
	97	2-Butanol	74.1	14898-79-4	C4H10O	-114	100		1	406	1		
C16 normal alcohol	98	Ethanol, 2-(tetradecyloxy)-	258.4	2136-70-1	C16H34O2		253		7	300	34		boiling pt estimated by tetradecane
	99	1-Hexadecanol	242.4	36653-82-4	C16H34O	49	344		6	300	34		
	100	6,10-Dodecadien-1-ol, 3,7,11-trimethyl-	224.4	51411-24-6	C15H28O		216		7	300	34		boiling pt estimated by dodecane
	101	1,2-Propanediol	76.1	57-55-6	C3H8O2	-59	187.6	>10	1	371	1		
	102	3-Buten-2-ol	72.1	598-32-3	C4H8O		96		1	450	36		
	103	2-Pentanol	88.2	6032-29-7	C5H12O	-50	118		1	343	1		
	104	3-Buten-1-ol	72.1	627-27-0	C4H8O		113		1	450	36		
	105	Ethanol	46.1	64-17-5	C2H6O	-114	78.3	miscible	1	423	1		
	106	Methanol	32.0	67-56-1	CH4O	-98	64.6	miscible	1	470	1		
	107	2-Propanol	60.1	67-63-0	C3H8O	-88.5	82.4	miscible	1	399	23		
	108	1-Propanol	60.1	71-23-8	C3H8O	-126	97.2	miscible	1	440	1		
	109	2-Propanol, 2-methyl-	74.1	75-65-0	C4H10O	25.5	82.2	miscible	1	480	1		
	110	1-Propanol, 2,2-dimethyl-	88.2	75-84-3	C5H12O	50	113		1	480	36		
	111	2-Butanol, 2-methyl-	88.2	75-85-4	C5H12O	-12	102		1	437	1		
	112	2-Butanol	74.1	78-92-2	C4H10O	-115	99.5	15	1	406	1		
	113	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	260.8	87-68-3	C4Cl6	-21	210	0.00032	1	610	1		
	114	Cyclopentanol	86.1	96-41-3	C5H10O	-19	139	slightly	1	350	37		
	115	1-Propene, 2-fluoro-	60.1	1184-60-7	C3H5F		-24		8	600	35		
	116	Ethene, tetrachloro-	165.8	127-18-4	C2Cl4	-22.3	121.1	0.015	1	871	40	0	flammability of zero is from MSDS - JTBaker (http://www.rose-
	117	Ethene, 1,2-dichloro-, (Z)-	96.9	156-59-2	C2H2Cl2	-80.5	60	0.08	1	460	38		
	118	Ethane, 1,1-dichloro-1-fluoro- (freon 14b)	117.0	1717-00-6	C2H3Cl2F	-104	32	0.17	6	550	42	0	flammability of zero is from MSDS- Static Specialists Co. (flammability of zero is from MSDS)
	119	Methane, tetrachloro-	153.8	56-23-5	CCl4	-22.9	76.7	0.0805	1	900	41	3	described as non-flammable by phys property source 6 - rating of 3 is for evolved gases
	120	Methane, chloro- (R-40)	50.5	74-87-3	CH3Cl	-97	-24.2	0.5325	1	662	40		
	121	Ethene, fluoro-	46.0	75-02-5	C2H3F	-161	-72	insoluble	6	385	42		
	122	Methane, dichloro-	84.9	75-09-2	CH2Cl2	-96.7	39.8	5-Jan	6	662	42		
	123	Methane, chlorodifluoro- (R-22)	86.5	75-45-6	CHClF2	-146	-40.8	0.3	6	632	42		
	124	Ethane, 1-chloro-1,1-difluoro- (R-142)	100.5	75-68-3	C2H3ClF2	-131	-10	slightly	6	632	42		
	125	Methane, trichlorofluoro- (R-11)	137.4	75-69-4	CCl3F	-111	23.7	0.1	6	900	41	0	
	126	Benzene, (1-methylpentyl)-	162.3	6031-02-3	C12H18		208		6	490	43		
	127	Benzene, ethyl-	106.2	100-41-4	C8H10	-94.9	136.2	0.0206	1	432	1		

Table 1-2 Compounds detected > 0.1 ppmv

Structure — some obvious structures are not shown due to chain length



no. of compounds	Chemical Name	Molecular Weight	Chemical Id	formula	melting pt	normal boiling pt	(water) solubility[1]	phys prop source	AIT	AIT source	NFPA flammability rating	Comments
	UNITS				°C	°C	g/100 ml		°C			
128	Benzene, ethenyl-	104.2	100-42-5	C8H8	-30.6	145.2	0.032	1	490	23		
129	Benzene, 1,4-dimethyl-	106.2	106-42-3	C8H10	13.3	1.38E+02	insoluble	1	529	23		
130	Benzene, 1,3-dimethyl-	106.2	108-38-3	C8H10	-47.8	139.1	insoluble	1	528	23		
131	Benzene, methyl-	92.1	108-88-3	C7H8	-93	110.6	0.0526	1	482	42		
132	Benzene, (2-methyl-2-propenyl)-	132.2	3290-53-7	C10H12	-48	183		6	490	43		
133	Benzene, pentyl-	148.3	538-68-1	C11H16	-75	205		1	420	43		
134	Benzene, 1-propenyl-	118.2	637-50-3	C9H10	-27.1	175.5		1	490	43		
135	1,1`-Biphenyl, 2-methyl-	168.2	643-58-3	C13H12	-0.2	255		6	495	23		
136	Benzene	78.1	71-43-2	C6H6	5.5	80.1	0.18	1	562	1		
137	1,1`-Biphenyl	154.2	92-52-4	C12H10	70	255	insoluble	1	540	23		
138	Benzene, 1,2-dimethyl-	106.2	95-47-6	C8H10	-25.2	144	insoluble	1	464	23		
139	1-Propyne	40.1	74-99-7	C3H4	-103	-23	0.36	6	340	40		
140	4-Nonyne	124.2	20184-91-2	C9H16		154		6	320	39		
141	4-Undecene, 4-methyl-	168.3	61142-40-3	C12H26		193		7	500	44		boiling pt estimated by 3-undecene and 1-undecene
142	1-Hexadecene	224.4	629-73-2	C16H32	4	274		1	500	44		
143	1-Undecene, 4-methyl-	168.3	74630-39-0	C12H24		193		7	500	44		boiling pt estimated by 3-undecene and 1-undecene
144	3-Undecene, 2-methyl-, (Z)-	168.3	74630-48-1	C12H24		193		7	500	44		boiling pt estimated by 3-undecene and 1-undecene
145	5-Undecene, (Z)-	154.3	764-96-5	C11H22	-107	192.3		6	500	44		
146	4,5-Nonadiene	124.2	821-74-9	C9H16		142.5		7	550	44		boiling pt estimated by 1,8-nonadiene
147	Naphthalene, decahydro-2,3-dimethyl-	166.3	1008-80-6	C12H22		187		7	288	45		boiling pt estimated by Decahydronaphthalene
148	Cyclohexane, methyl-	98.2	108-87-2	C7H14	-126	101	insoluble	1	250	1		
149	Cyclohexane	84.2	110-82-7	C6H12	6.6	80.7	<0.1	1	245	1		
150	Cyclopropane, octyl-	154.3	1472-09-9	C11H22		150.8		7	498	46		boiling pt estimated by nonane
151	Naphthalene, decahydro-2,6-dimethyl-	166.3	1618-22-0	C12H22		187		7	288	45		boiling pt estimated by Decahydronaphthalene
152	Cyclopropane, 1,1-dimethyl-	70.1	1630-94-0	C5H10	-109	21		1	498	46		
153	Cyclohexane, butyl-	140.3	1678-93-9	C10H20	-75	181		1	246	23		
154	Cyclopropane, propyl-	84.2	2415-72-7	C6H12		69		1	498	46		
155	Cyclopentane	70.1	287-92-3	C5H10	-93.9	49.3	insoluble	1	380	1		
156	Octane, 2-cyclohexyl-	196.4	2883-05-8	C14H28		181		7	246	47		boiling pt estimated by butylcyclohexane
157	Cyclododecane	168.3	294-62-2	C12H24	61	239		1	235	48		
158	Naphthalene, decahydro-2-methyl-	152.3	2958-76-1	C11H20		201		6	288	45		
159	Cyclohexane, 1,1,3-trimethyl-	126.2	3073-66-3	C9H18	-65.7	136.6		5	320	49		
160	Cyclopentane, 1,3-dimethyl-2-(1-methylethyl)	140.3	32281-85-9	C10H20		92		7	350	49		boiling pt estimated by Cyclopentane, 1,2-dimethyl-, trans-
161	Naphthalene, decahydro-1,2-dimethyl-	166.3	3604-14-6	C12H22		187		7	288	45		boiling pt estimated by Decahydronaphthalene
162	Cyclopropane, 1-pentyl-2-propyl-	154.3	41977-33-7	C11H22		151		7	498	46		boiling pt estimated by nonane
163	Cyclohexane, pentyl-	154.3	4292-92-6	C11H22	-57.5	203.7		6	270	51		
164	Cyclobutane, ethyl-	84.2	4806-61-5	C6H12	-143	71		1	212	23		
165	Naphthalene, decahydro-, trans-	138.3	493-02-7	C10H18	-30.4	187.3		6	288	45		
166	Cyclohexane, 2-butyl-1,1,3-trimethyl-	182.4	54676-39-0	C13H26		203.7		7	320	49		boiling pt estimated by pentylcyclohexane
167	Bicyclo[4.1.0]heptane, 2-methyl-7-pentyl-	180.3	55937-92-3	C13H24		203.7		7	320	49		boiling pt estimated by pentylcyclohexane
168	Cyclopropane, methyl-	56.1	594-11-6	C4H8	-178	0.7		6	498	46		
169	Cyclobutane, methyl-	70.1	598-61-8	C5H10	-162	36.3		6	250	50		
170	Cyclohexane, (4-methylpentyl)-	168.3	61142-20-9	C12H24		203.7		7	270	51		boiling pt estimated by pentylcyclohexane

Table 1-2 Compounds detected > 0.1 ppmv

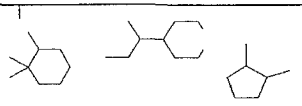
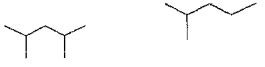
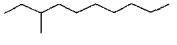
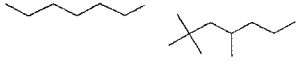
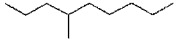
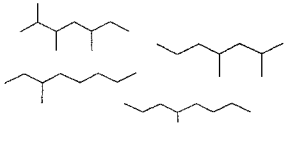
Structure (some obvious structures are not shown due to chain length)	no. of compounds	Chemical Name	Molecular Weight	Chemical Id	formula	melting pt	normal boiling pt	(water) solubility[1]	phys prop source	AIT	AIT source	NFPA flammability rating	Comments
		UNITS				°C	°C	g/100 ml		°C			
	171	Cyclohexane, (1-methylpropyl)-	140.3	7058-01-7	C10H20		179.3		6	270	51		
	172	Cyclohexane, 1,1,2-trimethyl-	126.2	7094-26-0	C9H18	-29	145.2		6	270	51		
	173	Cyclopentane, 1,2-dimethyl-, trans-	98.2	822-50-4	C7H14	-118	92		6	350	49		
	174	Undecane, 3-methyl-	170.3	1002-43-3	C12H26	-54.5	195		5*	500	44		boiling pt estimated by undecane
	175	Butane	58.1	106-97-8	C4H10	-139	-0.45	0.0061	1	405	1		
	176	Pentane, 2-methyl-	86.2	107-83-5	C6H14	-154	62	insoluble	1	306	42		
	177	Pentane, 2,4-dimethyl-	100.2	108-08-7	C7H16	-119	81		1	337	42		
	178	Pentane	72.2	109-66-0	C5H12	-130	36.1	0.04	1	260	23		
	179	Hexane	86.2	110-54-3	C6H14	-95	69	0.00095	1	225	1		
	180	Octane	114.2	111-65-9	C8H18	-56.8	126	slightly	1	220	1		
	181	Nonane	128.3	111-84-2	C9H20	-53	150.8	<0.1	1	206	42		
normal C-11 alkane	182	Undecane	156.3	1120-21-4	C11H24	-25.6	195.6	insoluble	1	202	42		
normal C-12 alkane	183	Dodecane	170.3	112-40-3	C12H26	-9.6	216.3	0.37	6	204	42		
normal C-10 alkane	184	Decane	142.3	124-18-5	C10H22	-29.7	174.1	insoluble	6	210	1		
	185	Decane, 3-methyl-	156.3	13151-34-3	C11H24	-76	190		1	225	52		
	186	Decane, 5-methyl-	156.3	13151-35-4	C11H24		190		7	225	52		boiling pt estimated by Decane, 3-methyl-
	187	Tridecane, 3-ethyl-	212.4	13286-73-2	C15H32		252		7	220	52		boiling pt estimated by tetradecane
	188	Tridecane, 6-methyl-	198.4	13287-21-3	C14H30		235		7	220	52		boiling pt estimated by tridecane
	189	Heptane	100.2	142-82-5	C7H16	-90.6	98.4	0.01	1	223	1		
	190	Heptane, 2,2,4-trimethyl-	142.3	14720-74-2	C10H22		148		1	275	52		
	191	Tridecane, 2-methyl-	198.4	1560-96-9	C14H30	-25	248		1	205	52		
	192	Undecane, 5-methyl-	170.3	1632-70-8	C12H26	-67.7	195		5*	220	52		boiling pt estimated by undecane
	193	Undecane, 2,6-dimethyl-	184.4	17301-23-4	C13H28		195		7	250	52		boiling pt estimated by undecane
	194	Undecane, 2,8-dimethyl-	184.4	17301-25-6	C13H28		195		7	250	52		boiling pt estimated by undecane
	195	Undecane, 2,10-dimethyl-	184.4	17301-27-8	C13H28		195		7	250	52		boiling pt estimated by undecane
	196	Undecane, 3,7-dimethyl-	184.4	17301-29-0	C13H28		195		7	250	52		boiling pt estimated by undecane
	197	Undecane, 3,8-dimethyl-	184.4	17301-30-3	C13H28		195		7	250	52		boiling pt estimated by undecane
	198	Undecane, 4,7-dimethyl-	184.4	17301-32-5	C13H28		195		7	250	52		boiling pt estimated by undecane
	199	Nonane, 4-methyl-	142.3	17301-94-9	C10H22	-99	165.7		6	220	52		
	200	Nonane, 2,6-dimethyl-	156.3	17302-28-2	C11H24		165		7	250	52		boiling pt estimated by 4-methyl nonane
	201	Nonane, 3,7-dimethyl-	156.3	17302-32-8	C11H24		165		7	250	52		boiling pt estimated by 4-methyl nonane
	202	Decane, 2,5-dimethyl-	170.3	17312-50-4	C12H26	-61.8	195		5*	250	52		boiling pt estimated by undecane
	203	Dodecane, 3-methyl-	184.4	17312-57-1	C13H28	-59.4	216		5*	220	52		boiling pt estimated by dodecane
	204	Undecane, 6-ethyl-	184.4	17312-60-6	C13H28		216		7	220	52		boiling pt estimated by dodecane
	205	Undecane, 5,5-dimethyl-	184.4	17312-73-1	C13H28		216		7	250	52		boiling pt estimated by dodecane
	206	Undecane, 6,6-dimethyl-	184.4	17312-76-4	C13H28		216		7	250	52		boiling pt estimated by dodecane
	207	Undecane, 2,3-dimethyl-	184.4	17312-77-5	C13H28		216		7	250	52		boiling pt estimated by dodecane
	208	Undecane, 2,4-dimethyl-	184.4	17312-80-0	C13H28		216		7	250	52		boiling pt estimated by dodecane
	209	Undecane, 4,6-dimethyl-	184.4	17312-82-2	C13H28		216		7	250	52		boiling pt estimated by dodecane
	210	Undecane, 5-ethyl-	184.4	17453-94-0	C13H28		216		7	220	52		boiling pt estimated by dodecane
	211	Heptane, 2,3,5-trimethyl-	142.3	20278-85-7	C10H22		160.7		6	275	52		
	212	Heptane, 2,4-dimethyl-	128.3	2213-23-2	C9H20		133		1	330	52		
	213	Octane, 3-methyl-	128.3	2216-33-3	C9H20	-108	144		1	220	23		

Table 1-2 Compounds detected > 0.1 ppmv

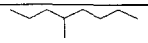
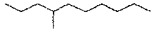
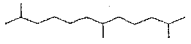
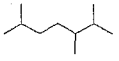
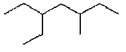
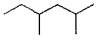
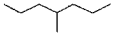
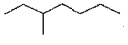
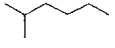
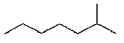
Structure (some obvious structures are not shown due to chain length)	no. of compounds	Chemical Name	Molecular Weight	Chemical Id	formula	melting pt	normal boiling pt	(water) solubility[1]	phys prop source	AIT	AIT source	NFPA flammability rating	Comments
		UNITS				°C	°C	g/100 ml		°C			
	214	Octane, 4-methyl-	128.3	2216-34-4	C9H20	-113	142		1	220	23		
	215	Tetradecane, 4-methyl-	212.4	25117-24-2	C15H32	-33	253.7		5*	220	52		boiling pt estimated by tetradecane
	216	Tridecane, 5-methyl-	198.4	25117-31-1	C14H30	-53.5	235		5*	220	52		boiling pt estimated by tridecane
	217	Tridecane, 4-methyl-	198.4	26730-12-1	C14H30	-45.7	235		5*	220	52		boiling pt estimated by tridecane
	218	Tridecane, 7-methyl-	198.4	26730-14-3	C14H30	-37.2	235		6*	225	52		boiling pt estimated by tridecane
	219	Decane, 4-methyl-	156.3	2847-72-5	C11H24	-77.5	187		6	225	52		
	220	Undecane, 4-methyl-	170.3	2980-69-0	C12H26	-66.5	210		5	220	52		
	221	Dodecane, 2,6,11-trimethyl-	212.4	31295-56-4	C15H32		252		7	250	52		boiling pt is estimated by Dodecane, 2,6,10-trimethyl-
	222	Dodecane, 2,6,10-trimethyl-	212.4	3891-98-3	C15H32		252		5	250	52		
	223	Heptane, 2,3,6-trimethyl-	142.3	4032-93-3	C10H22		156		1	275	52		
	224	Heptane, 3-ethyl-5-methyl-	142.3	52896-90-9	C10H22		158.2		6	275	52		
normal C16 alkane	225	Hexadecane	226.4	544-76-3	C16H34	18.2	287	insoluble	6	202	23		
	226	Tridecane, 4,8-dimethyl-	212.4	55030-62-1	C15H32		253.7		7	250	52		boiling pt estimated by tetradecane
	227	Dodecane, 2-methyl-8-propyl-	226.4	55045-07-3	C16H34		253.7		7	250	52		boiling pt estimated by tetradecane
	228	Tridecane, 5-propyl-	226.4	55045-11-9	C18H38		253.7		7	225	52		boiling pt estimated by tetradecane
	229	Pentane, 3,3-dimethyl-	100.2	562-49-2	C7H16	-135	90		5	350	52		
	230	Dodecane, 2,5-dimethyl-	198.4	56292-65-0	C14H30		235		7	225	52		boiling pt estimated by tridecane
	231	Pentane, 2,3-dimethyl-	100.2	565-59-3	C7H16	-134	90		5	337	42		
	232	Hexane, 3-methyl-	100.2	589-34-4	C7H16	-119	92		1	280	23		
	233	Hexane, 2,4-dimethyl-	114.2	589-43-5	C8H18		109		1	437	42		
	234	Heptane, 4-methyl-	114.2	589-53-7	C8H18	-121	118		1	250	52		
	235	Heptane, 3-methyl-	114.2	589-81-1	C8H18	-121	119		1	239	42		
	236	Hexane, 2-methyl-	100.2	591-76-4	C7H16	-118	90		1	280	23		
	237	Heptane, 2-methyl-	114.2	592-27-8	C8H18	-109	118	insoluble	6	247	42		
	238	Dodecane, 4,6-dimethyl-	198.4	61141-72-8	C14H30		235		7	225	52		boiling pt estimated by tridecane
	239	Dodecane, 4-methyl-	184.4	6117-97-1	C13H28		216		7	220	52		boiling pt estimated by dodecane
	240	3-Ethylpentane	100.2	617-78-7	C7H16	-119	93		1	275	52		
	241	Octane, 2,3,3-trimethyl-	156.3	62016-30-2	C11H24		174		7	290	52		boiling pt estimated by decane
	242	Octane, 2,3,7-trimethyl-	156.3	62016-34-6	C11H24		174		7	290	52		boiling pt estimated by decane
	243	Decane, 6-ethyl-2-methyl-	184.4	62108-21-8	C13H28		216		7	275	52		boiling pt estimated by dodecane
	244	Decane, 2,6,7-trimethyl-	184.4	62108-25-2	C13H28		216		7	290	52		boiling pt estimated by dodecane
	245	Decane, 2,4,6-trimethyl-	184.4	62108-27-4	C13H28		216		7	290	52		boiling pt estimated by dodecane
	246	Decane, 2,3,7-trimethyl-	184.4	62238-13-5	C13H28		216		7	290	52		boiling pt estimated by dodecane
	247	Tridecane	184.4	629-50-5	C13H28	-5.5	235.4		1	202	42		
C-14 alkane	248	Tetradecane	198.4	629-59-4	C14H30	5.9	253.7		1	200	23		
C-15 alkane	249	Pentadecane	212.4	629-62-9	C15H32	9.9	270.6		1	202	42		
C-17 alkane	250	Heptadecane	240.5	629-78-7	C17H36	22	301.8		1	202	42		
	251	Propane	44.1	74-98-6	C3H8	-188	-42	0.01	1	450	1		
	252	Propane, 2-methyl-	58.1	75-28-5	C4H10	-255	-11.7	slightly	6	462	1		
	253	Butane, 2-methyl-	72.2	78-78-4	C5H12	-160	30	<0.1	1	420	42		
	254	Pentane, 3-methyl-	86.2	96-14-0	C6H14	-118	64	insoluble	6	278	23		
	255	Pentane, trimethyl-, isomer	114.3	565-75-3	C8H18	-109	113.5		1	427	42		

Table 1-2 Compounds detected > 0.1 ppmv

Structure some obvious structures are not shown due to chain length	no. of compounds	Chemical Name	Molecular Weight	Chemical Id	formula	melting pt	normal boiling pt	(water) solubility[1]	phys prop source	AIT	AIT source	NFPA flammability rating	Comments
		UNITS				°C	°C	g/100 ml		°C			

Notes

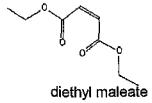
1 *"quotes" imply the information is shown as written in the source*
2 this compound was assigned two different CAS numbers in TWINS
* boiling point was estimated based on criteria of physical property source #7 and the available melting pt of the compound

pysical property sources

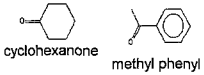
1 *chemfinder (http://chemfinder.cambridgesoft.com/)*
2 msds (http://www.unitexchemical.com/MSD/Uniplex214.htm)
3 estimated from msds for tetramethylcyclotetrasiloxane (http://www.schumacher.com/products/msds/tomcat_0926.pdf)
4 esimated from 2(3H)-Furanone, dihydro-5-methyl- msds (http://www.pschem.com/MSDS/pdf/GammaValerolactonePENN.PDF)
5 National Instutute of Standards and Technology (NIST) database (http://webbook.nist.gov)
6 University of Akron - Chemical Database (http://ull.chemistry.uakron.edu/erd/)
7 *values estimated from similar structures - boiling pt is reported conservatively low as to not overstate adsorption potential on activated carbon*
8 Interactive PhysProp Database Demo: (http://esc.syrres.com/interkow/physdemo.htm)

AIT sources (estimates are considered conservatively high based on trends within similar chemical structures)

1 Lange's Handbook of Chemistry - 14th edition
2 estimated from msds for tetramethylcyclotetrasiloxane (http://www.schumacher.com/products/msds/tomcat_0926.pdf)
3 estimated from pyridine which has same root structure - in general, alkane substitutions on any root will lower the AIT
4 estimated from 2-nitrobutane (reference 2 shows 1-nitropropane AIT is 420, nitroethane is 414, nitromethane is 418)
5 estimated from nitric acid ethyl ester (90 deg C) and nitric acid propyl ester (175 deg C)
6 estimated based on pyrolidine and tetrahydrofuran
7 estimated from MSDS which shows this compound is explosive when heated (Matheson Tri-Gas MSDS)
8 Estimated from nitrous acid -butyl ester (butyl nitrite)
9 estimated from nitric acid - propyl ester -shown with an AIT of 175 deg C by reference 2
10 estimated from tetrahydrofuran - accounting for double bonds (e.g. cyclo hexane AIT=245, benzene=562 and butane = 405, 1,3-butadiene = 420)
11 estimated from pyradine and benzene (AIT 482 and 562 respectively) accounting for the nitrogen reactivity to help oxidize the molecule
12 estimated from BASF technical data sheet (http://www.basf.com/businesses/chemicals/diols/pdfs/dihydro.pdf) showing 3,4-dihydro-2H-pyran AIT of 240 deg C.
13 estimated from 2(3H)-Furanone, dihydro-
14 estimated based on ethylene oxide AIT=429, this compound is expected to have lower AIT based on the alkane branch
15 estimated from pyridine and taking into acount that there is no resonant structure containing double bonds
16 estimated from trimethylamine AIT of 190 deg C
17 AIT reference is on COPC sheet
18 safety data from (http://physchem.ox.ac.uk/MSDS/BU/butyronitrile.html)
19 estimated based on propanenitrile and butanenitrile - in general, as the alkane chain grows, the AIT will decrease
20 estimated based on butanoic acid - alkane esters will lower the AIT below 450 deg C as shown by reference 2
21 estimated to be less than 400 deg C based on length of alkane chain
22 estimated from dimethyl phthalate and dibutylphthalate 556 and 403 deg C respectively - shown in reference 23
23 Rules of Thumb for Chemical Engineers, Gulf Publishing 1994, by Carl Branan
24 estimated from diethyl maleate (see structure on left) AIT = 350 deg C shown by reference 23
25 estimated from ethyl formate AIT of 455 deg C from reference 23
26 estimated from propyl acetate AIT of 450 deg C from reference 23
27 estimated from stearic acid (heptadecanoic (C17) acid) AIT of 395 deg C *from reference 23 - this is considered valid for all of the longer chain carboxylic acids, esters, and keytones.*
28 estimated from MIBK (4-methyl-2-pentanone) and 2-heptanone (AIT=457, and 533 deg C respectively) from reference 23
29 estimated from methyl phenyl ketone and cyclohexanone (AIT 570 and 420 repsectively) from reference 23 - see structures to left
30 estimated from butanone (AIT=516 deg C) considering the extra methyl substitution as an element which lowers the AIT
31 estimated from butanone (AIT=516 deg C) considering the double bond which raises the AIT
32 estimated from heptanone and nonane (AIT = 533 and 190 deg C respectively) from reference 1 - accounting for the longer alkane chain which will lower the AIT from that of heptanone
33 estimated from the trend of AITs *for increasing alkane chain length within available aldehydes from reference 23*
34 estimated from 1-dodecanol (AIT=275) and the trend of AIT temperature which increases as the alkane chain length decreases
35 estimated from ethyl chloride, propyl chloride, 1-2-dichloropropane, dichloroethylene, hexachlorobutadiene, and perfluorodimethylcyclohexane
36 estimated from 2-butanol, isopropyl alcohol, and 2-pentanol from reference 23
37 estimated based on cyclohexanol (AIT=300 deg C) from reference 23
38 taken from OSHA Safety and Heath Guideline database: (http://www.osha-slc.gov/SLTC/healthguidelines/1_2-dichloroethylene/recognition.html)
39 *estimated from acetylene and similar length alkene from reference 1 (i.e. decene AIT = 244 deg C)*
40 see AIT sources for COPCs
41 AIT for this compound can not be found - available references for safety data and MSDS indicate the compound is not flammable - to show that no credit will be taken for destruction via oxidation, the AIT is reported as 900 deg C
42 University of Akron - Chemical Database (http://ull.chemistry.uakron.edu/erd/)
43 estimated from isoproyl benzene, styrene, and butyl benzene from reference 23
44 estimated from 2-methylundecane from reference 23, however the general trend for long chain branched alkanes is a low AIT - this value (500 deg C) is considered unreasonable high - it is used here to be most conservative
45 estimated from decahydronaphthalene from reference 23 (288 deg C) -the methyl substitutions will lower the AIT
46 estimated from cyclopropane (AIT = 498 deg C)- long alkane substitution should appreciably lower the AIT
47 estimated from octylcyclohexane, cyclohexane, and methylcyclohexane from reference 1 and 23 (AIT=236, 245, and 250 respectively)



diethyl maleate
(2-betenedioic acid, diethyl ester)



cyclohexanone

methyl phenyl ketone

Table 1-2 Compounds detected > 0.1 ppmv

Structure some obvious structures are not shown due to chain length	no. of compounds	Chemical Name	Molecular Weight	Chemical Id	formula	melting pt	normal boiling pt	(water) solubility[1]	phys prop source	AIT	AIT source	NFPA flammability rating	Comments
		UNITS				°C	°C	g/100 ml		°C			

48 estmated from cyclo decane (AIT=235 deg C from reference 23)
49 estimated from methyl cyclopentane, hexylcyclopentane, and 1,2,4 and 1,3,5 trimethylcyclohexane from reference 23
50 estimated from ethyl cyclobutane from reference 23
51 estimated from propylcyclohexane from reference 23 (AIT = 269 deg C)
52 estimated from reference 23 which shows AIT for common alkanes, and their single, double and triple branched derivatives - not all compounds are represented, however general trends appear and all AITs (except methane) are below 500 deg C
53 estimated from reference 42 indication that this compound is a flammable solid
54 estimated from the compound structure - no data or similar compound data were found available - the 800 deg C estimate will ensure that the compound is conservatively accounted for (Benzene AIT is 562 deg C and referenceable amines range from the low 300 deg C to mid 600 deg C for aromatic amines)

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Attachment 2 Tables of Destruction DFs

Table 2-1 COPCs
Table 2-2 Compounds Detected >0.1 ppmv

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Table 2-1 COPCs

no. of compound	CAS #	COPC Compound	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
1	100-00-5	p-Nitrochlorobenzene	950.0	650.0	99.99	10000
2	100-21-0	p-Phthalic acid	1250.0	350.0	95	20
3	100-41-4	Ethyl benzene	810.0	790.0	99.99	10000
4	100-42-5	Styrene	915.0	685.0	99.99	10000
5	10061-01-5	cis-1,3-Dichloropropene	1112.0	488.0	99	100
6	10061-02-6	trans-1,3-Dichloropropene	1130.0	470.0	98	50
7	101-55-3	4-Bromophenylphenyl ether	1542.0	58.0	70	3.33
8	101-84-8	Diphenyl ether	1144.0	456.0	98	50
9	106-35-4	3-Heptanone	734.0	866.0	99.99	10000
10	106-42-3	p-Xylene (Dimethyl benzene)	986.0	614.0	99.9	1000
11	106-46-7	1,4-Dichlorobenzene	1184.0	416.0	98	50
12	106-88-7	1,2-Epoxybutane	894.2	705.8	99.99	10000
13	106-93-4	Ethylene dibromide (Dibromoethane)	1600.0	0.0	0	1
14	106-97-8	Butane (R-600)	761.0	839.0	99.99	10000
15	106-99-0	1,3-Butadiene	840.2	759.8	99.99	10000
16	107-02-8	Acrolein	455.0	1145.0	99.99	10000
17	107-05-1	3-Chloropropene (Allyl chloride)	905.0	695.0	99.99	10000
18	107-06-2	1,2-Dichloroethane (Ethylene chloride) (freon 150)	773.6	826.4	99.99	10000
19	107-12-0	Propionitrile	950.0	650.0	99.99	10000
20	107-13-1	Acrylonitrile	897.8	702.2	99.99	10000
21	107-18-6	2-Propene-1-ol	712.4	887.6	99.99	10000
22	107-31-3	Formic acid, methyl ester	869.0	731.0	99.99	10000
23	107-66-4	Dibutylphosphate	950.0	650.0	99.99	10000
24	107-87-9	2-Pentanone	941.0	659.0	99.99	10000
25	108-03-2	1-Nitropropane	788.0	812.0	99.99	10000
26	108-05-4	Vinyl acetate	800.6	799.4	99.99	10000
27	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	858.0	742.0	99.99	10000
28	108-20-3	Bis(isopropyl)ether	829.0	771.0	99.99	10000
29	108-38-3	m-Xylene (Dimethyl benzene)	986.0	614.0	99.9	1000
30	108-39-4	m-Cresol	1038.2	561.8	99.9	1000
31	108-87-2	Methylcyclohexane	482.0	1118.0	99.99	10000
32	108-88-3	Toluene	896.0	704.0	99.99	10000
33	108-90-7	Chlorobenzene	1245.0	355.0	95	20
34	108-93-0	Cyclohexanol	572.0	1028.0	99.99	10000
35	108-94-1	Cyclohexanone	788.0	812.0	99.99	10000
36	108-95-2	Phenol	1319.0	281.0	90	10
37	109-66-0	n-Pentane	500.0	1100.0	99.99	10000
38	109-99-9	Tetrahydrofuran	609.8	990.2	99.99	10000
39	110-12-3	5-Methyl-2-hexanone	376.0	1224.0	99.99	10000
40	110-43-0	2-Heptanone	739.0	861.0	99.99	10000

Table 2-1 COPCs

no. of compound	CAS #	COPC Compound	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
41	110-54-3	n-Hexane	437.0	1163.0	99.99	10000
42	110-62-3	n-Valeraldehyde	500.0	1100.0	99.99	10000
43	110-82-7	Cyclohexane	473.0	1127.0	99.99	10000
44	110-83-8	Cyclohexene	590.0	1010.0	99.99	10000
45	110-86-1	Pyridine	899.6	700.4	99.99	10000
46	111-65-9	n-Octane	428.0	1172.0	99.99	10000
47	111-76-2	Ethylene glycol monobutyl ether	460.4	1139.6	99.99	10000
48	111-84-2	n-Nonane	374.0	1226.0	99.99	10000
49	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	734.0	866.0	99.99	10000
50	117-84-0	n-Dioctyl phthalate	735.1	864.9	99.99	10000
51	120-12-7	Anthracene	1000.4	599.6	99.9	1000
52	120-82-1	1,2,4-Trichlorobenzene	1060.0	540.0	99	100
53	120-83-2	2,4-Dichlorophenol	1542.0	58.0	70	3.33
54	121-44-8	Triethylamine	480.0	1120.0	99.99	10000
55	121-69-7	Dimethylaniline	699.8	900.2	99.99	10000
56	122-39-4	N,N-Diphenylamine	1173.0	427.0	98	50
57	123-19-3	4-Heptanone	842.0	758.0	99.99	10000
58	123-38-6	n-Propionaldehyde	404.6	1195.4	99.99	10000
59	123-51-3	3-Methyl-1-butanol	662.0	938.0	99.99	10000
60	123-86-4	Acetic acid n-butyl ester	797.0	803.0	99.99	10000
61	123-91-1	1,4-Dioxane	356.0	1244.0	99.99	10000
62	126-73-8	Tributyl phosphate	899.6	700.4	99.99	10000
63	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	860.0	740.0	99.99	10000
64	127-18-4	Perchloroethylene (tetrachloroethylene)	1600.0	0.0	0	1
65	127-19-5	N,N-Dimethylacetamide	914.0	686.0	99.99	10000
66	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	878.0	722.0	99.99	10000
67	129-00-0	Pyrene	1542.0	58.0	70	3.33
68	1321-64-8	Pentachloronaphthalene	1542.0	58.0	70	3.33
69	1321-65-9	Trichloronaphthalene	1542.0	58.0	70	3.33
70	132-64-9	Dibenzofuran	1542.0	58.0	70	3.33
71	1335-87-1	Hexachloronaphthalene	1542.0	58.0	70	3.33
72	1335-88-2	Tetrachloronaphthalene	1542.0	58.0	70	3.33
73	1336-36-3	Polychlorinated biphenyls (PCBs)	1542.0	58.0	70	3.33
74	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	906.8	693.2	99.99	10000
75	141-79-7	4-Methyl-3-penten-2-one	651.0	949.0	99.99	10000
76	142-82-5	n-Heptane	433.4	1166.6	99.99	10000
77	144-62-7	Oxalic acid	1400.0	200.0	90	10
78	156-60-5	trans-1,2-Dichloroethylene	860.0	740.0	99.99	10000
79	1634-04-4	Methyl tert-butyl ether	815.0	785.0	99.99	10000
80	189-55-9	Dibenzo[a,i]pyrene	1542.0	58.0	70	3.33

Table 2-1 COPCs

no. of compound	CAS #	COPC Compound	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
81	189-64-0	Dibenzo[a,h]pyrene	1542.0	58.0	70	3.33
82	191-24-2	Benzo(g,h,i)perylene	1542.0	58.0	70	3.33
83	191-30-0	Benzo[a,i]pyrene	1542.0	58.0	70	3.33
84	192-65-4	Dibenzo[a,e]pyrene	1542.0	58.0	70	3.33
85	193-39-5	Indeno(1,2,3-cd)pyrene	1542.0	58.0	70	3.33
86	206-44-0	Fluoranthene	1542.0	58.0	70	3.33
87	208-96-8	Acenaphthylene	1542.0	58.0	70	3.33
88	2234-13-1	Octachloronaphthalene	1542.0	58.0	70	3.33
89	224-42-0	Dibenz[a,j]acridine	1542.0	58.0	70	3.33
90	226-36-8	Dibenz[a,h]acridine	1542.0	58.0	70	3.33
91	25551-13-7	Trimethyl benzene	1022.0	578.0	99.9	1000
92	26140-60-3	Terphenyls	1542.0	58.0	70	3.33
93	27154-33-2	Trichlorofluoroethane	1600.0	0.0	0	1
94	287-92-3	Cyclopentane	716.0	884.0	99.99	10000
95	3697-24-3	5-Methylchrysene	1542.0	58.0	70	3.33
96	3825-26-1	Ammonium perfluorooctanoate	1542.0	58.0	70	3.33
97	4170-30-3	2-Butenaldehyde (2-Butenal)	446.0	1154.0	99.99	10000
98	50-00-0	Formaldehyde	806.0	794.0	99.99	10000
99	50-32-8	Benzo(a)pyrene	1542.0	58.0	70	3.33
100	53-70-3	Dibenzo(a,h)anthracene	1542.0	58.0	70	3.33
101	540-59-0	1,2-Dichloroethylene	860.0	740.0	99.99	10000
102	540-84-1	2,2,4-Trimethylpentane	779.0	821.0	99.99	10000
103	541-73-1	1,3-Dichlorobenzene	1184.0	416.0	98	50
104	56-23-5	Carbon tetrachloride (R-10)	1600.0	0.0	0	1
105	563-80-4	3-Methyl-2-butanone	845.6	754.4	99.99	10000
106	56-49-5	3-Methylcholanthrene	1542.0	58.0	70	3.33
107	57-14-7	1,1-Dimethylhydrazine	480.2	1119.8	99.99	10000
108	58-90-2	2,3,4,6-Tetrachlorophenol	1542.0	58.0	70	3.33
109	591-78-6	2-Hexanone	991.0	609.0	99.9	1000
110	59-50-7	4-Chloro-3-methylphenol	1542.0	58.0	70	3.33
111	59-89-2	N-Nitrosomorpholine	932.0	668.0	99.99	10000
112	602-87-9	5-Nitroacenaphthene	1542.0	58.0	70	3.33
113	60-29-7	Ethyl ether	320.0	1280.0	99.99	10000
114	603-34-9	Triphenylamine	1542.0	58.0	70	3.33
115	60-34-4	Methylhydrazine	384.8	1215.2	99.99	10000
116	60-35-5	Acetamide	896.0	704.0	99.99	10000
117	621-64-7	Di-n-Propylnitrosamine	527.0	1073.0	99.99	10000
118	624-83-9	Methyl isocyanate	995.0	605.0	99.9	1000
119	627-13-4	Nitric acid, propyl ester	788.0	812.0	99.99	10000
120	62-75-9	N-Nitroso-N,N-dimethylamine	932.0	668.0	99.99	10000

Table 2-1 COPCs

no. of compound	CAS #	COPC Compound	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
121	630-20-6	1,1,1,2-Tetrachloroethane	1600.0	0.0	0	1
122	64-17-5	Ethyl alcohol	798.8	801.2	99.99	10000
123	64-18-6	Formic acid	813.2	786.8	99.99	10000
124	64-19-7	Acetic acid	869.0	731.0	99.99	10000
125	67-56-1	Methyl alcohol (Methanol)	878.0	722.0	99.99	10000
126	67-63-0	2-Propyl alcohol (Isopropanol)	852.8	747.2	99.99	10000
127	67-64-1	2-Propanone (Acetone)	869.0	731.0	99.99	10000
128	67-66-3	Chloroform (R-20)	1832.0	-232.0	0	1
129	67-72-1	Hexachloroethane	1600.0	0.0	0	1
130	684-16-2	Hexafluoroacetone	1600.0	0.0	0	1
131	71-23-8	n-Propyl alcohol	824.0	776.0	99.99	10000
132	71-36-3	n-Butyl alcohol	692.6	907.4	99.99	10000
133	71-43-2	Benzene	1097.6	502.4	99	100
134	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	999.0	601.0	99.9	1000
135	74-83-9	Bromomethane (Methyl bromide) (halon 1001)	998.6	601.4	99.9	1000
136	74-87-3	Chloromethane (Methyl chloride) (R-40)	1223.6	376.4	95	20
137	74-97-5	Bromochloromethane (halon 1011)	1600.0	0.0	0	1
138	74-99-7	Methylacetylene	644.0	956.0	99.99	10000
139	75-00-3	Chloroethane	966.2	633.8	99.9	1000
140	75-01-4	Vinyl chloride (1-Chloroethene)	881.6	718.4	99.99	10000
141	75-05-8	Acetonitrile	975.2	624.8	99.9	1000
142	75-07-0	Acetaldehyde	347.0	1253.0	99.99	10000
143	75-09-2	Dichloromethane (Methylene chloride) (R-30)	1223.6	376.4	95	20
144	75-12-7	Formamide	932.0	668.0	99.99	10000
145	75-15-0	Carbon disulfide	257.0	1343.0	99.99	10000
146	75-21-8	Ethylene oxide (Oxirane)	804.2	795.8	99.99	10000
147	75-27-4	Bromodichloromethane	1600.0	0.0	0	1
148	75-34-3	1,1-Dichloroethane	852.8	747.2	99.99	10000
149	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	854.6	745.4	99.99	10000
150	75-43-4	Dichlorofluoromethane (R-21)	1026.0	574.0	99.9	1000
151	75-45-6	Chlorodifluoromethane (R-22)	1170.0	430.0	98	50
152	75-50-3	Trimethylamine	374.0	1226.0	99.99	10000
153	75-52-5	Nitromethane	784.4	815.6	99.99	10000
154	75-55-8	2-Methylaziridine	914.0	686.0	99.99	10000
155	75-61-6	Difluorodibromomethane (freon 12B2- halon 1202)	1600.0	0.0	0	1
156	75-63-8	Trifluorobromomethane (R-13B1)	1600.0	0.0	0	1
157	75-65-0	2-Methyl-2-propanol	892.4	707.6	99.99	10000
158	75-69-4	Trichlorofluoromethane (R-11)	1600.0	0.0	0	1
159	75-71-8	Dichlorodifluoromethane (R-12)	1600.0	0.0	0	1
160	76-03-9	Trichloroacetic acid	1600.0	0.0	0	1

Table 2-1 COPCs

no. of compound	CAS #	COPC Compound	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
161	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane (R-112a)	1350.0	250.0	90	10
162	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane (R-112)	1350.0	250.0	90	10
163	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	1256.0	344.0	95	20
164	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (R-114)	1600.0	0.0	0	1
165	76-15-3	Chloropentafluoroethane (R-115)	1600.0	0.0	0	1
166	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	779.0	821.0	99.99	10000
167	78-87-5	1,2-Dichloropropane	1034.0	566.0	99.9	1000
168	78-92-2	1-Methylpropyl alcohol (2-Butanol)	762.8	837.2	99.99	10000
169	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	960.8	639.2	99.9	1000
170	79-00-5	1,1,2-Trichloroethane	932.0	668.0	99.99	10000
171	79-01-6	Trichloroethylene	788.0	812.0	99.99	10000
172	79-09-4	Propionic acid	914.0	686.0	99.99	10000
173	79-10-7	2-Propenoic acid	820.4	779.6	99.99	10000
174	79-20-9	Methyl acetate	935.6	664.4	99.99	10000
175	79-34-5	1,1,2,2-Tetrachloroethane	1600.0	0.0	0	1
176	83-32-9	Acenaphthene	1542.0	58.0	70	3.33
177	84-66-2	Diethyl phthalate	855.0	745.0	99.99	10000
178	84-74-2	Dibutyl phthalate	756.0	844.0	99.99	10000
179	85-01-8	Phenanthrene	1542.0	58.0	70	3.33
180	85-68-7	Butylbenzyl phthalate	451.4	1148.6	99.99	10000
181	86-73-7	Fluorene	1542.0	58.0	70	3.33
182	87-68-3	Hexachlorobutadiene	1130.0	470.0	98	50
183	88-06-2	2,4,6-Trichlorophenol	1542.0	58.0	70	3.33
184	88-72-2	2-Nitrotoluene	581.0	1019.0	99.99	10000
185	88-75-5	2-Nitrophenol	1542.0	58.0	70	3.33
186	88-89-1	Picric acid	572.0	1028.0	99.99	10000
187	91-20-3	Naphthalene	1054.0	546.0	99	100
188	91-22-5	Quinoline	896.0	704.0	99.99	10000
189	91-58-7	2-Chloronapthalene	1542.0	58.0	70	3.33
190	92-52-4	1,1`-Biphenyl	1004.0	596.0	99.9	1000
191	92-93-3	4-Nitrobiphenyl	1542.0	58.0	70	3.33
192	95-13-6	Indene	979.0	621.0	99.9	1000
193	95-47-6	o-Xylene	869.0	731.0	99.99	10000
194	95-48-7	o-Cresol (2-Methylphenol)	1038.2	561.8	99.9	1000
195	95-49-8	2-Chlorotoluene	932.0	668.0	99.99	10000
196	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	1184.0	416.0	98	50
197	95-57-8	2-Chlorophenol	779.0	821.0	99.99	10000
198	95-95-4	2,4,5-Trichlorophenol	1542.0	58.0	70	3.33
199	96-18-4	1,2,3-Trichloropropane	932.0	668.0	99.99	10000
200	96-22-0	3-Pentanone	842.0	758.0	99.99	10000

Table 2-1 COPCs

no. of compound	CAS #	COPC Compound	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
201	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	1542.0	58.0	70	3.33
202	98-51-1	p-tert-Butyltoluene	950.0	650.0	99.99	10000
203	98-82-8	Cumene	795.0	805.0	99.99	10000
204	98-83-9	alpha-Methylstyrene	1065.2	534.8	99	100
205	98-86-2	Acetophenone	1059.8	540.2	99	100
206	98-95-3	Nitrobenzene	899.6	700.4	99.99	10000

Table 2-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	headspace detects >0.1 ppmv Compound name	AIT deg C	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
1	541-05-9	Cyclotrisiloxane, hexamethyl-	400	752	848	99.99	10000
2	556-67-2	Cyclotetrasiloxane, octamethyl-	400	752	848	99.99	10000
3	USI000-06	tetramethylcyclotrisiloxane	250	482	1118	99.99	10000
4	3622-84-2	Benzenesulfonamide, N-butyl-	800	1472	128	80	5
5	5145-07-1	2(3H)-Furanone, dihydro-3,5-dimethyl-	425	797	803	99.99	10000
6	108-47-4	Pyridine, 2,4-dimethyl-	482	899.6	700.4	99.99	10000
7	109-99-9	Furan, tetrahydro-	321	609.8	990.2	99.99	10000
8	110-00-9	Furan	360	680	920	99.99	10000
9	110-86-1	Pyridine	482	899.6	700.4	99.99	10000
10	1708-29-8	Furan, 2,5-dihydro-	450	842	758	99.99	10000
11	24405-16-1	2H-Pyran-2-one, tetrahydro-5,6-dimethyl-, trans-	350	662	938	99.99	10000
12	289-95-2	Pyrimidine	450	842	758	99.99	10000
13	290-37-9	Pyrazine	450	842	758	99.99	10000
14	534-22-5	Furan, 2-methyl-	450	842	758	99.99	10000
15	930-22-3	Oxirane, ethenyl-	429	804.2	795.8	99.99	10000
16	96-48-0	2(3H)-Furanone, dihydro- (gamma butyrolactone)	450	842	758	99.99	10000
17	3457-90-7	1,3-Propanediol, dinitrate	450	842	758	99.99	10000
18	3457-91-8	1,4-Butanediol, dinitrate	450	842	758	99.99	10000
19	544-16-1	Nitrous acid, butyl ester	450	842	758	99.99	10000
20	624-91-9	Nitrous acid, methyl ester	500	932	668	99.99	10000
21	625-58-1	Nitric acid, ethyl ester	90	194	1406	99.99	10000
22	627-05-4	Butane, 1-nitro-	450	842	758	99.99	10000
23	627-13-4	Nitric acid, propyl ester	175	347	1253	99.99	10000
24	62-75-9M	Methanamine, N-methyl-N-nitroso- and others	500	932	668	99.99	10000
25	928-45-0	Nitric acid, butyl ester	400	752	848	99.99	10000
26	123-75-1	Pyrrolidine	450	842	758	99.99	10000
27	22431-09-0	Methanamine, N-(1-methylbutylidene)-	350	662	938	99.99	10000
28	616-45-5	2-Pyrrolidinone	450	842	758	99.99	10000
29	75-50-3	Methanamine, N,N-dimethyl-	190	374	1226	99.99	10000
30	107-12-0	Propanenitrile	510	950	650	99.99	10000
31	109-74-0	Butanenitrile	488	910.4	689.6	99.99	10000
32	110-59-8	Pentanenitrile	475	887	713	99.99	10000
33	124-12-9	Octanenitrile	450	842	758	99.99	10000
34	2243-27-8	Nonanenitrile	440	824	776	99.99	10000
35	628-73-9	Hexanenitrile	470	878	722	99.99	10000
36	629-08-3	Heptanenitrile	460	860	740	99.99	10000
37	75-05-8	Acetonitrile	524	975.2	624.8	99.9	1000
38	109-21-7	Butanoic acid, butyl ester	450	842	758	99.99	10000

Table 2-2 Compounds Detected >0.1 ppmv

		headspace detects >0.1 ppmv	AIT	AIT	RTO degrees above AIT	est DE	est DF
no of compound	CAS #	Compound name	deg C	deg F	deg F	%	mass in / mass out
39	110-27-0	Tetradecanoic acid, 1-methylethyl ester	400	752	848	99.99	10000
40	123-25-1	Butanedioic acid, diethyl ester	350	662	938	99.99	10000
41	123-86-4	Acetic acid, butyl ester	425	797	803	99.99	10000
42	126-73-8	Phosphoric acid tributyl ester	482	899.6	700.4	99.99	10000
43	141-78-6	Acetic acid ethyl ester	482	899.6	700.4	99.99	10000
44	1838-59-1	Formic acid, 2-propenyl ester	500	932	668	99.99	10000
45	590-01-2	Propanoic acid, butyl ester	427	800.6	799.4	99.99	10000
46	591-87-7	Acetic acid, 2-propenyl ester	475	887	713	99.99	10000
47	592-84-7	Formic acid, butyl ester	322	611.6	988.4	99.99	10000
48	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester	540	1004	596	99.9	1000
49	1002-84-2	Pentadecanoic acid	400	752	848	99.99	10000
50	107-92-6	Butanoic acid	450	842	758	99.99	10000
51	2091-29-4	9-Hexadecenoic acid	400	752	848	99.99	10000
52	544-63-8	Tetradecanoic acid	400	752	848	99.99	10000
53	57-10-3	Hexadecanoic acid	400	752	848	99.99	10000
54	64-19-7	Acetic acid	465	869	731	99.99	10000
55	105-42-0	2-Hexanone, 4-methyl-	457	854.6	745.4	99.99	10000
56	106-35-4	3-Heptanone	390	734	866	99.99	10000
57	106-68-3	3-Octanone	525	977	623	99.9	1000
58	107-87-9	2-Pentanone	505	941	659	99.99	10000
59	108-10-1	2-Pentanone, 4-methyl- (MIBK)	457	854.6	745.4	99.99	10000
60	110-43-0	2-Heptanone	533	991.4	608.6	99.9	1000
61	111-13-7	2-Octanone	525	977	623	99.9	1000
62	112-12-9	2-Undecanone	400	752	848	99.99	10000
63	123-19-3	4-Heptanone	533	991.4	608.6	99.9	1000
64	1534-26-5	3-Tridecanone	400	752	848	99.99	10000
65	1534-27-6	3-Dodecanone	400	752	848	99.99	10000
66	15932-80-6	Cyclohexanone, 5-methyl-2-(1-methylethylidene)-	500	932	668	99.99	10000
67	22026-12-6	6-Tridecanone	400	752	848	99.99	10000
68	2216-87-7	3-Undecanone	400	752	848	99.99	10000
69	50639-02-6	5-Undecanone, 2-methyl-	400	752	848	99.99	10000
70	563-80-4	2-Butanone, 3-methyl-	500	932	668	99.99	10000
71	589-38-8	3-Hexanone	533	991.4	608.6	99.9	1000
72	589-63-9	4-Octanone	525	977	623	99.9	1000
73	591-78-6	2-Hexanone	533	991.4	608.6	99.9	1000
74	593-08-8	2-Tridecanone	400	752	848	99.99	10000
75	629-23-2	3-Tetradecanone	400	752	848	99.99	10000
76	67-64-1	2-Propanone	465	869	731	99.99	10000

Table 2-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	headspace detects >0.1 ppmv Compound name	AIT deg C	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
77	763-93-9	3-Hexen-2-one	550	1022	578	99.9	1000
78	78-93-3	2-Butanone	516	960.8	639.2	99.9	1000
79	78-94-4	3-Buten-2-one	550	1022	578	99.9	1000
80	821-55-6	2-Nonanone	500	932	668	99.99	10000
81	89-82-7	Cyclohexanone, 5-methyl-2-(1-methylethylidene)	500	932	668	99.99	10000
82	925-78-0	3-Nonanone	500	932	668	99.99	10000
83	928-68-7	2-Heptanone, 6-methyl-	525	977	623	99.9	1000
84	98-86-2	Ethanone, 1-phenyl-	571	1059.8	540.2	99	100
85	110-62-3	Pentanal	222	431.6	1168.4	99.99	10000
86	111-71-7	Heptanal	300	572	1028	99.99	10000
87	123-38-6	Propanal	207	404.6	1195.4	99.99	10000
88	123-72-8	Butanal	230	446	1154	99.99	10000
89	124-13-0	Octanal	300	572	1028	99.99	10000
90	124-19-6	Nonanal	300	572	1028	99.99	10000
91	19269-28-4	Hexanal, 3-methyl-	200	392	1208	99.99	10000
92	66-25-1	Hexanal	300	572	1028	99.99	10000
93	75-07-0	Acetaldehyde	175	347	1253	99.99	10000
94	104-76-7	1-Hexanol, 2-ethyl-	300	572	1028	99.99	10000
95	111-70-6	1-Heptanol	320	608	992	99.99	10000
96	112-92-5	1-Octadecanol	300	572	1028	99.99	10000
97	14898-79-4	2-Butanol	406	762.8	837.2	99.99	10000
98	2136-70-1	Ethanol, 2-(tetradecyloxy)-	300	572	1028	99.99	10000
99	36653-82-4	1-Hexadecanol	300	572	1028	99.99	10000
100	51411-24-6	6,10-Dodecadien-1-ol, 3,7,11-trimethyl-	300	572	1028	99.99	10000
101	57-55-6	1,2-Propanediol	371	699.8	900.2	99.99	10000
102	598-32-3	3-Buten-2-ol	450	842	758	99.99	10000
103	6032-29-7	2-Pentanol	343	649.4	950.6	99.99	10000
104	627-27-0	3-Buten-1-ol	450	842	758	99.99	10000
105	64-17-5	Ethanol	423	793.4	806.6	99.99	10000
106	67-56-1	Methanol	470	878	722	99.99	10000
107	67-63-0	2-Propanol	399	750.2	849.8	99.99	10000
108	71-23-8	1-Propanol	440	824	776	99.99	10000
109	75-65-0	2-Propanol, 2-methyl-	480	896	704	99.99	10000
110	75-84-3	1-Propanol, 2,2-dimethyl-	480	896	704	99.99	10000
111	75-85-4	2-Butanol, 2-methyl-	437	818.6	781.4	99.99	10000
112	78-92-2	2-Butanol	406	762.8	837.2	99.99	10000
113	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	610	1130	470	98	50
114	96-41-3	Cyclopentanol	350	662	938	99.99	10000

Table 2-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	headspace detects >0.1 ppmv Compound name	AIT deg C	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
115	1184-60-7	1-Propene, 2-fluoro-	600	1112	488	99	100
116	127-18-4	Ethene, tetrachloro-	871	1599.8	0.2	0	1
117	156-59-2	Ethene, 1,2-dichloro-, (Z)-	460	860	740	99.99	10000
118	1717-00-6	Ethane, 1,1-dichloro-1-fluoro- (freon 14b)	550	1022	578	99.9	1000
119	56-23-5	Methane, tetrachloro-	900	1652	-52	0	1
120	74-87-3	Methane, chloro- (R-40)	662	1223.6	376.4	95	20
121	75-02-5	Ethene, fluoro-	385	725	875	99.99	10000
122	75-09-2	Methane, dichloro-	662	1223.6	376.4	95	20
123	75-45-6	Methane, chlorodifluoro- (R-22)	632	1169.6	430.4	98	50
124	75-68-3	Ethane, 1-chloro-1,1-difluoro- (R-142)	632	1169.6	430.4	98	50
125	75-69-4	Methane, trichlorofluoro- (R-11)	900	1652	-52	0	1
126	6031-02-3	Benzene, (1-methylpentyl)-	490	914	686	99.99	10000
127	100-41-4	Benzene, ethyl-	432	809.6	790.4	99.99	10000
128	100-42-5	Benzene, ethenyl-	490	914	686	99.99	10000
129	106-42-3	Benzene, 1,4-dimethyl-	529	984.2	615.8	99.9	1000
130	108-38-3	Benzene, 1,3-dimethyl-	528	982.4	617.6	99.9	1000
131	108-88-3	Benzene, methyl-	482	899.6	700.4	99.99	10000
132	3290-53-7	Benzene, (2-methyl-2-propenyl)-	490	914	686	99.99	10000
133	538-68-1	Benzene, pentyl-	420	788	812	99.99	10000
134	637-50-3	Benzene, 1-propenyl-	490	914	686	99.99	10000
135	643-58-3	1,1`-Biphenyl, 2-methyl-	495	923	677	99.99	10000
136	71-43-2	Benzene	562	1043.6	556.4	99.9	1000
137	92-52-4	1,1`-Biphenyl	540	1004	596	99.9	1000
138	95-47-6	Benzene, 1,2-dimethyl-	464	867.2	732.8	99.99	10000
139	74-99-7	1-Propyne	340	644	956	99.99	10000
140	20184-91-2	4-Nonyne	320	608	992	99.99	10000
141	61142-40-3	4-Undecene, 4-methyl-	500	932	668	99.99	10000
142	629-73-2	1-Hexadecene	500	932	668	99.99	10000
143	74630-39-0	1-Undecene, 4-methyl-	500	932	668	99.99	10000
144	74630-48-1	3-Undecene, 2-methyl-, (Z)-	500	932	668	99.99	10000
145	764-96-5	5-Undecene, (Z)-	500	932	668	99.99	10000
146	821-74-9	4,5-Nonadiene	550	1022	578	99.9	1000
147	1008-80-6	Naphthalene, decahydro-2,3-dimethyl-	288	550.4	1049.6	99.99	10000
148	108-87-2	Cyclohexane, methyl-	250	482	1118	99.99	10000
149	110-82-7	Cyclohexane	245	473	1127	99.99	10000
150	1472-09-9	Cyclopropane, octyl-	498	928.4	671.6	99.99	10000
151	1618-22-0	Naphthalene, decahydro-2,6-dimethyl-	288	550.4	1049.6	99.99	10000
152	1630-94-0	Cyclopropane, 1,1-dimethyl-	498	928.4	671.6	99.99	10000

Table 2-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	headspace detects >0.1 ppmv Compound name	AIT deg C	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
153	1678-93-9	Cyclohexane, butyl-	246	474.8	1125.2	99.99	10000
154	2415-72-7	Cyclopropane, propyl-	498	928.4	671.6	99.99	10000
155	287-92-3	Cyclopentane	380	716	884	99.99	10000
156	2883-05-8	Octane, 2-cyclohexyl-	246	474.8	1125.2	99.99	10000
157	294-62-2	Cyclododecane	235	455	1145	99.99	10000
158	2958-76-1	Naphthalene, decahydro-2-methyl-	288	550.4	1049.6	99.99	10000
159	3073-66-3	Cyclohexane, 1,1,3-trimethyl-	320	608	992	99.99	10000
160	32281-85-9	Cyclopentane, 1,3-dimethyl-2-(1-methylethyl)-	350	662	938	99.99	10000
161	3604-14-6	Naphthalene, decahydro-1,2-dimethyl-	288	550.4	1049.6	99.99	10000
162	41977-33-7	Cyclopropane, 1-pentyl-2-propyl-	498	928.4	671.6	99.99	10000
163	4292-92-6	Cyclohexane, pentyl-	270	518	1082	99.99	10000
164	4806-61-5	Cyclobutane, ethyl-	212	413.6	1186.4	99.99	10000
165	493-02-7	Naphthalene, decahydro-, trans-	288	550.4	1049.6	99.99	10000
166	54676-39-0	Cyclohexane, 2-butyl-1,1,3-trimethyl-	320	608	992	99.99	10000
167	55937-92-3	Bicyclo[4.1.0]heptane, 2-methyl-7-pentyl-	320	608	992	99.99	10000
168	594-11-6	Cyclopropane, methyl-	498	928.4	671.6	99.99	10000
169	598-61-8	Cyclobutane, methyl-	250	482	1118	99.99	10000
170	61142-20-9	Cyclohexane, (4-methylpentyl)-	270	518	1082	99.99	10000
171	7058-01-7	Cyclohexane, (1-methylpropyl)-	270	518	1082	99.99	10000
172	7094-26-0	Cyclohexane, 1,1,2-trimethyl-	270	518	1082	99.99	10000
173	822-50-4	Cyclopentane, 1,2-dimethyl-, trans-	350	662	938	99.99	10000
174	1002-43-3	Undecane, 3-methyl-	500	932	668	99.99	10000
175	106-97-8	Butane	405	761	839	99.99	10000
176	107-83-5	Pentane, 2-methyl-	306	582.8	1017.2	99.99	10000
177	108-08-7	Pentane, 2,4-dimethyl-	337	638.6	961.4	99.99	10000
178	109-66-0	Pentane	260	500	1100	99.99	10000
179	110-54-3	Hexane	225	437	1163	99.99	10000
180	111-65-9	Octane	220	428	1172	99.99	10000
181	111-84-2	Nonane	206	402.8	1197.2	99.99	10000
182	1120-21-4	Undecane	202	395.6	1204.4	99.99	10000
183	112-40-3	Dodecane	204	399.2	1200.8	99.99	10000
184	124-18-5	Decane	210	410	1190	99.99	10000
185	13151-34-3	Decane, 3-methyl-	225	437	1163	99.99	10000
186	13151-35-4	Decane, 5-methyl-	225	437	1163	99.99	10000
187	13286-73-2	Tridecane, 3-ethyl-	220	428	1172	99.99	10000
188	13287-21-3	Tridecane, 6-methyl-	220	428	1172	99.99	10000
189	142-82-5	Heptane	223	433.4	1166.6	99.99	10000
190	14720-74-2	Heptane, 2,2,4-trimethyl-	275	527	1073	99.99	10000

Table 2-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	headspace detects >0.1 ppmv Compound name	AIT deg C	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
191	1560-96-9	Tridecane, 2-methyl-	205	401	1199	99.99	10000
192	1632-70-8	Undecane, 5-methyl-	220	428	1172	99.99	10000
193	17301-23-4	Undecane, 2,6-dimethyl-	250	482	1118	99.99	10000
194	17301-25-6	Undecane, 2,8-dimethyl-	250	482	1118	99.99	10000
195	17301-27-8	Undecane, 2,10-dimethyl-	250	482	1118	99.99	10000
196	17301-29-0	Undecane, 3,7-dimethyl-	250	482	1118	99.99	10000
197	17301-30-3	Undecane, 3,8-dimethyl-	250	482	1118	99.99	10000
198	17301-32-5	Undecane, 4,7-dimethyl-	250	482	1118	99.99	10000
199	17301-94-9	Nonane, 4-methyl-	220	428	1172	99.99	10000
200	17302-28-2	Nonane, 2,6-dimethyl-	250	482	1118	99.99	10000
201	17302-32-8	Nonane, 3,7-dimethyl-	250	482	1118	99.99	10000
202	17312-50-4	Decane, 2,5-dimethyl-	250	482	1118	99.99	10000
203	17312-57-1	Dodecane, 3-methyl-	220	428	1172	99.99	10000
204	17312-60-6	Undecane, 6-ethyl-	220	428	1172	99.99	10000
205	17312-73-1	Undecane, 5,5-dimethyl-	250	482	1118	99.99	10000
206	17312-76-4	Undecane, 6,6-dimethyl-	250	482	1118	99.99	10000
207	17312-77-5	Undecane, 2,3-dimethyl-	250	482	1118	99.99	10000
208	17312-80-0	Undecane, 2,4-dimethyl-	250	482	1118	99.99	10000
209	17312-82-2	Undecane, 4,6-dimethyl-	250	482	1118	99.99	10000
210	17453-94-0	Undecane, 5-ethyl-	220	428	1172	99.99	10000
211	20278-85-7	Heptane, 2,3,5-trimethyl-	275	527	1073	99.99	10000
212	2213-23-2	Heptane, 2,4-dimethyl-	330	626	974	99.99	10000
213	2216-33-3	Octane, 3-methyl-	220	428	1172	99.99	10000
214	2216-34-4	Octane, 4-methyl-	220	428	1172	99.99	10000
215	25117-24-2	Tetradecane, 4-methyl-	220	428	1172	99.99	10000
216	25117-31-1	Tridecane, 5-methyl-	220	428	1172	99.99	10000
217	26730-12-1	Tridecane, 4-methyl-	220	428	1172	99.99	10000
218	26730-14-3	Tridecane, 7-methyl-	225	437	1163	99.99	10000
219	2847-72-5	Decane, 4-methyl-	225	437	1163	99.99	10000
220	2980-69-0	Undecane, 4-methyl-	220	428	1172	99.99	10000
221	31295-56-4	Dodecane, 2,6,11-trimethyl-	250	482	1118	99.99	10000
222	3891-98-3	Dodecane, 2,6,10-trimethyl-	250	482	1118	99.99	10000
223	4032-93-3	Heptane, 2,3,6-trimethyl-	275	527	1073	99.99	10000
224	52896-90-9	Heptane, 3-ethyl-5-methyl-	275	527	1073	99.99	10000
225	544-76-3	Hexadecane	202	395.6	1204.4	99.99	10000
226	55030-62-1	Tridecane, 4,8-dimethyl-	250	482	1118	99.99	10000
227	55045-07-3	Dodecane, 2-methyl-8-propyl-	250	482	1118	99.99	10000
228	55045-11-9	Tridecane, 5-propyl-	225	437	1163	99.99	10000

Table 2-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	headspace detects >0.1 ppmv Compound name	AIT deg C	AIT deg F	RTO degrees above AIT deg F	est DE %	est DF mass in / mass out
229	562-49-2	Pentane, 3,3-dimethyl-	350	662	938	99.99	10000
230	56292-65-0	Dodecane, 2,5-dimethyl-	225	437	1163	99.99	10000
231	565-59-3	Pentane, 2,3-dimethyl-	337	638.6	961.4	99.99	10000
232	589-34-4	Hexane, 3-methyl-	280	536	1064	99.99	10000
233	589-43-5	Hexane, 2,4-dimethyl-	437	818.6	781.4	99.99	10000
234	589-53-7	Heptane, 4-methyl-	250	482	1118	99.99	10000
235	589-81-1	Heptane, 3-methyl-	239	462.2	1137.8	99.99	10000
236	591-76-4	Hexane, 2-methyl-	280	536	1064	99.99	10000
237	592-27-8	Heptane, 2-methyl-	247	476.6	1123.4	99.99	10000
238	61141-72-8	Dodecane, 4,6-dimethyl-	225	437	1163	99.99	10000
239	6117-97-1	Dodecane, 4-methyl-	220	428	1172	99.99	10000
240	617-78-7	3-Ethylpentane	275	527	1073	99.99	10000
241	62016-30-2	Octane, 2,3,3-trimethyl-	290	554	1046	99.99	10000
242	62016-34-6	Octane, 2,3,7-trimethyl-	290	554	1046	99.99	10000
243	62108-21-8	Decane, 6-ethyl-2-methyl-	275	527	1073	99.99	10000
244	62108-25-2	Decane, 2,6,7-trimethyl-	290	554	1046	99.99	10000
245	62108-27-4	Decane, 2,4,6-trimethyl-	290	554	1046	99.99	10000
246	62238-13-5	Decane, 2,3,7-trimethyl-	290	554	1046	99.99	10000
247	629-50-5	Tridecane	202	395.6	1204.4	99.99	10000
248	629-59-4	Tetradecane	200	392	1208	99.99	10000
249	629-62-9	Pentadecane	202	395.6	1204.4	99.99	10000
250	629-78-7	Heptadecane	202	395.6	1204.4	99.99	10000
251	74-98-6	Propane	450	842	758	99.99	10000
252	75-28-5	Propane, 2-methyl-	462	863.6	736.4	99.99	10000
253	78-78-4	Butane, 2-methyl-	420	788	812	99.99	10000
254	96-14-0	Pentane, 3-methyl-	278	532.4	1067.6	99.99	10000
255	565-75-3	Pentane, trimethyl-, isomer	427	800.6	799.4	99.99	10000

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Attachment 3 Tables of Removal DFs

Table 3-1 COPCs
Table 3-2 Compounds Detected >0.1 ppmv

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Table 3-1 COPCs

no of compo und	CAS	Compound Name (COPC)	MW	Boiling pt.	Yaws capacity correlation carbon loading quadratic constants			assumed outlet equilibrium of isotherm-PPMV (y)	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001)			estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995)		
								0.10			Estimated Carbon Capacity	Predicted RE	DF	Estimated Carbon Capacity	Predicted RE	DF
			g/mol	deg C	A	B	C	g ads/100 g carbon			g/100 g C	%	mass in / mass out	g/100 g C	%	mass in / mass out
1	100-00-5	p-Nitrochlorobenzene	157.6	242							40	98	50	40	98	50
2	100-21-0	p-Phthalic acid	166.1	sublimes							40	98	50	40	98	50
4	100-41-4	Ethyl benzene	106.2	136.2							2	80	5	2	80	5
5	100-42-5	Styrene	104.1	145.2							2	80	5	2	80	5
6	10061-01-5	cis-1,3-Dichloropropene	111.0	104.3							2	80	5	2	80	5
7	10061-02-6	trans-1,3-Dichloropropene	111.0	112							2	80	5	2	80	5
8	101-55-3	4-Bromophenylphenyl ether	249.1	310.14							40	98	50	40	98	50
9	101-84-8	Diphenyl ether	170.2	498							40	98	50	40	98	50
10	106-35-4	3-Heptanone	114.2	147							2	80	5	2	80	5
11	106-42-3	p-Xylene (Dimethyl benzene)	106.2	138.3							2	80	5	2	80	5
12	106-46-7	1,4-Dichlorobenzene	147.0	173.4							10	95	20	10	95	20
13	106-88-7	1,2-Epoxybutane	72.1	63.3	0.36719	0.37654	-0.0236	0.93	(0.07)	(7.88)	1	50	2	0.5	20	1.25
14	106-93-4	Ethylene dibromide (Dibromoethane)	187.9	131.7	1.44231	0.255	-0.02666	14.48	9.48	65.46	5	90	10	5	90	10
15	106-97-8	Butane	58.1	-0.45	0.03071	0.34304	-0.01596	0.47	0.47	100.00	0	0	1	0	0	1
16	106-99-0	1,3-Butadiene	54.1	-4.4	-0.03359	0.34764	-0.01297	0.40	0.40	100.00	0	0	1	0	0	1
17	107-02-8	Acrolein	56.1	52.7	-0.29632	0.49437	-0.02471	0.15	(0.85)	(553.73)	1	50	2	0	0	1
18	107-05-1	3-Chloropropene (Allyl chloride)	76.5	44	0.32792	0.36553	-0.01853	0.88	0.38	43.10	0.5	20	1.25	0.5	20	1.25
19	107-06-2	1,2-Dichloroethane (Ethylene chloride)	99.0	83.5	0.55343	0.37072	-0.02161	1.45	0.45	30.99	1	50	2	1	50	2
20	107-12-0	Propionitrile	55.1	97.2	0.05925	0.51747	-0.03781	0.32	(0.68)	(213.35)	1	50	2	0	0	1
21	107-13-1	Acrylonitrile	53.1	77.3	0.07669	0.49986	-0.035	0.35	(0.65)	(187.19)	1	50	2	0	0	1
22	107-18-6	2-Propene-1-ol	58.1	97	0.3239	0.49368	-0.0437	0.61	(0.39)	(63.49)	1	50	2	0.5	20	1.25
23	107-31-3	Formic acid, methyl ester	60.1	32	-0.99586	0.61693	-0.01847	0.02	(0.48)	(2039.09)	0.5	20	1.25	0	0	1
24	107-66-4	Dibutylphosphate	210.2	100							2	80	5	2	80	5
25	107-87-9	2-Pentanone	86.1	100							1	50	2	1	50	2
26	108-03-2	1-Nitropropane	89.1	131	0.91328	0.34648	-0.0373	3.38	1.38	40.91	2	80	5	2	80	5
27	108-05-4	Vinyl acetate	86.1	72.3	0.61067	0.34797	-0.02595	1.72	0.72	42.02	1	50	2	1	50	2
28	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	100.2	117.4							2	80	5	2	80	5
29	108-20-3	Bis(isopropyl)ether	102.2	68.5							1	50	2	1	50	2
30	108-38-3	m-Xylene (Dimethyl benzene)	106.2	139.1							2	80	5	2	80	5
31	108-39-4	m-Cresol	108.1	202							10	95	20	10	95	20
32	108-87-2	Methylcyclohexane	98.2	101							2	80	5	2	80	5
33	108-88-3	Toluene	92.1	110.6							2	80	5	2	80	5
34	108-90-7	Chlorobenzene	112.6	130							2	80	5	2	80	5
35	108-93-0	Cyclohexanol	100.2	161							10	95	20	10	95	20
36	108-94-1	Cyclohexanone	98.2	155.6							10	95	20	10	95	20
37	108-95-2	Phenol	94.1	181.7							10	95	20	10	95	20
38	109-66-0	n-Pentane	72.2	36.1							0.5	20	1.25	0.5	20	1.25
39	109-99-9	Tetrahydrofuran	72.1	66	0.29856	0.35648	-0.0155	0.84	(0.16)	(18.42)	1	50	2	0.5	20	1.25
40	110-12-3	5-Methyl-2-hexanone	114.2	144							2	80	5	2	80	5
41	110-43-0	2-Heptanone	114.2	150							2	80	5	2	80	5
42	110-54-3	n-Hexane	86.2	69							1	50	2	1	50	2
43	110-62-3	n-Valeraldehyde	86.1	103							2	80	5	2	80	5
44	110-82-7	Cyclohexane	84.2	80.7							1	50	2	1	50	2
45	110-83-8	Cyclohexene	82.1	83							1	50	2	1	50	2
46	110-86-1	Pyridine	79.1	115.2							2	80	5	2	80	5
47	111-65-9	n-Octane	114.2	126							2	80	5	2	80	5
48	111-76-2	Ethylene glycol monobutyl ether	118.0	171							10	95	20	10	95	20
49	111-84-2	n-Nonane	128.3	150.8							10	95	20	10	95	20
50	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	390.5	386.9							40	98	50	40	98	50
51	117-84-0	n-Dioctyl phthalate	390.6	220							40	98	50	40	98	50
53	120-12-7	Anthracene	178.2	340							40	98	50	40	98	50

Table 3-1 COPCs

no of compo und	CAS	Compound Name (COPC)	MW	Boiling pt.	Yaws capacity correlation carbon loading quadratic constants			assumed outlet equilibrium of isotherm-PPMV (y)	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001)			estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995)		
								0.10			Estimated Carbon Capacity	Predicted RE	DF	Estimated Carbon Capacity	Predicted RE	DF
			g/mol	deg C	A	B	C	g ads/100 g carbon			g/100 g C	%	mass in / mass out	g/100 g C	%	mass in / mass out
54	120-82-1	1,2,4-Trichlorobenzene	181.5	214.4							40	98	50	40	98	50
55	120-83-2	2,4-Dichlorophenol	163.0	210							40	98	50	40	98	50
56	121-44-8	Triethylamine	101.2	88.9							1	50	2	1	50	2
57	121-69-7	Dimethylaniline	121.2	194							10	95	20	10	95	20
58	122-39-4	N,N-Diphenylamine	169.2	302							40	98	50	40	98	50
59	123-19-3	4-Heptanone	114.2	144							2	80	5	2	80	5
60	123-38-6	n-Propionaldehyde	58.1	49	0.05519	0.49738	-0.04331	0.33	(0.17)	(52.92)	0.5	20	1.25	0	0	1
61	123-51-3	3-Methyl-1-butanol	88.2	130							2	80	5	2	80	5
62	123-86-4	Acetic acid n-butyl ester	116.2	126.1							2	80	5	2	80	5
63	123-91-1	1,4-Dioxane	88.1	101.1	0.66781	0.36208	-0.03034	1.89	(0.11)	(6.08)	2	80	5	1	50	2
64	126-73-8	Tributyl phosphate	266.3	289							40	98	50	40	98	50
65	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	67.1	90.3	0.46655	0.3889	-0.03042	1.11	0.11	10.30	1	50	2	1	50	2
66	127-18-4	Perchloroethylene (tetrachloroethylene)	165.9	121.1	1.40596	0.20802	-0.02097	15.03	10.03	66.73	5	90	10	5	90	10
67	127-19-5	N,N-Dimethylacetamide	87.1	166	1.20026	0.25124	-0.03263	8.25	(1.75)	(21.23)	10	95	20	5	90	10
68	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	220.4	265							40	98	50	40	98	50
69	129-00-0	Pyrene	202.2	404							40	98	50	40	98	50
70	1321-64-8	Pentachloronaphthalene	300.4	327							40	98	50	40	98	50
71	1321-65-9	Trichloronaphthalene	231.5	304							40	98	50	40	98	50
72	132-64-9	Dibenzofuran	168.2	285							40	98	50	40	98	50
73	1335-87-1	Hexachloronaphthalene	334.8	343							40	98	50	40	98	50
74	1335-88-2	Tetrachloronaphthalene	266.0	316							40	98	50	40	98	50
75	1336-36-3	Polychlorinated biphenyls (PCBs)	322.0	>195							40	98	50	40	98	50
76	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	88.1	77.1	0.63612	0.34441	-0.02691	1.84	0.84	45.65	1	50	2	1	50	2
77	141-79-7	4-Methyl-3-penten-2-one	98.2	127							2	80	5	2	80	5
78	142-82-5	n-Heptane	100.2	98.4							1	50	2	1	50	2
79	144-62-7	Oxalic acid	90.0	190							10	95	20	10	95	20
80	156-60-5	trans-1,2-Dichloroethylene	97.0	47.5	0.47567	0.39061	-0.02554	1.15	0.65	56.40	0.5	20	1.25	0.5	20	1.25
82	1634-04-4	Methyl tert-butyl ether	88.2	55.2							1	50	2	1	50	2
84	189-55-9	Dibenzo[a,i]pyrene	302.4	404							40	98	50	40	98	50
85	189-64-0	Dibenzo[a,h]pyrene	302.4	404							40	98	50	40	98	50
86	191-24-2	Benzo(g,h,i)perylene	276.3	500							40	98	50	40	98	50
87	191-30-0	Benzo[a,j]pyrene	302.4	404							40	98	50	40	98	50
88	192-65-4	Dibenzo[a,e]pyrene	302.4	sublimes							40	98	50	40	98	50
89	193-39-5	Indeno(1,2,3-cd)pyrene	276.3	536							40	98	50	40	98	50
92	206-44-0	Fluoranthene	202.3	375							40	98	50	40	98	50
94	208-96-8	Acenaphthylene	152.2	265							40	98	50	40	98	50
96	2234-13-1	Octachloronaphthalene	403.7	440							40	98	50	40	98	50
97	224-42-0	Dibenz[a,j]acridine	279.3	>346							40	98	50	40	98	50
98	226-36-8	Dibenz[a,h]acridine	279.3	>346							40	98	50	40	98	50
100	25551-13-7	Trimethyl benzene	120.2	164.7							10	95	20	10	95	20
101	26140-60-3	Terphenyls	230.3	337							40	98	50	40	98	50
102	27154-33-2	Trichlorofluoroethane	151.4	146.5							5	90	10	5	90	10
103	287-92-3	Cyclopentane	70.1	49							0.5	20	1.25	0.5	20	1.25
108	3697-24-3	5-Methylchrysene	242.3	404							40	98	50	40	98	50
109	3825-26-1	Ammonium perfluorooctanoate	431.1	192							20	98	50	20	98	50
110	4170-30-3	2-Butenaldehyde (2-Butenal)	70.1	102	0.68353	0.3656	-0.034	1.92	(0.08)	(4.02)	2	80	5	1	50	2
112	50-00-0	Formaldehyde	30.0	-19.5	-2.48524	0.69123	-0.00375	0.00	0.00	100.00	0	0	1	0	0	1
114	50-32-8	Benzo(a)pyrene	252.3	495							40	98	50	40	98	50
115	53-70-3	Dibenzo(a,h)anthracene	278.3	524							40	98	50	40	98	50
116	540-59-0	1,2-Dichloroethylene	96.9	48	0.47567	0.39061	-0.02554	1.15	0.65	56.40	0.5	20	1.25	0.5	20	1.25
117	540-84-1	2,2,4-Trimethylpentane	114.2	99.2							1	50	2	1	50	2

Table 3-1 COPCs

no of compo und	CAS	Compound Name (COPC)	MW	Boiling pt.	Yaws capacity correlation carbon loading quadratic constants			assumed outlet equilibrium of isotherm-PPMV (y)	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001)			estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995)		
								0.10			Estimated Carbon Capacity	Predicted RE	DF	Estimated Carbon Capacity	Predicted RE	DF
			g/mol	deg C	A	B	C	g ads/100 g carbon			g/100 g C	%	mass in / mass out	g/100 g C	%	mass in / mass out
118	541-73-1	1,3-Dichlorobenzene	147.0	173							10	95	20	10	95	20
119	56-23-5	Carbon tetrachloride	153.8	76.7	1.07481	0.28186	-0.02276	5.89	3.89	66.05	2	80	5	2	80	5
120	563-80-4	3-Methyl-2-butanone	86.1	94							1	50	2	1	50	2
121	56-49-5	3-Methylcholanthrene	268.4	280							40	98	50	40	98	50
123	57-14-7	1,1-Dimethylhydrazine	60.1	63							1	50	2	1	50	2
125	58-90-2	2,3,4,6-Tetrachlorophenol	231.9	150							5	90	10	5	90	10
126	591-78-6	2-Hexanone	100.2	127							2	80	5	2	80	5
127	59-50-7	4-Chloro-3-methylphenol	142.6	235							10	95	20	10	95	20
128	59-89-2	N-Nitrosomorpholine	116.1	224							10	95	20	10	95	20
129	602-87-9	5-Nitroacenaphthene	199.2	279							40	98	50	40	98	50
130	60-29-7	Ethyl ether	74.1	34.6	0.23477	0.36044	-0.02236	0.71	0.21	29.69	0.5	20	1.25	0.5	20	1.25
131	603-34-9	Triphenylamine	245.3	347							40	98	50	40	98	50
132	60-34-4	Methylhydrazine	46.1	87.8							0	0	1	0	0	1
133	60-35-5	Acetamide	59.1	221	1.23333	0.21723		10.38	0.38	3.64	10	95	20	10	95	20
135	621-64-7	Di-n-Propylnitrosamine	130.2	206							10	95	20	10	95	20
136	624-83-9	Methyl isocyanate	57.1	39	-1.07579	0.85881	-0.06876	0.01	(0.49)	(4938.83)	0.5	20	1.25	0	0	1
137	627-13-4	Nitric acid, propyl ester	105.1	110							2	80	5	2	80	5
138	62-75-9	N-Nitroso-N,N-dimethylamine	74.1	153							2	95	20	2	95	20
139	630-20-6	1,1,1,2-Tetrachloroethane	167.9	130.5							5	90	10	5	90	10
140	64-17-5	Ethyl alcohol	46.1	78.3	-0.51153	0.67525	-0.04473	0.06	0.06	100.00	0	0	1	0	0	1
141	64-18-6	Formic acid	46.0	100.7	-1.77731	1.09503	-0.06354	1.16E-03	0.00	100.00	0	0	1	0	0	1
142	64-19-7	Acetic acid	60.1	118	-0.05553	0.6841	-0.06071	0.16	(1.84)	(1162.90)	2	80	5	0	0	1
143	67-56-1	Methyl alcohol (Methanol)	32.0	64.6							0	0	1	0	0	1
144	67-63-0	2-Propyl alcohol (Isopropanol)	60.1	82.4	0.27183	0.46419	-0.03682	0.59	(0.41)	(69.50)	1	50	2	0.5	20	1.25
145	67-64-1	2-Propanone (Acetone)	58.1	56.2	-0.14546	0.47497	-0.02286	0.23	(0.77)	(339.84)	1	50	2	0	0	1
146	67-66-3	Chloroform	119.4	61.7	0.67102	0.36148	-0.02288	1.93	0.93	48.32	1	50	2	1	50	2
147	67-72-1	Hexachloroethane	236.7	sublimes							40	98	50	40	98	50
148	684-16-2	Hexafluoroacetone	166.0	-26							0	0	1	0	0	1
149	71-23-8	n-Propyl alcohol	60.1	97.2	0.38644	0.48033	-0.04505	0.73	(0.27)	(37.70)	1	50	2	0.5	20	1.25
150	71-36-3	n-Butyl alcohol	74.1	117.6	0.89881	0.32534	-0.03648	3.44	1.44	41.92	2	80	5	2	80	5
151	71-43-2	Benzene	78.1	80.1							1	50	2	1	50	2
152	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	133.4	74.1	0.97331	0.28737	-0.02277	4.60	3.60	78.28	1	50	2	1	50	2
157	74-83-9	Bromomethane (Methyl bromide)	95.0	3.56	-1.23835	0.78564	-0.05521	0.01	0.01	100.00	0	0	1	0	0	1
158	74-87-3	Chloromethane (Methyl chloride)	50.5	-24.2	-1.91871	0.62053	-0.00549	0.00	0.00	100.00	0	0	1	0	0	1
159	74-97-5	Bromochloromethane	129.4	67.8	0.61399	0.41353	-0.02531	1.50	0.50	33.19	1	50	2	1	50	2
160	74-99-7	Methylacetylene	40.1	-23	-2.52865	1.74715	-0.21635	0.00	0.00	100.00	0	0	1	0	0	1
161	75-00-3	Chloroethane	64.5	12.3	-0.50828	0.50364	-0.02179	0.09	0.09	100.00	0	0	1	0	0	1
162	75-01-4	Vinyl chloride (1-Chloroethene)	62.5	-13.9	-0.98889	0.66564	-0.0432	0.02	0.02	100.00	0	0	1	0	0	1
163	75-05-8	Acetonitrile	41.1	81.6	-0.79666	0.63512	-0.02598	0.03	0.03	100.00	0	0	1	0	0	1
164	75-07-0	Acetaldehyde	44.1	20.1	-1.17047	0.62766	-0.02475	0.02	0.02	100.00	0	0	1	0	0	1
165	75-09-2	Dichloromethane (Methylene chloride)	84.9	39.8	-0.07043	0.4921	-0.02276	0.26	(0.24)	(92.42)	0.5	20	1.25	0	0	1
166	75-12-7	Formamide	45.0	210	1.30981	0.25274		11.40	11.40	100.00	0	0	1	0	0	1
167	75-15-0	Carbon disulfide	76.1	46.2							0.5	20	1.25	0.5	20	1.25
168	75-21-8	Ethylene oxide (Oxirane)	44.1	10.7	-2.42379	0.94878	-0.04062	0.00	0.00	100.00	0	0	1	0	0	1
169	75-27-4	Bromodichloromethane	163.8	90.1							2	80	5	2	80	5
170	75-34-3	1,1-Dichloroethane	99.0	57.3	0.54485	0.36091	-0.02192	1.45	0.45	31.14	1	50	2	1	50	2
171	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	97.0	31.7							0.5	20	1.25	0.5	20	1.25
172	75-43-4	Dichlorofluoromethane	102.9	9							0	0	1	0	0	1
173	75-45-6	Chlorodifluoromethane	86.5	-40.8							0	0	1	0	0	1
174	75-50-3	Trimethylamine	59.1	2.87	-0.09422	0.32583	-0.00337	0.38	0.38	100.00	0	0	1	0	0	1
175	75-52-5	Nitromethane	61.0	101	-0.32847	0.70602	-0.05111	0.08	(1.92)	(2335.73)	2	80	5	0	0	1

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								0.10			Estimated Carbon Capacity	Predicted RE	DF	Estimated Carbon Capacity	Predicted RE	DF
			g/mol	deg C	A	B	C	g ads/100 g carbon			g/100 g C	%	mass in / mass out	g/100 g C	%	mass in / mass out
176	75-55-8	2-Methylaziridine	57.1	66	0.06919	0.43529	-0.02293	0.41	(0.59)	(144.92)	1	50	2	0	0	1
177	75-61-6	Difluorodibromomethane	209.8	24	0.82076	0.30701	-0.01384	3.16	3.16	100.00	0	0	1	0	0	1
178	75-63-8	Trifluorobromomethane	148.9	-57.8							0	0	1	0	0	1
179	75-65-0	2-Methyl-2-propanol	74.1	82.2							1	50	2	1	50	2
180	75-69-4	Trichlorofluoromethane	137.4	23.8	0.17307	0.40715	-0.01915	0.56	0.56	100.00	0	0	1	0	0	1
181	75-71-8	Dichlorodifluoromethane	120.9	-29.79	-0.0735	0.40145	-0.01404	0.32	0.32	100.00	0	0	1	0	0	1
183	76-03-9	Trichloroacetic acid	163.4	196							20	98	50	20	98	50
184	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	203.8	91							2	80	5	2	80	5
185	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	203.8	93	1.37307	0.17625	-0.01465	15.21	13.21	86.85	2	80	5	2	80	5
186	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	187.4	47.6	1.27368	0.18656	-0.01231	11.88	10.88	91.58	1	50	2	1	50	2
187	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	170.9	3.8							0	0	1	0	0	1
188	76-15-3	Chloropentafluoroethane	154.5	-39.1	0.08264	0.34756	-0.01343	0.53	0.53	100.00	0	0	1	0	0	1
190	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	74.1	107.9	0.84818	0.33155	-0.03559	3.03	1.03	33.93	2	80	5	2	80	5
191	78-87-5	1,2-Dichloropropane	113.0	96.8	0.98872	0.287	-0.02571	4.74	3.74	78.91	1	50	2	1	50	2
192	78-92-2	1-Methylpropyl alcohol (2-Butanol)	74.1	99.5	0.76814	0.34611	-0.03478	2.44	1.44	59.00	1	50	2	1	50	2
193	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	72.1	79.6	0.46525	0.37688	-0.02801	1.15	0.15	12.98	1	50	2	1	50	2
194	79-00-5	1,1,2-Trichloroethane	133.4	113.8	1.17163	0.27791	-0.02746	7.35	5.35	72.79	2	80	5	2	80	5
195	79-01-6	Trichloroethylene	131.4	86.7	1.02411	0.29929	-0.02539	5.01	4.01	80.02	1	50	2	1	50	2
196	79-09-4	Propionic acid	74.1	140.7	0.77846	0.4457	-0.05209	1.91	(0.09)	(4.80)	2	80	5	1	50	2
197	79-10-7	2-Propenoic acid	72.1	141.6	0.75549	0.47108	-0.05615	1.69	(0.31)	(18.24)	2	80	5	1	50	2
198	79-20-9	Methyl acetate	74.1	56.9	0.13314	0.42849	-0.02188	0.48	(0.52)	(107.60)	1	50	2	0	0	1
199	79-34-5	1,1,2,2-Tetrachloroethane	167.9	146.3	1.52322	0.17848	-0.02019	21.11	16.11	76.32	5	90	10	5	90	10
202	83-32-9	Acenaphthene	154.2	279							40	98	50	40	98	50
203	84-66-2	Diethyl phthalate	222.2	298							40	98	50	40	98	50
204	84-74-2	Dibutyl phthalate	278.3	340							40	98	50	40	98	50
205	85-01-8	Phenanthrene	178.2	340							40	98	50	40	98	50
206	85-68-7	Butylbenzyl phthalate	312.4	370							40	98	50	40	98	50
207	86-73-7	Fluorene	166.2	295							40	98	50	40	98	50
208	87-68-3	Hexachlorobutadiene	260.8	210							40	98	50	40	98	50
210	88-06-2	2,4,6-Trichlorophenol	197.5	244.5							40	98	50	40	98	50
211	88-72-2	2-Nitrotoluene	137.1	221							10	95	20	10	95	20
212	88-75-5	2-Nitrophenol	139.1	214.6							10	95	20	10	95	20
214	88-89-1	Picric acid	229.1	>300							40	98	50	40	98	50
215	91-20-3	Naphthalene	128.2	218							10	95	20	10	95	20
216	91-22-5	Quinoline	129.2	238							10	95	20	10	95	20
217	91-58-7	2-Chloronapthalene	162.6	256							40	98	50	40	98	50
218	92-52-4	1,1`-Biphenyl	154.2	255							40	98	50	40	98	50
219	92-93-3	4-Nitrobiphenyl	199.2	340							40	98	50	40	98	50
223	95-13-6	Indene	116.2	181.6							10	95	20	10	95	20
224	95-47-6	o-Xylene	106.2	144							2	80	5	2	80	5
225	95-48-7	o-Cresol (2-Methylphenol)	108.1	191							10	95	20	10	95	20
226	95-49-8	2-Chlorotoluene	126.6	159							10	95	20	10	95	20
227	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	147.0	180.5							10	95	20	10	95	20
228	95-57-8	2-Chlorophenol	128.6	175.6							10	95	20	10	95	20
229	95-95-4	2,4,5-Trichlorophenol	197.5	253							40	98	50	40	98	50
230	96-18-4	1,2,3-Trichloropropane	147.4	156	1.47241	0.18136	-0.02165	18.60	8.60	46.22	10	95	20	10	95	20
231	96-22-0	3-Pentanone	86.1	101							2	80	5	2	80	5
232	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	358.5	316							40	98	50	40	98	50
233	98-51-1	p-tert-Butyltoluene	148.3	193							10	95	20	10	95	20
234	98-82-8	Cumene	120.2	151							10	95	20	10	95	20
235	98-83-9	alpha-Methylstyrene	118.2	165.4							10	95	20	10	95	20

Table 3-1 COPCs

no of compo und	CAS	Compound Name (COPC)	MW	Boiling pt.	Yaws capacity correlation carbon loading quadratic constants			assumed outlet equilibrium of isotherm-PPMV (y)	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001)			estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995)		
								0.10			Estimated Carbon Capacity	Predicted RE	DF	Estimated Carbon Capacity	Predicted RE	DF
			g/mol	deg C	A	B	C	g ads/100 g carbon			g/100 g C	%	mass in / mass out	g/100 g C	%	mass in / mass out
236	98-86-2	Acetophenone	120.5	201.7							10	95	20	10	95	20
237	98-95-3	Nitrobenzene	123.1	210.8							10	95	20	10	95	20

Table 3-2 Compounds detected >0.1 ppm

no of compound	CAS	Compound Name (COPC)	MW	Boiling pt.	carbon loading estimate constants A	B	C	assumed outlet equilibrium of isotherm PPMV (y) 0.100 g ads/100 g carbon	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001) Estimated Carbon Capacity g/100 g C	Predicted RE %	DF mass in / mass out	estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995) Estimated Carbon Capacity g/100 g C	Predicted RE %	DF mass in / mass out
1	541-05-9	Cyclotrisiloxane, hexamethyl-	222.5	134							5	90	10	5	90	10
2	556-67-2	Cyclotetrasiloxane, octamethyl-	296.6	175							20	98	50	20	98	50
3	USI000-06	tetramethylcyclotrisiloxane	194.0	135							5	90	10	5	90	10
4	3622-84-2	Benzenesulfonamide, N-butyl-	213.3	314							40	98	50	40	98	50
5	5145-07-1	2(3H)-Furanone, dihydro-3,5-dimethyl-	114.1	206							10	95	20	10	95	20
6	108-47-4	Pyridine, 2,4-dimethyl-	107.2	159							10	95	20	10	95	20
7	109-99-9	Furan, tetrahydro-	72.1	66	0.29856	0.35648	-0.0155	0.844	(0.156)	-18.42	1	50	2	0.5	20	1.25
8	110-00-9	Furan	68.1	31.4	0.04084	0.40613	-0.0162	0.415	(0.085)	-20.35	0.5	20	1.25	0	0	1
9	110-86-1	Pyridine	79.1	115.2							2	80	5	2	80	5
10	1708-29-8	Furan, 2,5-dihydro-	70.1	67	0.3399	0.40041	-0.02451	0.822	(0.178)	-21.62	1	50	2	0.5	20	1.25
11	24405-16-	2H-Pyran-2-one, tetrahydro-5,6-dimethyl-, trans-	128.2	180							10	95	20	10	95	20
12	289-95-2	Pyrimidine	80.1	123							2	80	5	2	80	5
13	290-37-9	Pyrazine	80.1	115							2	80	5	2	80	5
14	534-22-5	Furan, 2-methyl-	82.1	63							1	50	2	1	50	2
15	930-22-3	Oxirane, ethenyl-	70.1	67							1	50	2	1	50	2
16	96-48-0	2(3H)-Furanone, dihydro- (gamma butyrolactone)	86.1	205	1.29434	0.29719	-0.04658	8.924	(1.076)	-12.05	10	95	20	5	90	10
17	3457-90-7	1,3-Propanediol, dinitrate	166.1	100							2	80	5	2	80	5
18	3457-91-8	1,4-Butanediol, dinitrate	180.1	130							5	90	10	5	90	10
19	544-16-1	Nitrous acid, butyl ester	103.1	78							1	50	2	1	50	2
20	624-91-9	Nitrous acid, methyl ester	61.0	64.6							1	50	2	1	50	2
21	625-58-1	Nitric acid, ethyl ester	91.1	88							1	50	2	1	50	2
22	627-05-4	Butane, 1-nitro-	103.1	153							10	95	20	10	95	20
23	627-13-4	Nitric acid, propyl ester	105.1	110							2	80	5	2	80	5
24	62-75-9M	Methanamine, N-methyl-N-nitroso- and others	74.1	153							10	95	20	10	95	20
25	928-45-0	Nitric acid, butyl ester	119.1	136							2	80	5	2	80	5
26	123-75-1	Pyrrolidine	71.1	87	0.60693	0.36363	-0.03004	1.634	0.634	38.80	1	50	2	1	50	2
27	22431-09-(	Methanamine, N-(1-methylbutylidene)-	99.2	130							2	80	5	2	80	5
28	616-45-5	2-Pyrrolidinone	85.1	245							10	95	20	10	95	20
29	75-50-3	Methanamine, N,N-dimethyl-	59.1	2.9	-0.09422	0.32583	-0.00337	0.377	0.377	100.00	0	0	1	0	0	1
30	107-12-0	Propanenitrile	55.1	97	0.05925	0.51747	-0.03781	0.319	(0.681)	-213.35	1	50	2	0	0	1
31	109-74-0	Butanenitrile	69.1	118	0.64311	0.38787	-0.03822	1.648	(0.352)	-21.34	2	80	5	1	50	2
32	110-59-8	Pentanenitrile	83.1	139							2	80	5	2	80	5
33	124-12-9	Octanenitrile	125.2	199							10	95	20	10	95	20
34	2243-27-8	Nonanenitrile	139.2	224							10	95	20	10	95	20
35	628-73-9	Hexanenitrile	97.2	162							10	95	20	10	95	20
36	629-08-3	Heptanenitrile	111.2	180							10	95	20	10	95	20
37	75-05-8	Acetonitrile	41.1	81	-0.79666	0.63512	-0.02598	0.035	(0.965)	-2769.19	1	50	2	0	0	1
38	109-21-7	Butanoic acid, butyl ester	144.2	166							10	95	20	10	95	20
39	110-27-0	Tetradecanoic acid, 1-methylethyl ester	270.5	300							40	98	50	40	98	50
40	123-25-1	Butanedioic acid, diethyl ester	174.2	217							40	98	50	40	98	50
41	123-86-4	Acetic acid, butyl ester	116.2	126							2	80	5	2	80	5
42	126-73-8	Phosphoric acid tributyl ester	266.3	289							40	98	50	40	98	50
43	141-78-6	Acetic acid ethyl ester	88.1	77.1	0.63612	0.34441	-0.02691	1.840	0.840	45.65	1	50	2	1	50	2
44	1838-59-1	Formic acid, 2-propenyl ester	86.1	83							1	50	2	1	50	2
45	590-01-2	Propanoic acid, butyl ester	130.2	145							2	80	5	2	80	5
46	591-87-7	Acetic acid, 2-propenyl ester	100.1	103							2	80	5	2	80	5
47	592-84-7	Formic acid, butyl ester	102.1	107							2	80	5	2	80	5
48	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester	222.2	298							40	98	50	40	98	50
49	1002-84-2	Pentadecanoic acid	242.4	339							40	98	50	40	98	50

Table 3-2 Compounds detected >0.1 ppm

no of compound	CAS	Compound Name (COPC)	MW	Boiling pt.	carbon loading estimate constants A	B	C	assumed outlet equilibrium of isotherm PPMV (y) 0.100 g ads/100 g carbon	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001) Estimated Carbon Capacity g/100 g C	Predicted RE %	DF mass in / mass out	estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995) Estimated Carbon Capacity g/100 g C	Predicted RE %	DF mass in / mass out
50	107-92-6	Butanoic acid	88.1	163.5	1.22589	0.26481	-0.03737	8.389	(1.611)	-19.20	10	95	20	5	90	10
51	2091-29-4	9-Hexadecenoic acid	254.4	350							40	98	50	40	98	50
52	544-63-8	Tetradecanoic acid	228.4	326							40	98	50	40	98	50
53	57-10-3	Hexadecanoic acid	256.4	399							40	98	50	40	98	50
54	64-19-7	Acetic acid	60.1	118	-0.05553	0.6841	-0.06071	0.158	(1.842)	-1162.90	2	80	5	0	0	1
55	105-42-0	2-Hexanone, 4-methyl-	114.2	140							2	80	5	2	80	5
56	106-35-4	3-Heptanone	114.2	147							2	80	5	2	80	5
57	106-68-3	3-Octanone	128.2	166							10	95	20	10	95	20
58	107-87-9	2-Pentanone	86.1	102							2	80	5	2	80	5
59	108-10-1	2-Pentanone, 4-methyl- (MIBK)	100.2	117.4							2	80	5	2	80	5
60	110-43-0	2-Heptanone	114.2	150							2	80	5	2	80	5
61	111-13-7	2-Octanone	128.2	173							10	95	20	10	95	20
62	112-12-9	2-Undecanone	170.3	229							40	98	50	40	98	50
63	123-19-3	4-Heptanone	114.2	144							2	80	5	2	80	5
64	1534-26-5	3-Tridecanone	198.4	263							40	98	50	40	98	50
65	1534-27-6	3-Dodecanone	184.3	250							40	98	50	40	98	50
66	15932-80-(	Cyclohexanone, 5-methyl-2-(1-methylethylidene)-	152.2	224							40	98	50	40	98	50
67	22026-12-(	6-Tridecanone	198.4	263							40	98	50	40	98	50
68	2216-87-7	3-Undecanone	170.3	227							40	98	50	40	98	50
69	50639-02-(	5-Undecanone, 2-methyl-	184.3	210							40	98	50	40	98	50
70	563-80-4	2-Butanone, 3-methyl-	86.1	94							1	50	2	1	50	2
71	589-38-8	3-Hexanone	100.2	123							2	80	5	2	80	5
72	589-63-9	4-Octanone	128.2	166							10	95	20	10	95	20
73	591-78-6	2-Hexanone	100.2	127							2	80	5	2	80	5
74	593-08-8	2-Tridecanone	198.4	255							40	98	50	40	98	50
75	629-23-2	3-Tetradecanone	212.4	263							40	98	50	40	98	50
76	67-64-1	2-Propanone	58.1	56	-0.14546	0.47497	-0.02286	0.227	(0.773)	-339.84	1	50	2	0	0	1
77	763-93-9	3-Hexen-2-one	98.1	140							2	80	5	2	80	5
78	78-93-3	2-Butanone	72.1	80	0.46525	0.37688	-0.02801	1.149	0.149	12.98	1	50	2	1	50	2
79	78-94-4	3-Buten-2-one	70.1	82							1	50	2	1	50	2
80	821-55-6	2-Nonanone	142.2	195							10	95	20	10	95	20
81	89-82-7	Cyclohexanone, 5-methyl-2-(1-methylethylidene)	152.2	224							40	98	50	40	98	50
82	925-78-0	3-Nonanone	142.2	188							10	95	20	10	95	20
83	928-68-7	2-Heptanone, 6-methyl-	128.2	165							10	95	20	10	95	20
84	98-86-2	Ethanone, 1-phenyl-	120.2	201.7							10	95	20	10	95	20
85	110-62-3	Pentanal	86.1	103							2	80	5	2	80	5
86	111-71-7	Heptanal	114.2	153							10	95	20	10	95	20
87	123-38-6	Propanal	58.1	49	0.05519	0.49738	-0.04331	0.327	(0.173)	-52.92	0.5	20	1.25	0	0	1
88	123-72-8	Butanal	72.1	76	0.45056	0.37372	-0.02689	1.122	0.122	10.86	1	50	2	1	50	2
89	124-13-0	Octanal	128.2	171							10	95	20	10	95	20
90	124-19-6	Nonanal	142.2	93							1	50	2	1	50	2
91	19269-28-(	Hexanal, 3-methyl-	114.2	143							2	80	5	2	80	5
92	66-25-1	Hexanal	100.2	131							2	80	5	2	80	5
93	75-07-0	Acetaldehyde	44.1	20.1	-1.17047	0.62766	-0.02475	0.015	0.015	100.00	0	0	1	0	0	1
94	104-76-7	1-Hexanol, 2-ethyl-	130.2	183							10	95	20	10	95	20
95	111-70-6	1-Heptanol	116.2	176							10	95	20	10	95	20
96	112-92-5	1-Octadecanol	270.5	336							40	98	50	40	98	50
97	14898-79-(	2-Butanol	74.1	100	0.76814	0.34611	-0.03478	2.439	1.439	59.00	1	50	2	1	50	2
98	2136-70-1	Ethanol, 2-(tetradecyloxy)-	258.4	253							40	98	50	40	98	50

Table 3-2 Compounds detected >0.1 ppm

no of compound	CAS	Compound Name (COPC)	MW	Boiling pt.	carbon loading estimate constants A	B	C	assumed outlet equilibrium of isotherm PPMV (y) 0.100 g ads/100 g carbon	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001) Estimated Carbon Capacity g/100 g C	Predicted RE %	DF mass in / mass out	estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995) Estimated Carbon Capacity g/100 g C	Predicted RE %	DF mass in / mass out
99	36653-82-4	1-Hexadecanol	242.4	344							40	98	50	40	98	50
100	51411-24-6	6,10-Dodecadien-1-ol, 3,7,11-trimethyl-	224.4	216							40	98	50	40	98	50
101	57-55-6	1,2-Propanediol	76.1	187.6							10	95	20	10	95	20
102	598-32-3	3-Buten-2-ol	72.1	96							1	50	2	1	50	2
103	6032-29-7	2-Pentanol	88.2	118							2	80	5	2	80	5
104	627-27-0	3-Buten-1-ol	72.1	113							2	80	5	2	80	5
105	64-17-5	Ethanol	46.1	78.3	-0.51153	0.67525	-0.04473	0.059	(0.941)	-1604.16	1	50	2	0	0	1
106	67-56-1	Methanol	32.0	64.6	-1.96739	0.82107	-0.01393	0.002	(0.998)	-63343.92	1	50	2	0	0	1
107	67-63-0	2-Propanol	60.1	82.4	0.27183	0.46419	-0.03682	0.590	(0.410)	-69.50	1	50	2	0.5	20	1.25
108	71-23-8	1-Propanol	60.1	97.2	0.38644	0.48033	-0.04505	0.726	(0.274)	-37.70	1	50	2	0.5	20	1.25
109	75-65-0	2-Propanol, 2-methyl-	74.1	82.2							1	50	2	1	50	2
110	75-84-3	1-Propanol, 2,2-dimethyl-	88.2	113							2	80	5	2	80	5
111	75-85-4	2-Butanol, 2-methyl-	88.2	102							2	80	5	2	80	5
112	78-92-2	2-Butanol	74.1	99.5	0.76814	0.34611	-0.03478	2.439	1.439	59.00	1	50	2	1	50	2
113	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	260.8	210							40	98	50	40	98	50
114	96-41-3	Cyclopentanol	86.1	139							2	80	5	2	80	5
115	1184-60-7	1-Propene, 2-fluoro-	60.1	-24							0	0	1	0	0	1
116	127-18-4	Ethene, tetrachloro-	165.8	121.1	1.40596	0.20802	-0.02097	15.030	10.030	66.73	5	90	10	5	90	10
117	156-59-2	Ethene, 1,2-dichloro-, (Z)-	96.9	60	0.47567	0.39061	-0.02554	1.147	0.147	12.81	1	50	2	1	50	2
118	1717-00-6	Ethane, 1,1-dichloro-1-fluoro- (freon 14b)	117.0	32							0.5	20	1.25	0.5	20	1.25
119	56-23-5	Methane, tetrachloro-	153.8	76.7	1.07481	0.28186	-0.02273	5.891	3.891	66.05	2	80	5	2	80	5
120	74-87-3	Methane, chloro- (R-40)	50.5	-24.2	-1.91871	0.62053	-0.00549	0.003	0.003	100.00	0	0	1	0	0	1
121	75-02-5	Ethene, fluoro-	46.0	-72							0	0	1	0	0	1
122	75-09-2	Methane, dichloro-	84.9	39.8	-0.07043	0.4921	-0.02276	0.260	(0.240)	-92.42	0.5	20	1.25	0	0	1
123	75-45-6	Methane, chlorodifluoro- (R-22)	86.5	-40.8							0	0	1	0	0	1
124	75-68-3	Ethane, 1-chloro-1,1-difluoro- (R-142)	100.5	-10							0	0	1	0	0	1
125	75-69-4	Methane, trichlorofluoro- (R-11)	137.4	23.7	0.17307	0.40715	-0.01915	0.558	0.558	100.00	0	0	1	0	0	1
126	6031-02-3	Benzene, (1-methylpentyl)-	162.3	208							40	98	50	40	98	50
127	100-41-4	Benzene, ethyl-	106.2	136.2							2	80	5	2	80	5
128	100-42-5	Benzene, ethenyl-	104.2	145.2							2	80	5	2	80	5
129	106-42-3	Benzene, 1,4-dimethyl-	106.2	138							2	80	5	2	80	5
130	108-38-3	Benzene, 1,3-dimethyl-	106.2	139.1							2	80	5	2	80	5
131	108-88-3	Benzene, methyl-	92.1	110.6							2	80	5	2	80	5
132	3290-53-7	Benzene, (2-methyl-2-propenyl)-	132.2	183							10	95	20	10	95	20
133	538-68-1	Benzene, pentyl-	148.3	205							10	95	20	10	95	20
134	637-50-3	Benzene, 1-propenyl-	118.2	175.5							10	95	20	10	95	20
135	643-58-3	1,1`-Biphenyl, 2-methyl-	168.2	255							40	98	50	40	98	50
136	71-43-2	Benzene	78.1	80.1							1	50	2	1	50	2
137	92-52-4	1,1`-Biphenyl	154.2	255							40	98	50	40	98	50
138	95-47-6	Benzene, 1,2-dimethyl-	106.2	144							2	80	5	2	80	5
139	74-99-7	1-Propyne	40.1	-23	-2.52865	1.74715	-0.21635	0.000	0.000	100.00	0	0	1	0	0	1
140	20184-91-2	4-Nonyne	124.2	154							10	95	20	10	95	20
141	61142-40-3	4-Undecene, 4-methyl-	168.3	193							20	98	50	20	98	50
142	629-73-2	1-Hexadecene	224.4	274							40	98	50	40	98	50
143	74630-39-0	1-Undecene, 4-methyl-	168.3	193							20	98	50	20	98	50
144	74630-48-1	3-Undecene, 2-methyl-, (Z)-	168.3	193							20	98	50	20	98	50
145	764-96-5	5-Undecene, (Z)-	154.3	192.3							20	98	50	20	98	50
146	821-74-9	4,5-Nonadiene	124.2	142.5							2	80	5	2	80	5
147	1008-80-6	Naphthalene, decahydro-2,3-dimethyl-	166.3	187							20	98	50	20	98	50

Table 3-2 Compounds detected >0.1 ppm

no of compound	CAS	Compound Name (COPC)	MW	Boiling pt.	carbon loading estimate constants			assumed outlet equilibrium of isotherm PPMV (y)	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001)			estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995)		
								0.100			Estimated Carbon Capacity	Predicted RE	DF	Estimated Carbon Capacity	Predicted RE	DF
					A	B	C	g ads/100 g carbon			g/100 g C	%	mass in / mass out	g/100 g C	%	mass in / mass out
148	108-87-2	Cyclohexane, methyl-	98.2	101							2	80	5	2	80	5
149	110-82-7	Cyclohexane	84.2	80.7							1	50	2	1	50	2
150	1472-09-9	Cyclopropane, octyl-	154.3	150.8							20	98	50	20	98	50
151	1618-22-0	Naphthalene, decahydro-2,6-dimethyl-	166.3	187							20	98	50	20	98	50
152	1630-94-0	Cyclopropane, 1,1-dimethyl-	70.1	21							0	0	1	0	0	1
153	1678-93-9	Cyclohexane, butyl-	140.3	181							10	95	20	10	95	20
154	2415-72-7	Cyclopropane, propyl-	84.2	69							1	50	2	1	50	2
155	287-92-3	Cyclopentane	70.1	49.3							0.5	20	1.25	0.5	20	1.25
156	2883-05-8	Octane, 2-cyclohexyl-	196.4	181							20	98	50	20	98	50
157	294-62-2	Cyclododecane	168.3	239							40	98	50	40	98	50
158	2958-76-1	Naphthalene, decahydro-2-methyl-	152.3	201							40	98	50	40	98	50
159	3073-66-3	Cyclohexane, 1,1,3-trimethyl-	126.2	136.6							2	80	5	2	80	5
160	32281-85-9	Cyclopentane, 1,3-dimethyl-2-(1-methylethyl)-	140.3	92							1	50	2	1	50	2
161	3604-14-6	Naphthalene, decahydro-1,2-dimethyl-	166.3	187							20	98	50	20	98	50
162	41977-33-1	Cyclopropane, 1-pentyl-2-propyl-	154.3	151							20	98	50	20	98	50
163	4292-92-6	Cyclohexane, pentyl-	154.3	203.7							40	98	50	40	98	50
164	4806-61-5	Cyclobutane, ethyl-	84.2	71							1	50	2	1	50	2
165	493-02-7	Naphthalene, decahydro-, trans-	138.3	187.3							10	95	20	10	95	20
166	54676-39-0	Cyclohexane, 2-butyl-1,1,3-trimethyl-	182.4	203.7							40	98	50	40	98	50
167	55937-92-3	Bicyclo[4.1.0]heptane, 2-methyl-7-pentyl-	180.3	203.7							40	98	50	40	98	50
168	594-11-6	Cyclopropane, methyl-	56.1	0.7							0	0	1	0	0	1
169	598-61-8	Cyclobutane, methyl-	70.1	36.3							0.5	20	1.25	0.5	20	1.25
170	61142-20-9	Cyclohexane, (4-methylpentyl)-	168.3	203.7							40	98	50	40	98	50
171	7058-01-7	Cyclohexane, (1-methylpropyl)-	140.3	179.3							10	95	20	10	95	20
172	7094-26-0	Cyclohexane, 1,1,2-trimethyl-	126.2	145.2							2	80	5	2	80	5
173	822-50-4	Cyclopentane, 1,2-dimethyl-, trans-	98.2	92							1	50	2	1	50	2
174	1002-43-3	Undecane, 3-methyl-	170.3	195							20	98	50	20	98	50
175	106-97-8	Butane	58.1	-0.45	0.03071	0.34304	-0.01596	0.470	0.470	100.00	0	0	1	0	0	1
176	107-83-5	Pentane, 2-methyl-	86.2	62							1	50	2	1	50	2
177	108-08-7	Pentane, 2,4-dimethyl-	100.2	81							1	50	2	1	50	2
178	109-66-0	Pentane	72.2	36.1							0.5	20	1.25	0.5	20	1.25
179	110-54-3	Hexane	86.2	69							1	50	2	1	50	2
180	111-65-9	Octane	114.2	126							2	80	5	2	80	5
181	111-84-2	Nonane	128.3	150.8							10	95	20	10	95	20
182	1120-21-4	Undecane	156.3	195.6							20	98	50	20	98	50
183	112-40-3	Dodecane	170.3	216.3							40	98	50	40	98	50
184	124-18-5	Decane	142.3	174.1							10	95	20	10	95	20
185	13151-34-3	Decane, 3-methyl-	156.3	190							20	98	50	20	98	50
186	13151-35-4	Decane, 5-methyl-	156.3	190							20	98	50	20	98	50
187	13286-73-2	Tridecane, 3-ethyl-	212.4	252							40	98	50	40	98	50
188	13287-21-3	Tridecane, 6-methyl-	198.4	235							40	98	50	40	98	50
189	142-82-5	Heptane	100.2	98.4							1	50	2	1	50	2
190	14720-74-2	Heptane, 2,2,4-trimethyl-	142.3	148							2	80	5	2	80	5
191	1560-96-9	Tridecane, 2-methyl-	198.4	248							40	98	50	40	98	50
192	1632-70-8	Undecane, 5-methyl-	170.3	195							20	98	50	20	98	50
193	17301-23-4	Undecane, 2,6-dimethyl-	184.4	195							20	98	50	20	98	50
194	17301-25-6	Undecane, 2,8-dimethyl-	184.4	195							20	98	50	20	98	50
195	17301-27-8	Undecane, 2,10-dimethyl-	184.4	195							20	98	50	20	98	50
196	17301-29-0	Undecane, 3,7-dimethyl-	184.4	195							20	98	50	20	98	50

Table 3-2 Compounds detected >0.1 ppm

no of compound	CAS	Compound Name (COPC)	MW	Boiling pt.	carbon loading estimate constants			assumed outlet equilibrium of isotherm PPMV (y)	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001)			estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995)		
					A	B	C	0.100 g ads/100 g carbon			Estimated Carbon Capacity g/100 g C	Predicted RE %	DF mass in / mass out	Estimated Carbon Capacity g/100 g C	Predicted RE %	DF mass in / mass out
197	17301-30-1	Undecane, 3,8-dimethyl-	184.4	195							20	98	50	20	98	50
198	17301-32-9	Undecane, 4,7-dimethyl-	184.4	195							20	98	50	20	98	50
199	17301-94-9	Nonane, 4-methyl-	142.3	165.7							10	95	20	10	95	20
200	17302-28-2	Nonane, 2,6-dimethyl-	156.3	165							20	98	50	20	98	50
201	17302-32-8	Nonane, 3,7-dimethyl-	156.3	165							20	98	50	20	98	50
202	17312-50-4	Decane, 2,5-dimethyl-	170.3	195							20	98	50	20	98	50
203	17312-57-1	Dodecane, 3-methyl-	184.4	216							40	98	50	40	98	50
204	17312-60-6	Undecane, 6-ethyl-	184.4	216							40	98	50	40	98	50
205	17312-73-1	Undecane, 5,5-dimethyl-	184.4	216							40	98	50	40	98	50
206	17312-76-4	Undecane, 6,6-dimethyl-	184.4	216							40	98	50	40	98	50
207	17312-77-5	Undecane, 2,3-dimethyl-	184.4	216							40	98	50	40	98	50
208	17312-80-0	Undecane, 2,4-dimethyl-	184.4	216							40	98	50	40	98	50
209	17312-82-2	Undecane, 4,6-dimethyl-	184.4	216							40	98	50	40	98	50
210	17453-94-0	Undecane, 5-ethyl-	184.4	216							40	98	50	40	98	50
211	20278-85-1	Heptane, 2,3,5-trimethyl-	142.3	160.7							10	95	20	10	95	20
212	2213-23-2	Heptane, 2,4-dimethyl-	128.3	133							2	80	5	2	80	5
213	2216-33-3	Octane, 3-methyl-	128.3	144							2	80	5	2	80	5
214	2216-34-4	Octane, 4-methyl-	128.3	142							2	80	5	2	80	5
215	25117-24-2	Tetradecane, 4-methyl-	212.4	253.7							40	98	50	40	98	50
216	25117-31-1	Tridecane, 5-methyl-	198.4	235							40	98	50	40	98	50
217	26730-12-1	Tridecane, 4-methyl-	198.4	235							40	98	50	40	98	50
218	26730-14-3	Tridecane, 7-methyl-	198.4	235							40	98	50	40	98	50
219	2847-72-5	Decane, 4-methyl-	156.3	187							20	98	50	20	98	50
220	2980-69-0	Undecane, 4-methyl-	170.3	210							40	98	50	40	98	50
221	31295-56-4	Dodecane, 2,6,11-trimethyl-	212.4	252							40	98	50	40	98	50
222	3891-98-3	Dodecane, 2,6,10-trimethyl-	212.4	252							40	98	50	40	98	50
223	4032-93-3	Heptane, 2,3,6-trimethyl-	142.3	156							10	95	20	10	95	20
224	52896-90-9	Heptane, 3-ethyl-5-methyl-	142.3	158.2							10	95	20	10	95	20
225	544-76-3	Hexadecane	226.4	287							40	98	50	40	98	50
226	55030-62-1	Tridecane, 4,8-dimethyl-	212.4	253.7							40	98	50	40	98	50
227	55045-07-3	Dodecane, 2-methyl-8-propyl-	226.4	253.7							40	98	50	40	98	50
228	55045-11-9	Tridecane, 5-propyl-	226.4	253.7							40	98	50	40	98	50
229	562-49-2	Pentane, 3,3-dimethyl-	100.2	90							1	50	2	1	50	2
230	56292-65-0	Dodecane, 2,5-dimethyl-	198.4	235							40	98	50	40	98	50
231	565-59-3	Pentane, 2,3-dimethyl-	100.2	90							1	50	2	1	50	2
232	589-34-4	Hexane, 3-methyl-	100.2	92							1	50	2	1	50	2
233	589-43-5	Hexane, 2,4-dimethyl-	114.2	109							2	80	5	2	80	5
234	589-53-7	Heptane, 4-methyl-	114.2	118							2	80	5	2	80	5
235	589-81-1	Heptane, 3-methyl-	114.2	119							2	80	5	2	80	5
236	591-76-4	Hexane, 2-methyl-	100.2	90							1	50	2	1	50	2
237	592-27-8	Heptane, 2-methyl-	114.2	118							2	80	5	2	80	5
238	61141-72-8	Dodecane, 4,6-dimethyl-	198.4	235							40	98	50	40	98	50
239	6117-97-1	Dodecane, 4-methyl-	184.4	216							40	98	50	40	98	50
240	617-78-7	3-Ethylpentane	100.2	93							1	50	2	1	50	2
241	62016-30-2	Octane, 2,3,3-trimethyl-	156.3	174							20	98	50	20	98	50
242	62016-34-6	Octane, 2,3,7-trimethyl-	156.3	174							20	98	50	20	98	50
243	62108-21-8	Decane, 6-ethyl-2-methyl-	184.4	216							40	98	50	40	98	50
244	62108-25-2	Decane, 2,6,7-trimethyl-	184.4	216							40	98	50	40	98	50
245	62108-27-4	Decane, 2,4,6-trimethyl-	184.4	216							40	98	50	40	98	50

Table 3-2 Compounds detected >0.1 ppm

no of compound	CAS	Compound Name (COPC)	MW	Boiling pt.	carbon loading estimate constants			assumed outlet equilibrium of isotherm PPMV (y)	difference with BP and MW estimation	% error with Yaws prediction	estimated by BP and MW as per A. Shepherd (Shepherd 2001)			estimated by BP and MW with conservativatism for mixing and values no higher than predicted by Yaws (Yaws 1995)		
								0.100			Estimated Carbon Capacity	Predicted RE	DF	Estimated Carbon Capacity	Predicted RE	DF
					A	B	C	g ads/100 g carbon			g/100 g C	%	mass in / mass out	g/100 g C	%	mass in / mass out
246	62238-13-9	Decane, 2,3,7-trimethyl-	184.4	216							40	98	50	40	98	50
247	629-50-5	Tridecane	184.4	235.4							40	98	50	40	98	50
248	629-59-4	Tetradecane	198.4	253.7							40	98	50	40	98	50
249	629-62-9	Pentadecane	212.4	270.6							40	98	50	40	98	50
250	629-78-7	Heptadecane	240.5	301.8							40	98	50	40	98	50
251	74-98-6	Propane	44.1	-42	-0.7946	0.49029	-0.02398	0.049	0.049	100.00	0	0	1	0	0	1
252	75-28-5	Propane, 2-methyl-	58.1	-11.7	-0.01676	0.33495	-0.01274	0.432	0.432	100.00	0	0	1	0	0	1
253	78-78-4	Butane, 2-methyl-	72.2	30							0.5	20	1.25	0.5	20	1.25
254	96-14-0	Pentane, 3-methyl-	86.2	64							1	50	2	1	50	2
255	565-75-3	Pentane, trimethyl-, isomer	114.3	113.5							2	80	5	2	80	5

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Attachment 4 Tables of DF Analysis Results

Table 4-1 COPCs
Table 4-2 Compounds Detected >0.1 ppmv

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Table 4-1 COPCs

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
1	100-00-5	p-Nitrochlorobenzene	10000	50	5	50000
2	100-21-0	p-Phthalic acid	20	50	50	1000
3	100-41-4	Ethyl benzene	10000	5	1	10000
4	100-42-5	Styrene	10000	5	1	10000
5	10061-01-5	cis-1,3-Dichloropropene	100	5	1	100
6	10061-02-6	trans-1,3-Dichloropropene	50	5	1	50
7	101-55-3	4-Bromophenylphenyl ether	3.33	50	50	167
8	101-84-8	Diphenyl ether	50	50	5	250
9	106-35-4	3-Heptanone	10000	5	1	10000
10	106-42-3	p-Xylene (Dimethyl benzene)	1000	5	1	1000
11	106-46-7	1,4-Dichlorobenzene	50	20	2	100
12	106-88-7	1,2-Epoxybutane	10000	1.25	1	10000
13	106-93-4	Ethylene dibromide (Dibromoethane)	1	10	10	10
14	106-97-8	Butane (R-600)	10000	1	1	10000
15	106-99-0	1,3-Butadiene	10000	1	1	10000
16	107-02-8	Acrolein	10000	1	1	10000
17	107-05-1	3-Chloropropene (Allyl chloride)	10000	1.25	1	10000
18	107-06-2	1,2-Dichloroethane (Ethylene chloride) (freon 150)	10000	2	1	10000
19	107-12-0	Propionitrile	10000	1	1	10000
20	107-13-1	Acrylonitrile	10000	1	1	10000
21	107-18-6	2-Propene-1-ol	10000	1.25	1	10000
22	107-31-3	Formic acid, methyl ester	10000	1	1	10000
23	107-66-4	Dibutylphosphate	10000	5	1	10000
24	107-87-9	2-Pentanone	10000	5	1	10000
25	108-03-2	1-Nitropropane	10000	5	1	10000
26	108-05-4	Vinyl acetate	10000	2	1	10000
27	108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	10000	5	1	10000
28	108-20-3	Bis(isopropyl)ether	10000	2	1	10000
29	108-38-3	m-Xylene (Dimethyl benzene)	1000	5	1	1000
30	108-39-4	m-Cresol	1000	20	2	2000
31	108-87-2	Methylcyclohexane	10000	5	1	10000
32	108-88-3	Toluene	10000	5	1	10000
33	108-90-7	Chlorobenzene	20	5	5	100
34	108-93-0	Cyclohexanol	10000	20	2	20000
35	108-94-1	Cyclohexanone	10000	20	2	20000
36	108-95-2	Phenol	10	20	20	200
37	109-66-0	n-Pentane	10000	1.25	1	10000
38	109-99-9	Tetrahydrofuran	10000	1.25	1	10000

Table 4-1 COPCs

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
39	110-12-3	5-Methyl-2-hexanone	10000	5	1	10000
40	110-43-0	2-Heptanone	10000	5	1	10000
41	110-54-3	n-Hexane	10000	2	1	10000
42	110-62-3	n-Valeraldehyde	10000	5	1	10000
43	110-82-7	Cyclohexane	10000	2	1	10000
44	110-83-8	Cyclohexene	10000	2	1	10000
45	110-86-1	Pyridine	10000	5	1	10000
46	111-65-9	n-Octane	10000	5	1	10000
47	111-76-2	Ethylene glycol monobutyl ether	10000	20	2	20000
48	111-84-2	n-Nonane	10000	20	2	20000
49	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	10000	50	5	50000
50	117-84-0	n-Dioctyl phthalate	10000	50	5	50000
51	120-12-7	Anthracene	1000	50	5	5000
52	120-82-1	1,2,4-Trichlorobenzene	100	50	5	500
53	120-83-2	2,4-Dichlorophenol	3.33	50	50	167
54	121-44-8	Triethylamine	10000	2	1	10000
55	121-69-7	Dimethylaniline	10000	20	2	20000
56	122-39-4	N,N-Diphenylamine	50	50	5	250
57	123-19-3	4-Heptanone	10000	5	1	10000
58	123-38-6	n-Propionaldehyde	10000	1	1	10000
59	123-51-3	3-Methyl-1-butanol	10000	5	1	10000
60	123-86-4	Acetic acid n-butyl ester	10000	5	1	10000
61	123-91-1	1,4-Dioxane	10000	2	1	10000
62	126-73-8	Tributyl phosphate	10000	50	5	50000
63	126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	10000	2	1	10000
64	127-18-4	Perchloroethylene (tetrachloroethylene)	1	10	10	10
65	127-19-5	N,N-Dimethylacetamide	10000	10	1	10000
66	128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	10000	50	5	50000
67	129-00-0	Pyrene	3.33	50	50	167
68	1321-64-8	Pentachloronaphthalene	3.33	50	50	167
69	1321-65-9	Trichloronaphthalene	3.33	50	50	167
70	132-64-9	Dibenzofuran	3.33	50	50	167
71	1335-87-1	Hexachloronaphthalene	3.33	50	50	167
72	1335-88-2	Tetrachloronaphthalene	3.33	50	50	167
73	1336-36-3	Polychlorinated biphenyls (PCBs)	3.33	50	50	167
74	141-78-6	Acetic acid ethyl ester (Ethyl acetate)	10000	2	1	10000
75	141-79-7	4-Methyl-3-penten-2-one	10000	5	1	10000
76	142-82-5	n-Heptane	10000	2	1	10000

Table 4-1 COPCs

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
77	144-62-7	Oxalic acid	10	20	20	200
78	156-60-5	trans-1,2-Dichloroethylene	10000	1.25	1	10000
79	1634-04-4	Methyl tert-butyl ether	10000	2	1	10000
80	189-55-9	Dibenzo[a,i]pyrene	3.33	50	50	167
81	189-64-0	Dibenzo[a,h]pyrene	3.33	50	50	167
82	191-24-2	Benzo(g,h,i)perylene	3.33	50	50	167
83	191-30-0	Benzo[a,i]pyrene	3.33	50	50	167
84	192-65-4	Dibenzo[a,e]pyrene	3.33	50	50	167
85	193-39-5	Indeno(1,2,3-cd)pyrene	3.33	50	50	167
86	206-44-0	Fluoranthene	3.33	50	50	167
87	208-96-8	Acenaphthylene	3.33	50	50	167
88	2234-13-1	Octachloronaphthalene	3.33	50	50	167
89	224-42-0	Dibenz[a,j]acridine	3.33	50	50	167
90	226-36-8	Dibenz[a,h]acridine	3.33	50	50	167
91	25551-13-7	Trimethyl benzene	1000	20	2	2000
92	26140-60-3	Terphenyls	3.33	50	50	167
93	27154-33-2	Trichlorofluoroethane	1	10	10	10
94	287-92-3	Cyclopentane	10000	1.25	1	10000
95	3697-24-3	5-Methylchrysene	3.33	50	50	167
96	3825-26-1	Ammonium perfluorooctanoate	3.33	50	50	167
97	4170-30-3	2-Butenaldehyde (2-Butenal)	10000	2	1	10000
98	50-00-0	Formaldehyde	10000	1	1	10000
99	50-32-8	Benzo(a)pyrene	3.33	50	50	167
100	53-70-3	Dibenzo(a,h)anthracene	3.33	50	50	167
101	540-59-0	1,2-Dichloroethylene	10000	1.25	1	10000
102	540-84-1	2,2,4-Trimethylpentane	10000	2	1	10000
103	541-73-1	1,3-Dichlorobenzene	50	20	2	100
104	56-23-5	Carbon tetrachloride (R-10)	1	5	5	5
105	563-80-4	3-Methyl-2-butanone	10000	2	1	10000
106	56-49-5	3-Methylcholanthrene	3.33	50	50	167
107	57-14-7	1,1-Dimethylhydrazine	10000	2	1	10000
108	58-90-2	2,3,4,6-Tetrachlorophenol	3.33	10	10	33
109	591-78-6	2-Hexanone	1000	5	1	1000
110	59-50-7	4-Chloro-3-methylphenol	3.33	20	20	67
111	59-89-2	N-Nitrosomorpholine	10000	20	2	20000
112	602-87-9	5-Nitroacenaphthene	3.33	50	50	167
113	60-29-7	Ethyl ether	10000	1.25	1	10000
114	603-34-9	Triphenylamine	3.33	50	50	167
115	60-34-4	Methylhydrazine	10000	1	1	10000
116	60-35-5	Acetamide	10000	20	2	20000

Table 4-1 COPCs

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
117	621-64-7	Di-n-Propylnitrosamine	10000	20	2	20000
118	624-83-9	Methyl isocyanate	1000	1	1	1000
119	627-13-4	Nitric acid, propyl ester	10000	5	1	10000
120	62-75-9	N-Nitroso-N,N-dimethylamine	10000	20	2	20000
121	630-20-6	1,1,1,2-Tetrachloroethane	1	10	10	10
122	64-17-5	Ethyl alcohol	10000	1	1	10000
123	64-18-6	Formic acid	10000	1	1	10000
124	64-19-7	Acetic acid	10000	1	1	10000
125	67-56-1	Methyl alcohol (Methanol)	10000	1	1	10000
126	67-63-0	2-Propyl alcohol (Isopropanol)	10000	1.25	1	10000
127	67-64-1	2-Propanone (Acetone)	10000	1	1	10000
128	67-66-3	Chloroform (R-20)	1	2	2	2
129	67-72-1	Hexachloroethane	1	50	50	50
130	684-16-2	Hexafluoroacetone	1	1	1	1
131	71-23-8	n-Propyl alcohol	10000	1.25	1	10000
132	71-36-3	n-Butyl alcohol	10000	5	1	10000
133	71-43-2	Benzene	100	2	1	100
134	71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	1000	2	1	1000
135	74-83-9	Bromomethane (Methyl bromide) (halon 1001)	1000	1	1	1000
136	74-87-3	Chloromethane (Methyl chloride) (R-40)	20	1	1	20
137	74-97-5	Bromochloromethane (halon 1011)	1	2	2	2
138	74-99-7	Methylacetylene	10000	1	1	10000
139	75-00-3	Chloroethane	1000	1	1	1000
140	75-01-4	Vinyl chloride (1-Chloroethene)	10000	1	1	10000
141	75-05-8	Acetonitrile	1000	1	1	1000
142	75-07-0	Acetaldehyde	10000	1	1	10000
143	75-09-2	Dichloromethane (Methylene chloride) (R-30)	50	1	1	50
144	75-12-7	Formamide	10000	1	1	10000
145	75-15-0	Carbon disulfide	10000	1.25	1	10000
146	75-21-8	Ethylene oxide (Oxirane)	10000	1	1	10000
147	75-27-4	Bromodichloromethane	1	5	5	5
148	75-34-3	1,1-Dichloroethane	10000	2	1	10000
149	75-35-4	1,1-Dichloroethene (Vinylidene chloride)	10000	1.25	1	10000
150	75-43-4	Dichlorofluoromethane (R-21)	1000	1	1	1000
151	75-45-6	Chlorodifluoromethane (R-22)	50	1	1	50
152	75-50-3	Trimethylamine	10000	1	1	10000

Table 4-1 COPCs

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
153	75-52-5	Nitromethane	10000	1	1	10000
154	75-55-8	2-Methylaziridine	10000	1	1	10000
155	75-61-6	Difluorodibromomethane (freon 12B2-halon 1202)	1	1	1	1
156	75-63-8	Trifluorobromomethane (R-13B1)	1	1	1	1
157	75-65-0	2-Methyl-2-propanol	10000	2	1	10000
158	75-69-4	Trichlorofluoromethane (R-11)	1	1	1	1
159	75-71-8	Dichlorodifluoromethane (R-12)	1	1	1	1
160	76-03-9	Trichloroacetic acid	1	50	50	50
161	76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane (R-112a)	20	5	5	100
162	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane (R-112)	20	5	5	100
163	76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	20	2	2	40
164	76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (R-114)	1	1	1	1
165	76-15-3	Chloropentafluoroethane (R-115)	1	1	1	1
166	78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	10000	5	1	10000
167	78-87-5	1,2-Dichloropropane	1000	2	1	1000
168	78-92-2	1-Methylpropyl alcohol (2-Butanol)	10000	2	1	10000
169	78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	1000	2	1	1000
170	79-00-5	1,1,2-Trichloroethane	10000	5	1	10000
171	79-01-6	Trichloroethylene	10000	2	1	10000
172	79-09-4	Propionic acid	10000	2	1	10000
173	79-10-7	2-Propenoic acid	10000	2	1	10000
174	79-20-9	Methyl acetate	10000	1	1	10000
175	79-34-5	1,1,2,2-Tetrachloroethane	1	10	10	10
176	83-32-9	Acenaphthene	3.33	50	50	167
177	84-66-2	Diethyl phthalate	10000	50	5	50000
178	84-74-2	Dibutyl phthalate	10000	50	5	50000
179	85-01-8	Phenanthrene	3.33	50	50	167
180	85-68-7	Butylbenzyl phthalate	10000	50	5	50000
181	86-73-7	Fluorene	3.33	50	50	167
182	87-68-3	Hexachlorobutadiene	50	50	5	250
183	88-06-2	2,4,6-Trichlorophenol	3.33	50	50	167
184	88-72-2	2-Nitrotoluene	10000	20	2	20000
185	88-75-5	2-Nitrophenol	3.33	20	20	67
186	88-89-1	Picric acid	10000	50	5	50000
187	91-20-3	Naphthalene	100	20	2	200

Table 4-1 COPCs

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
188	91-22-5	Quinoline	10000	20	2	20000
189	91-58-7	2-Chloronapthalene	3.33	50	50	167
190	92-52-4	1,1`-Biphenyl	1000	50	5	5000
191	92-93-3	4-Nitrobiphenyl	3.33	50	50	167
192	95-13-6	Indene	1000	20	2	2000
193	95-47-6	o-Xylene	10000	5	1	10000
194	95-48-7	o-Cresol (2-Methylphenol)	1000	20	2	2000
195	95-49-8	2-Chlorotoluene	10000	20	2	20000
196	95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	50	20	2	100
197	95-57-8	2-Chlorophenol	10000	20	2	20000
198	95-95-4	2,4,5-Trichlorophenol	3.33	50	50	167
199	96-18-4	1,2,3-Trichloropropane	10000	20	2	20000
200	96-22-0	3-Pentanone	10000	5	1	10000
201	96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	3.33	50	50	167
202	98-51-1	p-tert-Butyltoluene	10000	20	2	20000
203	98-82-8	Cumene	10000	20	2	20000
204	98-83-9	alpha-Methylstyrene	100	20	2	200
205	98-86-2	Acetophenone	100	20	2	200
206	98-95-3	Nitrobenzene	10000	20	2	20000

Table 4-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
1	541-05-9	Cyclotrisiloxane, hexamethyl-	10000	10	1	10000
2	556-67-2	Cyclotetrasiloxane, octamethyl-	10000	50	5	50000
3	USI000-06	tetramethylcyclotrisiloxane	10000	10	1	10000
4	3622-84-2	Benzenesulfonamide, N-butyl-	5	50	50	250
5	5145-07-1	2(3H)-Furanone, dihydro-3,5-dimethyl-	10000	20	2	20000
6	108-47-4	Pyridine, 2,4-dimethyl-	10000	20	2	20000
7	109-99-9	Furan, tetrahydro-	10000	1.25	1	10000
8	110-00-9	Furan	10000	1	1	10000
9	110-86-1	Pyridine	10000	5	1	10000
10	1708-29-8	Furan, 2,5-dihydro-	10000	1.25	1	10000
11	24405-16-1	2H-Pyran-2-one, tetrahydro-5,6-dimethyl-, trans-	10000	20	2	20000
12	289-95-2	Pyrimidine	10000	5	1	10000
13	290-37-9	Pyrazine	10000	5	1	10000
14	534-22-5	Furan, 2-methyl-	10000	2	1	10000
15	930-22-3	Oxirane, ethenyl-	10000	2	1	10000
16	96-48-0	2(3H)-Furanone, dihydro- (gamma butyrolactone)	10000	10	1	10000
17	3457-90-7	1,3-Propanediol, dinitrate	10000	5	1	10000
18	3457-91-8	1,4-Butanediol, dinitrate	10000	10	1	10000
19	544-16-1	Nitrous acid, butyl ester	10000	2	1	10000
20	624-91-9	Nitrous acid, methyl ester	10000	2	1	10000
21	625-58-1	Nitric acid, ethyl ester	10000	2	1	10000
22	627-05-4	Butane, 1-nitro-	10000	20	2	20000
23	627-13-4	Nitric acid, propyl ester	10000	5	1	10000
24	62-75-9M	Methanamine, N-methyl-N-nitroso- and others	10000	20	2	20000
25	928-45-0	Nitric acid, butyl ester	10000	5	1	10000
26	123-75-1	Pyrrolidine	10000	2	1	10000
27	22431-09-0	Methanamine, N-(1-methylbutylidene)-	10000	5	1	10000
28	616-45-5	2-Pyrrolidinone	10000	20	2	20000
29	75-50-3	Methanamine, N,N-dimethyl-	10000	1	1	10000
30	107-12-0	Propanenitrile	10000	1	1	10000
31	109-74-0	Butanenitrile	10000	2	1	10000
32	110-59-8	Pentanenitrile	10000	5	1	10000
33	124-12-9	Octanenitrile	10000	20	2	20000
34	2243-27-8	Nonanenitrile	10000	20	2	20000
35	628-73-9	Hexanenitrile	10000	20	2	20000
36	629-08-3	Heptanenitrile	10000	20	2	20000
37	75-05-8	Acetonitrile	1000	1	1	1000
38	109-21-7	Butanoic acid, butyl ester	10000	20	2	20000

Table 4-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
39	110-27-0	Tetradecanoic acid, 1-methylethyl ester	10000	50	5	50000
40	123-25-1	Butanedioic acid, diethyl ester	10000	50	5	50000
41	123-86-4	Acetic acid, butyl ester	10000	5	1	10000
42	126-73-8	Phosphoric acid tributyl ester	10000	50	5	50000
43	141-78-6	Acetic acid ethyl ester	10000	2	1	10000
44	1838-59-1	Formic acid, 2-propenyl ester	10000	2	1	10000
45	590-01-2	Propanoic acid, butyl ester	10000	5	1	10000
46	591-87-7	Acetic acid, 2-propenyl ester	10000	5	1	10000
47	592-84-7	Formic acid, butyl ester	10000	5	1	10000
48	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester	1000	50	5	5000
49	1002-84-2	Pentadecanoic acid	10000	50	5	50000
50	107-92-6	Butanoic acid	10000	10	1	10000
51	2091-29-4	9-Hexadecenoic acid	10000	50	5	50000
52	544-63-8	Tetradecanoic acid	10000	50	5	50000
53	57-10-3	Hexadecanoic acid	10000	50	5	50000
54	64-19-7	Acetic acid	10000	1	1	10000
55	105-42-0	2-Hexanone, 4-methyl-	10000	5	1	10000
56	106-35-4	3-Heptanone	10000	5	1	10000
57	106-68-3	3-Octanone	1000	20	2	2000
58	107-87-9	2-Pentanone	10000	5	1	10000
59	108-10-1	2-Pentanone, 4-methyl- (MIBK)	10000	5	1	10000
60	110-43-0	2-Heptanone	1000	5	1	1000
61	111-13-7	2-Octanone	1000	20	2	2000
62	112-12-9	2-Undecanone	10000	50	5	50000
63	123-19-3	4-Heptanone	1000	5	1	1000
64	1534-26-5	3-Tridecanone	10000	50	5	50000
65	1534-27-6	3-Dodecanone	10000	50	5	50000
66	15932-80-6	Cyclohexanone, 5-methyl-2-(1-methylethylidene)-	10000	50	5	50000
67	22026-12-6	6-Tridecanone	10000	50	5	50000
68	2216-87-7	3-Undecanone	10000	50	5	50000
69	50639-02-6	5-Undecanone, 2-methyl-	10000	50	5	50000
70	563-80-4	2-Butanone, 3-methyl-	10000	2	1	10000
71	589-38-8	3-Hexanone	1000	5	1	1000
72	589-63-9	4-Octanone	1000	20	2	2000
73	591-78-6	2-Hexanone	1000	5	1	1000
74	593-08-8	2-Tridecanone	10000	50	5	50000
75	629-23-2	3-Tetradecanone	10000	50	5	50000
76	67-64-1	2-Propanone	10000	1	1	10000

Table 4-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
77	763-93-9	3-Hexen-2-one	1000	5	1	1000
78	78-93-3	2-Butanone	1000	2	1	1000
79	78-94-4	3-Buten-2-one	1000	2	1	1000
80	821-55-6	2-Nonanone	10000	20	2	20000
81	89-82-7	Cyclohexanone, 5-methyl-2-(1-methylethylidene)	10000	50	5	50000
82	925-78-0	3-Nonanone	10000	20	2	20000
83	928-68-7	2-Heptanone, 6-methyl-	1000	20	2	2000
84	98-86-2	Ethanone, 1-phenyl-	100	20	2	200
85	110-62-3	Pentanal	10000	5	1	10000
86	111-71-7	Heptanal	10000	20	2	20000
87	123-38-6	Propanal	10000	1	1	10000
88	123-72-8	Butanal	10000	2	1	10000
89	124-13-0	Octanal	10000	20	2	20000
90	124-19-6	Nonanal	10000	2	1	10000
91	19269-28-4	Hexanal, 3-methyl-	10000	5	1	10000
92	66-25-1	Hexanal	10000	5	1	10000
93	75-07-0	Acetaldehyde	10000	1	1	10000
94	104-76-7	1-Hexanol, 2-ethyl-	10000	20	2	20000
95	111-70-6	1-Heptanol	10000	20	2	20000
96	112-92-5	1-Octadecanol	10000	50	5	50000
97	14898-79-4	2-Butanol	10000	2	1	10000
98	2136-70-1	Ethanol, 2-(tetradecyloxy)-	10000	50	5	50000
99	36653-82-4	1-Hexadecanol	10000	50	5	50000
100	51411-24-6	6,10-Dodecadien-1-ol, 3,7,11-trimethyl-	10000	50	5	50000
101	57-55-6	1,2-Propanediol	10000	20	2	20000
102	598-32-3	3-Buten-2-ol	10000	2	1	10000
103	6032-29-7	2-Pentanol	10000	5	1	10000
104	627-27-0	3-Buten-1-ol	10000	5	1	10000
105	64-17-5	Ethanol	10000	1	1	10000
106	67-56-1	Methanol	10000	1	1	10000
107	67-63-0	2-Propanol	10000	1.25	1	10000
108	71-23-8	1-Propanol	10000	1.25	1	10000
109	75-65-0	2-Propanol, 2-methyl-	10000	2	1	10000
110	75-84-3	1-Propanol, 2,2-dimethyl-	10000	5	1	10000
111	75-85-4	2-Butanol, 2-methyl-	10000	5	1	10000
112	78-92-2	2-Butanol	10000	2	1	10000
113	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	50	50	5	250
114	96-41-3	Cyclopentanol	10000	5	1	10000

Table 4-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
115	1184-60-7	1-Propene, 2-fluoro-	100	1	1	100
116	127-18-4	Ethene, tetrachloro-	1	10	10	10
117	156-59-2	Ethene, 1,2-dichloro-, (Z)-	10000	2	1	10000
118	1717-00-6	Ethane, 1,1-dichloro-1-fluoro- (freon 14b)	1000	1.25	1	1000
119	56-23-5	Methane, tetrachloro-	1	5	5	5
120	74-87-3	Methane, chloro- (R-40)	20	1	1	20
121	75-02-5	Ethene, fluoro-	10000	1	1	10000
122	75-09-2	Methane, dichloro-	20	1	1	20
123	75-45-6	Methane, chlorodifluoro- (R-22)	50	1	1	50
124	75-68-3	Ethane, 1-chloro-1,1-difluoro- (R-142)	50	1	1	50
125	75-69-4	Methane, trichlorofluoro- (R-11)	1	1	1	1
126	6031-02-3	Benzene, (1-methylpentyl)-	10000	50	5	50000
127	100-41-4	Benzene, ethyl-	10000	5	1	10000
128	100-42-5	Benzene, ethenyl-	10000	5	1	10000
129	106-42-3	Benzene, 1,4-dimethyl-	1000	5	1	1000
130	108-38-3	Benzene, 1,3-dimethyl-	1000	5	1	1000
131	108-88-3	Benzene, methyl-	10000	5	1	10000
132	3290-53-7	Benzene, (2-methyl-2-propenyl)-	10000	20	2	20000
133	538-68-1	Benzene, pentyl-	10000	20	2	20000
134	637-50-3	Benzene, 1-propenyl-	10000	20	2	20000
135	643-58-3	1,1`-Biphenyl, 2-methyl-	10000	50	5	50000
136	71-43-2	Benzene	1000	2	1	1000
137	92-52-4	1,1`-Biphenyl	1000	50	5	5000
138	95-47-6	Benzene, 1,2-dimethyl-	10000	5	1	10000
139	74-99-7	1-Propyne	10000	1	1	10000
140	20184-91-2	4-Nonyne	10000	20	2	20000
141	61142-40-3	4-Undecene, 4-methyl-	10000	50	5	50000
142	629-73-2	1-Hexadecene	10000	50	5	50000
143	74630-39-0	1-Undecene, 4-methyl-	10000	50	5	50000
144	74630-48-1	3-Undecene, 2-methyl-, (Z)-	10000	50	5	50000
145	764-96-5	5-Undecene, (Z)-	10000	50	5	50000
146	821-74-9	4,5-Nonadiene	1000	5	1	1000
147	1008-80-6	Naphthalene, decahydro-2,3-dimethyl-	10000	50	5	50000
148	108-87-2	Cyclohexane, methyl-	10000	5	1	10000
149	110-82-7	Cyclohexane	10000	2	1	10000
150	1472-09-9	Cyclopropane, octyl-	10000	50	5	50000
151	1618-22-0	Naphthalene, decahydro-2,6-dimethyl-	10000	50	5	50000
152	1630-94-0	Cyclopropane, 1,1-dimethyl-	10000	1	1	10000
153	1678-93-9	Cyclohexane, butyl-	10000	20	2	20000

Table 4-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
154	2415-72-7	Cyclopropane, propyl-	10000	2	1	10000
155	287-92-3	Cyclopentane	10000	1.25	1	10000
156	2883-05-8	Octane, 2-cyclohexyl-	10000	50	5	50000
157	294-62-2	Cyclododecane	10000	50	5	50000
158	2958-76-1	Naphthalene, decahydro-2-methyl-	10000	50	5	50000
159	3073-66-3	Cyclohexane, 1,1,3-trimethyl-	10000	5	1	10000
160	32281-85-9	Cyclopentane, 1,3-dimethyl-2-(1-methylethyl)-	10000	2	1	10000
161	3604-14-6	Naphthalene, decahydro-1,2-dimethyl-	10000	50	5	50000
162	41977-33-7	Cyclopropane, 1-pentyl-2-propyl-	10000	50	5	50000
163	4292-92-6	Cyclohexane, pentyl-	10000	50	5	50000
164	4806-61-5	Cyclobutane, ethyl-	10000	2	1	10000
165	493-02-7	Naphthalene, decahydro-, trans-	10000	20	2	20000
166	54676-39-0	Cyclohexane, 2-butyl-1,1,3-trimethyl-	10000	50	5	50000
167	55937-92-3	Bicyclo[4.1.0]heptane, 2-methyl-7-pentyl-	10000	50	5	50000
168	594-11-6	Cyclopropane, methyl-	10000	1	1	10000
169	598-61-8	Cyclobutane, methyl-	10000	1.25	1	10000
170	61142-20-9	Cyclohexane, (4-methylpentyl)-	10000	50	5	50000
171	7058-01-7	Cyclohexane, (1-methylpropyl)-	10000	20	2	20000
172	7094-26-0	Cyclohexane, 1,1,2-trimethyl-	10000	5	1	10000
173	822-50-4	Cyclopentane, 1,2-dimethyl-, trans-	10000	2	1	10000
174	1002-43-3	Undecane, 3-methyl-	10000	50	5	50000
175	106-97-8	Butane	10000	1	1	10000
176	107-83-5	Pentane, 2-methyl-	10000	2	1	10000
177	108-08-7	Pentane, 2,4-dimethyl-	10000	2	1	10000
178	109-66-0	Pentane	10000	1.25	1	10000
179	110-54-3	Hexane	10000	2	1	10000
180	111-65-9	Octane	10000	5	1	10000
181	111-84-2	Nonane	10000	20	2	20000
182	1120-21-4	Undecane	10000	50	5	50000
183	112-40-3	Dodecane	10000	50	5	50000
184	124-18-5	Decane	10000	20	2	20000
185	13151-34-3	Decane, 3-methyl-	10000	50	5	50000
186	13151-35-4	Decane, 5-methyl-	10000	50	5	50000
187	13286-73-2	Tridecane, 3-ethyl-	10000	50	5	50000
188	13287-21-3	Tridecane, 6-methyl-	10000	50	5	50000
189	142-82-5	Heptane	10000	2	1	10000
190	14720-74-2	Heptane, 2,2,4-trimethyl-	10000	5	1	10000
191	1560-96-9	Tridecane, 2-methyl-	10000	50	5	50000

Table 4-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
192	1632-70-8	Undecane, 5-methyl-	10000	50	5	50000
193	17301-23-4	Undecane, 2,6-dimethyl-	10000	50	5	50000
194	17301-25-6	Undecane, 2,8-dimethyl-	10000	50	5	50000
195	17301-27-8	Undecane, 2,10-dimethyl-	10000	50	5	50000
196	17301-29-0	Undecane, 3,7-dimethyl-	10000	50	5	50000
197	17301-30-3	Undecane, 3,8-dimethyl-	10000	50	5	50000
198	17301-32-5	Undecane, 4,7-dimethyl-	10000	50	5	50000
199	17301-94-9	Nonane, 4-methyl-	10000	20	2	20000
200	17302-28-2	Nonane, 2,6-dimethyl-	10000	50	5	50000
201	17302-32-8	Nonane, 3,7-dimethyl-	10000	50	5	50000
202	17312-50-4	Decane, 2,5-dimethyl-	10000	50	5	50000
203	17312-57-1	Dodecane, 3-methyl-	10000	50	5	50000
204	17312-60-6	Undecane, 6-ethyl-	10000	50	5	50000
205	17312-73-1	Undecane, 5,5-dimethyl-	10000	50	5	50000
206	17312-76-4	Undecane, 6,6-dimethyl-	10000	50	5	50000
207	17312-77-5	Undecane, 2,3-dimethyl-	10000	50	5	50000
208	17312-80-0	Undecane, 2,4-dimethyl-	10000	50	5	50000
209	17312-82-2	Undecane, 4,6-dimethyl-	10000	50	5	50000
210	17453-94-0	Undecane, 5-ethyl-	10000	50	5	50000
211	20278-85-7	Heptane, 2,3,5-trimethyl-	10000	20	2	20000
212	2213-23-2	Heptane, 2,4-dimethyl-	10000	5	1	10000
213	2216-33-3	Octane, 3-methyl-	10000	5	1	10000
214	2216-34-4	Octane, 4-methyl-	10000	5	1	10000
215	25117-24-2	Tetradecane, 4-methyl-	10000	50	5	50000
216	25117-31-1	Tridecane, 5-methyl-	10000	50	5	50000
217	26730-12-1	Tridecane, 4-methyl-	10000	50	5	50000
218	26730-14-3	Tridecane, 7-methyl-	10000	50	5	50000
219	2847-72-5	Decane, 4-methyl-	10000	50	5	50000
220	2980-69-0	Undecane, 4-methyl-	10000	50	5	50000
221	31295-56-4	Dodecane, 2,6,11-trimethyl-	10000	50	5	50000
222	3891-98-3	Dodecane, 2,6,10-trimethyl-	10000	50	5	50000
223	4032-93-3	Heptane, 2,3,6-trimethyl-	10000	20	2	20000
224	52896-90-9	Heptane, 3-ethyl-5-methyl-	10000	20	2	20000
225	544-76-3	Hexadecane	10000	50	5	50000
226	55030-62-1	Tridecane, 4,8-dimethyl-	10000	50	5	50000
227	55045-07-3	Dodecane, 2-methyl-8-propyl-	10000	50	5	50000
228	55045-11-9	Tridecane, 5-propyl-	10000	50	5	50000
229	562-49-2	Pentane, 3,3-dimethyl-	10000	2	1	10000
230	56292-65-0	Dodecane, 2,5-dimethyl-	10000	50	5	50000
231	565-59-3	Pentane, 2,3-dimethyl-	10000	2	1	10000

Table 4-2 Compounds Detected >0.1 ppmv

no of compound	CAS #	Compound	Oxidizer DF massflow in / massflow out	Adsorption DF massflow in / massflow out	reduced Adsorption DF massflow in / massflow out	Combined DF massflow in / massflow out
232	589-34-4	Hexane, 3-methyl-	10000	2	1	10000
233	589-43-5	Hexane, 2,4-dimethyl-	10000	5	1	10000
234	589-53-7	Heptane, 4-methyl-	10000	5	1	10000
235	589-81-1	Heptane, 3-methyl-	10000	5	1	10000
236	591-76-4	Hexane, 2-methyl-	10000	2	1	10000
237	592-27-8	Heptane, 2-methyl-	10000	5	1	10000
238	61141-72-8	Dodecane, 4,6-dimethyl-	10000	50	5	50000
239	6117-97-1	Dodecane, 4-methyl-	10000	50	5	50000
240	617-78-7	3-Ethylpentane	10000	2	1	10000
241	62016-30-2	Octane, 2,3,3-trimethyl-	10000	50	5	50000
242	62016-34-6	Octane, 2,3,7-trimethyl-	10000	50	5	50000
243	62108-21-8	Decane, 6-ethyl-2-methyl-	10000	50	5	50000
244	62108-25-2	Decane, 2,6,7-trimethyl-	10000	50	5	50000
245	62108-27-4	Decane, 2,4,6-trimethyl-	10000	50	5	50000
246	62238-13-5	Decane, 2,3,7-trimethyl-	10000	50	5	50000
247	629-50-5	Tridecane	10000	50	5	50000
248	629-59-4	Tetradecane	10000	50	5	50000
249	629-62-9	Pentadecane	10000	50	5	50000
250	629-78-7	Heptadecane	10000	50	5	50000
251	74-98-6	Propane	10000	1	1	10000
252	75-28-5	Propane, 2-methyl-	10000	1	1	10000
253	78-78-4	Butane, 2-methyl-	10000	1.25	1	10000
254	96-14-0	Pentane, 3-methyl-	10000	2	1	10000
255	565-75-3	Pentane, trimethyl-, isomer	10000	5	1	10000

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Attachment 5 Thermal Stability Ranking Study

Figure 9 of Technical Article *Development of a Thermal Stability Based Ranking of Hazardous Organic Compound Incinerability* (Dellinger 2000)

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Table IV. ΔT_{99} as a Function of Waste Feed Concentration (Radical Concentration) for Five Model Compounds[a]

A/A_0	R/R_0	$CHCl_3$	CH_2Cl_2	$C_6H_5CH_3$	CH_3Cl	C_6H_6
1.1	1.02	<-1	<-1	<-1	<-1	-5
1.3	1.06	<-1	<-1	<-1	-2	-14
1.5	1.10	<-1	<-1	-1	-3	-23
2.0	1.20	<-1	<-1	-1	-6	-46
3.0	1.40	<-1	<-1	-3	-12	-88

[a] In this analysis, we have assumed that the additional radical concentration (R/R_0) abstracts a H atom from the model compound at the same rate as a Cl atom. The relationship between waste feed concentration (A/A_0) and radical concentration was determined from a series of equilibrium calculations for nominal incinerability mixtures at 1000 °C.

sumption above 750 °C while H metathesis by OCl and C_2Cl_3 are significant destruction pathways at lower temperatures (*15*).

Effect of Varying Waste Feed Rate and Radical Chains. On the basis of the known complexity of hydrocarbon and chlorinated hydrocarbon reaction systems (*47, 14–17*) it may seem fortuitous that such a simple kinetic model can predict the thermal decomposition behavior of such a wide range of species. We acknowledge the need for detailed chemical kinetic mechanisms to predict the thermal decomposition behavior of a given species over wide ranges of experimental conditions. However, the goal of this kinetic analysis was simply the prediction of T_{99}s for one experimental condition.

Using eq 1, we have iteratively calculated the effect of increases in the waste feed concentration on T_{99} for the five model compounds. As shown in Table IV, results indicate that acceptably small decreases in T_{99} (<20 °C) were observed for all compounds for a factor of 2 increase in waste feed rate and acceptably small decreases were observed for all compounds except benzene for a factor of 3 increase in waste feed concentration (~40% increase in radical concentration). For chloroform and dichloromethane, the insensitivity of T_{99} on waste feed concentration is consistent with mechanisms dominated by molecular elimination reactions. The variance in T_{99} for the other compounds is due to the relative contributions of bimolecular radical attack versus unimolecular reaction.

In principle, radical chain reactions can increase the effect of varying radical concentration. Significant chain lengths ($\lambda > 2$) are not expected under incineration conditions due to termination by the formation of stable H_2 and HCl molecules. Polymerization reactions may have longer chain lengths but these reactions are not likely to contribute to POHC destruction in the H- and Cl-rich environment of an incinerator. Both pseudoequilibrium and kinetic calculations indicate that other readily formed polyatomic radicals (e.g., CH_3, CCl_3) that can participate in short chains are in concentrations lower by a factor of 10–100 than H and Cl. Thus, chain lengths for these species would have to be on the order of 10–100 before they would contribute to POHC destruction, which is highly unlikely. Our calculations indicate that chains of $\lambda \leq 2$ produce shifts in T_{99} of equal or lesser magnitude than the effect of changing the radical concentration of up to a factor of 2.

The above analysis indicates that exceptional compounds that are resistant to unimolecular reaction and exhibit large shifts in T_{99} with small increases in radical concentration do exist (e.g., C_6H_6). However, since the stability of all compounds undergoing bimolecular decomposition will shift in the same direction as the radical concentration is varied, changes in their *relative* T_{99} values

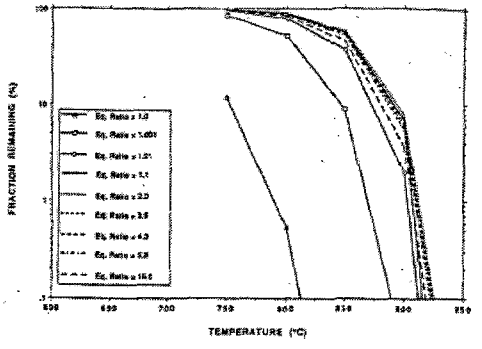

Figure 9. Sensitivity of toluene thermal decomposition behavior as a function of waste/oxygen equivalence ratio. Mixture elemental composition, C_7H_7Cl; t_r = 2.0 s.

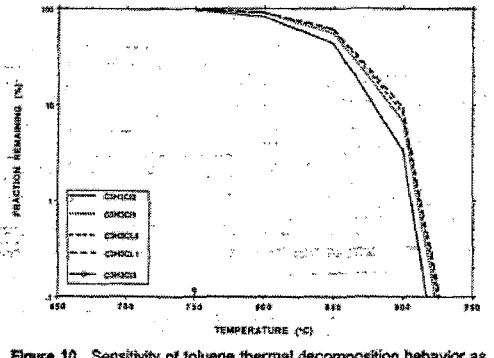

Figure 10. Sensitivity of toluene thermal decomposition behavior as a function of organic mixture Cl atom population. Φ = 3.0; t_r = 2.0 s.

will be suppressed. Since compounds at the top of the ranking decompose predominantly via bimolecular reactions, changes in their relative incinerability are expected to be minimal. Only as we descend through the ranking to where different compounds decompose by bimolecular versus unimolecular pathways will the ranking be expected to exhibit some variance. However, in this regime unimolecular decomposition reactions are available for compounds dominated by bimolecular pathways at nominal conditions. Thus, changes in T_{99} are again expected to be minimal.

Effect of Varying Equivalence Ratio and Waste Feed Composition. Toluene was selected as the model compound for further analysis, as this compound decomposes by numerous bimolecular reactions that are sensitive to changes in reaction atmosphere. We have analyzed the effect of reaction atmosphere by varying the fuel/oxygen stoichiometry ($0.05 < \Phi < 10.0$) for nominal values of mixture elemental composition and by varying mixture elemental composition ($0.33 < H/Cl < 30.0$) for nominal values of fuel/oxygen stoichiometry. Figure 9 presents the results of the sensitivity analysis for variation of waste/oxygen equivalence ratio while Figure 10 presents the results in relation to a variation of Cl and H atom populations, respectively.

Inspection of Figure 9 indicates that for waste/oxygen equivalence ratios ranging from 2.0 to 5.0, there is no significant difference (±10 °C) in T_{99}. As one decreases this parameter to 10.0, a small decrease in T_{99} was ob-

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Attachment 6 VOC Properties and Adsorption Potential

Technology Paper *Activated Carbon Adsorption for Treatment of VOC Emissions* (Shepherd 2001)

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ACTIVATED CARBON ADSORPTION FOR TREATMENT OF VOC EMISSIONS

Presented at the 13th Annual EnviroExpo, Boston Massachusetts—May 2001

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A review of the characteristics of activated carbon and its applicability to emission control of VOC's. Design and costs of carbon systems are also discussed.

INTRODUCTION

The principal use of vapor phase activated carbon in the environmental field is for the removal of volatile organic compounds such as hydrocarbons, solvents, toxic gases and organic based odors. In addition, chemically impregnated activated carbons can be used to control certain inorganic pollutants such as hydrogen sulfide, mercury, or radon.

When properly applied, the adsorption process will remove pollutants for which it is designed, to virtually non-detectable levels. In fact one of the first large- scale uses of activated carbon was in military gas masks where complete contaminant removal is essential. Carbon adsorption is equally effective on single component emissions as well as complex mixtures of pollutants.

In the industrial area, the most common applications of activated carbon are for process off-gases, tank vent emissions, work area air purification, and odor control, either within the plant or related to plant exhausts. Additionally, activated carbon is used in the hazardous waste remediation area to treat off-gases from air strippers and from soil vapor extraction remediation projects.

EVALUATION OF ALTERNATIVE TREATMENT PROCESSES	LOW VOC LEVELS	HIGH VOC LEVELS	CONTINUOS LOADS	INTERMITTENT LOADS	HALOGENATED ORGANICS	TEMP>150F	TEMP<150F	HIGH FLOWS	LOW FLOWS	HIGH HUMIDITY	INORGANIC PARTICLES
ACTIVATED CARBON	•		•	•	•		•	•	•		
THERMALOXIDATION		•	•			•			•	•	
SCRUBBERS	•	•	•			•	•	•	•		
PARTICULATE FILTERS			•	•			•			•	•
CATALYTIC OXIDATION		•	•			•			•	•	

TABLE I

APPLICATION CONSIDERATIONS

One of the major issues that must first be addressed when evaluating a specific environmental VOC problem is what treatment technology to consider. For a given situation there are likely a number of treatment alternatives that appear to have some utility.

The first step in this evaluation is to effectively characterize the application. You will need to know at least the following information:

Flow Rate - Continuos vs intermittent
Contaminants Present – individual contaminants, concentration and variability
Temperature - Average and maximum
Falamibility - Upper and lower explosive limits

Once you have characterized your problem, each technology can be considered for its ability to deal with the conditions identified. As an example, *Table I* lists some of the more common technologies used to control industrial vapor phase pollutants, and the conditions under which they might be most favorably applied. I can't stress enough the importance of this review, as this is where most technical solutions fail. If you solve the wrong problem or pick a technical solution that does not respond to all the variables of your application, poor performance will likely result.

HOW IT WORKS

In the adsorption process, molecules of a contaminated gas are attracted to and accumulate on the surface of the activated carbon. Carbon is a commonly used adsorbent due to its very large surface area. It can be made from a variety of base materials including coal, wood and coconut shells, and is manufactured or activated in a high temperature controlled oxidation process. A pound of highly activated carbon has a surface area approaching 140 acres.

CROSS SECTION OF CARBON

This *Figure I* presents an artist's rendition of the cross section of an activated carbon particle. Note that almost all of the surface area available for adsorption is associated with its internal pore structure. Also note the relative change in pore diameters, going from very large at the granule surface boundary, to much smaller within the particle interior. Balancing of the large and small pore volumes during the activation process is what makes individual activated carbons perform differently. Molecules of a contaminant tend to adsorb most strongly in areas where the pore diameter of the adsorbent is close to the molecular diameter of the compound.

While most organic compounds will adsorb on activated carbon to some degree, the adsorption process is most effective on higher molecular weight and high boiling point compounds.

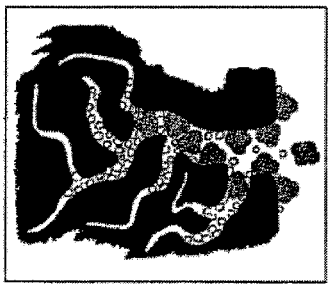


FIGURE I

LIST OF ORGANIC COMPOUNDS

RELATIVE ADSORBTION RATE

		MOLECULAR WEIGHT	BOILING POINT	CARBON CAPACITY %
STRONGER	NITROBENZENE	123	211 C	51
	TETRACHLOROETHANE	166	147 C	40
	TETRACHLOROETHYLENE	165	121 C	35
	STYRENE	104	145 C	25
	XYLENE	106	138 C	21
	NAPATHYLENE	128	217 C	20
	TOLUNE	92	111 C	20
	BENZENE	78	80 C	12
	MTBE	88	55 C	12
	HEXANE	86	68 C	7
	ETHLY ACRILATE	100	57 C	5
	DIDHLOROETHANE	99	99 C	7
	METHYL ETHYLKETONE	72	80 C	4
	METHYLENE CHLORIDE	84	40 C	2
	ACRILONITRILE	53	74 C	2
	ACETONE	58	56 C	0.8
	VINYLCHLORIDE	62	neg 14 C	0.7
	CHLOROETHANE	64	12 C	0.5
	BROMOTRI FLOROMETHANE	149	neg 58 C	0.13
WEAKER	METHANE	16	neg 161 C	0.0003

TABLEII

Compounds having a molecular weight over 50 and a boiling point greater than 50 degrees centigrade are good candidates for adsorption. *TABLE II* presents a representative list of organic compounds and their relative adsorption strength. Organic contaminants are often classified as weakly, moderately, or strongly adsorbed. You will note that a compound such as nitrobenzene having a molecular weight of 123 and a boiling point of 211 C is characterized as a very strong adsorber. On the other hand a compound such as methane which has a molecular weight of 16 and a boiling point of -161 C is a very weakly adsorbed compound. In fact, at this capacity, for all practical purposes, methane removal with activated carbon would not be cost effective.

ABSORPTION CAPACITY

Physical adsorption is dependant on the characteristics of the contaminant to be adsorbed, the temperature of the gas stream to be processed, and the concentration of the contaminant in the gas stream. The adsorption capacity for a particular contaminant represents the amount of the contaminant that can be adsorbed on a unit weight of activated carbon consumed at the conditions present in the application. Typical adsorption capacities for moderately adsorbed compounds range from 5 to 30 percent of the weight of the carbon.

TRICHLOROETHYLENE ISOTHERM

The adsorption isotherm plot shows the influence of concentration on adsorption capacity. *Figure II* presents an adsorption isotherm used to predict adsorption capacity for trichloroethylene. Note how the adsorption capacity varies from 20 to 65 percent over the concentration range of 10 to 10000 ppm in the gas stream.

A series of isotherms at differing temperatures shows the influence of temperature on adsorption capacity. In Figure III you can see the effect of temperature on the same trichloroethylene compound. At 100ppm the capacity of activated carbon for trichloroethylene varies from 17 to 40 percent as the temperature changes from 140 to 32 degrees F.

Fortunately, most carbon suppliers have developed isotherms for a range of environmental contaminants. At Carbtrol we have built a computerized database of adsorption isotherms so that we can easily model most environmental applications. By supplying to us the gas flow rate, the contaminant concentration and the temperature of the gas stream, a carbon usage prediction can be made.

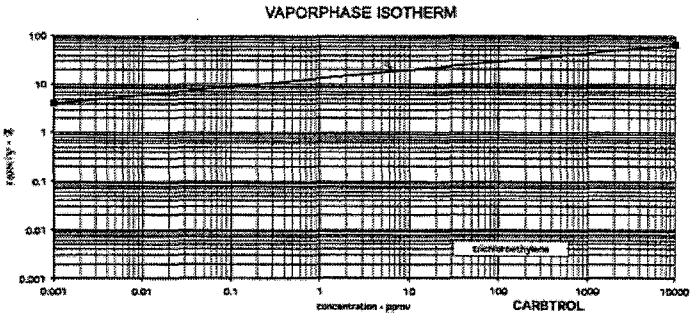


FIGURE II

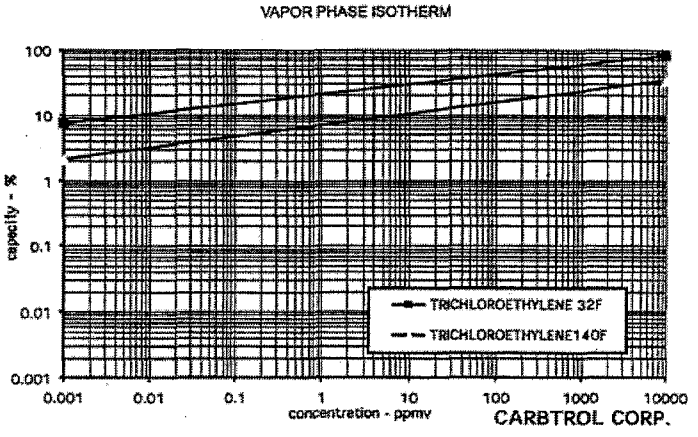
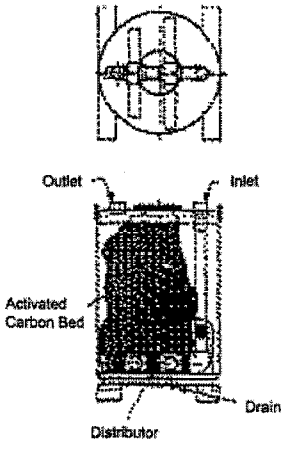


FIGURE III

DESIGN CONSIDERATIONS



CARBTROL G-4 ADSORBER

FIGURE IV

Activated carbons used in the air pollution control field are normally supplied in a granular form with a particle size ranging from 1 to 5 millimeters. In the granular form activated carbon can easily be packed into a containment device through which a contaminated gas stream can be processed for purification.

Figure IV shows the cross section of a typical fixed bed vapor phase adsorber. An adsorption system in its simplest form is made of a containment device (drum or vessel), distribution and collection devices to effect proper circulation of the gas stream through the activated carbon bed, and a means for moving the gas stream through the bed (such as a fan, a blower, or pressurized gas displacement). Packed activated carbon beds can be conveniently config-

ured into small transportable drums or tanks, or into large fixed contacting devices depending on the application.

Adsorber sizing for a particular application is governed primarily by bed surface loading rate. With a standard 4-foot carbon bed depth, a maximum gas-loading rate of 100 cfm per square foot of bed surface should be maintained. This insures adequate gas contact and sufficient time to reach adsorption equilibrium. Higher gas flows are handled by increasing the carbon bed surface (larger adsorbers) or adding multiple beds in parallel.

One of the chief advantages of granular activated carbon adsorption is its simplicity of application. Pre-engineered fixed bed adsorbers can be purchased and installed on most existing exhaust systems with a minimum of capital expenditure. Transportable adsorbers from 100 to 5000 pounds are readily available as standard supply from several manufactures. Air flows for these stock units go up to as much as 5000 CFM. Larger systems up to 20,000 CFM or higher are available on a custom basis. Once installed these systems operate for the most part unattended until the carbon becomes spent and requires replacement. The frequency of replacement will vary for each application but may range from weekly to annually.

Another significant advantage of an adsorption process is that it provides on line reserve capacity on a passive basis. The system is, in effect, available on a continuos basis to handle varying loads but only consumes carbon when contaminants are present in the exhaust stream. Other processes may have significant fuel or chemical operating costs even when no contaminants are being treated.

REACTIVATION

Once the activated carbon has become spent it must be removed from service and replaced with fresh carbon in order to maintain the effectiveness of treatment. The spent carbon can be disposed of and replaced with virgin carbon, or the spent carbon can be returned to the supplier for reactivation and reuse. Reactivation restores most of the original carbon adsorption capacity and avoids expensive disposal costs. Most carbon adsorption applications rely on offsite reactivation to support their activated carbon supply.

The spent carbon can be vacuumed from fixed adsorption vessels and shipped to the reactivation center in bulk, or returned to the reactivation facility in a transportable adsorber that serves both as an adsorption vessel and a UN shipping container.

CAPITAL AND OPERATING COSTS

Adsorption system capital and operating costs can vary widely but depend primarily on the gas volume to be treated and the amount of carbon consumed.

A simple100 cubic foot per minute adsorption system consisting of two 200 pound canisters and a blower would require about 20 sq ft of area and cost about 2-$3,000. When spent these smaller adsorption units can often be exchanged for new units with the original supplier.

Larger custom carbon adsorption systems can cost from several thousand, up to several hundred thousand dollars, and are usually supported with off site reactivation services.

A 5000 cfm system with two adsorbers and an exhaust blower would have a capital cost in the 30-$40,000 range and if skid mounted would take up an area of about 100sq ft.

The Custom reactivation service to support this system usually costs about $2.00 per pound of carbon processed including transportation.

ACTIVATED CARBON QUALITY

You should be aware that there is a significant difference in adsorption capacity among the various commercial activated carbon products available. When procuring activated carbons it is important to recognize that the value of the activated carbon product that you are purchasing is related to its adsorption capacity, and not its weight or volume.

The carbon manufacturing industry, in conjunction with ASTM, has developed several standard tests that enable comparison of the relative adsorption capacities of various activated carbons. These tests can be used to assess the quality of a virgin or reactivated carbon product and to predict its cost effectiveness.

The industry standard quality tests for VAPOR PHASE activated carbons is the CARBON TETRACHLORIDE ADSORPTION CAPACITY, or ASTM D3467. Typical vapor phase virgin activated carbons have CARBON TETRACHLORIDE ADSORPTION CAPACITIES ranging from 45 to 70 percent by weight.

When procuring either virgin or reactivated carbon products, make sure the appropriate adsorption number is specified. Then compare the alternative product specifications to insure you are getting the best activated carbon value.

SUMMARY

In summary, activated carbon has been shown to be applicable for treatment of a wide variety of environmental contaminants. It is a proven technology that is simple to install and easy to operate and maintain. Capital costs are among the least expensive for most alternative treatment technologies. Operating costs are primarily related to the amount of activated carbon consumed in the adsorption process.

Attachment 7 Prediction of VOC Adsorption Capacity

Technical Article *Determining VOC Adsorption Capacity* (Yaws 1995)

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POLLUTION ENGINEERING

Determining VOC Adsorption Capacity

Capacity data for the adsorption of VOCs on activated carbon is needed when meeting stricter air regs.

by Carl L. Yaws, Li Bu and Sachin Nijhawan

Physical and thermodynamic property data for organic compounds are especially helpful to engineers and scientists in industry. In particular, capacity data for adsorption of volatile organic compounds (VOCs) on activated carbon is becoming increasingly important in engineering and environmental studies because of more stringent air emissions regulations.

Results are presented for adsorption capacity as a function of the VOC concentration in the gas. The results can be used in engineering and environmental studies. Capacity data resulting from the correlation are useful in the engineering design of carbon adsorption systems to remove trace pollutants from gases. For pollution control to very low emission levels, such systems could include carbon adsorption followed by conventional steam regeneration with solvent recovery, or carbon adsorption followed by thermal or catalytic oxidation.

Adsorption capacity correlation

The correlation for adsorption on activated carbon is based on a logarithmic series expansion of concentration in the gas:

$$\log_{10}Q = A + B\log_{10}y + C[\log_{10}y]^2$$

where Q = adsorption capacity at equilibrium, g of compound/100 g of carbon
y = concentration in gas at 25°C and 1 atm, parts per million by volume, ppmv
A,B and C = correlation constants

The correlation constants (A,B and C) in Table 1 were determined from regression of the available data for adsorption on activated carbon. The tabulation is arranged by carbon number (C1, C2, C3...) so data can be quickly located using the chemical formula.

Estimation equation

In preparing the correlation, a literature search was conducted to identify sources for a database of adsorption capacity values at different concentrations (partial pressures). The database also served to check the accuracy of the correlation.

Adsorption capacity for the remaining compounds was then estimated. The following equation (developed by Calgon) was used to estimate the equilibrium adsorption capacity of activated carbon as a fifth order polynomial function of its adsorption potential:

$$\log_{10}Q = A + B\mu + C\mu^2 + D\mu^3 + E\mu^4 + F\mu^5$$

where Q = adsorption capacity at equilibrium, cm_3 of liquid compound/100 g of carbon
μ = adsorption potential of compound, $T/(V_l\Gamma_l)\log(P_l^{sat}/p_l)$
T = temperature, K
V_l = liquid molar volume of compound, cm^3/g-mol
Γ_l = relative polarizability, $[(n^2-1)(n^2+1)]/[(n^2-1)(n^2+1)]_{n\text{-heptane}}$
n = refractive index
P_l^{sat} = vapor pressure of compound, atm
p_l = partial pressure of compound, atm
A = 1.71
B = -1.46E-02
C = 1.65E-03
D = -4.11E-04
E = 3.14E-05
F = -6.75E-07

Examples

The correlation may be used to determine adsorption capacity of activated carbon for pollutants.

For example, the air from a paint-spraying operation contains 10 ppmv of n-butanol ($C_4H_{10}O$). The goal is to estimate the adsorption capacity of activated carbon for removing the pollutant at 25° C and 1 atm.

Substitution of the correlation constants from the table and concentration into the correlation equation yields

$$\log_{10}Q = 0.89881 + 0.32534\log_{10}(10) - 0.03648[\log_{10}(10)]^2 = 1.18767$$

Q = 15.41 g of n-butanol/100 g of carbon

In another case the air from an industrial operation contains 100 ppmv of methyl ethyl ketone (C_4H_8O). The adsorption capacity of activated carbon for removing the pollutant at 25° C and 1 atm must be estimated.

Substitution of the correlation constants from the table and concentration into the correlation equation yields

$$\log_{10}Q = 0.46525 + 0.37688\log_{10}(100) - 0.02801[\log_{10}(100)]^2 = 1.10697$$

Q = 12.79 g of methyl ethyl ketone/100 g of carbon

Operation and design

In actual operation under plant conditions, the capacity of an adsorption bed will seldom achieve equilibrium. Air

Table 1. Adsorption on Activated Carbon

No.	Formula	Name	$\log_{10} Q = A + B \log_{10} y + C (\log_{10} y)^2$			(Q = g of compound/100 g of carbon; y = ppmv in gas at 25 C and 1 atm)				
			A	B	C	Min	Max	Q @ 10 ppmv	Q @ 100 ppmv	Q @ 1000 ppmv
1	$CBrCl_3$	Bromotrichloromethane	1.39842	0.23228	−0.02184	10	10000	40.63	59.65	79.20
2	$CBrF_3$	Bromotrifluoromethane	−1.46247	0.58361	−0.01044	10	10000	0.13	0.46	1.56
3	CBr_2F_2	Dibromodifluoromethane	0.82076	0.30701	−0.01384	10	10000	13.00	23.96	41.42
4	CBr_3F	Tribromofluoromethane	−1.43748	0.55503	−0.00450	10	10000	0.13	0.45	1.54
5	CCl_2F_2	Dichlorodifluoromethane	−0.97350	0.40145	−0.01404	10	10000	2.06	4.71	10.10
6	CCl_2O	Phosgene	−0.64469	0.50428	−0.02986	10	10000	0.85	2.78	7.93
7	$CClF_3$	Trichlorofluoromethane	0.17307	0.40715	−0.01915	10	10000	3.64	8.14	16.68
8	CCl_3NO_2	Chloropicrin	1.26745	0.20841	−0.01258	10	10000	29.04	42.93	59.81
9	CCl_4	Carbon Tetrachloride	1.07481	0.28186	−0.02273	10	10000	21.57	35.29	51.98
10	$CHBr_3$	Tribromomethane	1.73184	0.19948	−0.02246	10	7238	81.07	109.89	134.33
11	$CHCl_3$	Chloroform	0.67102	0.36148	−0.02288	10	10000	10.22	20.07	35.45
12	CHN^2	Hydrogen Cyanide	−4.39245	1.08948	−0.00740	10	10000	4.9E-04	5.7E-03	6.4E-02
13	CH_2BrCl	Bromochloromethane	0.61399	0.41353	−0.02531	10	10000	10.05	21.87	42.35
14	CH_2BrF	Bromofluoromethane	0.45483	0.36332	−0.01606	10	10000	6.34	13.10	25.13
15	CH_2Br_2	Dibromomethane	1.08376	0.37211	−0.03238	10	10000	26.52	49.94	81.04
16	CH_2Cl_2	Dichloromethane	−0.07043	0.49210	−0.02276	10	10000	2.51	6.65	15.89
17	CH_2I_2	Diiodomethane	1.94756	0.14984	−0.01947	10	1581	119.66	147.70	166.67
18	CH_2O	Formaldehyde	−2.48524	0.69123	−0.00375	10	10000	1.6E-02	7.6E-02	0.36
19	CH_2O_2	Formic Acid	−1.72731	1.09503	−0.06354	10	10000	0.18	1.44	8.63
20	CH_3Br	Methyl Bromide	−1.23835	0.78564	−0.05521	10	10000	0.31	1.29	4.19
21	CH_3Cl	Methyl Chloride	−1.91871	0.62053	−0.00949	10	10000	5.0E-02	0.29	0.78
22	CH_3Cl_3Si	Methyl Trichlorosilane	1.07198	0.24275	−0.01911	10	10000	19.75	30.27	42.48
23	CH_3I	Methyl Iodide	0.73997	0.32985	−0.01330	10	10000	11.39	22.21	40.72
24	CH_3NO	Formamide	1.30981	0.25274	—	10	80	36.52	—	—
25	CH_3NO_2	Nitromethane	−0.17347	0.70602	−0.05111	10	10000	2.12	7.57	21.36
26	CH_4	Methane	−4.31008	0.77883	−0.00628	10	10000	2.9E-04	1.7E-03	9.3E-03
27	CH_5Cl_2Si	Methyl Dichlorosilane	0.73271	0.29305	−0.01822	10	10000	10.17	17.62	28.04
28	CH_4O	Methanol	−1.96739	0.82107	−0.03393	10	10000	6.9E-02	0.42	2.35
29	CH_4S	Methyl Mercaptan	−1.12288	0.60573	−0.02094	10	10000	0.29	1.01	3.21
30	CH_5N	Methylamine	−1.93548	0.64710	−0.01057	10	10000	5.0E-02	0.21	0.81
31	CN_4O_8	Tetranitromethane	1.49047	0.18181	−0.01894	10	10000	45.01	60.02	73.35
32	CO	Carbon Monoxide	−5.18782	0.90121	−0.01358	10	10000	5.0E-05	3.6E-04	2.5E-03
33	COS	Carbonyl Sulfide	−1.42882	0.51061	0.00028	10	10000	0.12	0.39	1.27
34	CO_2	Carbon Dioxide	−3.55224	0.80180	−0.00328	10	10000	2.4E-03	8.7E-03	3.3E-02
35	CS_2	Carbon Disulfide	−0.18899	0.47093	−0.01481	10	10000	1.85	4.94	12.32
36	$C_2Br_2F_4$	1,2-Dibromotetrafluoroethane	0.90388	0.25693	−0.00974	10	10000	14.16	22.92	38.64
37	C_2ClF_5	Chloropentafluoroethane	0.08264	0.34756	−0.01343	10	10000	2.61	5.30	10.10
38	$C_2Cl_3F_3$	1,1,2-Trichlorotrifluoroethane	1.17368	0.18655	−0.01231	10	10000	28.05	39.59	52.79
39	C_2Cl_4	Tetrachloroethylene	1.40596	0.20802	−0.02097	10	10000	39.17	54.72	69.39
40	$C_2Cl_4F_2$	1,1,2,2-Tetrachlorodifluoroethane	1.37307	0.17625	−0.01465	10	10000	34.25	46.45	58.88
41	$C_2HBrClF_3$	Halothane	0.92405	0.31204	−0.02004	10	10000	16.45	29.38	47.84
42	C_2HCl_3	Trichloroethylene	1.02411	0.29929	−0.02519	10	10000	19.86	33.20	49.38
43	C_2HCl_3O	Dichloroacetyl Chloride	1.23647	0.26219	−0.02596	10	10000	29.70	45.19	61.57
44	C_2HCl_3O	Trichloroacetaldehyde	1.12362	0.26973	−0.02513	10	10000	26.19	40.98	57.09
45	C_2HCl_5	Pentachloroethane	1.64566	0.13515	−0.01572	10	4829	58.22	71.30	81.22
46	$C_2HF_3O_2$	Trifluoroacetic Acid	−0.12577	0.59373	−0.03445	10	10000	2.71	8.39	22.15
47	C_2H_2	Acetylene	−2.24177	0.82454	−0.03390	10	10000	3.5E-02	0.19	0.84
48	$C_2H_2Br_4$	1,1,2,2-Tetrabromoethane	—	—	—	—	—	146.05	—	—
49	$C_2H_2Cl_2$	1,1-Dichloroethylene	0.48740	0.33282	−0.01622	10	10000	6.37	12.25	21.87
50	$C_2H_2Cl_2$	cis-1,2-Dichloroethylene	0.47567	0.39061	−0.02554	10	10000	6.93	14.28	26.16
51	$C_2H_2Cl_2$	trans-1,2-Dichloroethylene	0.47567	0.39061	−0.02554	10	10000	6.93	14.28	26.16
52	$C_2H_2Cl_2O_2$	Dichloroacetic Acid	1.69237	0.09630	—	10	235	61.47	76.73	—
53	$C_2H_2Cl_4$	1,1,1,2-Tetrachloroethane	1.44097	0.19166	−0.01995	10	10000	40.99	55.52	68.61
54	$C_2H_2Cl_4$	1,1,2,2-Tetrachloroethane	1.52322	0.17848	−0.02019	10	6073	48.03	63.01	75.33
55	C_2H_3Cl	Vinyl Chloride	−0.98889	0.66564	−0.04320	10	10000	0.43	1.48	4.16
56	C_2H_3ClO	Acetyl Chloride	0.03627	0.45526	−0.02093	10	10000	2.96	7.30	16.35
57	$C_2H_3ClO_2$	Methyl Chloroformate	0.41186	0.42776	−0.02776	10	10000	6.48	14.33	27.88
58	$C_2H_3Cl_3$	1,1,1-Trichloroethane	0.97331	0.28737	−0.02277	10	10000	17.29	28.64	42.70
59	$C_2H_3Cl_3$	1,1,2-Trichloroethane	1.17153	0.27791	−0.02746	10	10000	26.43	41.46	57.31
60	C_2H_3N	Acetonitrile	−0.79666	0.63512	−0.02598	10	10000	0.65	2.34	7.50
61	C_2H_3NO	Methyl Isocyanate	−1.07579	0.85881	−0.06876	10	10000	0.52	2.33	7.62
62	C_2H_4	Ethylene	−2.27102	0.61731	−0.01467	10	10000	2.1E-02	8.0E-02	0.28
63	$C_2H_4Br_2$	1,1-Dibromoethane	1.37260	0.25671	−0.02516	10	10000	40.19	61.01	82.48
64	$C_2H_4Br_2$	1,2-Dibromoethane	1.44231	0.25500	−0.02666	10	10000	46.84	70.09	92.77
65	$C_2H_4Cl_2$	1,1-Dichloroethane	0.54485	0.36091	−0.02192	10	10000	7.65	15.10	26.93
66	$C_2H_4Cl_2$	1,2-Dichloroethane	0.55343	0.37072	−0.02161	10	10000	7.99	16.16	29.59
67	$C_2H_4Cl_2O$	Bischloromethylether	0.95599	0.33784	−0.03200	10	10000	18.27	31.89	48.04
68	$C_2H_4F_2$	1,2-Difluoroethane	−3.97902	2.51862	−0.31617	10	10000	0.02	0.62	5.39
69	C_2H_4O	Acetaldehyde	−3.17947	0.82766	−0.02475	10	10000	0.27	0.97	3.09
70	C_2H_4O	Ethylene Oxide	−2.42379	0.94878	−0.04062	10	10000	0.03	0.20	1.14
71	$C_2H_4O_2$	Acetic Acid	−0.05553	0.68410	−0.06074	10	10000	3.70	11.74	28.21
72	$C_2H_4O_2$	Methyl Formate	−0.99586	0.61693	−0.01847	10	10000	0.40	1.46	4.88
73	C_2H_4S	Thiacyclopropane	0.02258	0.45520	−0.02154	10	10000	2.86	7.03	15.64
74	C_2H_5Br	Bromoethane	0.31783	0.43549	−0.03072	10	10000	5.28	11.64	22.27
75	C_2H_5Cl	Ethyl Chloride	−0.50828	0.50364	−0.02179	10	10000	0.94	2.58	6.40
76	C_2H_5ClO	2-Chloroethanol	0.74164	0.46933	−0.05158	10	9446	14.43	29.78	48.46
77	C_2H_5I	Ethyl Iodide	1.00356	0.32123	−0.02405	10	10000	19.99	35.47	56.33
78	C_2H_5N	Ethyleneimine	−1.16912	0.91238	−0.07400	10	10000	0.47	2.29	7.98
79	C_2H_5NO	N-Methylformamide	1.23333	0.21723	—	10	333	28.22	46.54	—
80	$C_2H_5NO_2$	Nitroethane	0.44968	0.49708	−0.04612	10	10000	7.96	18.17	33.56
81	C_2H_6	Ethane	−2.40393	0.68107	−0.01925	10	10000	1.8E-02	7.6E-02	0.29
82	C_2H_6O	Ethanol	−0.53153	0.67525	−0.04473	10	10000	1.32	4.57	12.93
83	C_2H_6OS	Dimethyl Sulfoxide	1.24042	0.31302	−0.04768	10	802	32.05	47.40	—

Table 1. Adsorption on Activated Carbon

No.	Formula	Name	$\text{Log}_{10} Q = A + B \text{ Log}_{10} y + C [\text{Log}_{10} y]^2$ A	B	C	(Q = g of compound/100 g of carbon, y = ppmv in gas at 25 C and 1 atm) Min	Max	Q @ 10 ppmv	Q @ 100 ppmv	Q @ 1000 ppmv
84	$C_2H_6O_2$	Ethylene Glycol	1.40474	0.18738	–0.02663	10	121	36.77	47.09	—
85	$C_2H_6O_4S$	Dimethyl Sulfate	1.34617	0.21539	–0.02336	10	890	34.53	48.25	—
86	C_2H_6S	Dimethyl Sulfide	0.48472	0.37358	–0.02770	10	10000	6.77	13.22	22.71
87	C_2H_6S	Ethyl Mercaptan	0.00552	0.40506	–0.01802	10	10000	2.47	5.54	11.44
88	$C_2H_6S_2$	Dimethyl Disulfide	0.75878	0.35928	–0.02953	10	10000	12.26	22.87	37.23
89	C_2H_7N	Dimethylamine	–1.22492	0.63962	–0.03266	10	10000	0.24	0.84	2.51
90	C_2H_7NO	Monoethanolamine	1.21569	0.21994	—	10	485	27.27	45.24	—
91	$C_2H_8N_2$	Ethylenediamine	0.56504	0.46307	–0.04789	10	10000	9.55	19.94	33.36
92	C_3H_3Cl	Propargyl Chloride	0.27135	0.40480	–0.02135	10	10000	4.52	9.90	19.66
93	C_3H_3N	Acrylonitrile	0.07669	0.49986	–0.03500	10	10000	3.48	8.64	18.25
94	C_3H_3NO	Oxazole	0.63350	0.30620	–0.02350	10	10000	8.25	14.19	21.91
95	[illegible]	Methylacetylene	[illegible]	[illegible]	[illegible]	10	10000	0.10	1.26	5.83
96	$C_3H_4Cl_2$	2,3-Dichloropropene	0.95417	0.30034	–0.02614	10	10000	16.92	28.20	41.68
97	C_3H_4O	Acrolein	–0.29632	0.49437	–0.02471	10	10000	1.49	3.92	9.21
98	C_3H_4O	Propargyl Alcohol	–0.22971	0.57711	–0.05441	10	10000	5.65	14.67	29.61
99	$C_3H_4O_2$	Acrylic Acid	0.75549	0.47108	–0.05615	10	5221	14.81	29.72	46.06
100	$C_3H_4O_3$	Pyruvic Acid	1.07410	0.41414	–0.05768	10	1679	26.95	46.95	62.72
101	C_3H_5Br	3-Bromo-1-Propene	0.84815	0.32392	–0.02398	10	10000	14.06	25.12	40.19
102	C_3H_5Cl	3-Chloropropene	0.32792	0.36553	–0.01853	10	10000	4.73	9.66	18.10
103	C_3H_5ClO	alpha-Epichlorohydrin	0.83203	0.38983	–0.03932	10	10000	15.22	28.47	44.42
104	$C_3H_5ClO_2$	Methyl Chloroacetate	1.07657	0.32514	–0.03617	10	9959	23.20	38.21	53.27
105	$C_3H_5ClO_2$	Ethyl Chloroformate	0.94901	0.32529	–0.03201	10	10000	17.47	29.62	43.33
106	$C_3H_5Cl_3$	1,2,3-Trichloropropane	1.47241	0.18136	–0.02165	10	4843	42.87	56.04	66.32
107	C_3H_5I	3-Iodo-1-Propene	1.33634	0.24222	–0.02273	10	10000	35.96	53.70	72.21
108	C_3H_5N	Propionitrile	[illegible]	[illegible]	[illegible]	10	10000	3.46	8.77	18.68
109	C_3H_5NO	Hydracrylonitrile	1.50994	0.11037	—	10	105	41.72	53.79	—
110	C_3H_5NO	Lactonitrile	1.44156	0.12689	—	10	157	37.02	49.58	—
111	C_3H_6	Propylene	–0.93674	0.57775	–0.03853	10	10000	0.40	1.16	2.82
112	$C_3H_6Cl_2$	1,1-Dichloropropane	0.95379	0.28791	–0.02487	10	10000	16.48	26.92	39.24
113	$C_3H_6Cl_2$	1,2-Dichloropropane	0.98872	0.28700	–0.02571	10	10000	17.78	28.83	41.53
114	$C_3H_6Cl_2$	1,3-Dichloropropane	1.10340	0.27837	–0.02824	10	10000	22.57	35.25	48.35
115	$C_3H_6Cl_2$	2,2-Dichloropropane	0.85314	0.29432	–0.02255	10	10000	13.33	22.47	34.13
116	[illegible]	Acetone	[illegible]	[illegible]	[illegible]	10	10000	2.03	5.16	11.85
117	C_3H_6O	Allyl Alcohol	0.32390	0.49368	–0.04370	10	10000	5.94	13.69	25.80
118	[illegible]	n-Propionaldehyde	[illegible]	[illegible]	[illegible]	10	10000	3.23	7.53	14.37
119	C_3H_6O	1,2-Propylene Oxide	–0.42829	0.53858	–0.02757	10	10000	1.21	3.46	8.70
120	C_3H_6O	1,3-Propylene Oxide	–0.50421	0.51872	–0.02296	10	10000	0.98	2.76	7.00
121	$C_3H_6O_2$	Ethyl Formate	0.12618	0.42260	–0.02090	10	10000	3.37	7.72	16.06
122	$C_3H_6O_2$	Methyl Acetate	0.13314	0.42849	–0.02188	10	10000	3.47	7.99	16.66
123	$C_3H_6O_2$	Propionic Acid	0.77846	0.44570	–0.05209	10	4872	14.86	28.94	44.34
124	$C_3H_6O_2S$	3-Mercaptopropionic Acid	1.68823	0.05916	—	10	66	55.90	—	—
125	$C_3H_6O_3$	Lactic Acid	1.60722	0.09225	—	10	107	50.06	61.90	—
126	$C_3H_6O_3$	Methoxyacetic Acid	1.61885	0.08873	—	10	71	51.00	—	—
127	C_3H_6S	Thiacyclobutane	0.67420	0.37225	–0.03151	10	10000	10.35	19.62	32.16
128	C_3H_7Br	1-Bromopropane	0.83601	0.32406	–0.02407	10	10000	13.68	24.43	39.04
129	C_3H_7Br	2-Bromopropane	0.81137	0.31043	–0.02155	10	10000	12.60	22.18	35.37
130	C_3H_7Cl	Isopropyl Chloride	0.31428	0.34779	–0.01661	10	10000	4.42	8.78	16.15
131	C_3H_7Cl	n-Propyl Chloride	0.40233	0.34678	–0.01933	10	10000	5.36	10.41	18.53
132	C_3H_7I	Isopropyl Iodide	1.26456	0.24157	–0.02122	10	10000	30.54	46.01	62.85
133	C_3H_7I	n-Propyl Iodide	1.30623	0.24227	–0.02250	10	10000	33.57	50.21	67.69
134	C_3H_7N	Allylamine	0.16250	0.39815	–0.02105	10	10000	3.46	7.49	14.71
135	C_3H_7N	Propyleneimine	0.06919	0.43529	–0.02293	10	10000	3.03	7.05	14.75
136	C_3H_7NO	N,N-Dimethylformamide	0.90253	0.37875	–0.04523	10	5220	17.22	30.14	42.83
137	$C_3H_7NO_2$	1-Nitropropane	0.91328	0.34648	–0.03730	10	10000	16.69	28.64	41.40
138	$C_3H_7NO_2$	2-Nitropropane	0.83248	0.35732	–0.03608	10	10000	14.25	25.28	37.99
139	[illegible]	Propane	[illegible]	[illegible]	[illegible]	10	10000	0.47	1.23	2.89
140	[illegible]	Isopropanol	[illegible]	[illegible]	[illegible]	10	10000	5.00	11.30	21.53
141	[illegible]	n-Propanol	[illegible]	[illegible]	[illegible]	10	10000	6.63	14.69	26.42
142	$C_3H_8O_2$	2-Methoxyethanol	0.74339	0.41792	–0.04536	10	10000	13.06	24.99	38.81
143	$C_3H_8O_2$	Methylal	0.19079	0.38167	–0.01775	10	10000	3.59	7.64	15.00
144	$C_3H_8O_2$	1,2-Propylene Glycol	1.48275	0.11594	—	10	170	39.69	51.84	—
145	$C_3H_8O_2$	1,3-Propylene Glycol	1.58563	0.08395	—	10	58	46.73	—	—
146	C_3H_8S	n-Propylmercaptan	0.59031	0.31407	–0.02190	10	10000	7.63	13.52	21.65
147	C_3H_8S	Isopropyl Mercaptan	0.55779	0.31539	–0.02051	10	10000	7.12	12.78	20.86
148	C_3H_8S	Ethyl-Methyl-Sulfide	0.62830	0.31889	–0.02320	10	10000	8.39	14.90	23.78
149	C_3H_9N	n-Propylamine	0.05768	0.34918	–0.01241	10	10000	2.48	5.09	9.85
150	C_3H_9N	Isopropylamine	0.07464	0.37106	–0.01568	10	10000	2.69	5.68	11.14
151	C_3H_9N	Trimethylamine	–0.09422	[illegible]	[illegible]	10	10000	1.69	3.50	7.13
152	C_3H_9NO	1-Amino-2-Propanol	1.25496	0.27456	–0.04254	10	617	30.69	43.04	—
153	C_3H_9NO	3-Amino-1-Propanol	1.53733	0.08156	—	10	101	41.58	50.17	—
154	C_3H_9NO	Methylethanolamine	1.14745	0.30208	–0.04243	10	1422	25.53	38.18	46.97
155	$C_3H_9O_3P$	Trimethyl-Phosphite	1.00568	0.21001	–0.01402	10	10000	15.91	23.42	32.32
156	$C_3H_9O_4P$	Trimethyl Phosphate	1.48463	0.16933	–0.02290	10	1196	42.76	53.91	61.17
157	$C_3H_{10}N_2$	1,2-Propanediamine	0.90237	0.31904	–0.03400	10	10000	15.40	25.38	35.77
158	C_4H_4O	Furan	–0.04084	[illegible]	[illegible]	10	10000	2.70	6.14	12.99
159	$C_4H_4O_2$	Diketene	0.87430	0.37094	–0.03962	10	10000	16.06	28.69	42.71
160	C_4H_4S	Thiophene	0.80753	0.32166	–0.02654	10	10000	12.67	22.12	34.17
161	C_4H_5Cl	Chloroprene	0.72957	0.29786	–0.02111	10	10000	10.15	17.41	27.11
162	C_4H_5N	trans-Crotonitrile	0.70791	0.37284	–0.03756	10	10000	11.05	20.11	30.79
163	C_4H_5N	cis-Crotonitrile	0.58131	0.39427	–0.03590	10	10000	8.70	16.84	27.61
164	C_4H_5N	Methacrylonitrile	0.46655	0.38890	–0.03042	10	10000	6.68	13.26	22.88
165	C_4H_5N	Pyrrole	0.83128	0.38413	–0.04217	10	10000	14.90	26.97	40.19
166	C_4H_5N	Vinylacetonitrile	0.61844	0.40844	–0.04032	10	10000	9.70	18.80	30.26
167	$C_4H_5NO_2$	Methyl Cyanoacetate	1.56587	0.09143	—	10	180	45.43	56.07	—
168	C_4H_6	1,3-Butadiene	–0.03359	0.34764	–0.01297	10	10000	2.00	4.07	7.81
169	C_4H_6	Dimethylacetylene	–0.06673	0.39387	–0.01524	10	10000	2.05	4.57	9.50
170	C_4H_6	Ethylacetylene	–0.02918	0.33636	–0.01056	10	10000	1.98	3.99	7.67
171	$C_4H_6Cl_2$	1,3-Dichloro-trans-2-Butene	1.30208	0.19939	–0.02091	10	10000	30.24	41.42	51.53
172	$C_4H_6Cl_2$	1,4-Dichloro-cis-2-Butene	1.40119	0.17876	–0.02041	10	5383	36.27	47.54	56.73

Table 1. Adsorption on Activated Carbon

No.	Formula	Name	$\log_{10} Q = A + B \log_{10} y + C (\log_{10} y)^2$			Q = g of compound/100 g of carbon, y = ppmv in gas at 25°C and 1 atm				
			A	B	C	Min	Max	Q @ 10 ppmv	Q @ 100 ppmv	Q @ 1000 ppmv
173	$C_4H_6Cl_2$	1,4-Dichloro-trans-2-Butene	1.40904	0.18120	−0.02179	10	4503	37.02	48.34	57.09
174	$C_4H_6Cl_2$	3,4-Dichloro-1-Butene	1.23394	0.21476	−0.02135	10	10000	26.75	37.85	48.54
175	$C_4H_6O_2$	trans-Crotonaldehyde butenal	0.68353	0.36560	−0.03400	10	10000	10.35	19.00	29.81
176	C_4H_6O	2,5-Dihydrofuran	[illegible]	[illegible]	[illegible]	10	10000	5.20	11.03	20.92
177	C_4H_6O	Methacrolein	0.43461	0.37019	−0.02474	10	10000	6.03	11.91	21.01
178	$C_4H_6O_2$	gamma-Butyrolactone	[illegible]	[illegible]	[illegible]	10	592	35.07	50.39	—
179	$C_4H_6O_2$	cis-Crotonic Acid	1.30871	0.25008	−0.03752	10	773	33.21	45.58	—
180	$C_4H_6O_2$	Methacrylic Acid	1.23099	0.27648	−0.03903	10	1282	29.41	42.44	51.19
181	$C_4H_6O_2$	Methyl Acrylate	0.45869	0.32104	−0.02001	10	10000	5.75	10.49	17.45
182	$C_4H_6O_2$	Vinyl Acetate	0.61067	0.34797	−0.02595	10	10000	8.56	15.95	26.36
183	$C_4H_6O_3$	Acetic Anhydride	1.07388	0.31083	−0.03575	10	7274	22.33	35.69	48.37
184	C_4H_7N	n-Butyronitrile	[illegible]	[illegible]	[illegible]	10	10000	9.83	18.45	29.02
185	C_4H_7N	Isobutyronitrile	0.56697	0.38807	−0.03531	10	10000	8.31	15.92	25.90
186	$C_4H_7NO_2$	3-Methoxypropionitrile	1.13283	0.28534	−0.03732	10	2598	24.04	35.83	44.98
187	C_4H_8	1-Butene	0.07313	0.32701	−0.01452	10	10000	2.43	4.67	8.38
188	$C_4H_8Br_2$	1,2-Dibromobutane	1.69234	0.12766	−0.01497	10	4094	63.83	77.23	87.22
189	$C_4H_8Br_2$	2,3-Dibromobutane	1.68176	0.12916	−0.01492	10	4934	62.52	75.93	86.10
190	$C_4H_8Cl_2$	1,4-Dichlorobutane	1.38278	0.17796	−0.02030	10	5427	34.71	45.45	54.20
191	C_4H_8O	n-Butyraldehyde	[illegible]	[illegible]	[illegible]	10	10000	6.27	12.31	21.36
192	C_4H_8O	Isobutyraldehyde	0.39315	0.36715	−0.02379	10	10000	5.45	10.77	19.08
193	C_4H_8O	1,2-Epoxybutane	0.36719	0.37654	−0.02360	10	10000	5.25	10.61	19.25
194	C_4H_8O	Methyl Ethyl Ketone	[illegible]	[illegible]	[illegible]	10	10000	6.52	12.79	22.07
195	C_4H_8O	Ethyl Vinyl Ether	0.33311	0.33471	−0.01711	10	10000	4.47	8.59	15.25
196	C_4H_8O	Tetrahydrofuran	[illegible]	[illegible]	[illegible]	10	10000	4.36	8.90	16.93
197	$C_4H_8O_2$	Isobutyric Acid	1.14021	0.29004	−0.03833	10	2388	24.66	36.89	46.27
198	$C_4H_8O_2$	n-Butyric Acid	[illegible]	[illegible]	[illegible]	10	1244	28.40	40.37	48.30
199	$C_4H_8O_2$	1,4-Dioxane	0.66791	0.36208	−0.03034	10	10000	9.99	18.65	30.27
200	$C_4H_8O_2$	Ethyl Acetate	[illegible]	[illegible]	[illegible]	10	10000	8.99	16.49	26.74
201	$C_4H_8O_2$	Methyl Propionate	0.64273	0.34862	−0.02767	10	10000	9.20	16.96	27.52
202	$C_4H_8O_2$	n-Propyl Formate	0.65855	0.34340	−0.02750	10	10000	9.43	17.19	27.62
203	$C_4H_8O_2S$	Sulfolane	1.77762	0.00118	0.00005	10	10000	60.10	60.28	60.48
204	C_4H_8S	Tetrahydrothiophene	0.93777	0.33197	−0.03877	10	10000	17.02	27.97	38.44
205	C_4H_9Br	1-Bromobutane	1.16698	0.24380	−0.02270	10	10000	24.44	36.62	49.44
206	C_4H_9Br	2-Bromobutane	1.13872	0.24481	−0.02203	10	10000	22.99	34.69	47.30
207	C_4H_9Cl	n-Butyl Chloride	0.80024	0.29114	−0.02370	10	10000	11.69	19.40	28.87
208	C_4H_9Cl	sec-Butyl Chloride	0.75046	0.29132	−0.02212	10	10000	10.46	17.56	26.63
209	C_4H_9Cl	tert-Butyl Chloride	0.68673	0.28529	−0.01944	10	10000	8.97	15.12	23.32
210	C_4H_9N	Pyrrolidine	[illegible]	[illegible]	[illegible]	10	10000	8.22	16.37	26.76
211	C_4H_9NO	N,N-Dimethylacetamide	1.20026	0.25124	−0.03263	10	2631	26.23	37.34	45.74
212	C_4H_9NO	Morpholine	1.00673	0.30572	−0.03294	10	10000	19.03	30.65	42.41
213	C_4H_{10}	n-Butane	[illegible]	[illegible]	[illegible]	10	10000	2.28	4.50	8.25
214	C_4H_{10}	Isobutane	[illegible]	[illegible]	[illegible]	10	10000	2.02	4.00	7.47
215	$C_4H_{10}O$	n-Butanol	0.89881	0.32534	−0.03648	10	9276	15.41	25.33	35.20
216	$C_4H_{10}O$	sec-Butanol	[illegible]	[illegible]	[illegible]	10	10000	12.01	20.95	31.15
217	$C_4H_{10}O$	Diethyl Ether	0.23477	0.36044	−0.02236	10	10000	3.74	7.35	13.03
218	$C_4H_{10}O$	Methyl-Propyl-Ether	0.36764	0.32893	−0.01787	10	10000	4.77	9.00	15.62
219	$C_4H_{10}O$	Methyl Isopropyl Ether	0.36373	0.31940	−0.01647	10	10000	4.64	8.64	14.92
220	$C_4H_{10}O$	Isobutanol	0.84818	0.33155	−0.03559	10	10000	13.94	23.38	33.30
221	$C_4H_{10}O_2$	1,3-Butanediol	—	—	—	—	—	48.89	—	—
222	$C_4H_{10}O_2$	1,4-Butanediol	—	—	—	—	—	51.19	—	—
223	$C_4H_{10}O_2$	2,3-Butanediol	1.50642	0.09239	—	10	239	39.70	49.11	—
224	$C_4H_{10}O_2$	t-Butyl Hydroperoxide	1.08563	0.26496	−0.03035	10	7205	20.90	31.20	40.49
225	$C_4H_{10}O_2$	1,2-Dimethoxyethane	0.74981	0.31330	−0.02616	10	10000	10.89	18.70	28.46
226	$C_4H_{10}O_2$	2-Ethoxyethanol	1.07911	0.27792	−0.03199	10	6983	21.14	32.14	42.16
227	$C_4H_{10}O_4S$	Diethyl Sulfate	1.64797	0.03805	—	10	278	50.82	58.08	—
228	$C_4H_{10}S$	n-Butyl Mercaptan	0.98086	0.24388	−0.02251	10	10000	15.93	23.91	32.35
229	$C_4H_{10}S$	Isobutyl Mercaptan	0.93709	0.24802	−0.02179	10	10000	14.57	22.18	30.55
230	$C_4H_{10}S$	sec-Butyl Mercaptan	0.92287	0.24856	−0.02146	10	10000	14.12	21.59	29.88
231	$C_4H_{10}S$	tert-Butyl Mercaptan	0.84380	0.24937	−0.01939	10	10000	11.85	18.41	26.15
232	$C_4H_{10}S$	Diethyl Sulfide	0.95993	0.24465	−0.02195	10	10000	15.21	22.98	31.35
233	$C_4H_{10}S$	Isopropyl-Methyl-Sulfide	0.92769	0.24689	−0.02132	10	10000	14.23	21.69	29.95
234	$C_4H_{10}S$	Methyl-Propyl-Sulfide	0.97217	0.24453	−0.02229	10	10000	15.65	23.55	32.00
235	$C_4H_{10}S_2$	Diethyl Disulfide	1.42594	0.12564	−0.01373	10	5627	34.50	41.91	47.79
236	$C_4H_{11}N$	n-Butylamine	0.64370	0.31857	−0.02570	10	10000	8.68	15.14	23.45
237	$C_4H_{11}N$	Isobutylamine	0.60137	0.31538	−0.02369	10	10000	7.82	13.72	21.59
238	$C_4H_{11}N$	sec-Butylamine	0.57706	0.31254	−0.02250	10	10000	7.36	12.95	20.52
239	$C_4H_{11}N$	tert-Butylamine	0.50036	0.30334	−0.01897	10	10000	6.09	10.74	17.37
240	$C_4H_{11}N$	Diethylamine	0.54770	0.30799	−0.02107	10	10000	6.83	12.01	19.14
241	$C_4H_{11}NO$	Dimethylethanolamine	1.18381	0.23249	−0.02857	10	4183	24.42	34.24	42.09
242	$C_4H_{12}Si$	Tetramethylsilane	0.70867	0.23089	−0.01505	10	10000	8.40	12.89	18.45
243	$C_4H_{13}N_3$	Diethylene Triamine	1.54270	0.06479	—	10	308	40.50	47.02	—

stripper bed capacity is said to be 30 percent to 40 percent of equilibrium for plant operating conditions. The EPA Design Manual suggests a working factor of 3 for design of adsorption beds. The total carbon requirements for an adsorption system are obtained by determining carbon required from equilibrium capacity and then multiplying by the working factor.

Factors affecting adsorption bed capacity include loss due to adsorption zone, loss due to heat wave (adsorption is an exothermic process); loss due to moisture in entering gas and loss due to residual moisture on the carbon.

Carl L. Yaws is a professor of chemical engineering at Lamar University, Beaumont, Texas, and Li Bu and Sachin Nijhawan are graduate students at Lamar University. A computer program with data for all compounds is available for a fee from Yaws at 409-880-8787.

Reader Interest Review

Please circle the appropriate number on the Reader Service Card to indicate the level of interest in the article.

High **409** Medium **410** Low **411**

Appendix I

Air Emissions Basis for Additional Identified Hazardous Organic Constituents in the Hanford Tank Farms

CCN 128557

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R10593785

Memorandum

To: File - MS9-A

From: Edgardo Berríos

Ext: 371-3817

Fax:

Date: December 9, 2005

CCN: 128557

Subject: **AIR EMISSIONS BASIS FOR ADDITIONAL IDENTIFIED HAZARDOUS ORGANICS CONSTITUENTS IN THE HANFORD TANK FARMS**

References:
1) CHG 2004, *Industrial Hygiene Chemical Vapor Technical Basis*, RPP-22491, Rev 0, October 2004, CH2M HILL
2) 24590-WTP-M4C-FRP-00006, Rev B, *WTP Air Emissions Hazardous Organic Constituents Feed Concentrations*
3) 24590-WTP-RPT-PO-03-008, Rev 1, *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant*
4) RPT-24590-EN00001, Rev 0, *Vessel Vents and PJM/RFD Emissions*
5) 24590-WTP-M4C-FRP-00005, *Estimation of Non-SSFM Represented Organic Emission Rates Required to Support the Integrated Emissions Baseline Report*
6) *Chemical Properties Handbook*, http://www.knovel.com
7) *Syracuse Research Corporation*, http://www.syrres.com/esc/physdemo.htm

Based on Reference 1, additional hazardous organic constituents, other than those already scoped through the WTP air permits, have been measured in Hanford tank headspaces. It is unknown if these constituents will be present in the WTP waste feed; therefore, the WTP and regulatory agencies have not determined if they will be included in the air permits and environmental risk evaluations. As the air emissions profile is currently being updated, it will be assumed for this update that these newly identified constituents are present in the WTP waste feed, and consequently their air emissions rates will be estimated. References 2 and 3 do not include the basis for these constituents; therefore, this memorandum serves as the documentation for these constituents basis.

The data (i.e. the basis) required to evaluate these constituents in the WTP air emissions flowsheet includes the following:

- Henry's Law constants - determines partition throughout the flowsheet and chemical group under which it is modeled.
- Appropriate modeling group per the guidelines established in References 3 and 4 - derived from the Henry's Law constants.

- Method detection limits - used to determine feed rate to the WTP.
- F_v values - used to determine unit operation removal efficiency throughout the WTP offgas systems (PT VV, PT PJV, LAW LOP/LVP, HLW HOP, and HLW PJV)

Per E&NS, the additional constituents to be evaluated are (from Reference 1, Tables 5-5 and 5-6):

CAS #	Organic Constituent
100-40-3	4-Ethenylcyclohexene
104-76-7	2-Ethyl-1-hexanol
10595-95-6	N-Nitrosomethylethylamine
109-74-0	Butanenitrile
110-59-8	Pentanenitrile
123-72-8	Butanal
134-32-7	alpha-Napthylamine
589-38-8	3-Hexanone
628-73-9	Hexanenitrile
75-02-5	Fluoroethene
79-46-9	2-Nitropropane

The basis for each constituent was established as follows:

Henry's Law constants

An Internet search was made to obtain the Henry's Law constant. The site used was the Syracuse Research Corporation website (Ref. 7). Results from each organic constituent search are provided in Attachment A and summarized below.

CAS#	Organic Constituent	Henry's Law Constant (atm-m^3/mole)
100-40-3	4-Ethenylcyclohexene	4.48E-02
104-76-7	2-Ethyl-1-hexanol	2.65E-05
10595-95-6	N-Nitrosomethylethylamine	1.44E-06
109-74-0	Butanenitrile	5.23E-05
110-59-8	Pentanenitrile	7.15E-05
123-72-8	Butanal	1.15E-04
134-32-7	alpha-Napthylamine	1.11E-07
589-38-8	3-Hexanone	1.25E-04
628-73-9	Hexanenitrile	9.49E-05
75-02-5	Fluoroethene	1.18E-01
79-46-9	2-Nitropropane	1.19E-04

Modeling Group

Per Reference 4, all organic constituents were organized into groups of similar physical properties. Representative compounds from each group were selected and modeled in the air

emissions flowsheet. This was done to avoid complexity of the flowsheet. Based on the results from the modeled constituents, the air emission rates for the non-modeled constituents are then calculated as they are assumed to behave similarly during vapor-liquid equilibrium conditions. Therefore, these new constituents need to be included into their pertaining group. The main criterion for the grouping was similar Henry's Law constants. Based on this methodology, the new identified hazardous organic constituents fall within the following groups:

CAS#	Organic Constituent	Group
100-40-3	4-Ethenylcyclohexene	22
104-76-7	2-Ethyl-1-hexanol	12
10595-95-6	N-Nitrosomethylethylamine	9
109-74-0	Butanenitrile	13
110-59-8	Pentanenitrile	13
123-72-8	Butanal	15
134-32-7	alpha-Napthylamine	6
589-38-8	3-Hexanone	15
628-73-9	Hexanenitrile	14
75-02-5	Fluoroethene	23
79-46-9	2-Nitropropane	15

Method Detection Limit

Detection limits are used to determine the concentration of the constituent in the waste feed as documented in Reference 2. No detection limits are readily available for these constituents therefore the approach taken is to assume that the constituents method detection limit will be the same to the method detection limit from a comparable compound found in the feed stream. For example, for 3-Hexanone, the method detection limit is assumed to be the same as for 3-Heptanone and for 2-Nitropropane, the method detection limit is assumed to be the same as for 1-Nitropropane. For the nitriles, the method detection limit was assumed to be the highest of all the nitriles in the feed which turned out to be acrylonitrile. After evaluating the new constituents against the existing constituents, the following detection limits were selected:

CAS#	Organic Constituent	Method Detection Limit (mg/L)	Constituent Used As Basis for Method Detection Limit
100-40-3	4-Ethenylcyclohexene	0.02	Cyclohexene
104-76-7	2-Ethyl-1-hexanol	0.07	Ethyl alcohol
10595-95-6	N-Nitrosomethylethylamine	0.3	N-Nitroso-di-n-propylamine
109-74-0	Butanenitrile	0.1	Acrylonitrile
110-59-8	Pentanenitrile	0.1	Acrylonitrile
123-72-8	Butanal	0.066	1,2-Epoxybutane
134-32-7	alpha-Napthylamine	0.066	Triethylamine
589-38-8	3-Hexanone	0.02	3-Heptanone
628-73-9	Hexanenitrile	0.1	Acrylonitrile
75-02-5	Fluoroethene	0.066	Chloropentafluoroethane
79-46-9	2-Nitropropane	0.3	1-Nitropropane

Per Table 4 of Reference 2, the adjusted concentrations of these constituents to arrive at the assumed total organic carbon weight percent in the feed are:

CAS#	Organic Constituent	Adjusted Feed Concentration (mg/L)
100-40-3	4-Ethenylcyclohexene	4
104-76-7	2-Ethyl-1-hexanol	10
10595-95-6	N-Nitrosomethylethylamine	60
109-74-0	Butanenitrile	20
110-59-8	Pentanenitrile	20
123-72-8	Butanal	10
134-32-7	alpha-Napthylamine	10
589-38-8	3-Hexanone	4
628-73-9	Hexanenitrile	20
75-02-5	Fluoroethene	10
79-46-9	2-Nitropropane	60

F_v values

F_v is a unitless parameter used to classify a constituent as being in one of three categories: vapor phase, particle phase, or particle-bound phase. This phase type affects the removal efficiency of the offgas control system for that compound. An F_v value of 1 indicates that the constituent exists only in the vapor phase. If the F_v value is less than 1, for example 0.9, this means that 90% of the compound exits in the vapor phase and 10% is particle-bound (i.e. [1-0.9]*100%). Therefore, removal efficiency for each portion of the constituent will differ based on the phase. Based on E&NS evaluations of each constituent's vapor pressure and melting point, the F_v values have been calculated to be 1 for all the constituents.

The decontamination factors (DFs) for these constituents for each unit operation will be the same as those for other vapor constituents in all unit operations except for the Pretreatment thermal oxidizer and carbon beds, which are calculated based on the constituent's properties. The DFs for these constituents are:

LAW

- Melter: 1.1
- SBS: 1
- WESP: 1
- HEPA: 1
- Carbon Beds: 1
- SCO: 20
- SCR: 1
- Caustic Scrubber: 1

HLW

- Melter: 1.1
- SBS: 1
- WESP: 1
- HEME: 1
- HEPA: 1
- Carbon Beds: 1
- Silver Mordenite: 1
- SCO: 20
- SCR: 1
- PJV HEPA: 1

Pretreatment

- Caustic Scrubber: 1
- HEME: 1
- HEPA: 1
- Thermal Oxidizer: calculated below
- Carbon Bed: calculated below
- PJV Demister: 1
- PJV HEPA: 1

The DFs for the Pretreatment thermal oxidizer and carbon beds depend on the auto ignition temperatures (AIT), boiling points, and molecular weights of each constituent. The methodology of calculating these DFs is explained in Appendix G of Reference 3. The AITs were obtained from the Chemicals Property Handbook located in Reference 6. When no data was available for a constituent, the AIT for the constituent used to obtain the method detection limit was used. When this situation occurred, the AITs were obtained from Table 1-1 in Appendix G of Reference 3.

The removal efficiency of the thermal oxidizer is based on the temperature difference between the operating temperature of the thermal oxidizer and the AIT of the constituent. Therefore, the higher the difference between the temperatures, the more efficient the unit is in destroying the organic constituent. The operating temperature of the thermal oxidizer is 1600°F. The AITs and the difference between that temperature and the operating temperature of the thermal oxidizer are:

CAS#	Organic Constituent	AIT (°F)	°F Difference from TO Operating Temperature
100-40-3	4-Ethenylcyclohexene	518	1082
104-76-7	2-Ethyl-1-hexanol	550	1050
10595-95-6	N-Nitrosomethylethylamine	**527**	1073
109-74-0	Butanenitrile	935	665
110-59-8	Pentanenitrile	**897.8**	702.2
123-72-8	Butanal	446	1154

CAS#	Organic Constituent	AIT (°F)	°F Difference from TO Operating Temperature
134-32-7	alpha-Napthylamine	**480**	1120
589-38-8	3-Hexanone	**734**	866
628-73-9	Hexanenitrile	**897.8**	702.2
75-02-5	Fluoroethene	725	875
79-46-9	2-Nitropropane	802	798

The AITs in bold indicate that these AITs are from the constituents used to determine the method detection limit.

Per the guidelines in Appendix G of Reference 3, for temperature differences between the AIT and thermal oxidizer operating range over 650°F, the expected thermal oxidizer removal efficiency is 99.99% (i.e. DF = 10,000). This indicates that all the constituents will have a DF of 10,000 in the Pretreatment thermal oxidizer.

For the carbon beds, the removal efficiency depends on the loading in the carbon beds, which is dependent on the organic constituent boiling point and molecular weight. Based on these values, the guidelines presented on Tables G-3 and G-4 of Appendix G in Reference 3 were applied to determine the removal efficiency for the constituent. The results are as follows:

CAS#	Boling Point (°C)	Molecular Weight (g/mole)	Adsorption Capability (g/100g carbon)	Carbon Bed Removal Efficiency (%)	Carbon Bed DF
100-40-3	128	108.18	2	80	5
104-76-7	184.6	130.23	10	95	20
10595-95-6	170	88.11	20	98	50
109-74-0	117.6	69.11	2	80	5
110-59-8	141.3	83.13	2	80	5
123-72-8	74.8	72.11	1	50	2
134-32-7	300.8	143.19	40	98	50
589-38-8	123.5	100.16	10	95	20
628-73-9	163.6	97.16	10	95	20
75-02-5	-72	46.05	0	0	1
79-46-9	120.2	89.1	2	80	5

Boiling points and molecular weights were obtained from Attachment 1 of this memorandum.

If these constituents are required to be included in the waste feed in the future, the bases presented in this memorandum will be included in References 2, 3, and 5.

Edgardo Berríos
Process Engineer
Process Engineering - Flowsheet and ORP Deliverables

EB/eb

Attachment: Organic Constituents Physical Properties Data

Distribution

Copy Coverage	MSIN
Berríos, E	MS4-C1
Bostic, L	MS4-D2
Cook, J	MS4-D2
Erlandson, B	MS4-D2
PDC	MS9-A
Saunders, S	MS4-C1

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```
CAS Number : 000100-40-3
Chem Name  : 4-VINYLCYCLOHEXENE
Mol Formula: C8H12
Mol Weight : 108.18
Melting Pt : -108.9 deg C
Boiling Pt : 128 deg C
Water Solubility:
   Value : 50 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 3.93
   Type  : EXP
   Ref   : CHEM INSPECT TEST INST (1992)
Vapor Pressure:
   Value : 15.7 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.0448 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 8.93E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000104-76-7
Chem Name  : 2-ETHYL-1-HEXANOL
Mol Formula: C8H18O
Mol Weight : 130.23
Melting Pt : -70 deg C
Boiling Pt : 184.6 deg C
Water Solubility:
   Value : 880 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : AMIDON,GL ET AL. (1974)
Log P (octanol-water):
   Value : 2.73
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 0.136 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 2.65E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 1.32E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 010595-95-6
Chem Name  : N-METHYL-N-NITROSOETHAMINE
Mol Formula: C3H8N2O
Mol Weight : 88.11
Melting Pt :
Boiling Pt : 170 deg C
Water Solubility:
   Value : 3E+005 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : IARC (1978)
Log P (octanol-water):
   Value : 0.04
   Type  : EXP
   Ref   : VERA,A ET AL. (1992)
Vapor Pressure:
   Value : 1.1 mm Hg
   Temp  : 20 deg C
   Type  : EST
   Ref   : KLEIN,RG (1982)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 1.44E-006 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1988)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000109-74-0
Chem Name  : BUTYRONITRILE
Mol Formula: C4H7N
Mol Weight : 69.11
Melting Pt : -111.9 deg C
Boiling Pt : 117.6 deg C
Water Solubility:
   Value : 3.3E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : RIDDICK,JA ET AL. (1986)
Log P (octanol-water):
   Value : 0.53
   Type  : EXP
   Ref   : TANII,H & HASHIMOTO,K (1984)
Vapor Pressure:
   Value : 19.5 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 5.23E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BUTLER,JAV AND RAMCHANDANI,CN (1935)
Atmospheric OH Rate Constant:
   Value : 7.56E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : ATKINSON,R (1988)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000110-59-8
Chem Name  : VALERONITRILE
Mol Formula: C5H9N
Mol Weight : 83.13
Melting Pt : -96.2 deg C
Boiling Pt : 141.3 deg C
Water Solubility:
   Value : 7750 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 1.12
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 7.3 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 7.15E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 1.67E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000123-72-8
Chem Name  : BUTYRALDEHYDE
Mol Formula: C4H8O
Mol Weight : 72.11
Melting Pt : -99 deg C
Boiling Pt : 74.8 deg C
Water Solubility:
   Value : 7.1E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : UNION CARBIDE (1974)
Log P (octanol-water):
   Value : 0.88
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 111 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1985)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000115 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BUTTERY,RG ET AL. (1969)
Atmospheric OH Rate Constant:
   Value : 2.35E-011 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1985)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000134-32-7
Chem Name  : 1-NAPHTHYLAMINE
Mol Formula: C10H9N
Mol Weight : 143.19
Melting Pt : 49.2 deg C
Boiling Pt : 300.8 deg C
Water Solubility:
   Value : 1700 mg/L
   Temp  : 20 deg C
   Type  : EXP
   Ref   : DRAGUN,J & HELLING,CS (1985)
Log P (octanol-water):
   Value : 2.25
   Type  : EXP
   Ref   : HANSCH,C ET AL. (1995)
Vapor Pressure:
   Value : 0.00418 mm Hg
   Temp  : 25 deg C
   Type  : EXT
   Ref   : CHAO,J ET AL. (1983)
pKa Dissociation Constant:
   Value : 3.92
   Temp  : 25 deg C
   Type  : EXP
   Ref   : WEAST,RC (1985)
Henry's Law Constant:
   Value : 1.11E-007 atm-m3/mole
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ABRAHAM,MH ET AL. (1994)
Atmospheric OH Rate Constant:
   Value : 2E-010 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000589-38-8
Chem Name  : 3-HEXANONE
Mol Formula: C6H12O
Mol Weight : 100.16
Melting Pt : -55.5 deg C
Boiling Pt : 123.5 deg C
Water Solubility:
   Value : 1.47E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YALKOWSKY,SH & DANNENFELSER,RM (1992)
Log P (octanol-water):
   Value : 1.24
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 13.9 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : YAWS,CL (1994A)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.000125 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 6.9E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000628-73-9
Chem Name  : HEXANENITRILE
Mol Formula: C6H11N
Mol Weight : 97.16
Melting Pt : -80.3 deg C
Boiling Pt : 163.6 deg C
Water Solubility:
   Value : 2480 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 1.66
   Type  : EXP
   Ref   : TANII,H & HASHIMOTO,K (1984)
Vapor Pressure:
   Value : 2.85 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 9.49E-005 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 3.09E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1993)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000075-02-5
Chem Name  : VINYLFLUORIDE
Mol Formula: C2H3F
Mol Weight : 46.05
Melting Pt : -160.5 deg C
Boiling Pt : -72 deg C
Water Solubility:
   Value : 1.29E+004 mg/L
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM ET AL. (1996)
Log P (octanol-water):
   Value : 1.19
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1995)
Vapor Pressure:
   Value : 1.98E+004 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1989)
pKa Dissociation Constant:
   Value :
   Temp  :
   Type  :
   Ref   :
Henry's Law Constant:
   Value : 0.118 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : MEYLAN,WM & HOWARD,PH (1991)
Atmospheric OH Rate Constant:
   Value : 5.56E-012 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : ATKINSON,R (1989)
```

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Data From SRC PhysProp Database:

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```
CAS Number : 000079-46-9
Chem Name  : 2-NITROPROPANE
Mol Formula: C3H7NO2
Mol Weight : 89.10
Melting Pt : -91.3 deg C
Boiling Pt : 120.2 deg C
Water Solubility:
   Value : 1.7E+004 mg/L
   Temp  : 25 deg C
   Type  : EXP
   Ref   : BAKER,PJJR & BOLLMEIER,AFJR (1981)
Log P (octanol-water):
   Value : 0.93
   Type  : EXP
   Ref   : CHEM INSPECT TEST INST (1992)
Vapor Pressure:
   Value : 17.2 mm Hg
   Temp  : 25 deg C
   Type  : EXP
   Ref   : DAUBERT,TE & DANNER,RP (1987)
pKa Dissociation Constant:
   Value : 7.68
   Temp  : 25 deg C
   Type  : EXP
   Ref   : SERJEANT,EP & DEMPSEY,B (1979)
Henry's Law Constant:
   Value : 0.000119 atm-m3/mole
   Temp  : 25 deg C
   Type  : EST
   Ref   : VP/WSOL
Atmospheric OH Rate Constant:
   Value : 2.6E-013 cm3/molecule-sec
   Temp  : 25 deg C
   Type  : EXP
   Ref   : LIU,R ET AL. (1990)
```

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