

**CRITERIA AND TOXIC AIR EMISSIONS
NOTICE OF CONSTRUCTION APPROVAL ORDER
CONDITIONS AND RESTRICTIONS**

REGULATORY AUTHORITY:

Pursuant to the Washington State Department of Ecology General Regulations for Air Pollution Sources, Chapter 173-400 Washington Administrative Code (WAC), and Controls for New Sources of Toxic Air Pollutants, Chapter 173-460 WAC, Ecology now finds the following:

FINDINGS OF FACT:

1. The United States Department of Energy (USDOE) proposes to modify their existing facility (Hanford) located in Richland, Washington.

2. Notice of Construction (NOC) application for the USDOE Effluent Treatment Facility (ETF) was submitted on February 12, 1993. The application was found to be complete and approval issued on December 20, 1993, as **ORDER NOC-93-3**.
 - a. The ETF is an industrial waste water treatment facility designed to treat dilute liquid waste streams generated on the Hanford Site.
 - b. The ETF was designed with a treatment capacity of 150 gallons per minute.
 - c. The ETF was designed in association with the Liquid Effluent Retention Facility (LERF) with an initial capacity of 27 million gallons. Construction of the LERF predated promulgation of WAC 173-460.
 - d. Intended waste feed streams included the Plutonium Uranium Extraction (PUREX) plant process distillate, PUREX ammonia scrubber distillate, and 242-A Evaporator process condensate.
 - e. Liquid treatment processes include solids removal, ultraviolet/oxidation with hydrogen peroxide, pH adjustment, degasification, reverse osmosis (RO), ion exchange, concentration of RO reject and resin regeneration solutions, and evaporation of product solids to dryness.
 - f. Emissions from sources of the ETF storage vessels and processes are depicted in Figure 1.
 - g. Estimated emissions included 2.41 pound per year (lb/yr) of ammonia, 581 lb/yr of volatile organic compounds (VOCs), and 5.2×10^{-4} lb/yr of particulate matter.
 - h. High efficiency particulate air (HEPA) filtration of ETF stack gases was determined to meet best available control technology for air toxics (tBACT).

3. The USDOE completed start-up testing of VOC and visible emissions required by Approval Conditions 2 and 3 of **ORDER NOC-93-3** on January 23, 1996. The testing verified initial compliance with Conditions 2 and 3, regarding VOC and visible emissions of **ORDER NOC-93-3** and Conditions 1.2.1.1, 1.2.2.1, and 1.2.2.2 of this ORDER.

4. The USDOE requested modification to the ETF NOC on October 7, 1996. The modification application was found to be complete and approval issued on October 16, 1996, as **ORDER 96NW-1-301**.
 - a. Waste feed streams originally intended for treatment at the ETF have been discontinued as a result of the PUREX plant shut down. Discontinued streams were the PUREX plant process distillate and PUREX ammonia scrubber distillate.
 - b. Additional waste streams from groundwater pumping, N-Basin, and other locations identified new potential air contaminants.
 - c. LERF VOC control through the use of granulated activated carbon (GAC) offgas treatment reduced VOC emissions from the facility and did not incur additional permitting approval requirements in the storage and management of new waste waters.
 - d. Assessment of new waste water streams identified minor changes in waste constituents for which WAC 173-460 approval was required.
 - e. Estimated emissions of the ETF operations are detailed in Table 1.
 - f. ETF installed GAC filtration for VOC control within the vessel offgas treatment train.
 - g. No change in treatment technology or tBACT analysis was required.
5. The USDOE requested modification to the ETF on April 10, 2007. The modification application was found to be complete on April 26, 2007, and included the construction and operation of a Solidification Treatment Unit (STU) for the solidification of brine wastes.
6. The modification of FINDING 5 was approved and ORDERED on June 6, 2007, as **ORDER DE07NWP-003** voiding **ORDERS NOC-93-3** and **96NW-1-301**.
7. Amendments 1 and 2 to **ORDER DE07NWP-003** were issued on August 7, 2007, and September 27, 2007, to correct editorial reference and identify additional toxic air pollutants upon Table 1, respectively.
8. The USDOE failed to initiate construction of modifications approved on June 6, 2007, resulting in the void of construction authorization of these modifications in accord with WAC 173-400-110(9).
9. Washington regulation affecting identification and Acceptable Source Impact Levels (ASILs) of Toxic Air Pollutants (TAPs) was altered, effective June 20, 2009, at WAC 173-460, resulting in the removal of some air contaminants from identification as toxic air pollutants from Table 1.
10. Hanford is an existing major stationary source that emits more than 250 tons of a regulated pollutant per year.
11. Emissions of criteria pollutants from the proposed project modification are below the Prevention of Significant Deterioration Significant Emission Rates.

12. Hanford is located in a Class II Area designated as “attainment” for the purpose of permitting for all pollutants.
13. Criteria air pollutant emissions from the proposed project modification are below the *de minimus* levels in WAC 173-400-110(5)(d).
14. Toxic Air Pollutants (TAPs) from the proposed project are below the Acceptable Source Impact Levels (ASILs) and Small Quantity Emission Rates (SQERs) of WAC 173-460.
15. The proposed project, if constructed and operated as herein required, will provide tBACT.
16. The proposed project, if operated as herein required, will be in accordance with applicable rules and regulations, as set forth in Chapter 173-400 WAC and Chapter 173-460 WAC, and the operation thereof will not result in ambient air quality standards being exceeded.
17. The project will have no significant impact on air quality.

THEREFORE, IT IS ORDERED that the project as described in said Notice of Construction application, and as detailed in emissions estimates and impact and control technology assessments submitted to the Washington State Department of Ecology in reference thereto, is approved for construction, installation, and operation, provided compliance with the conditions and restrictions described below. This ORDER shall be identified as NOC ORDER **DE07NWP-003, Rev. 1.**

1.0 GENERAL APPROVAL CONDITIONS

1.1 Effective Date

The effective date of this authorization shall be that as signed in Section 4.0. All references to procedures or test methods shall be to those in effect as of the effective date of this ORDER.

1.2 Emission Limits

1.2.1 Visible emissions

1.2.1.1 Visible emissions from the ETF stack (Figure 1) shall not exceed five percent.

1.2.2 Volatile Organic Compound (VOC) emissions

1.2.2.1 VOC emissions from the ETF (Figure 1) shall not exceed 0.50 gram per minute (g/min).

1.2.2.2 VOC emissions from the ETF (Figure 1) shall not exceed 0.55 gram per cubic meter (g/m³) at standard conditions.

1.2.2.3 VOC emissions from ETF operations shall not exceed 4,000 lb/yr. [WAC 173-400-110(5)(d)]

1.2.3 Particulate matter emissions shall not exceed 1,500 lb/yr.

[WAC 173-400-110(5)(d)]

- 1.2.4 Toxic Air Pollutant (TAP) emissions
 - 1.2.4.1 As submitted in the NOC Applications and identified in Table 1, shall not exceed ASILs. [WAC 173-460-070]
 - 1.2.4.2 Newly identified TAPs shall not exceed ASILs and with assessment of ASIL compliance may be processed. [WAC 173-460-070]

1.3 Compliance Demonstration

- 1.3.1 Visible emissions
 - 1.3.1.1 Compliance with Approval Condition 1.2.1.1 shall be met by Tier 3 Visible Emissions Survey requirements of the Hanford Air Operating Permit.
- 1.3.2 VOC emissions
 - 1.3.2.1 Compliance with Approval Conditions 1.2.2.1 and 1.2.2.2 shall be determined based upon the tested arithmetic mean of three one-hour periods for the G6 stream (Figure 1) using U.S. Environmental Protection Agency reference Method 25A or Method 18 (Finding 3) and upon waste analysis records as detailed in Approval Condition 2.2.
 - 1.3.2.2 Compliance with Approval Condition 1.2.2.3 shall be demonstrated by material emission estimates as detailed in Approval Condition 2.2.
- 1.3.3 Compliance with Approval Condition 1.2.3 shall be met by operating the exhauster systems only when in accord with:
 - 1.3.3.1 tBACT emission controls found for the ETF (Finding 2.h).
- 1.3.4 Compliance with Approval Condition 1.2.4.1 shall be demonstrated by waste analysis records as detailed in Approval Condition 2.2.
- 1.3.5 Compliance with Approval Condition 1.2.4.2 shall be demonstrated by compliance with Approval Condition 2.3 and assessment of ASIL compliance detailed in Approval Condition 2.2.

1.4 Manuals

Operations and Maintenance (O&M) manuals for all equipment, procedures, and controls associated with the proposed activities that have the potential to affect emissions to the atmosphere shall be developed and followed. Manufacturer's instructions may be referenced. The O&M manuals shall be updated to reflect any modifications of the process or operating procedures. Copies of the O&M manuals shall be available to Ecology upon request.

2.0 NOTIFICATIONS AND SUBMITTALS

2.1 Addressing

Any required notifications and submittals required under these Approval Conditions shall be sent electronically or in writing to:

Program Manager
Washington State Department of Ecology
Nuclear Waste Program
3100 Port of Benton Boulevard
Richland, Washington 99354

2.2 Recordkeeping

Specific records shall be kept on the Hanford Site by the Permittee and made available for inspection by Ecology upon request. The records shall be organized in a readily accessible manner and cover a minimum of the most recent 60-month period. The records to be kept shall include the following:

1. Records of calibration of stack gas flow rate and temperature measurement devices.
2. Exhauster system stack flow rates and temperature records.
3. All monitoring and operations records required to operate and maintain the emission control equipment which implements tBACT as described in Approval Condition 1.3.3.
4. Laboratory analysis result summaries of any waste influent samples undertaken after the effective date of this Order which are examined for potential TAPs or TAPs identified in Table 1 shall support Approval Conditions 1.3.4 and 1.3.5.
5. Waste stream influent volumetric records shall be retained to support Approval Conditions 1.3.4 and 1.3.5.
6. Waste feed influent assessment of VOC emission release potential to support Approval Condition 1.3.2.1.

2.3 Reporting

Identification of any TAP not previously identified within the NOC Applications, as defined in Table 1, shall be submitted to Ecology within 90 days of completion of laboratory analysis which verify actual or anticipated emissions of that toxic air pollutant from the project.

3.0 EMISSION MONITORING

No routine monitoring of criteria or toxic air pollutants from these approved operations is required.

4.0 APPROVAL ORDER AND RESTRICTIONS

Operation of the subject systems is intended for the storage, treatment, and discharge of Hanford Site waste waters as described in the NOC application.

This Authorization may be modified, suspended, or revoked in whole, or in part, for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this authorization.
2. Obtaining this authorization by misrepresentation, or failure to fully disclose all relevant facts.

The provisions of this authorization are severable and, if any provision of this authorization, or application of any provisions of this authorization to any circumstance, is held invalid, the application of such provision to their circumstances, and the remainder of this authorization, shall not be affected thereby.

Any person aggrieved by this ORDER may obtain review thereof by application, within thirty (30) days of receipt of this order, to:

Pollution Control Hearings Board
P.O. Box 40903
Olympia, Washington 98504-0903

Concurrently, copies of the application must be sent to:

Washington State Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

These procedures are consistent with the provisions of Chapter 43.21B RCW, and the rules and regulations adopted thereunder.

DATED at Richland, Washington, this 10th day of August 2010.

REVIEWED AND PREPARED BY:



Doug Hendrickson, P.E.



APPROVED BY:



Jane A. Hedges

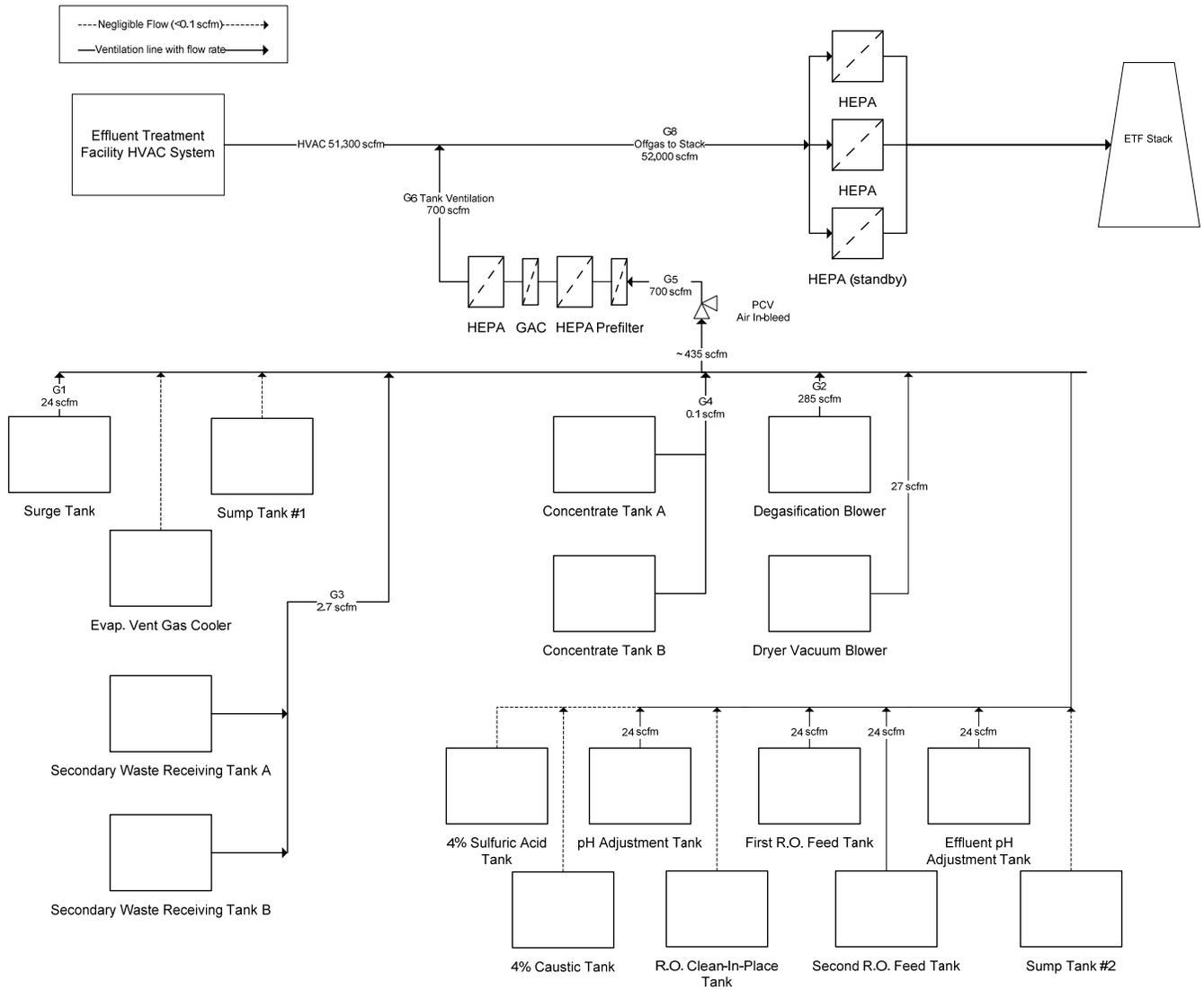


Figure 1: Effluent Treatment Facility Ventilation

Table 1: Effluent Treatment Facility Toxic Air Pollutants					
Toxic Air Pollutants ¹	CAS# ²	Emissions Estimate (lb/yr)	Averaging Period	ASIL ³ (µg/m³)	SQER ⁴ (lb/period)
1,1,1-Trichloroethane	71-55-6	8.35E-04	24-hr	1000	131
1,1,2-Trichloroethane	79-00-5	3.54E-04	year	0.0625	12
1,2-Dichloroethane	107-06-2	1.26E-04	year	0.0385	7.39
1,4-Dichlorobenzene	106-46-7	1.14E-04	year	0.0909	17.4
DDE	72-55-9	3.66E-04	year	0.0103	1.98
DDT	50-29-3	4.80E-03	year	0.0103	1.98
Aldrin	309-00-2	2.06E-03	year	0.000204	0.0391
Benzene	71-43-2	2.29E-03	year	0.0345	6.62
Carbon Tetrachloride	56-23-5	5.05E-01	year	0.0238	4.57
Chloroform	67-66-3	7.75E-03	year	0.0435	8.35
Dieldrin	60-57-1	4.34E-03	year	0.000217	0.0416
Ethylbenzene	100-41-4	1.03E-03	year	0.4	76.8
gamma-Hexachlorocyclohexane	58-89-9	1.94E-03	year	0.00323	0.62
Heptachlor	76-44-8	1.94E-03	year	0.0000769	0.0148
Dichloromethane	75-09-2	2.85E-03	year	1	192
Pentachlorophenol	87-86-5	3.09E-02	year	0.217	41.6
Phenol	108-95-2	9.60E-01	24-hr	200	26.3
Perchloroethylene	127-18-4	7.10E-04	year	0.169	32.4
Toluene	108-88-3	6.85E-04	24-hr	5000	657
Trichloroethylene	79-01-6	9.15E-03	year	0.5	95.9
Ammonia	7664-41-7	1.21E-06	24-hr	70.8	9.31
Beryllium & Compounds (NOS) ⁵	---	2.17E-07	year	0.000417	0.08
Cadmium & Compounds	7440-43-9	8.20E-07	year	0.000238	0.0457
Chromium Hexavalent: Soluble, except Chromic Trioxide	39227-28-6	2.95E-14	year	0.00000667	0.00128
Copper & Compounds	---	1.04E-04	1-hr	100	0.219
Fluoride containing chemicals, NOS	---	4.90E-13	24-hr	13	1.71
Lead and compounds (NOS)	----	1.95E-08	year	0.0833	16
Manganese & Compounds	---	4.34E-06	24-hr	0.04	0.00526
Sodium Hydroxide	1310-73-2	7.75E-03	1-hr	8	0.0175
Vanadium Pentoxide	1314-62-1	4.57E-06	1-hr	30	0.0657
Arsenic & Inorganic Arsenic Compounds	---	3.40E-12	year	0.000303	0.0581
Mercury, Elemental	7439-97-6	8.76E-13	24-hr	0.09	0.0118
Nitric Acid	7697-37-2	3.94E-07	1-hr	86	0.188
Phosphoric Acid	7664-38-2	9.64E-11	24-hr	7	0.92
Selenium & Selenium Compounds (other than Hydrogen Selenide)	---	1.40E-12	24-hr	20	2.63
Sulfuric Acid	7664-93-9	2.37E-04	24-hr	1	0.131
Methyl Ethyl Ketone	78-93-3	5.26E+00	24-hr	5000	657
Ethylene glycol monobutyl ether	111-76-2	1.31E+02	24-hr	13000	1710
Di(2-ethylhexyl)phthalate	117-81-7	6.00E+00	year	0.0417	8
Carbon disulfide	75-15-0	5.69E-02	24-hr	800	105
Methyl Chloride	74-87-3	8.58E-02	24-hr	90	11.8
n-Nitrosodimethylamine	62-75-9	1.20E-04	year	0.000217	0.0416
m-Xylene	108-38-3	1.83E-03	24-hr	221	29

Table 1: Effluent Treatment Facility Toxic Air Pollutants					
Toxic Air Pollutants ¹	CAS# ²	Emissions Estimate (lb/yr)	Averaging Period	ASIL ³ (µg/m³)	SQER ⁴ (lb/period)
o-Xylene	95-47-6		24-hr	221	29
p-Xylene	106-42-3		24-hr	221	29

Notes:

- 1: Toxic Air Pollutant as identified in WAC 173-460-150.
- 2: CAS # = Chemical Abstracts Service Registry number.
- 3: Acceptable Source Impact Level, ambient concentration.
- 4: Small Quantity Emission Rate.
5. NOS - Not otherwise specified. This applies to situations where emission factors for a group of pollutants is reported, but specific isomers, congeners, or chemicals are not reported.