Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

OCT 18 2013

14-ESQ-0003

Ms. J. A. Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

Dear Ms. Hedges:

SUBMITTAL OF ADDITIONAL CLOSURE PLANS FOR CLOSING DANGEROUS WASTE MANAGEMENT UNITS (DWMUs) AT THE T-PLANT COMPLEX

On June 26, 2013, the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA) executed a consent agreement and final order (CAFO) (Docket No: RCRA-10-2013-0113) requiring initiation of closure of several Hanford Site DWMUs. DOE has submitted closure plans for the units listed in the CAFO under letter 13-ESQ-0074. The permit modification request for that letter included an updated Part A permit application for the T-Plant Complex.

During preparation of the updated Part A permit application for the T-Plant Complex, five additional closure DWMUs were identified that no longer have a future use. This letter is submitting additional closure plans for these five additional DWMUs at the T-Plant Complex as a permit modification request. DOE requests these units to be considered at the same time as the permit modification request in letter 13-ESQ-0074. A copy of the permit modification request, including copies of the closure plans, is also being submitted to EPA Region 10.

A sixty-day public comment period will be held on the permit modification request as required by Washington Administrative Code (WAC) 173-303-830(4)(c)(ii)(A). The notice required by the Permittees in WAC 173-303-830(4)(c)(ii) will be included in the appropriate Hanford Federal Facility Agreement and Consent Order publication or list server, as described in Hanford Facility RCRA Permit Condition I.C.3. A public meeting will be held on December 9, 2013, per WAC 173-303-830(3)(c)(iv).

If you have any questions, please contact me, or your staff may contact Stacy L. Charboneau, Assistant Manager for Safety and Environment on (509) 373-3841.

Sincerely,

Matt McCormick
Manager

ESQ:ACM

Attachments

cc w/attachs: See page 2

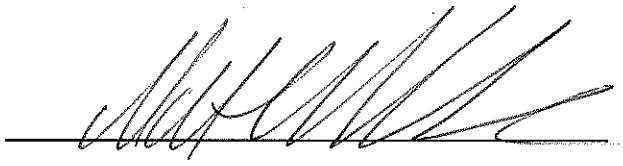
cc w/attachs:
E. Kowalski, EPA Region 10
Ecology NWP Library
Environmental Portal, LMSI, A3-95
Administrative Record, TSD: T-2-7, TS-2-4, D-2-9
HF Operating Record (J. K. Perry, MSA, H7-28)

cc w/o attachs:
D. B. Bartus, EPA
L. T. Blackford, CHPRC
A. E. Cawrse, CHPRC
S. J. Dahl, Ecology
B. J. Dixon, CHPRC
M. N. Jaraysi, CHPRC
S. S. Lowe, Ecology
J. B. Price, Ecology
A. L. Prignano, Ecology
F. A. Ruck III, CHPRC
J. R. Seaver, CHPRC

U.S. Department of Energy, Richland Operations Office Certification

The following certification statement is provided for the submittal of the permit modification package contained in letter 14-ESQ-0003.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



10/18/13

Matt McCormick
U.S. Department of Energy
Richland Operations Office

Date

Addendum H2

Closure Plans

T-Plant Complex

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Addendum H – SWOC Closure Units

H2 T-Plant Complex

H2.F Appendix F – 221-T Tank System

F1 Introduction

This appendix discusses closure activities for the T-Plant Complex Operating Unit Group (OUG) (T-Plant Complex) 221-T Tank System dangerous waste management unit (DWMU), hereinafter referred to as the 221-T Tank System. The 221-T Tank System has been out of operation since 1999. The Permittee has concluded that the 221-T Tank System will no longer be utilized for future receipts of dangerous waste and has, therefore, decided to coordinate closure of the DWMU with final closure of the T-Plant Complex OUG. Closure will be performed in accordance with the included schedule.

This closure plan complies with WAC 173-303-640(8), "Dangerous Waste Regulations," "Tank Systems," "Closure and Post-Closure Care," and WAC 173-303-610(2) through WAC 173-303-610(6), "Dangerous Waste Regulations," "Closure and Post-Closure," and represents the baseline for closure. Amendments to this closure plan will be submitted as a permit modification in accordance with WAC 173-303-610(3)(b).

F1.1 Unit Description

The 221-T Tank System is a non-operational tank system located inside of the 221-T Canyon Building. The 221-T Tank System previously contained multi-phasic waste originally comprised of liquids and sludge. The liquid portion was primarily rainwater mixed with dilute decontamination solutions. The sludge portion contained highly radioactive solids that were primarily dirt, sandblasting grit, oil, and grease from T-Plant decontamination operations. Liquids have naturally evaporated from the tank waste, leaving only dry waste residues below the level of detection by the tank level indicators; therefore, the level is effectively zero. The last addition of waste to the tank system occurred in June 1999 when the tank system was isolated and permanently removed from service. Further acceptance of dangerous or mixed waste is not authorized.

The 221-T Tank System consists of six tanks (Tank 5-6, Tank 5-7, Tank 5-9, Tank 6-1, Tank 11-R, and Tank 15-1), the 211-T Sump, the 5-8 sump, associated piping, and ancillary equipment. The six tanks are stainless steel, closed bottom tanks of varying size that have been isolated from further waste addition and are, therefore, considered non-operational (Figure F-1). The 5-8 sump is located in 221-T Cell 5R below Tank 5-7. The 211-T Sump is located between the 2706-T Building and the 221-T Building and has been isolated and is awaiting closure. The six tanks, 211-T Sump, 5-8 sump, and waste transfer piping and ancillary equipment leading from the tanks to the first isolation point will be closed under this plan.

The 221-T Tank System pre-dates the effective date of mixed waste (August 19, 1987) and the subsequent secondary containment and tank control requirements required by 40 CFR 264, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," Subpart J, "Tank Systems," and WAC 173-303-640. No individual secondary containment is provided for each tank. Any overflow or leakage from Tanks 5-6, 5-9, 6-1, 11-R, or 15-1 would have been collected in the 24 inch cell drain header then flowed to cell 5-R and collected in the 5-8 sump at the bottom of cell 5R. Any leaks or overflow from Tank 5-7 would have been collected in the 5-8 sump. The 5-8 sump is equipped with level indication and a remote display and alarm panel in the 221-T Operating Gallery.

The 221-T Tank System is located inside the 221-T Canyon facility, no liquid waste remains within the tank system, and the 221-T Tank System has been isolated from any further waste addition. Therefore, the 221-T Tank System is concluded to be in a safe configuration for an extended closure period. The 221-T Canyon facility is part of the Canyon Disposition Initiative (CDI). In addition, the T-Plant Complex OUG is included in the Tri-Party Agreement (TPA) (*Hanford Federal Facility Agreement and Consent Order* [Ecology et al., 1989a]) Action Plan (*Hanford Federal Facility Agreement and Consent Order Action Plan* [Ecology et al., 1989b]), Section 6, "Treatment Storage and Disposal Unit Process," and Section 8, "Facility Disposition Process."

> TPA Action Plan Section 6.1:
> *Some of the TSD groups/units (primarily those located within large processing facilities) will be integrated with the disposition of the facility, and therefore closed in accordance with the process defined in Section 8.0. These units are those that have physical closure actions that need to be done in conjunction with the physical disposition actions in the facility (e. g. removal of structural components).*

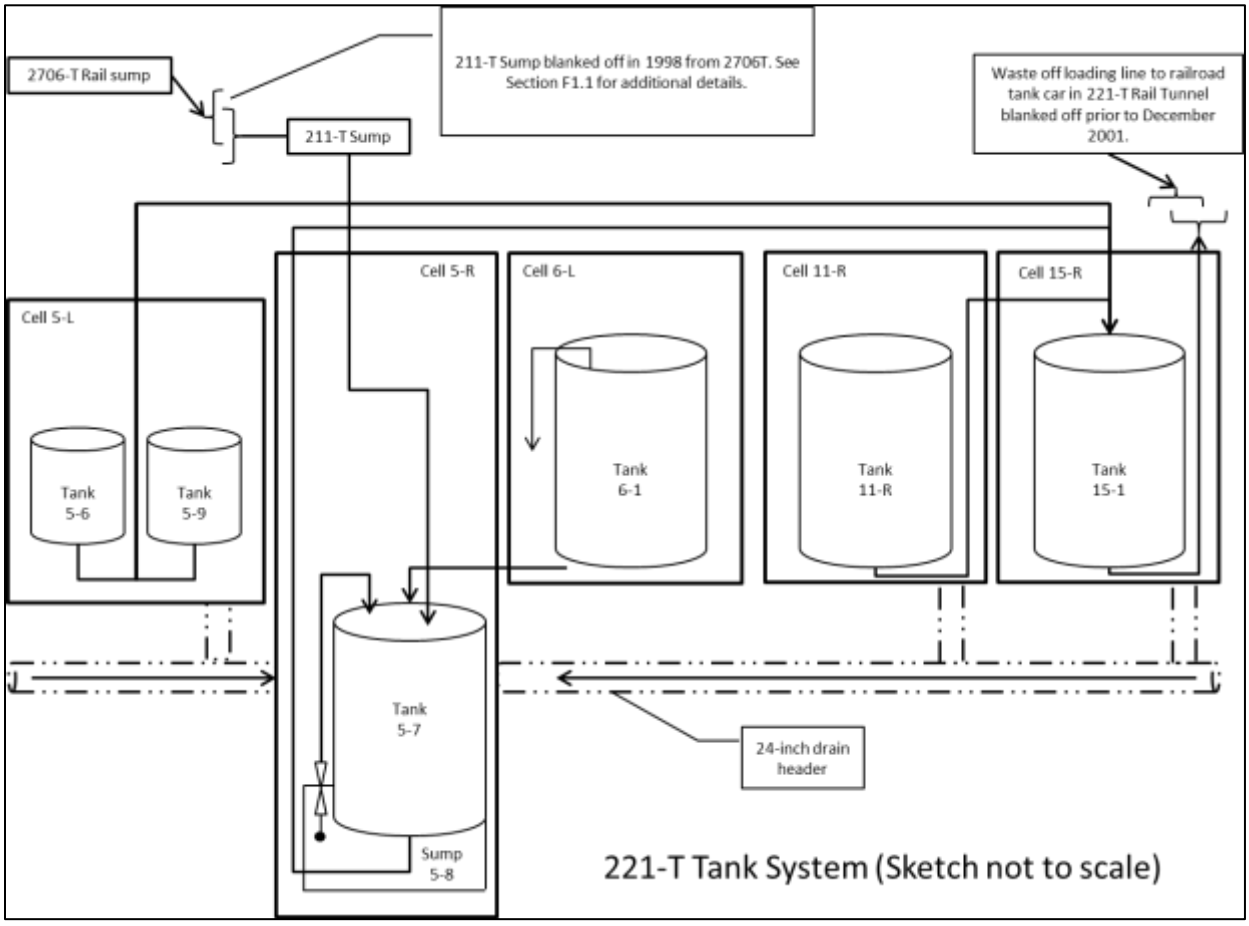

Figure F-1. T-Plant Complex 221-T Tank System

The strategy for the entire T-Plant Complex is a coordinated closure for both the RCRA closing units and CDI activities. When the 221-T Canyon Building is closed, the TPA (Ecology et al., 1989a) is anticipated to contain a milestone related to a past practice and treatment, storage, and disposal (TSD) unit disposition similar to what has been established for B-Plant and the Plutonium-Uranium Extraction Plant. Post-closure requirements for DWMUs in the 221-T Canyon Building will be required. The Permittees

will submit a permit modification to amend Addendum H that will coincide with coordination activities and past practice disposition under the TPA (Ecology et al., 1989a). Final closure of the tanks, sump, piping, and ancillary equipment will occur during the CDI activities for the T-Plant Complex.

F1.1.1 Maximum Waste Inventory

No incompatible wastes have been stored in the 221-T Tank System, and the last addition of waste to these tanks occurred on June 3, 1999. The maximum waste inventory of the 221-T Tank System is the maximum capacity of the 221-T Tank System as identified in Table F-1.

Table F-1. Maximum Waste Inventory of the 221-T Tank System

Tank Number	Maximum Waste Inventory
5-6	19,305 Liters (5,100 Gallons)
5-9	18,170 Liters (4,800 Gallons)
5-7	52,995 Liters (14,000 Gallons)
6-1	52,995 Liters (14,000 Gallons)
11-R	52,995 Liters (14,000 Gallons)
15-1	52,995 Liters (14,000 Gallons)
Sump 5-8	187,000 Liters (49,400 Gallons)

F2 Closure Performance Standard

Closure performance standards for the 221-T Tank System will be based on requirements found in WAC 173-303-640(8), “Tank Systems”, “Closure and Post-Closure Care,” and WAC 173-303-610(2), “Dangerous Waste Regulations,” “Closure and Post-Closure.” WAC 173-303-610(2) requires closure of the facility in a manner that:

- Minimizes the need for further maintenance
- Controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere
- Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity

Waste residue is not anticipated to be removed from the 221-T Tank System during final closure activities under T-Plant CDI activities. Therefore, 221-T Tank System closure performance standards will include the requirements outlined in WAC-173-303-610(b) concerning post-closure care for units where waste will remain after closure.

These performance standards are addressed in the Sections F2.1 and F3.11 of this closure plan.

F2.1 Closure Levels

The 221-T Tank System will be closed to the performance standards identified in WAC 173-303-610 in coordination with T-Plant CDI activities. The waste residue is anticipated to be left within the 221-T Tank System tanks; therefore, the DWMU will close as a landfill in accordance with requirements outlined in WAC 173-303-645(6), "Dangerous Waste Regulations," "Releases from Regulated Units," and will require post-closure care. Location of the 221-T Tank System inside of the 221-T Canyon Building and any post-closure care coordinated with T-Plant CDI activities will control, minimize, or eliminate the potential release of any dangerous waste constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or atmosphere. Final closure of the 221-T Tank System will be achieved in conjunction with T-Plant Complex CDI activities.

F3 Closure Activities

Anticipated closure activities for the 221-T Tank System include grouting of the tanks and the associated T-Plant Canyon cells and placement of a final cover in coordination with T-Plant Complex CDI activities. Knowledge of historical operations, the current non-operational configuration of the 221-T Tank System, and the isolated location of the tanks within the 221-T Canyon cells, leads to the conclusion that the 221-T Tank System is in a safe configuration for an extended closure period. The 221-T Tank System will undergo final RCRA closure as a landfill in conjunction with the CDI activities. Should these closure activities change, a permit modification request will be submitted to amend this closure plan to coincide with past practice disposition under the TPA (Ecology et al., 1989a).

Due to the extended closure period that will be required to complete closure activities, closure activities have been divided into near-term and extended period activities.

Near-term closure activities are as follows:

- Identify known operating history for the 221-T Tank System (completed; see Section F1.1).
- Review the most recent visual inspection of the 221-T Tank System (completed; see Attachment A).
- Continue inspection of the 221-T Tank System in accordance with the requirements in Addendum I, "Inspection Plan."

Extended closure activities include the following:

- The 221-T Tank System will remain in place and be managed under the final T-Plant Complex CDI activities.
- Waste residue will be sampled (if necessary).
- Tanks and surrounding cells will be filled with grout in coordination with the T-Plant Complex CDI.
- A cover will be placed in coordination with the T-Plant Complex CDI.

F3.1 Health and Safety Requirements

Closure will be performed to ensure the safety of personnel and the surrounding environment. Qualified personnel will perform any necessary closure activities in compliance with established safety and environmental procedures. Personnel will be equipped with appropriate personal protective equipment. Qualified personnel will be trained in applicable safety and environmental procedures in accordance with the Solid Waste Operations Complex T-Plant, Addendum G, "Personnel Training," and will have

appropriate training and experience in sampling activities. Field operations will be performed in accordance with applicable health and safety requirements.

The Permittees have instituted training or qualification programs to meet training requirements imposed by regulations, DOE orders, and national standards such as those published by the American National Standards Institute/American Society of Mechanical Engineers. For example, the environmental, safety, and health training program provides workers with the knowledge and skills necessary to execute assigned duties safely. Field personnel typically have completed the following training before starting work:

- Occupational Safety and Health Administration 40-Hour Hazardous Waste Worker Training
- 8-Hour Hazardous Waste Worker Refresher Training (as required)
- Hanford General Employee Training

Project-specific safety training addressed explicitly to the project and the day's activity will be provided that includes the following:

- Training will provide the knowledge and skills that sampling personnel need to perform work safely and in accordance with quality assurance requirements.
- Samplers are required to be qualified in the type of sampling being performed in the field.

In addition, pre-job briefings will be performed to evaluate activities and associated hazards by considering the following factors:

- Objective of the activities
- Individual tasks to be performed
- Hazards associated with the planned tasks
- Environment in which the job will be performed
- Facility where the job will be performed
- Equipment and material required
- Safety protocols applicable to the job
- Training requirements for individuals assigned to perform the work
- Level of management control
- Proximity of emergency contacts

Training records are maintained for each employee in an electronic training record database. The Permittees training organization maintains the training records system.

F3.2 Removal of Wastes and Waste Residues

No liquid waste remains in the 221-T Tank System, and removal of solid waste residues is not anticipated. Therefore, this section is not applicable.

F3.3 Unit Components, Parts, and Ancillary Equipment

The 221-T Tank System tanks, sumps, piping, and ancillary equipment will remain in place pending final disposition under the CDI activities and RCRA corrective actions associated with the T-Plant Complex OUG.

F3.4 Inspection of Units Before Decontamination

Decontamination activities are not planned for the 221-T Tank System.

F3.5 Decontamination

Decontamination activities are not planned for the 221-T Tank System.

F3.6 Identifying and Managing Contaminated Environmental Media

The 221-T Tank System is located inside the 221-T Canyon. Contaminated environmental media is not anticipated.

F3.7 Confirming Closure

The 221-T Tank System will be closed in conjunction with T-Plant CDI activities. All dangerous or mixed waste has been removed using the practices commonly employed to remove waste from the tanks (i.e., pumping), although solid residue remains in an amount undetectable by the level detection system of the tank. The 221-T Tank System is located inside the 221-T Canyon Building; therefore, any potential releases of dangerous or mixed waste will be contained within the 221-T Canyon Building. The 221-T Tank System has been isolated preventing addition of waste. Post-closure escape of dangerous waste and any associated dangerous waste constituents, leachate, contaminated runoff, and dangerous waste decomposition products to the ground, surface water, groundwater, or air is not anticipated. Post-closure care of the 221-T Tank System will be identified for the 221-T Canyon Building during the T-Plant Complex CDI.

F3.8 Sampling and Analysis and Constituents to Be Analyzed

F3.8.1 Sampling and Analysis Plan

Sampling and analysis of the 221-T Tank System residue, if deemed necessary, will be identified and performed in conjunction with T-Plant CDI activities. As part of the CDI, a data quality objectives (DQO) process will be conducted to determine any data needs necessary to support final disposition of the 221-T Canyon Building. The T-Plant Complex OUG Part A Form identifies potential characteristics of the waste in the tanks, using waste numbers for the chemicals potentially received, and will be used during the DQO process.

F3.9 Role of the Independent Qualified Registered Professional Engineer

An independent, qualified, registered, professional engineer will be retained to provide certification of the closure and sign the closure certification as required by WAC 173-303-610(6). The resulting engineering report will be retained in the operating record.

F3.10 Closure Certification

In accordance with WAC 173-303-610(6), certification that the DWMU has been closed in accordance with the specifications in this closure plan will be submitted to Ecology by registered mail within 60 days of completion of 221-T Tank System DWMU closure. The certification will be signed by the owner or operator and by an independent, qualified, registered, professional engineer.

F3.11 Conditions that will be Achieved when Closure is Complete

Upon completion of the near-term closure activities, the 221-T Tank System will remain in an "as-is" state. Post-closure requirements for DWMUs in the 221-T Canyon Building will be required. The Permittees will submit a permit modification to amend this closure plan to coincide with coordination activities with past practice disposition under the TPA Action Plan (Ecology et al., 1989b), Chapter 8.0, "Facility Disposition Process." The 221-T Tank System will undergo final closure under the CDI activities associated with the T-Plant Complex OUG.

F4 Closure Schedule and Time Frame

Several near-term closure activities have been completed and documented in this closure plan. This DWMU is located within the 221-T Canyon building, a large operating facility that currently serves as both waste treatment and storage at the Hanford Site for multiple waste streams. The TPA Action Plan (Ecology et al., 1989b) identified that some TSD groups/units (primarily those located within large processing facilities) will be integrated with the disposition of the facility. Those units have physical closure actions that need to be done in conjunction with the physical disposition actions in the facility (e.g., removal of structural components).

Chapter 8.0, "Facility Disposition Process," of the TPA Action Plan (Ecology et al., 1989b), contains the process for determining final disposition of facilities like the T-Plant Complex. An extended closure period is required for closure of the 221-T Tank System to coordinate closure activities with the T-Plant Complex closure. The extended closure activities will occur under the CDI activities associated with T-Plant Complex OUG. T-Plant Complex OUG cleanup actions are included in the Central Plateau Cleanup Actions which are outlined in the annual Hanford Lifecycle Scope, Schedule, and Cost Report required by TPA (Ecology et al., 1989a) Milestone M-036-01.

Approval of this closure plan will grant the Hanford Site an extended closure period for performance of extended closure activities in accordance with WAC 173-303-610(4)(c), and a separate extension request will not be filed.

F5 Closure Costs

An annual report outlining updated projections of anticipated closure costs for the Hanford Facility TSD units having final status is not required per Permit Condition II.H.

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Attachment A

HNF-8812, Revision 1, T Plant Cell Investigation Phase II Report

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HNF-EDC- 02 - 13921

Page 1 of 2

ENGINEERING DOCUMENT CHANGE CONTROL

Change Identification

21. Release:

DEC 18 2002
DATE:
STA: 5
HANFORD RELEASE
ID: 12

1. Change Category:
☒ Direct Revision ☐ Supplemental Change ☐ Page Change
☐ Supersedure ☐ Cancel/Void ☐ New

2. Classification of Change: dp 12/18/02
☒ Major ☒ Minor ☐ Conf Baseline

3. Date: 12/09/02

4. Originator's Name, Organization, MSIN, and Telephone No.:
K.L. Hladek, FH Waste Managment Planning and Projects, 372-3201

5. USQ Required? ☐ Yes ☒ No
USQ No.:
CX No.:

6. Technical Authority:
K.L. Hladek

7. Project/Program (WMP, FFTF, etc.): WMP

8. Area: 200W RCHN dp 12/18/02

9. Building: 221-T 2420 Stvne dp 12/18/02

10. Reviewer Designator: N/A

11. Plan:
N/A

12. Criteria:
N/A

13. Change Description:
General update of text and revision of cell content data sheets.

14. Documents Issued or Changed by this EDC:

Document	Page	Revision	Comments
HNF-8812	all	0	

15. Technical Justification (Need):
Update required due to changing cell contents at T Plant. Updated due to cell cleanout progress.

Evaluation and Coordination

16. Change Impact:
None

17. Affected Documents:

Document Number	Page	Revision	Person Notified/Comments
N/A			

A-6003-282 (10/01)

HNF-EDC- 02 - 13921 Page 2 of 2

ENGINEERING DOCUMENT CHANGE CONTROL (continued)

Verification

18. Verification:
Peer review

19. Approvals/Reviews:

Initials, Last Name, Date, MSIN	Initials, Last Name, Date, MSIN
Technical Authority: K.L. Hladek H8-44 12/18/02	Technical Authority Manager: D.E. McKenney H8-44 12/17/02
Reviewer (Title): M.D. Ellefson, Tech. Services 12/18/02	Reviewer (Title):
Reviewer (Title):	Reviewer (Title):
Reviewer (Title):	Reviewer (Title):
Reviewer (Title):	Reviewer (Title):

Solution

20. Change Description (Solution) - Continuation Sheet:
Report updates due to changing cell contents at T Plant. Updated due to cell cleanout progress.

A-6003-282 (10/01)

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	KL Hladek	Date 12/13/02
Project Title/Work Order: HNF-EDC-02-13921, T-Plant Cell Investigation Phase II Report		EDT No. NA
		ECN No. NA

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
WS Ayers	T3-28	x			
DG Black	H8-44	x			
BV Burrow	T3-28	x			
KL Hladek	H8-44	x			
D Levinskas	T3-28	x			
DE McKenney	H8-44	x			
BV Barnes	T3-28	x			
MD Ellefson	T3-05	x			
NJ Sullivan	T3-28	x			
JE Geary	T3-28	x			
Central Files	B1-07	x			

A-6000-135 (10/97)

HNF-8812
1

T Plant Cell Investigation Phase II Report

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Fluor Hanford
P.O. Box 1000
Richland, Washington

Contractor for the U.S. Department of Energy
Richland Operations Office under Contract DE-AC06-96RL13200

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T Plant Cell Investigation Phase II Report

KL Hladek

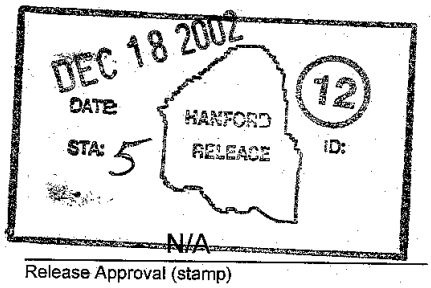
Fluor Hanford

December 2002

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Fluor Hanford
P.O. Box 1000
Richland, Washington

Contractor for the U.S. Department of Energy
Richland Operations Office under Contract DE-AC06-96RL13200



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12/18/02
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Release Approval (stamp)

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HNF-8812
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For use with Technical Documents (when appropriate)	
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(2) Title
T Plant Cell Investigation Phase II Report

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		(5) Cog. Engr.	(6) Cog. Mgr. Date
RS 1	(7) Replaces HNF-8812, Rev. 0 completely per HNF-EDC-02-13921	DG Black 12-13-02	DJ 12/17/02

A-7320-005 (10/97)

HNF-8812, Rev. 1

T PLANT CELL INVESTIGATION PHASE II REPORT

December 13, 2002

INTRODUCTION

Activities associated with the clean up of the T Plant Canyon (221-T) include process cell clean out. During the planning and evaluation phase of that effort, some apparently unknown conditions were found in one of the process cells. A task team was formed to develop a database of available information about each of the process cells to review the information and make recommendations based upon that review regarding the potential hazards that might be encountered in proceeding with cell clean out activities. This database will be used to evaluate the hazards associated with each cell in future cell clean out activities.

Operations, procedures, and cell clean out techniques are not included within the scope of the task team investigation.

A copy of the information included in the database and the current format is attached. To facilitate use of the database, a "Data Field Definitions," listing is also provided in this report.

CONCLUSIONS AND RECOMMENDATIONS

No information was found by the task team that would indicate that there could be significant unexpected hazards in any of the process cells in the 221-T facility.

Table 1 is a summary table of the current cell database.

Table 1. Summary of Cell Investigation Data

Cell Number	Current Contents [1]	Cell Last Opened	Investigation Status [2]
Head End Cell A	Cell filled with grout	NA	NA
Head End Cell B	Cell filled with grout	NA	NA
1L & 1R	Now part of head end – not accessible	NA	NA
2L	Railroad tunnel – not a cell	NA	NA
2R	PWR pool – contains remaining PWR Core 2 blanket assemblies, racks and ancillary equipment.	Open	Complete
3L	Sludge storage rack – cell ready to receive KE Basin sludge containers	2002	Complete
3R	Open cell with pump storage rack that contains pumps and an agitator; miscellaneous debris on floor	Open	Complete
4L	Open cell with pump storage rack that contains pumps and mixers	Open	Complete
4R	Many jumpers; possibly other equipment	1986	Need permission to open cell
5L	Two large tanks and many installed jumpers. (Appears to be original cell equipment)	2001	Complete
5R	Tank 5-7 (contains liquid and sludge) and installed jumpers	2001	Complete
6L	Tank 6-1 (contains liquid and sludge), transfer pump and installed jumper	1999	Complete
6R	Open cell with pump storage rack that contains pumps and mixers	Open	Complete
7L	Two Purex tube bundles, thin tank (identity unknown), large tank (moved from 9L), centrifuge (moved from 8R) and 9 jumpers (2 originally in 7L, 7 moved from 8R)	2002	Complete
7R	Two Purex pulsar agitators, jumpers and miscellaneous debris.	Open	Complete
8L	Large tank, small tank and many jumpers installed. (Appears to be original process equipment)	1986	Need permission to open cell
8R	Cell is empty	2002	Complete
9L	Cell is empty	2002	Complete
9R	Large tank, centrifuge pedestal block and many jumpers (appears to be original process equipment)	1986	Need permission to open cell
10L	Sludge storage rack – cell ready to receive KE Basin sludge containers	2002	Complete
10R	Vent pipe, 3 small tanks, and 1 large process vessel (unknown identity)	1986	Need permission to open cell
11L	Large open top tank containing liquid and solid (salt cake) residues; transfer jet installed	2002	Complete
11R	Large open top tank	Unknown	Complete
12L	Open cell with large tank and silver reactor	Open	Complete
12R	Open cell with 4 girders (across top of cell), decontamination cage sprayer, and large amount of sandblast grit and small debris on bottom	Open	Complete

Cell Number	Current Contents [1]	Cell Last Opened	Investigation Status [2]
13L	Sludge storage rack – cell ready to receive KE Basin sludge containers	2002	Complete
13R	Skiff with residues, large tank (moved from 13L) and centrifuge (moved from 14R)	2002	Complete
14L	One large tank, 1 small tank; significant amount of sandblast grit and vibratory finisher media. (Tanks appear to be original process equipment.)	2001	Complete
14R	Cell is empty	2002	Complete
15L	Sludge storage rack – cell ready to receive KE Basin sludge containers	2002	Complete
15R	Tank 15-1 (contains liquid and sludge); installed jumpers and transfer jet	1999	Complete
16L	Believed to contain original process equipment: 2 tanks and associated jumpers (no video available)	Unknown	Need permission to open cell
16R	Cell is empty	2002	Complete
17L	One large tank, 1 small tank and many installed jumpers (appears to be original cell equipment); 2 drums of parts.	2001	Complete
17R	Large tank with jumpers attached (appears to be original equipment), centrifuge pedestal block (from cell 14R), centrifuge base (from cell 16R), 9'x5'x5' box with centrifuge lid (from cell 16R) and silver reactor (from cell 16R)	2002	Complete
18L	One large tank, 1 small tank, many jumpers still connected (appears to be original cell equipment.)	2001	Complete
18R	Centrifuge, centrifuge pedestal block, and catch tank (appears to be original cell equipment; all jumpers have been removed.)	2001	Complete
19L	One large tank with agitator, 1 small tank and many jumpers installed (appears to be original cell equipment)	2001	Complete
19R	Pump run-in tank, piping, pump test equipment	2001	Complete
20L	Unknown; crane cannot reach this cell to open	Unknown	Need permission to open cell
20R	Unknown; crane cannot reach this cell to open	Unknown	Need permission to open cell

Table notes:

[1] Cell contents as of December 1, 2002.

[2] "Complete" means that the cell contents have been confirmed and there are no issues requiring resolution before opening the cell in the future.

The T Plant organization will maintain the 221-T Cell Inventory and Status database under configuration control for use as a reference.

ACTIVITIES

The task team developed a preliminary database of information; the results were issued in a Phase I report, HNF-8812, Rev. 0. That information has been updated in this Phase II report. This report is planned to be the final phase of the investigation effort prior to turnover of future updates to the T Plant staff.

This information about cell contents and status was gathered on an initiative of Fluor Hanford in order to help reduce uncertainties regarding cell contents during future work in and around T Plant process cells. The Phase I team consisted of representatives inside and outside of FH, and team members are listed below. A limited number of the team members participated in the Phase II effort of updating the database.

Members of the T Plant Cell Investigation Team and the organization that they represented:

John Atwood	Waste Programs
Roberts Barcot	Waste Programs
Dale Black	Waste Programs
Bill Bowen	Quality Assurance
Ken Hladek – Team Lead	Waste Programs
Jack Kasper	Parsons
Mark Kerns	Waste Programs
Bryan Kidder	Communications
Art Lee	Systems Engineering
Jim Maupin	Quality Assurance
Pam Olsen	ES&H
Lee Roberts	Engineering
Hans Showalter	Rad Con
Dale McKenney	Waste Programs

The task team searched readily available documentation and compiled the results into a cell-by-cell listing. These documented data were not always consistent. This investigation only provided the information and sources. Resolution of conflicting information or comments on gaps in the data were not intended to be addressed in this investigation effort, nor were operational procedures and techniques. The second phase of the investigation, although limited in scope, updated the database to reflect current information, including which cells have been cleaned out to date.

Interviews of workers with specific knowledge of process and maintenance activities in the T Plant are an additional source of information about process cell contents. Scheduling around current work at T Plant did not permit this activity to be included in the Phase I or Phase II efforts. Such interviews would be expected to provide additional information on cell content and history, and are, therefore, a recommended follow-on activity. A list of personnel that would be potential interviewees was compiled. The following names have been suggested as good

interview candidates or sources of additional information or names of other candidates. The list is not in any order or preference or importance. Name, spelling, titles, locations, and "status" are not guaranteed.

Mike Doyle	Former Operations Manager
J. D. Anderson	Engineer
Mike Yencopal	
Howard Sharnock	
Jerry Entrop	Now at PFP
Maria Ortega	Engineer at T Plant 10-12 years ago
Izzy Zavala	
Jim Dudley	
Howard Muira	Could help provide other names
Roger Szelmeczka	
Doug Smith	
Brad Brannon	
Carol Davidson	Now retired
Ron Everham	
Dan Dabbs	
Curtis Richards	
Bill Frisbee	
Don White	
Gary Altmiller	
Tom Orgill	Could help provide other names
Russ Knight	
Bernie Serezik	
Wayne Killen	
Marta Cabellero	
Ed Adams	Could help provide other names
Don Ham	
William (Bill) Tyler	Currently at the HAMMER Facility
Wayne Gentry	
Steve Fryer	Retired but in the area, 627-5726
Pat Baynes	Currently with FH
Mike E. Johnson	
Blaine Barton	Currently with CHG
Roger Hulgrem	Retired but in the area
Note: Michele Gerber suggested we also contact Russ Knight and Bernie Saueressig.	

Further information that may be useful in any future investigations of cell contents and process facility timelines were developed for T Plant, PUREX, and B Plant. The timelines for T Plant and PUREX are attached to this report. The timeline for B Plant is available in the Record Management Information System as accession number D196845935, "B Plant Operations."

T PLANT ACTIVITIES

Following the Phase I effort of the task team, cell clean out activities at T Plant continued. Based upon the results of these activities, no anomalies or unexpected observations were experienced when compared to the Phase I report. The cells that were cleaned out, and their current status, is included in the updated database of this Phase II report.

Attachment 2 consists of copies of the most recent photos of cells in 221-T. Used in conjunction with the database information, they can be valuable in providing both validation of the interpretation of the data and in perspective of the size, shape, and nature of the material/equipment contained within the individual cells.

FUTURE WORK

When the Phase I report was commissioned, certain cells were not to be opened without permission from the Cell Investigation Team. At the time of the report, seven cells had not been opened: 4R, 8L, 9R, 10R, 16L, 20L, and 20R, and have not been opened since 1986, or earlier, and are still listed as "permission required to open." Since the publication of this Phase II report concludes the team's charter, authority to grant permission to open these cells should revert to the VP in charge of the project for T Plant. Plans to open these cells will be developed and implemented when funding and direction are provided by DOE.

DATA FIELD DEFINITIONS

The T Plant cell database contains various data fields. They are defined below. Note that not all of the fields are currently used for this Phase II product. It is expected that follow-on activities will provide more additional information; the additional (currently unused fields) would accommodate some of this expansion.

New Cell No. – The current cell designation (alphanumeric, e.g., 10L)

Old Cell No. – Previously used cell designation (numeric)

HNF-1982 Info. – Historical info from the HNF-1982 document, *Historical Records for 221-T Facility*.

MR-0452 Info. – Historical info. from the WHC-MR-0452 document, *A Brief History of the T Plant Facility at the Hanford Site*.

HNF-1982 Recent – Consists of "current" data from HNF-1982. It may or may not still represent what is in the cell today.

ISB and LTDES – Information from the Interim Safety Basis, HNF-SD-WM-ISB-006, Rev. 2, *Interim Safety Basis for Solid Waste Facilities (T Plant)*, and the Long-Term Decontamination Engineering Study, WHC-SD-WM-ES-283, *Long-Term Decontamination Engineering Study*. This field is includes data extracted from these two documents. Where the data agrees between the two documents, just a single entry is made. Where there is a difference, "[ISB]" or "[LTDES]" is used after the applicable data.

Video Info. – Includes information from review of the 1986 and 2001 video of the cells; information is designated by date.

Chemical Info. – Includes available information on what chemicals were used in the cell, and therefore may possibly still exist in the cell. The source of the information is cited, where applicable.

Plant Interface – Information on what equipment/chemicals may have been or were transmitted to or from other plants.

Radiological Info. – Available radiation field info from any available source. The source of the data (e.g., "[HNF-1982]" or "[1986 survey data]") is cited.

Interview 1 – (Also Interview 2). The three Interview fields are for documentation of personnel interview results. The name of the interviewee is cited.

Current Contents – As applicable, the current contents of the cell as verified by physical inspection and review of other data.

Property List – Contains data from the "T Plant Tracked Property" list, which is a Fluor Hanford database of government-tracked equipment. Pieces of equipment on this list that appear to be clearly identified to a cell are added to this field.

Investigation Status – Includes notes regarding the cell investigation status regarding the specific cell. For example, when it has been concluded that there is sufficient data on a cell to determine that no unusual hazards are likely to be present, the investigation would be noted as complete for this cell.

ATTACHMENT 1

T Plant Cell Investigation Database Sheets
Numbered Pages 1-42

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	Head End Cell A
Old Cell No	Head End Cell A
HNF-1982 Info	Radiochemical process improvement semi-works for the Hanford Engineering Works as well as other subsequent uses. A 7 foot separation wall from the rest of the canyon has been removed and the cell has been filled with grout, providing deck space.
MR-0452 Info	Radiochemical process improvement semi-works for the Hanford Engineering Works as well as other subsequent uses.
HNF-1982 Recent	NA. Filled with grout. No longer a cell.
ISB and LTDES	NA (Head End) Note: For all cells, info in the two references matches unless noted by [ISB] or [LTDES] after specific information.
Video Info	None
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Cell filled with grout
Property List	
Investigation Status	NA

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	Head End Cell B
Old Cell No	Head End Cell B
HNF-1982 Info	Radiochemical process improvement semi-works for the Hanford Engineering Works as well as other subsequent uses. A 7 foot separation wall from the rest of the canyon has been removed and the cell has been filled with grout, providing deck space.
MR-0452 Info	Radiochemical process improvement semi-works for the Hanford Engineering Works as well as other subsequent uses.
HNF-1982 Recent	NA. Filled with grout. No longer a cell.
ISB and LTDES	NA (Railroad Tunnel)
Video Info	None
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Cell filled with grout
Property List	
Investigation Status	NA

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	1L
Old Cell No	1
HNF-1982 Info	Storage of contaminated, discarded equipment. Separated by a sheet metal wall from rest of canyon. A wall separating the cells has been removed making one large single cell out of 1L and 1R. Houses the Containment System Test Facility, now abandoned.
MR-0452 Info	Storage of contaminated, discarded equipment.
HNF-1982 Recent	Used as storage for approximately 1800 kg of sodium. No info. Canyon crane cannot reach this cell due to partition. Cell blocks not installed and cannot be reinstalled.
ISB and LTDES	
Video Info	None
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	None
Property List	
Investigation Status	NA

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	1R
Old Cell No	2
HNF-1982 Info	Storage of contaminated, discarded equipment. Separated by a sheet metal wall from rest of canyon. A wall separating the cells has been removed making one large single cell out of 1L and 1R. Houses the Containment System Test Facility, now abandoned.
MR-0452 Info	Storage of contaminated, discarded equipment.
HNF-1982 Recent	Used as storage for approximately 1800 kg of sodium. No info. Canyon crane cannot reach this cell due to partition. Cell blocks not installed and cannot be reinstalled.
ISB and LTDES	
Video Info	None
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	None
Property List	
Investigation Status	NA

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	2L
Old Cell No	3
HNF-1982 Info	Railroad tunnel for bringing in irradiated fuel.
MR-0452 Info	Railroad tunnel for bringing in irradiated fuel.
HNF-1982 Recent	Today this is not considered a process cell. Cell has 6 cover blocks, rather than 4 as with other cells.
ISB and LTDES	N/A (Railroad Tunnel)
Video Info	None
Chemical Info	Charcoal mesh, synthetic ion exchange resin, and ion exhange resin may be present [LTDES Table C-5]
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	None
Property List	
Investigation Status	NA

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	2R
Old Cell No	4
HNF-1982 Info	Storage of slugs with ruptured jackets. This cell was kept filled with water.
MR-0452 Info	Storage of slugs with ruptured jackets. This cell was kept filled with water.
HNF-1982 Recent	Today this cell is used to store the PWR Core 2 blanket fuel assemblies under water. 72, 12' long fuel elements stored underwater in a 13' high by 27.5' long by 28' wide cell. Today this is not considered a process cell. Cell has 6 cover blocks, rather than 4 as with other cells.
ISB and LTDES	PWR Spent Fuel Storage Pool, 72 Elements
Video Info	None
Chemical Info	Charcoal mesh, synthetic ion exchange resin, and ion exhange resin may be present [LTDES Table C-5]
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	PWR Core 2 blanket assemblies; racks and ancillary equipment.
Property List	
Investigation Status	Complete

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	3L
Old Cell No	5
HNF-1982 Info	Coating removal, metal dissolving, and reduction.
MR-0452 Info	Coating removal, metal dissolving, and reduction.
HNF-1982 Recent	Essentially empty except for a few pieces of junk at the bottom. Exceptionally clean compared with the other cells.
ISB and LTDES	Misc. Equipment
Video Info	1986 - relatively empty. Small debris, hose, step off pad, tubing, misc. junk. [1:05:47 - 1:06:53] 4/23/01 - As above. Dry. Orange-stained, unchipped walls. No large items. Wrapped items, concrete chunks, tools/other metal items, many chokers, plastic.
Chemical Info	
Plant Interface	
Radiological Info	100-200 mR/hr shallow dose, 0 deep dose, cell bottom prior to cell cleanout (T Plant handout)
Interview1	
Interview2	
Current Contents	Sludge storage rack - cell ready to receive KE Basin sludge containers
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	3R
Old Cell No	6
HNF-1982 Info	Coating removal, metal dissolving, and reduction.
MR-0452 Info	Coating removal, metal dissolving, and reduction.
HNF-1982 Recent	A "hot" cell in which some highly radioactive pumps from B Plant and PUREX have been stored in a pump rack. About 16 pumps on rack. These pumps were originally stored in anticipation of being refurbished for reuse.
ISB and LTDES	Pumps from PUREX and B Plants
Video Info	1986 - Pump rack with pumps. Cell looks fairly clean otherwise. [59:23 - 1:04:29] 4/23/01 - As above. Dry. ~13 - 20 pumps plus several more that have fallen below rack. No visible liquid or moisture. From photos, no ID visible on pumps except two have illegible (PA-262 or -282) identification.
Chemical Info	
Plant Interface	
Radiological Info	Radioactivity levels two feet back from the lip of the cell in the canyon are about 100 mR/hr when the cell blocks are removed. Activity at the walkway is about 1 R/hr. (HNF-1982) 800-3500 shallow dose, 400-600 deep dose, top of pumps (T Plant handout)
Interview1	
Interview2	
Current Contents	Open cell with pump stroage rack that contains pumps and an agitator; miscellaneous debris on floor
Property List	
Investigation Status	Complete - open cell

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	4L
Old Cell No	7
HNF-1982 Info	Coating removal, metal dissolving, and reduction.
MR-0452 Info	Coating removal, metal dissolving, and reduction.
HNF-1982 Recent	Contains an open pump rack. No cell blocks installed. Pumps on rack: 22-1, PC 52, 8P-001, 1P-521 (wrapped), 6P55 (wrapped), X-02 (wrapped), 36PF-13 (wrapped), H-2-74417 (wrapped),), 2 pumps w/o I.D. or motors, 4 pumps w/motors no I.D. Two large jumpers. Pump 40 PF10 on deck along side 4L.
ISB and LTDES	Rack 1 PUREX XC-1 Pump 1 B Plant 22-1 Pump 1 PUREX J-21 Pump 1 PUREX 6P-J5 Pump 1 PUREX (no ID) Pump 1 PUREX (no ID) Pump 1 PUREX (no ID) Pump 1 PUREX XD-2 Pump 2 PUREX F-13 Pumps w/o motors 1 PUREX JG4173 Pump 1 PC52 Pump 2 Tank Farm Sluicer Assemblies
Video Info	No video. From photos, pump rack with various pumps and mixers on rack. Verified pumps: 22-1, 6P-J5.
Chemical Info	
Plant Interface	
Radiological Info	Dose rate 10 mR/hr (HNF-1982)
Interview1	
Interview2	
Current Contents	Open cell with pump storage rack that contains pumps and mixers
Property List	All of these items are listed for Cell 4 - not distinguished between 4L and 4R: Monitoring System (Cohu), 2 chillers (Dunham Bush), 2 condensers (Parmec Aire), electrical station equipment (Hanford), grappler (shop made), hoist (Yale), work platform (shop made), columns (shop made), column (unknown).
Investigation Status	Complete - open cell

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	4R
Old Cell No	8
HNF-1982 Info	Metal solution storage.
MR-0452 Info	Metal solution storage.
HNF-1982 Recent	Has a 14 inch diameter vent pipe resting in one corner. It is about 17 ft. long, and has an elbow ("hockey stick") on top. The bottom of the cell is covered with many abandoned jumpers (~25). The jumpers are not connected, but are "dump packed" in the bottom of the cell. Misc. equipment, jumpers, and parts. Pump.
ISB and LTDES	1 Misc. Jumper Assembly 1 Pulser 2 Contaminated Filter Assemblies
Video Info	1986 - Vent pipe in corner. Many discarded jumpers. [1:11:47 - 1:13:59]
Chemical Info	
Plant Interface	
Radiological Info	Dose rate 300 to 450 mR/hr. (HNF-1982)
Interview1	
Interview2	
Current Contents	Many jumpers; possibly other equipment.
Property List	All of these items are listed for Cell 4 - not distinguished between 4L and 4R: Monitoring System (Cohu), 2 chillers (Dunham Bush), 2 condensers (Parmec Aire), electrical station equipment (Hanford), grappler (shop made), hoist (Yale), work platform (shop made), columns (shop made), column (unknown).
Investigation Status	Need permission to open cell

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	5L
Old Cell No	9
HNF-1982 Info	Sewage disposal, holding tanks.
MR-0452 Info	Sewage disposal, holding tanks. [Note that this does not mean sanitary sewage, but process sewage].
HNF-1982 Recent	Has two closed tanks in operation, tanks 5-6 and 5-9, both of which are about 10 ft. in diameter and about 10 ft. high, several jumpers between tanks. A jumper from tank 5-9 to tank 5-6, a jumper from tank 5-6 to 5-7, and a jumper from tank 5-9 to tank 5-7. 3 jumpers on top of tanks not connected. No water on floor, very little sludge.
ISB and LTDES	Two tanks in use: - 5-6 (4800 gal [LTDES], 19,000 L, 5100 gal [ISB]) - 5-9 (4600 gal [LTDES], 18,000 L, 4800 gal [ISB]) LTDES Decon function: Radioactive liquid waste storage. Enclosed Tank 5-6 noted as 4600 gal. Enclosed Tank 5-9 4808 gal.
Video Info	1986 - Two tanks with lids. Connected and disconnected jumpers. Tanks may have been added as part of decon. system, but look similar to original equipment. [26:23 - 29:46] 2001 - As above. Lots of corrosion, staining. Dry. (But tank contents unknown). Corroded and yellow-stained paint above connectors, clean bottom except for glove and crescent wrench. ~1/2 jumpers still connected.
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Two large tanks and many installed jumpers. (Appears to be original cell equipment).
Property List	2 Tanks (Struthers Wells)
Investigation Status	Complete - Opened 2001

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	5R
Old Cell No	10
HNF-1982 Info	Sewage disposal, sewer cell.
MR-0452 Info	Sewage disposal, sewer cell. [Note that this does not mean sanitary sewage, but process sewage].
HNF-1982 Recent	Deepest cell in the plant. Full cell rectangular open-top tank (5-7 tank). The cell is called the 5-8 tank, no longer in use as a tank. It is possible to jet the contents of tank 5-7 to tank 5-9, also 5-7 to 5-6. Jumpers on the wall (~6), and a number of junk jumpers (~4) in the bottom of the cell. One 40' jumper, high [?] side, not connected. Back wall five 40' jumpers to 5-7, one loose. Low side eight 4-' jumpers. 24" drain - front corners. Flooded, much sludge.
ISB and LTDES	Original Equipment Tank 5-7 (38,000 L [10,000 gal]) LTDES Decon Function: Radioactive liquid waste storage. Open tank 5-7 (SS, 14,000 gal) and sumps 508 (14' X 16' X 22') The radioactive drain lines from all other cell floors drains in tank 5-7
Video Info	1986 - Almost full-size tank in cell with liquid. Liquid was over the level of the top of the tank at this time (tank not visible). Pipes, jumpers. Tank appears to be constructed with a "flared out bottom" (cell widens out in deeper areas). 2001 - Liquid within tank. Cracked sludge on side walls. No jumpers, 45' deep receiver tank, two 24" headers terminate above tank, active bubbling (probably from "nozzle 47 - liquid level and pressure"), rack and pump above water, >2" cracked overflow sludge adjacent to tank, rad sign, plastic bottle, orange stain on walls. (Video footage 19:19-26:23 and 29:46-33:47)
Chemical Info	F001-F005 from tank 5-7 contents; PCBs >500 ppm in waste
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Tank 5-7 (contains liquid and sludge) and installed jumpers.
Property List	Tank (Struthers Wells)
Investigation Status	Complete - opened 2001

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	6L
Old Cell No	11
HNF-1982 Info	Spare. Sometimes was used for a by-product precipitation before extraction.
MR-0452 Info	Spare. Sometimes was used for a by-product precipitation before extraction. Section 6 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Semi-rectangular tank w/rounded corners. Has openings in top for agitators, long since removed leaving no covers on the openings. The tank is full of liquid. Both the cell and the tank drain into tank 5-7. There are ~4 jumpers stored in the cell. There are two cover blocks installed. [Handwritten comments unreadable, includes comment about approx. 3 jumpers].
ISB and LTDES	Tank 6-1 (53,000 L [14,000 gal]), misc. jumpers [ISB]
Video Info	1986 - Oval-shaped large tank. Open access ports. Full of liquid. Like tank in 11L, but with lid rather than open top. Two to three jumpers connected. [57:36 -
Chemical Info	Assume F001-F005 from Tank 6-1 contents. PCBs found in sludge (sample number 221T-99-022)
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Tank 6-1 (contains liquid and sludge), transfer pump and installed jumper
Property List	Tank (Hanford)
Investigation Status	Complete - opened 1999

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	6R
Old Cell No	12
HNF-1982 Info	Spare. Sometimes was used for a by-product precipitation before extraction.
MR-0452 Info	Spare. Sometimes was used for a by-product precipitation before extraction. Section 6 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains an open pump rack. Beneath the pump rack is an open tank that is used to cool and test the pumps. It is believed that this is the original equipment tank in the original cell. There are no cover blocks on this cell. Pumps on rack: A 20-1, P-17-2, P-22-1, PA-22-1, P-13-1, P-14-2-1, A11-1-1, 2A-31-1, P-26-3, PA-18-1, P-25-1, JG 4173. 1 pump w/motor no I.D. 4 pumps w/o motor or I.D. 1 BA 46400 jumper. In cell - 1 open top bath tub.
ISB and LTDES	Tank 6-1 [LTDES] 1 Agitator 18-1 1 Pump 25-1 1 Agitator 2A-31-1 1 Pump P2P-F13 1 Pump P-22-1 1 Agitator A20-1 1 Agitator (philly gears agitator) 1 Pump PA-22-1 1 Pump 45P-F13 1 Pump P26-3 1 Agitator A11-1-1 1 Pump P17-2 1 Pump P-13-1 3 High-Speed B Plant Agitators 1 (no ID) PUREX Pump LTDES Decon Function: Radioactive liquid waste storage from Building 2706-T. Empty Cell (~18' X 13' X 22')
Video Info	No video. From photos: Pump rack, many pumps, mixers, and other parts. Verified: P-25-1, P-26-3, P-22-1, PA-22-1, A-11-1-1, P-14-2-1
Chemical Info	
Plant Interface	
Radiological Info	High radiation area on deck adjacent to cell
Interview1	
Interview2	
Current Contents	Open cell with pump storage rack that contains pumps and mixers.
Property List	Tank (Hanford)
Investigation Status	Complete - cell open

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	7L
Old Cell No	13
HNF-1982 Info	Extraction (spare).
MR-0452 Info	Extraction (spare). Section 7 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	There are two PUREX tube bundles stored. These are not connected. There is some junk stored in the bottom of the cell, including a PUREX tank vent and a pulser rack.
ISB and LTDES	2 PUREX Ti-Tube Bundles 1 PUREX Tower Vent Line Pulser Stand
Video Info	1986 - Two unknown cylindrical objects. Added to cell rather than original. Referred to as PUREX tube bundles elsewhere, but may or may not be these. Smaller vessel dumped, angled into corner, hot water heater sized and shaped, w/red label. Jumpers in cell. [52:03 - 55:13]
Chemical Info	
Plant Interface	
Radiological Info	Dose rate 300 - 18,000 mR/hr window open; 200 - 3500 mR/hr window closed (survey report TC001039) Equipment contamination surveys performed (survey report TC001040)
Interview1	
Interview2	
Current Contents	Two Purex tube bundles, 1 thin tank (identity unknown), large tank (moved from 9L), centrifuge (moved from 8R), 9 jumpers (2 originally in 7L, 9 moved from 8R).
Property List	Tank (Hanford)
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	7R
Old Cell No	14
HNF-1982 Info	Extraction (spare).
MR-0452 Info	Extraction (spare). Section 7 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains stored junk, including two pulsers on stands (this is sort of a pump) and a jumper pan. One jumper is connected. There is also a work platform. The cell has two cover blocks installed.
ISB and LTDES	2 Pulser 001 AR Agitator 2 Jumpers
Video Info	1986 - ~5-gal bucket upside down covering top of large piece of unknown equipment (motor?). 2nd piece of equipment on other side of cell. These may be REDOX pulsers. Small jumper pan with jumpers, connectors, misc. metal in bottom ~3' of cell. Only one connector still attached near coverblocks. [1:04:29 - 1:05:27]
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Two Purex pulsar agitators, jumpers and miscellaneous debris.
Property List	
Investigation Status	Complete - open

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	8L
Old Cell No	15
HNF-1982 Info	Extraction.
MR-0452 Info	Extraction. Section 8 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains two tanks: one 9' by 9' and one 4' by 9'. These items appear to be still connected. Original tanks and jumpers.
ISB and LTDES	Original Equipment Tanks and Jumpers
Video Info	1986 - Centrifuge or pump on top of tank (covered). Smaller tank. Jumpers connected. [50:24 - 52:03]
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Large tank, small tank and many jumpers installed. (Appears to be original process equipment)
Property List	
Investigation Status	Need permission to open.

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	8R
Old Cell No	16
HNF-1982 Info	Extraction
MR-0452 Info	Extraction. Section 8 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains centrifuge pedestal, and a centrifuge that is stored (dumped) into cell. Some jumpers stored in bottom of cell. Centrifuge appears disconnected, but there are some jumpers still connected to the wall nozzles. Centrifuge w/o motor. Misc. jumpers. Sand on bottom. Drains - OK.
ISB and LTDES	Original Equipment Jumpers and Centrifuges
Video Info	1986 - Centrifuge, appears somewhat disassembled, on concrete pedestal. Large tank removed. [55:13 - 57:15]
Chemical Info	
Plant Interface	
Radiological Info	Dose rate 100 - 700 mR/hr window open and <100 - 200 mR/hr window closed, before equipment removal (survey report TC001039) Contamination surveys performed on equipment removed from cell (survey report TC001040)
Interview1	
Interview2	
Current Contents	Cell is empty
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	9L
Old Cell No	17
HNF-1982 Info	Treatment of waste metal solution.
MR-0452 Info	Treatment of waste metal solution. Section 9 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Tank in the bottom of cell. Appears to be about 9' dia. by 9' high. One jumper connected. A small amount of junk is dumped in bottom of cell. One jumper from first head on low side to 6th head on high side. One large open top tank (empty). One short SS pipe (10') flange on one end.
ISB and LTDES	Original Equipment Tanks, Jumpers, Etc.
Video Info	1986 - Single tank, reflection of "water" inside. <16" of water in cell bottom. (Washdown water from activities ongoing during video). Drain likely plugged? Paint chips and concrete chunks. [11:29 - 19:44]
Chemical Info	
Plant Interface	
Radiological Info	Dose rate 100 - 85,000 mR/hr window open, 100 - 5,200 mR/hr window closed before tank was removed from cell (Survey report TC001039) Contamination survey performed on tank prior to removal from cell (survey report TC001040)
Interview1	
Interview2	
Current Contents	Cell is empty
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	9R
Old Cell No	18
HNF-1982 Info	Treatment of waste metal solution.
MR-0452 Info	Treatment of waste metal solution. Section 9 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains an installed centrifuge pedestal in the bottom of the cell. A few installed jumpers. Many (~18) are disconnected and are lying on the bottom of the cell. The cell also contains a 6' dia. by 6' high tank. Three installed jumpers were identified. There is a connected jumper from nozzle 55 to nozzle 70.
ISB and LTDES	Original Equipment Tanks, Jumpers, Centrifuges
Video Info	1986 - Centrifuge pedestal. One tank w/unknown contents. Connected jumpers. [7:43 - 11:29]
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Large tank, centrifuge pedestal and many jumpers (appears to be original process equipment)
Property List	
Investigation Status	Need permission to open cell

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	10L
Old Cell No	19
HNF-1982 Info	Treatment of waste metal solution (spare).
MR-0452 Info	Treatment of waste metal solution (spare). Section 10 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	There are no jumpers still connected. There is a 55-gallon drum of connector heads stored in the bottom of the cell. There are also four jumpers stored in the bottom of the cell. 55-gal drum with misc. junk, connector heads.
ISB and LTDES	Misc. T Plant Jumpers, Drums of Connector Heads
Video Info	1986 - Jumpers/junk on bottom of cell. No drums at this time. [6:47 - 7 ;43]
Chemical Info	
Plant Interface	
Radiological Info	Dose rate 40 mR/hr. (HNF-1982)
Interview1	
Interview2	
Current Contents	Sludge storage rack - cell ready to receive KE Basin sludge contaienrs
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	10R
Old Cell No	20
HNF-1982 Info	Treatment of waste metal solution (spare).
MR-0452 Info	Treatment of waste metal solution (spare). Section 10 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Vert. tank ~4' dia. by 8' tall in cell bottom. Four smaller cylindrical tanks mounted on single base in bottom of cell. Vent pipe ~12' long by ~14" dia. lying in corner of cell. Does not appear that there are any jumpers connected. SS tube 2' [?] dia. standing on end [?]. 8' dia. tank opening on top. Small [???] on bottom of cell. 4 small to medium tanks interconnected on single base.
ISB and LTDES	Open Top Decon Tank (14'x16'x10')
Video Info	1986 - Vent pipe in corner. Cylindrical object, like a tank, in corner, unknown source, 4 to 5 ft diameter. Four tanks in cell in addition to this object. Rounded-top appearing object (bowling ball size?) with 3 visible round indentations on upper side (for picking up or turning?). Nothing in cell looks like original equipment. [14:44 - 19:19]
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Vent pipe, 3 small tanks and 1 large process vessel (unknown identity).
Property List	
Investigation Status	Need permission to open cell

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	11L
Old Cell No	21
HNF-1982 Info	Spare (unequipped, as of 1945).
MR-0452 Info	Spare (unequipped, as of 1945).
HNF-1982 Recent	A full-cell open-top tank. (The cell acts as a tank). There are no apparent connected jumpers. 1 large catch tank.
ISB and LTDES	Open Top (full cell) Decon Tank (14'x16'x10'; 14,000gal) Open Top Waste Tank (14'x16'x10'; 14,000gal)
Video Info	1986 - Open top oval tank with liquid. [00:00 - 00:07] 2001 - Open top oval tank (14,000 gal SS) with greenish liquid and whitish crystals. Evidence of significant evaporation on tank sides, ~2" liquid and ~4" residuals level is current estimate. Assumed to be a potassium permanganate and caustic solution used as a dip tank for decon purposes.
Chemical Info	Liquid and solid samples obtained in 2002. pH of liquid is 13.3, solid is 12.1. Contains regulated qtys. of Cd, Cr, Pb, and Se. PCBs below regulatory thresholds. F001-F005 due to decontamination activities performed in the tank. (T Plant sample numbers 221T-02-014 through 019)
Plant Interface	
Radiological Info	Dose rate around cell 40 mR/hr. (HNF-1982) 215 mR/hr open window, 5 mRem/hr closed window. (T Plant handout)
Interview1	
Interview2	
Current Contents	14000 gallon open top tank containing liquid and solid (salt cake) residues; transfer jet installed.
Property List	Tank (Hanford)
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	11R
Old Cell No	22
HNF-1982 Info	Spare (unequipped, as of 1945).
MR-0452 Info	Spare (unequipped, as of 1945).
HNF-1982 Recent	Cover block is steel and concrete (all other cells not noted are concrete). Contains 1 large, open-top oval tank. No known connected jumpers. There is one jumper, the transfer jumper from tank 11R to tank 15R. Believed to be orig. tank in the cell.
ISB and LTDES	Open-top SS waste tank (4.3 m [14 ft] deep; 53,000 L [14,000 gal]) [ISB] LTDES Decon. Equip.: Decon Thimbles. Immersion tank for chemical decon purposes. Piping includes air, steam, caustic, acid, and water. 68" deep by 50" diameter, SS, 2128 gal capacity, immersion tank for chemical decon purposes. Piping includes air, steam, caustic, acid, and water. 4 to 1 and 5 to 1 Portable Chemical Spray Pumps. Location Where Needed (i.e., 11R, 13R, 15R). Beta-gamma decon using chemicals or water. Pressure at nozzle four times greater than air pressure applied. SS pump section. Outlet discharge pressure is four or five times greater than inlet pressure. LTDES Decon Function: Radioactive liquid waste storage. Open tank 11-L [typo?] (SS, 14,000 gal capacity)
Video Info	None
Chemical Info	Assume F001-F005 from decontamination activities performed in the cell.
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	14000 gal open top tank.
Property List	Tank (Hanford)
Investigation Status	Complete

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	12L
Old Cell No	23
HNF-1982 Info	Storage and oxidation of metal solution.
MR-0452 Info	Storage and oxidation of metal solution.
HNF-1982 Recent	Contains a silver reactor. There is a 10' high by 10' dia. tank and a second tank ~4' by 6' oval. There is one cover block installed.
ISB and LTDES	Decon Cell (Empty) [LTDES] Silver reactor, 2 tanks [ISB] LTDES Decon Function: Decon cell. Open cell (no cover block, ~18' X 13' X 22')
Video Info	None
Chemical Info	Assume F001-F005 from decontamination activities performed in the cell.
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Large tank and silver reactor.
Property List	
Investigation Status	Complete - open cell

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	12R
Old Cell No	24
HNF-1982 Info	Storage and oxidation of metal solution.
MR-0452 Info	Storage and oxidation of metal solution.
HNF-1982 Recent	The cell is open, and contains a small number of misc. jumpers. There is one block installed. The block has a large crack, and must be inspected carefully before lifting.
ISB and LTDES	Decon Cell (Empty) [LTDES] Misc. jumpers. In use as decon. cell. [ISB] LTDES Decon Function: Decon cell. Open cell (no cover block, ~18' X 13' X 22')
Video Info	2001 - Lots of junk. Dry and dirty. Cage used for grit blasting, lots of grit. Aerosol can, plywood, car tire, metal items, chokers, decon cage sprayer, general debris.
Chemical Info	Assume F001-F005 from decontamination activities performed in the cell.
Plant Interface	
Radiological Info	Bottom of cell, 30 - 4700 shallow dose, 5 - 500 deep dose (T Plant handout). 500 mR/hr penetrating dose rate, within 2 feet of bottom of cell. (T Plant video meeting).
Interview1	
Interview2	
Current Contents	Open cell with 4 girders (across top of cell), decontamination cage sprayer, large amount of sandblast grit and miscellaneous small debris including aerosol cans.
Property List	Tank (Struthers Wells)
Investigation Status	Complete - opened 2001

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	13L
Old Cell No	25
HNF-1982 Info	First decontamination cycle, by-product precipitation.
MR-0452 Info	First decontamination cycle, by-product precipitation. Section 13 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains a large 8' dia. tank in the bottom of the cell. There are no connected jumpers. 1 9 x 9 tank. Some sand at bottom of cell. Drain not plugged. Key block has crack.
ISB and LTDES	PUREX Off-Gas Silver Reactor [LTDES] Tank [ISB]
Video Info	1986 - one large vessel with lid. [5:23 - 6:47] 2001 - as above. Lots of small debris, like paint chips. No silver reactor. Lots of grit (from 12R sandblasting). Tank has small openings from disconnected jumpers, can't see bottom.
Chemical Info	No equipment remaining, but any floor residues removed would be assumed F001-F005 due to decontamination activities performed in the cell.
Plant Interface	
Radiological Info	Dose rate: 40 mR/hr at front of cell. 120 mR/hr towards back of cell. (HNF-1982) 100 - 2000 uncorrected ~6' from cell bottom (T Plant handout). 2R/hr about 2 feet from bottom of cell. Dose rate in the tanks dropped off. 350 mR/hr around perimeter of cell. (T Plant video meeting).
Interview1	
Interview2	
Current Contents	Sludge storage rack - cell ready to receive KE Basin sludge containers
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	13R
Old Cell No	26
HNF-1982 Info	First decontamination cycle, by-product precipitation.
MR-0452 Info	First decontamination cycle, by-product precipitation. Section 13 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	One 9' by 9' tank. Misc. junk is stored in one corner. Silver reactor formerly stored in this cell was moved to cell 12L. No connected jumpers. 1 jumper pan w/liquid. 4 drums of jumper heads and misc. junk. Cell bottom has ~3" of sand, drain plugged.
ISB and LTDES	Jumpers and Connector Heads Tank [ISB] LTDES Decon Equipment: 4 to 1 and 5 to 1 Portable Chemical Spray Pumps. Location Where Needed (i.e., 11R, 13R, 15R). Beta-gamma decon using chemicals or water. Pressure at nozzle four times greater than air pressure applied. SS pump section. Outlet discharge pressure is four or five times greater than inlet pressure. LTDES Decon Function: Radioactive liquid waste drainage for SS decon pad. Empty cell (~18' X 13' X 22')
Video Info	1986 - Liquid in rectangular tank (skiff) [00:08 - 05:23] 2001 - 3' x 8' x 10' skiff w/~6" crust (paint chips, grit, decon. detergent, concrete?) Looks dry. Discarded bucket in skiff. Bailed drum containing connector heads, adjacent to skiff. Jumper connectors, paint chips, sand blast grit.
Chemical Info	Assume F001-F005 from decontamination activities performed in the cell.
Plant Interface	
Radiological Info	Dose rate 1,000 - 15,200 mR/hr window open, 100 - 2,000 mR/hr window closed prior to addition of 14R centrifuge (survey report TC-001061) Contamination surveys performed on equipment (survey report TC-001083)
Interview1	
Interview2	
Current Contents	Skiff with residues, large tank (moved from 13L) and centrifuge (moved from 14R).
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	14L
Old Cell No	27
HNF-1982 Info	First decontamination cycle, product precipitation.
MR-0452 Info	First decontamination cycle, product precipitation. Section 14 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains a centrifuge and a centrifuge base.
ISB and LTDES	12 Centrifuges; Centrifuge Block [LTDES] Misc. centrifuge parts [ISB]
Video Info	2001 - Two tanks with open tops. Larger tank contains ~4" of dry, powdery/crusty whitish material (possibly ground vibratory finisher pellets). Smaller tank appears empty. Paint chips and small-sized junk in cell. Dry.
Chemical Info	Assume F001-F005 from decontamination activities performed in or above cell.
Plant Interface	
Radiological Info	Up to 350 Rad/400 mrem 6" outside vessel (drops to <100 mrem/hr, zero inside). (T Plant handout)
Interview1	
Interview2	
Current Contents	One large tank; 1 small tank; significant amount of sandblast grit and vibratory finisher media. (Tanks appear to be original process equipment.)
Property List	
Investigation Status	Complete - opened 2001

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	14R
Old Cell No	28
HNF-1982 Info	First decontamination cycle, product precipitation.
MR-0452 Info	First decontamination cycle, product precipitation. Section 14 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains one concrete centrifuge base and a complete centrifuge from B Plant. The centrifuge is not hooked up, and there are no known jumpers connected.
ISB and LTDES	Original Equipment [LTDES] Misc. centrifuge parts [ISB] LTDES Decon. Equip.: Electrochemical Decon Equipment. Alpha and beta-gamma decon using reverse electroplating processes in phosphoric chromic acid bath. 4' X 4' X 6', SS, 700 gal. capacity. Rectified input power requirement of 25 A for 3-phase 440 VAC; produces 1000 A at 0 to 12 V.
Video Info	1986 - Centrifuge (not on pedestal) on cell bottom. Angled centrifuge pedestal with nothing on top. [1:08:35 - 1:11:47 need to confirm] 2001 - As above. Lots of grit in bottom. Greenish stain on 1/3 of floor and part of pedestal. Suspected residual chromic acid from electropolisher.
Chemical Info	Assume F001-F005 from decontamination activities performed in cell. Green staining, probably from electropolisher chromic acid solutions, can be seen.
Plant Interface	
Radiological Info	Dose rates 400 - 84,000 mR/hr window open, 0 - 400 mR/hr window closed, before removal of equipment (survey report TC-001061) Contamination surveys performed on equipment before removal (survey report TC-001083)
Interview1	
Interview2	
Current Contents	Cell is empty
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	15L
Old Cell No	29
HNF-1982 Info	Treatment of decontamination wastes.
MR-0452 Info	Treatment of decontamination wastes. Section 15 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Cover block is steel and concrete (all other cells not noted are concrete). 3 empty fuel racks stored in bottom of cell. Also two fuel canisters. A few of the cell connections are blanked. There are no installed jumpers.
ISB and LTDES	Waste Tanks 15-6 and 15-9 (not in use) Misc. equipment [ISB]
Video Info	1986 - Six fuel racks (considered three racks due to configuration?) in bottom. Four (two pairs of two attached canisters) fuel canisters (N Reactor) standing up on side of cell, believed empty. One pair has tops with holes, other pair has no tops. Possibly one jumper installed? [40:05 - 42:04]
Chemical Info	No equipment remaining, but any floor residues removed would be assumed F001-F005 due to decontamination activities performed in the cell.
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Sludge storage rack - ready to receive KE Basin sludge containers
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	15R
Old Cell No	30
HNF-1982 Info	Treatment of decontamination wastes.
MR-0452 Info	Treatment of decontamination wastes. Section 15 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Cover block steel and concrete (all other cells not noted are concrete). Contains large oval open-top tank in bottom of cell, not believed to be original. Installed in 1960 from U or B Plant (?), receives waste from tank 5-7. Some jumpers appear to be connected (~5). 4 jumper heads (no good). Drain not plugged. Flow to drain good. Bottom of cell has little bit of trash.
ISB and LTDES	Waste Tank 15-1 (53,000 L [14,000 gal]) LTDES Decon. Equip.: Decon Thimbles. Immersion tank for chemical decon purposes. Piping includes air, steam, caustic, acid, and water. 48" deep by 30" diameter, SS, 350 gal. Capacity. 48" deep by 36" diameter, SS, 332 gal. Capacity. 4 to 1 and 5 to 1 Portable Chemical Spray Pumps. Location Where Needed (i.e., 11R, 13R, 15R). Beta-gamma decon using chemicals or water. Pressure at nozzle four times greater than air pressure applied. SS pump section. Outlet discharge pressure is four or five times greater than inlet pressure. LTDES Decon Function: Radioactive liquid waste storage. Open tank 15-1 (SS, 14,000 gal. Capacity)
Video Info	1986 - Oval tank without lid full of liquid (same design as tank in 11L and 11R). [1:06:54 - 1:08:35]
Chemical Info	Assume F001-F005 from tank 15-1 contents. PCBs found in tank sludge (T Plant sample 221T-99-023)
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Tank 15-1 (large open-top tank)
Property List	Tank (Hanford)
Investigation Status	Cell is visible.

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	16L
Old Cell No	31
HNF-1982 Info	Second decontamination cycle, by-product precipitation.
MR-0452 Info	Second decontamination cycle, by-product precipitation. Section 16 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Full of misc. junk. One of the cover blocks (the key block) is stuck, and cannot be moved with the crane.
ISB and LTDES	Original Equipment, Tanks, and Jumpers
Video Info	None
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Believed to contain original process equipment: 2 tanks and asociated jumpers (no video available)
Property List	
Investigation Status	Need permission to open.

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	16R
Old Cell No	32
HNF-1982 Info	Second decontamination cycle, by-product precipitation.
MR-0452 Info	Second decontamination cycle, by-product precipitation. Section 16 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains one 5' dia. by 6' high tank. Another smaller vessel, the silver reactor off-gas vessel, is stored in the corner of the tank. [Cell?]. There are no known connected jumpers.
ISB and LTDES	Original Equipment, Tank Centrifuges, and Jumpers Silver reactor off-gas vessel [ISB]
Video Info	1986 - Large base for something (or covered tank?). 5' x 5' x 9' metal box containing centrifuge lid wrapped in pink plastic (taken from canyon deck). Smaller tank in corner, possibly the silver reactor. [42:04 - 43:56] 2001- Unknown base as above, ~6' diameter, cylindrical, "2V" with hydraulic lines. One ~2.5" diameter by 5' closed vessel with bail, small metal items outside box. Waste box with wrapped centrifuge lid and also something else wrapped (possible tube bundle). Metal, plastic, junk in box.
Chemical Info	
Plant Interface	
Radiological Info	Dose rate <100 - 3300 mR/hr window open; <100 - 800 mR/hr window closed, prior to removal of equipment Contamination surveys performed on equipment before removal (survey report TC-001071)
Interview1	
Interview2	
Current Contents	Cell is empty
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	17L
Old Cell No	33
HNF-1982 Info	Second decontamination cycle, product precipitation.
MR-0452 Info	Second decontamination cycle, product precipitation. Section 17 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Small amount of junk stored in bottom of cell. Jumpers (~35) are still hooked up. (Most of the jumpers in T plant have 4" heads. Most of the actual pipes are nominal 2" pipes).). Two stored 55-gal. drums of junk are stored. Orig. tanks still in cell.
ISB and LTDES	Original Equipment, Tanks and Jumpers
Video Info	1986 - Appears to be original equipment (two tanks), many jumpers. 55-gallon drum, says Carbon Tetrachloride on side, full of connectors. Another drum which is deformed. Maybe a few jumpers thrown in to the cell. Electrical, piping, and air connections. [33:47 - 36:44] 2001 - "Carbon Tet." drum still there, has bail for lifting. Full of jumper connectors and heads. Second deformed drum with junk contents. Two tanks, many jumpers. Dry. Corroded paint chips abundant, exposed aggregate.
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	One large tank 1 small tank, many installed jumpers; 2 drums of parts. (Except for drums, the cell appears to be original cell equipment,)
Property List	
Investigation Status	Complete - opened 2001

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	17R
Old Cell No	34
HNF-1982 Info	Second decontamination cycle, product precipitation.
MR-0452 Info	Second decontamination cycle, product precipitation. Section 17 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Contains one concrete centrifuge pedestal. There is also one large tank still connected. A number of jumpers (~25) are stored in this cell. None of the equipment is in service.
ISB and LTDES	Original Equipment Tank, Centrifuges, and Jumpers
Video Info	1986 - Centrifuge pedestal with pickup bail. One covered tank with some jumpers connected, others discarded. [36:58 - 38:12] 2001 - Tank with jumpers, most connected. Centrifuge pedestal. Dry. Bottom of cell pitted and corroded, paint chips.
Chemical Info	
Plant Interface	
Radiological Info	Dose rate less than 100 mR/hr throughout cell except 200 mR/hr measurement near floor drain (2002) Contamination surveys performed on equipment (survey report TC-001071)
Interview1	
Interview2	
Current Contents	Large tank with jumpers attached; centrifuge pedestal block (from 14R); silver reactor, centrifuge bowl and box with centrifuge lid (all from 16R).
Property List	
Investigation Status	Complete - opened 2002

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	18L
Old Cell No	35
HNF-1982 Info	Third decontamination cycle (spare).
MR-0452 Info	Third decontamination cycle (spare). Section 18 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	There are tanks installed and many of the jumpers (~37) are still connected. None of the equipment is in service. In effect the cell is full of junk.
ISB and LTDES	Original Equipment and Tank Jumpers [LTDES] Original Equipment, tanks, and jumpers [ISB]
Video Info	1986 - Large covered tank and small uncovered tank with some liquid content. Centrifuge sitting on top of tank. Lots of water in bottom of cell. ~15-20 jumpers connected. [38:12 - 40:15 need to confirm]
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	One large tank; 1 small tank, many jumpers still connected. (Appears to be original cell equipment.)
Property List	
Investigation Status	Complete - opened 2001

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	18R
Old Cell No	36
HNF-1982 Info	Third decontamination cycle (spare).
MR-0452 Info	Third decontamination cycle (spare). Section 18 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Centrifuge still installed on base. 9' dia. by 9' high tank stored. Appears there is an agitator in the tank. Original equipment. One tank with jumpers still connected. 1 centrifuge on block, connected to tank.
ISB and LTDES	Original Equipment Centrifuge, Tanks, and Jumpers
Video Info	1986 - Tank connected to centrifuge on pedestal. No jumpers. Pump/agitator installed on top of tank. [47:19 - 50:20] 2001 - Centrifuge on pedestal and tank. Dry. Jumpers mostly disconnected.
Chemical Info	
Plant Interface	
Radiological Info	Dose rate around cell <6 mR/hr.
Interview1	
Interview2	
Current Contents	Centrifuge, centrifuge pedestal block, and catch tank. (Appears to be original cell equipment; all jumpers have been removed.)
Property List	
Investigation Status	Complete - opened 2001

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	19L
Old Cell No	37
HNF-1982 Info	Third decontamination cycle (spare).
MR-0452 Info	Third decontamination cycle (spare). Section 19 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Full of junk, including 2 large tanks w/pumps. Extra pump stored on top of one of the tanks. Appears this material is still more or less connected. Some jumpers have been discarded into the bottom of the cell (~50). An old agitator is dumped into this cell on top of other debris. Original equipment. 2 tanks with agitators. Misc. equipment. 1 agitator and about 5 jumpers on top of tanks.
ISB and LTDES	Original Equipment Tanks Misc. pumps, jumpers and agitators [ISB]
Video Info	1986 - Looks original. Covered tank, centrifuge or smaller tank, many jumpers. Pump dropped into cell. [43:56 - 47:19] 2001 - As above. Unknown tank content. Smaller tank with open top appears to have some sort of solid inside. Dry. Lots of items.
Chemical Info	
Plant Interface	
Radiological Info	Dose rate around cell <5 mR/hr. (HNF-1982)
Interview1	
Interview2	
Current Contents	One large tank with agitator, 1 small tank and many jumpers installed (appears to be original cell equipment)
Property List	
Investigation Status	Complete - opened 2001

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	19R
Old Cell No	38
HNF-1982 Info	Third decontamination cycle (spare).
MR-0452 Info	Third decontamination cycle (spare). Section 19 contained a standard grouping of process equipment that consisted of four pieces: a precipitator, a catch tank, a centrifuge, and a solution tank.
HNF-1982 Recent	Has been modified such that there are two tanks and a work platform where pumps can be set up and tested (called the pump run-in station.)
ISB and LTDES	Pump Run-In Recirculation Tank LTDES Decon Function: Testing of various pumps. Pump run-in station with tank (SS, 4000 gal capacity)
Video Info	None
Chemical Info	Assume F001-F005 from testing contaminated pumps.
Plant Interface	
Radiological Info	Very low dose
Interview1	
Interview2	
Current Contents	Pump run-in tank, piping, pump test equipment.
Property List	Tank (Southwest Welding)
Investigation Status	Complete - open cell

HNF-8812 Rev. 1

T Plant Cell Investigation Team - Cell Inventory

New Cell No	20L
Old Cell No	39
HNF-1982 Info	Spare (unequipped, as of 1945).
MR-0452 Info	Spare (unequipped, as of 1945).
HNF-1982 Recent	Cells in section 20 can't be reached w/75 ton crane, due to 10 ton crane installed on S end of building using same rails. Cell 20R does not have cell blocks, but has a diamond plate tread cover plate over the hole. May contain pulser parts.
ISB and LTDES	Original Equipment 20-1 Tank
Video Info	None
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Contents cannot be verified.
Property List	
Investigation Status	Need permission to open cell

HNF-8812 Rev. 1

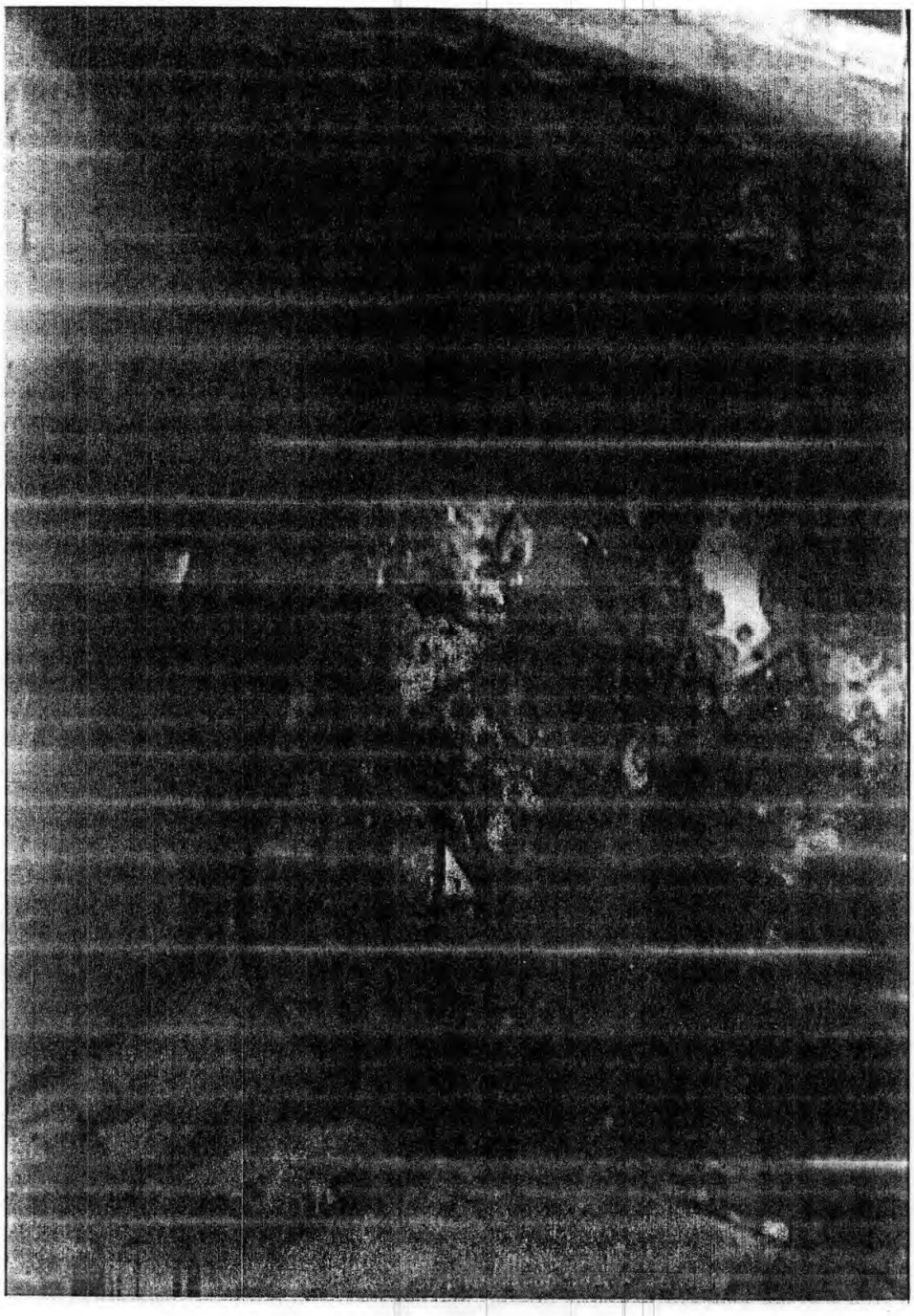
T Plant Cell Investigation Team - Cell Inventory

New Cell No	20R
Old Cell No	40
HNF-1982 Info	Spare (unequipped, as of 1945).
MR-0452 Info	Unequipped.
HNF-1982 Recent	Lack of access as with cell 20L. No separate detail on contents or cover. Pulser parts (large)
ISB and LTDES	Not for Storage; Contains Miscellaneous Centrifuge Parts
Video Info	None
Chemical Info	
Plant Interface	
Radiological Info	
Interview1	
Interview2	
Current Contents	Contents cannot be verified.
Property List	
Investigation Status	Need permission to open cell

ATTACHMENT 2

T Plant Cell Photographs
Numbered pages 2-1 through 2-83

HNF-5812 Rev. 1

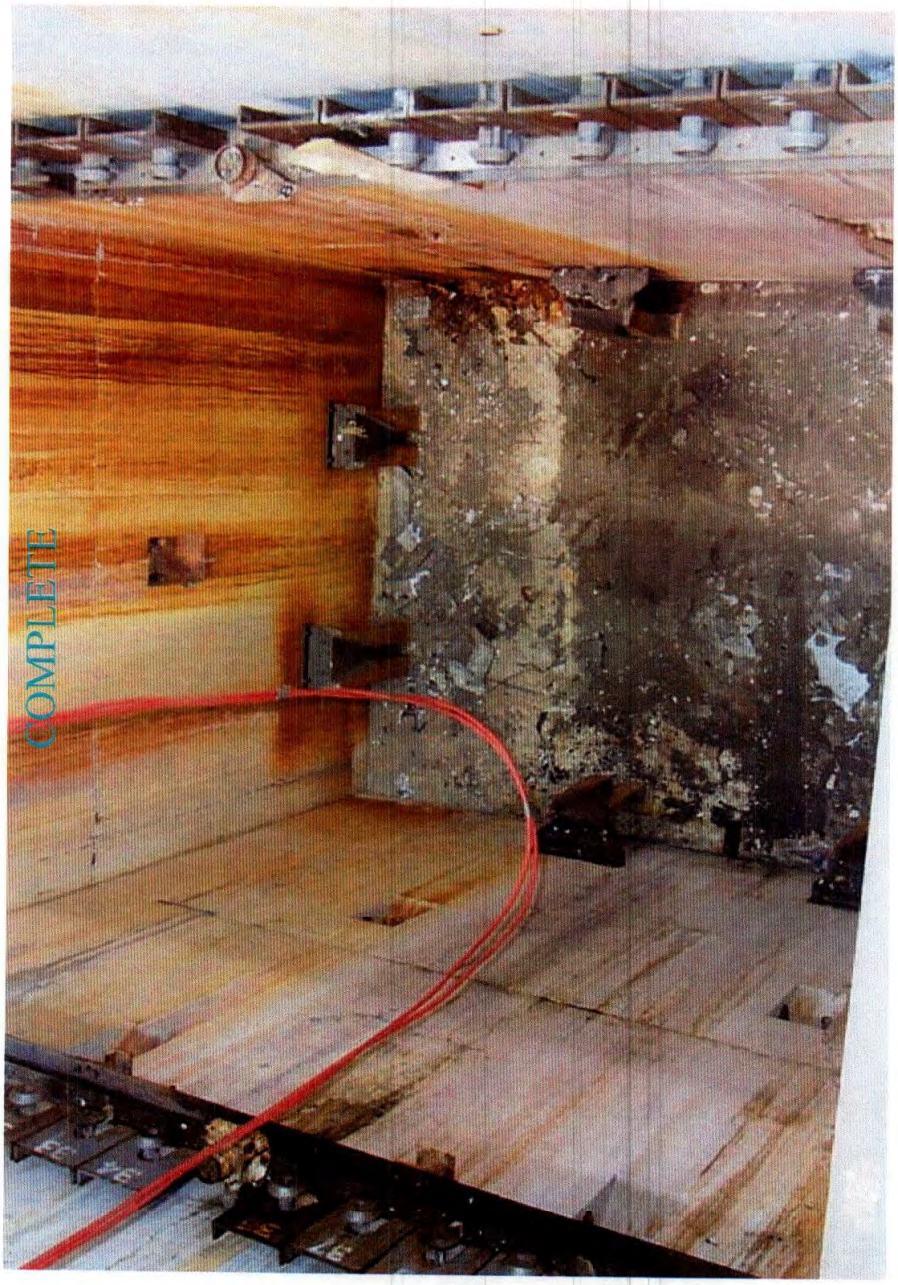


Cell 3L 2001

Attachment 2

2-1

HNF-8312 Rev. 1

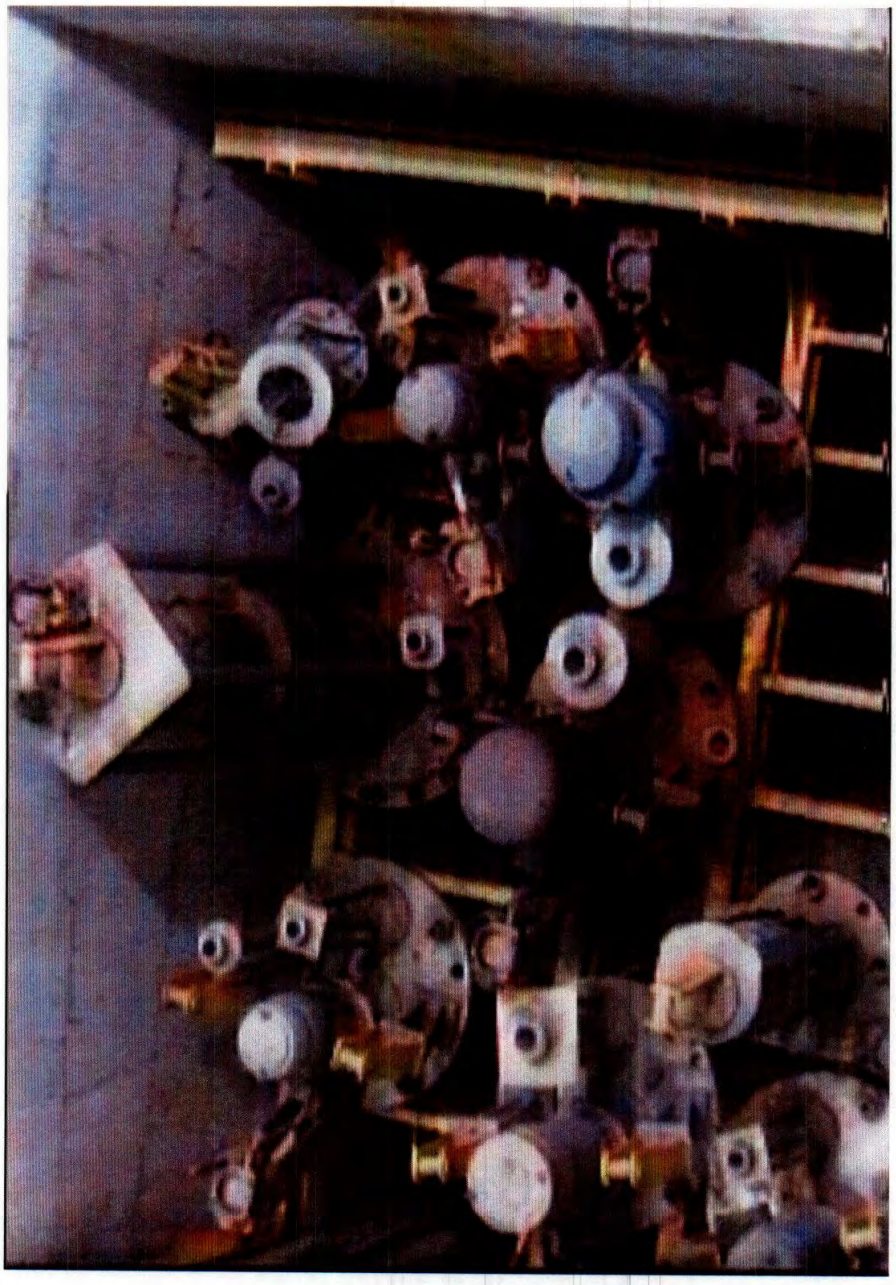


Cell 3L 2002

Attachment 2.

2-2

HNF-8812 Rev 1

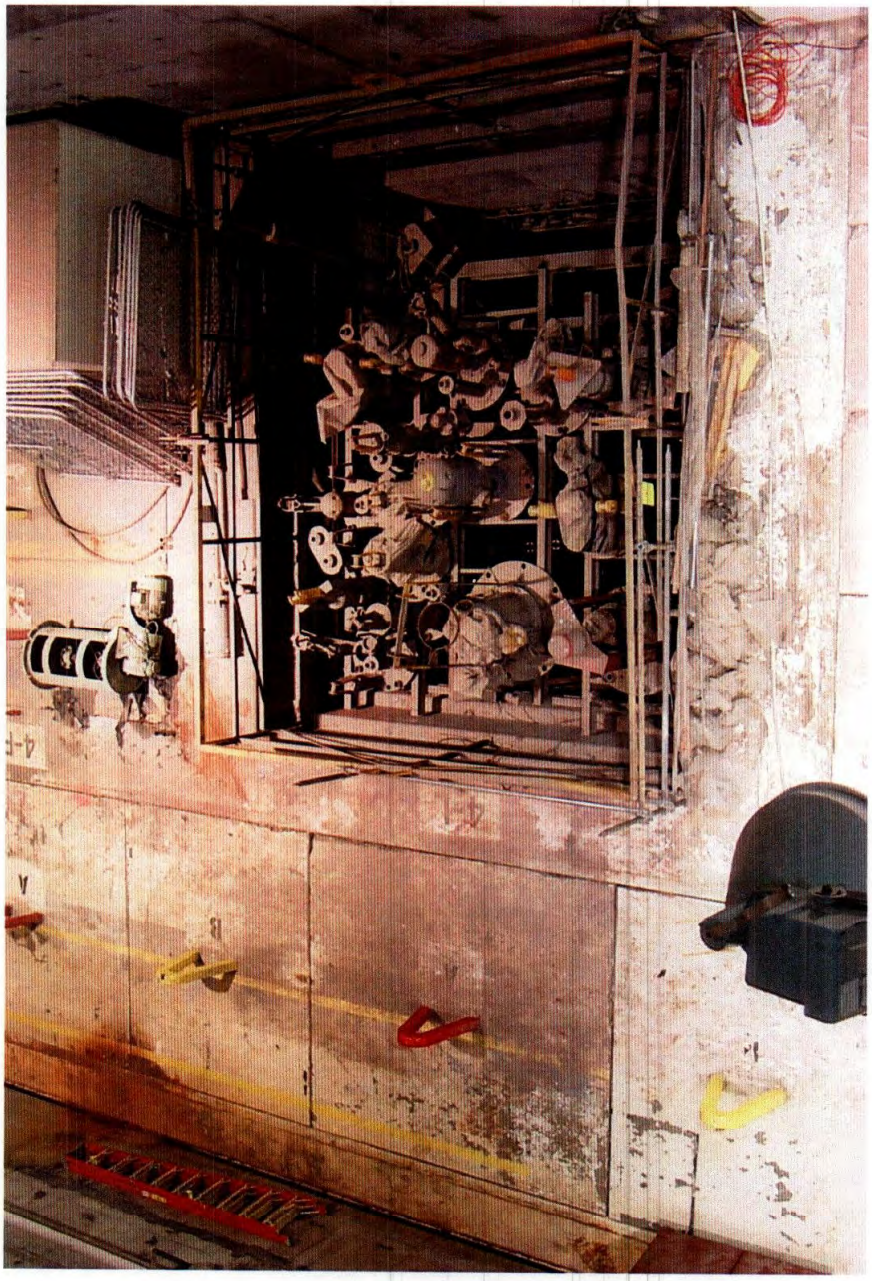


Cell 3R 2001

Attachment 2

2-3

HNF-8312 Rev 1



Cell 4L 2000

Attachment 2

2-4

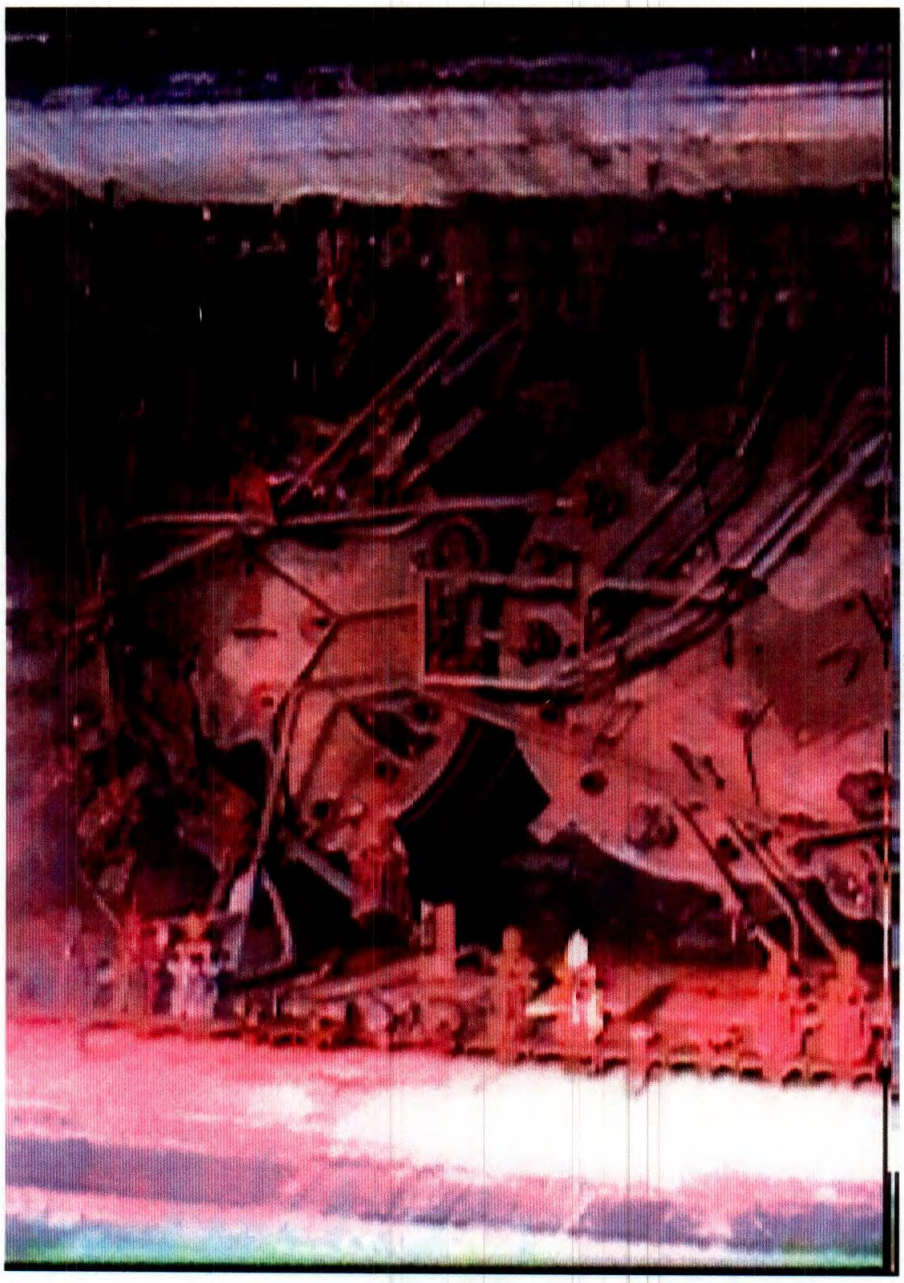
HNF-8812 Rev 1

Cell 4R 1986

Attachment 2

2-5

HNF-8812 Rev 1



Cell 5L 1986

Attachment 2

2-6

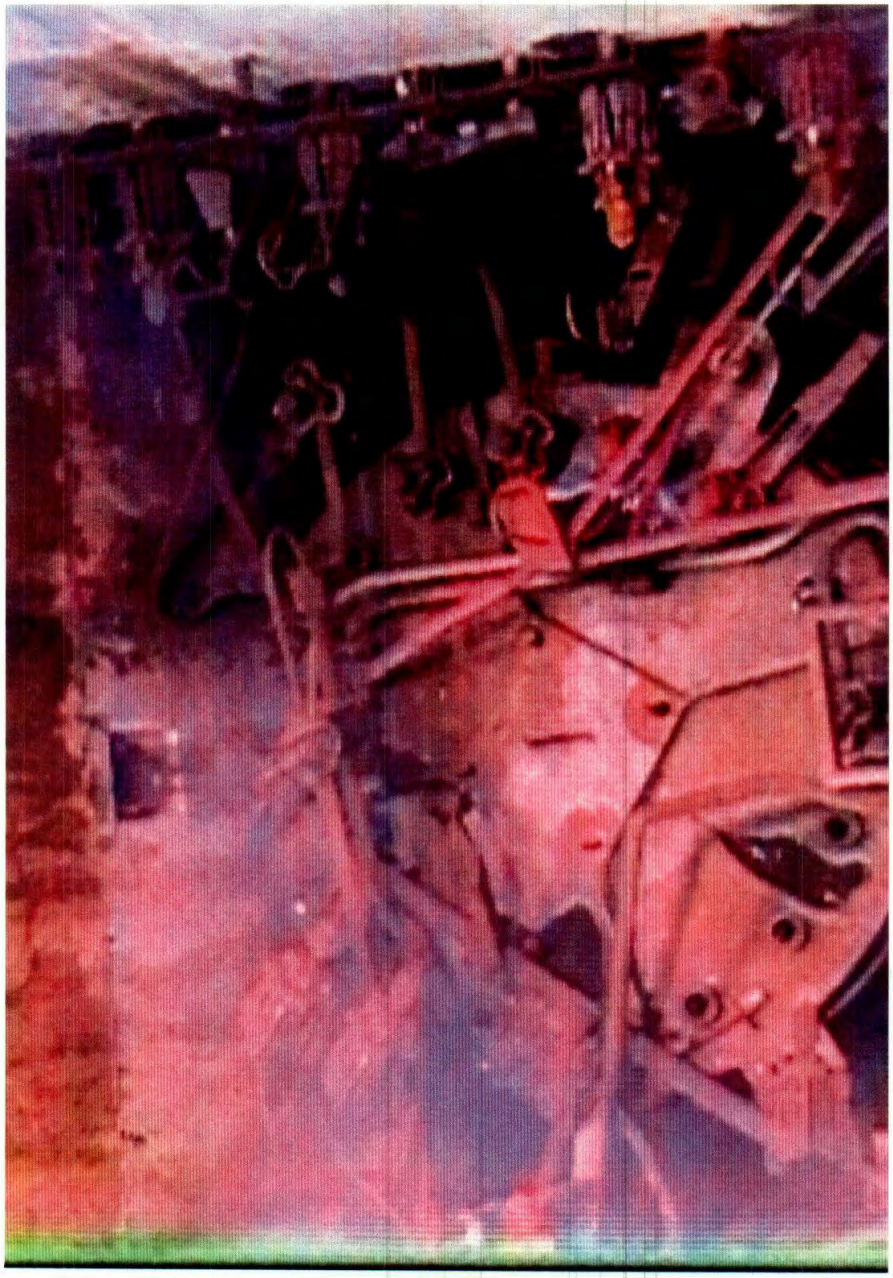
HNF-8812 Rev. 1

Cell 5L 1986

Attachment 2

2-7

HNF-8812, Rev. 1

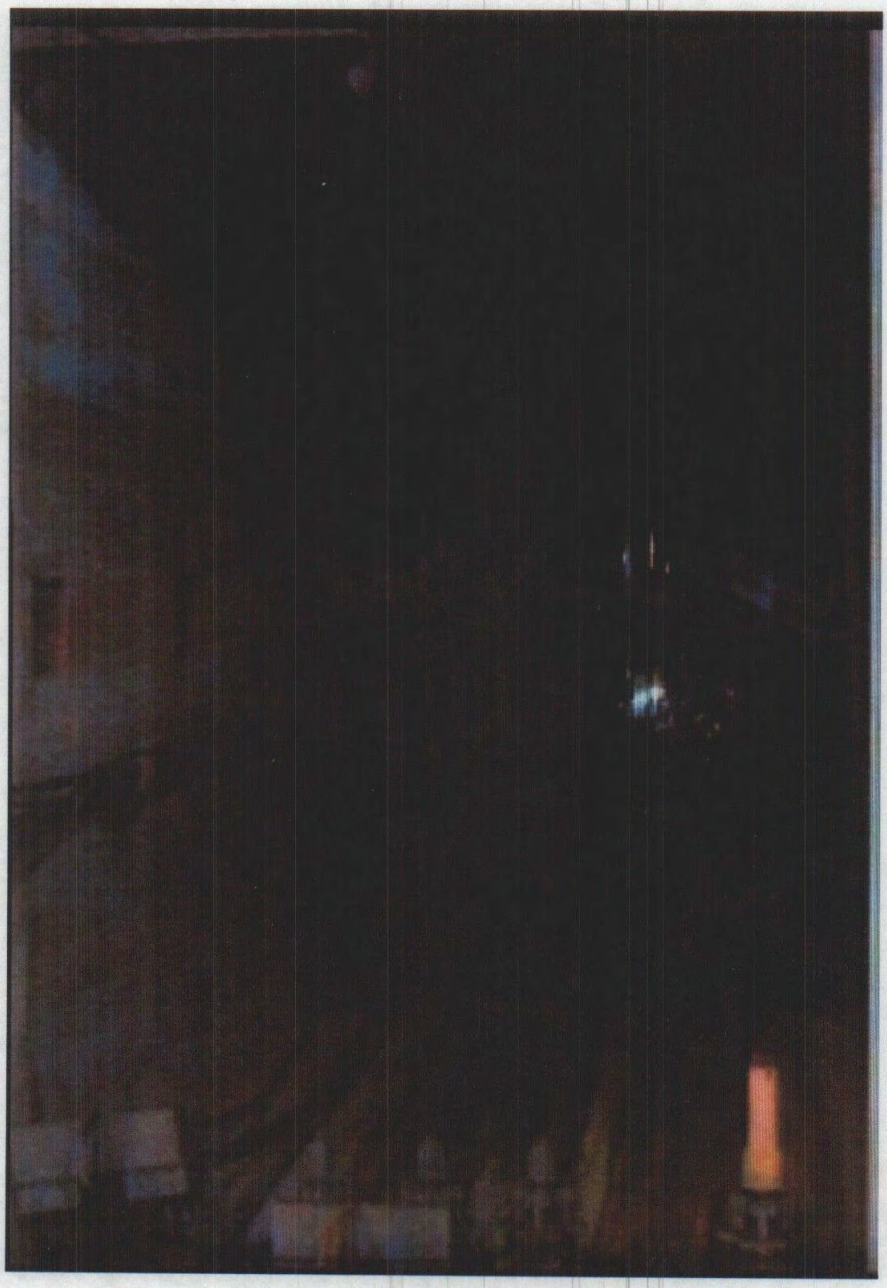


Cell 5L 1986

Attachment 2

2-8

HNF-8812 Rev. 1

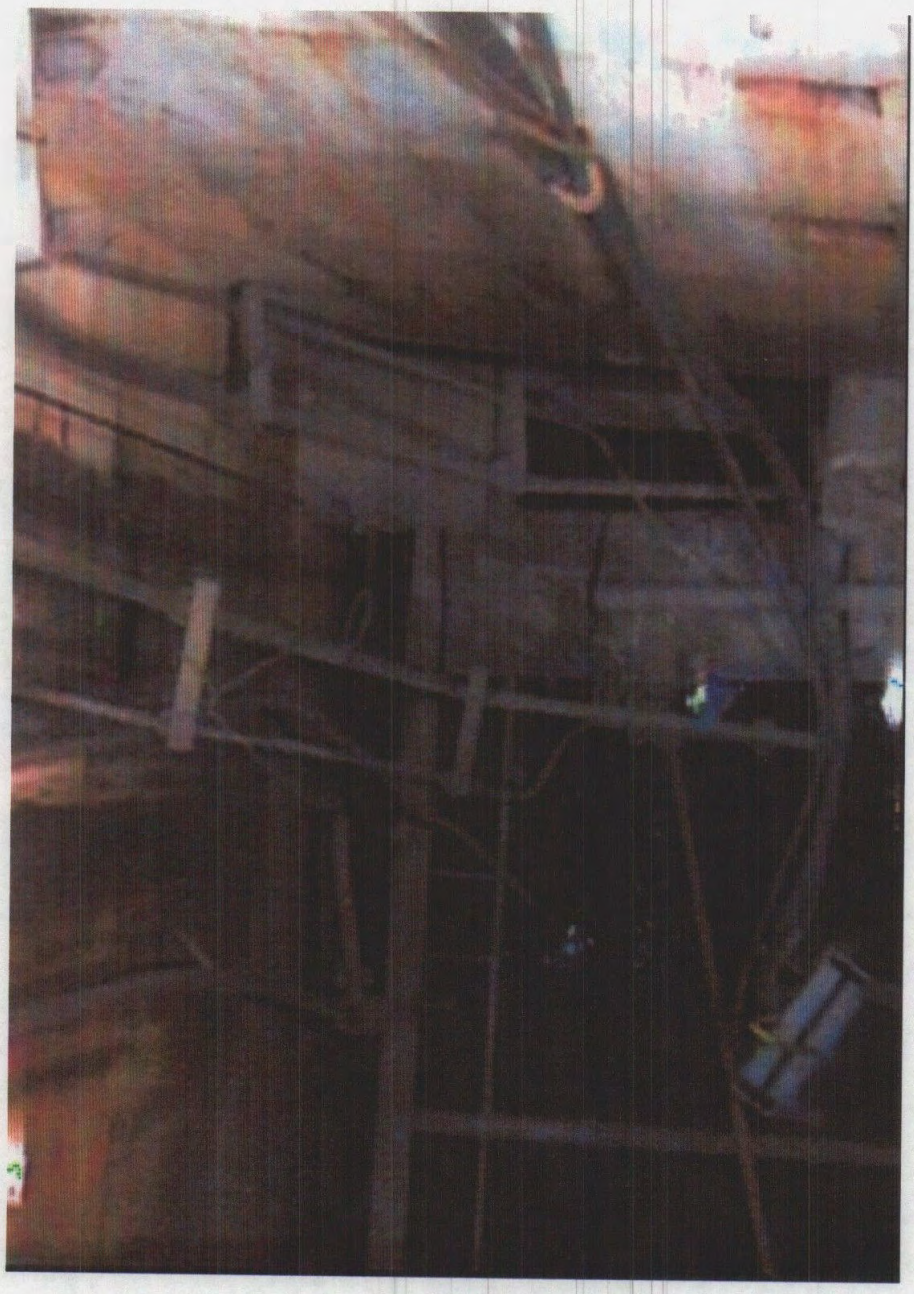


Cell 5R 2001

Attachment 2

2-9

HNF-3812 Rev. 1



Cell 5R 2001

Attachment 2

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HNF-8812 Rev 1

Attachment 2

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HNF-3812 Rev. 1

Cell 5R 1986

Attachment 2

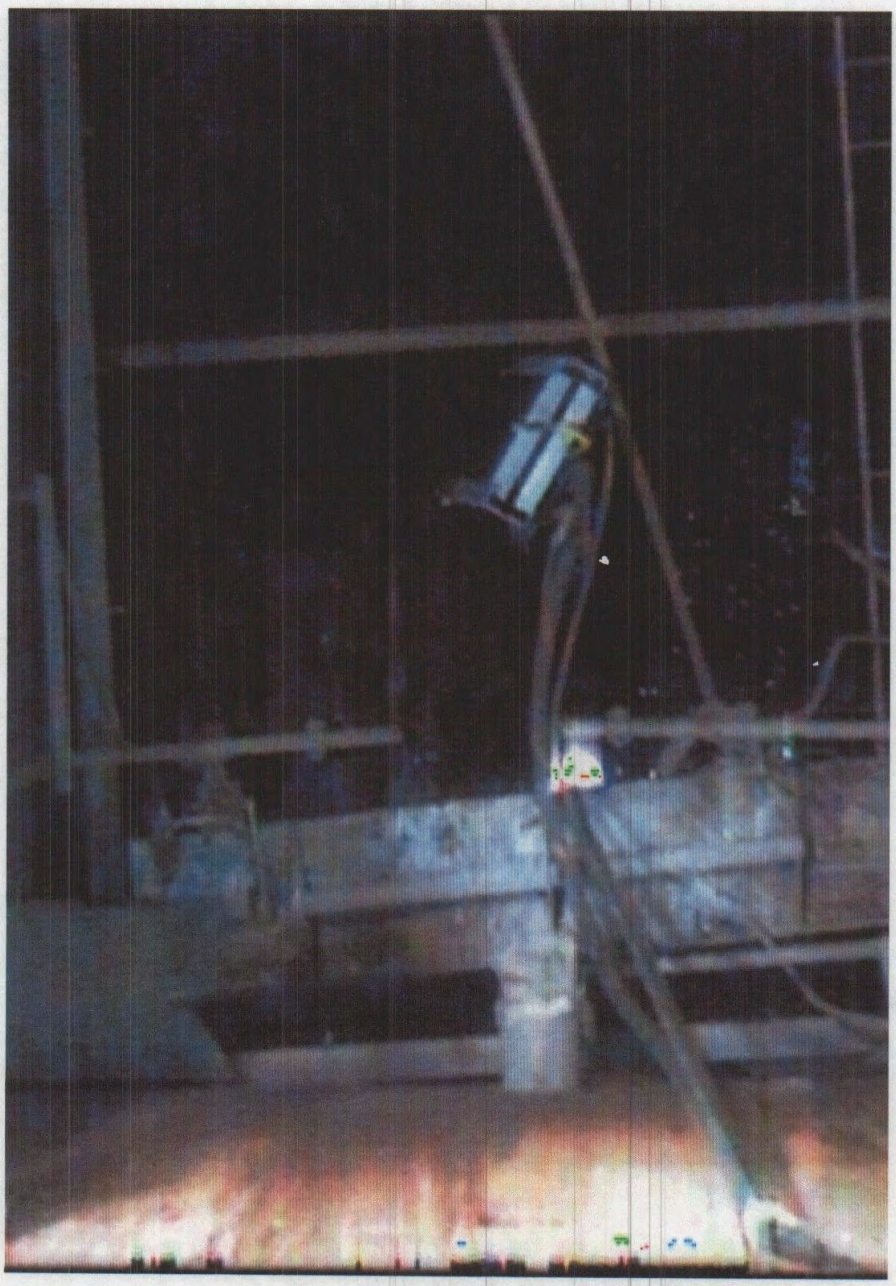
2-12

HNF-8812 Rev 1

Attachment 2

2-13

HNF-8812 Rev. 1

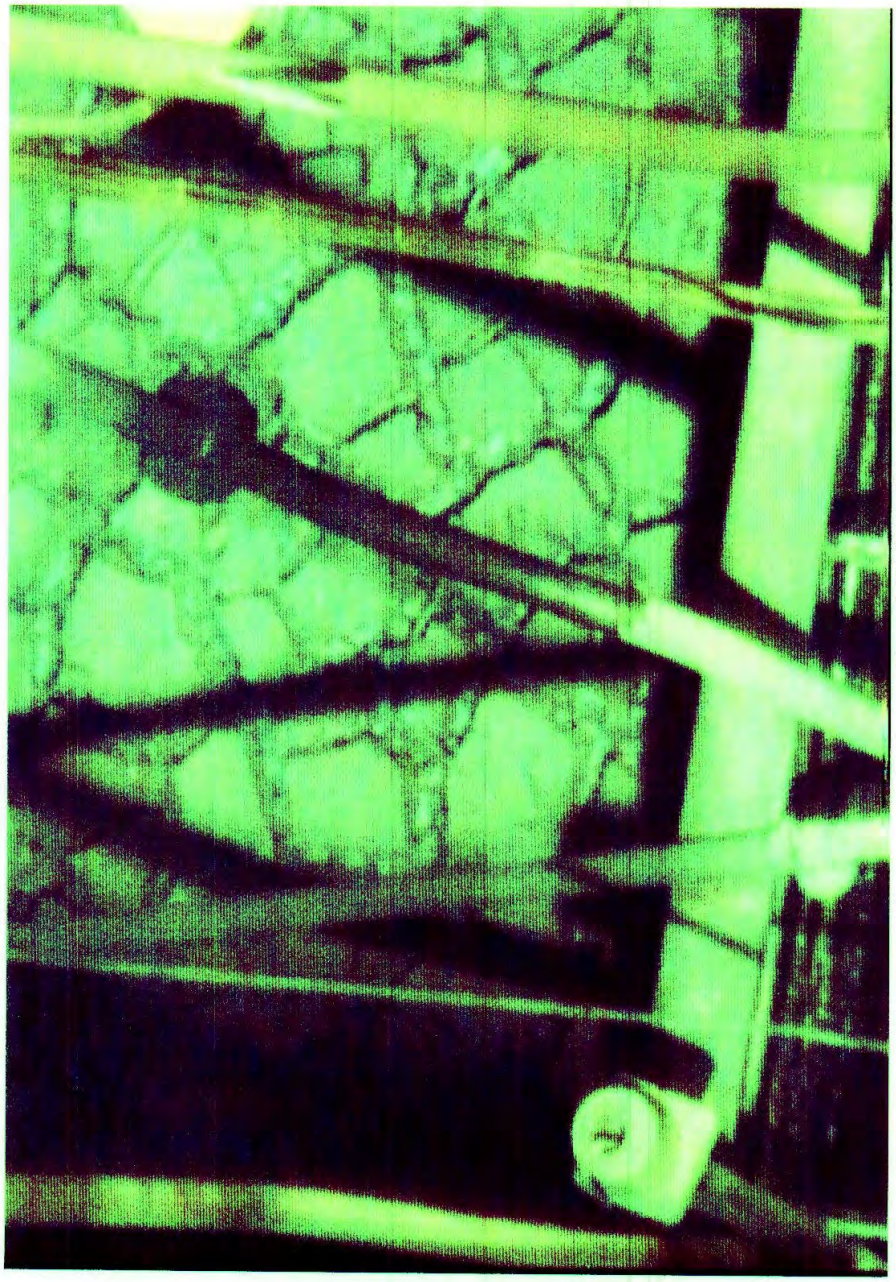


Cell 5R 2001

Attachment 2

2-14

HNF-8812, Rev. 1

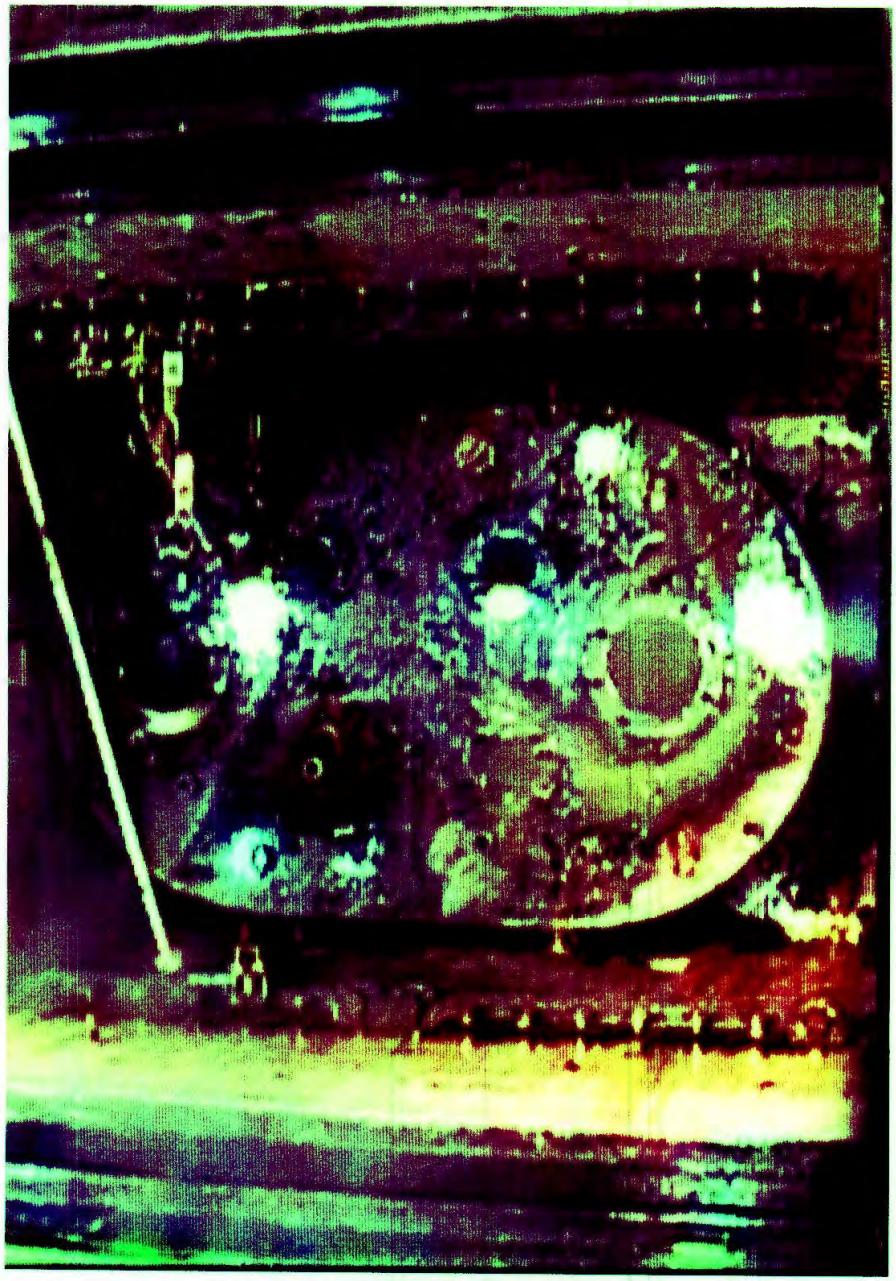


Cell 5R 2001

Attachment 2

2-15

HNF-8812, Rev. 1

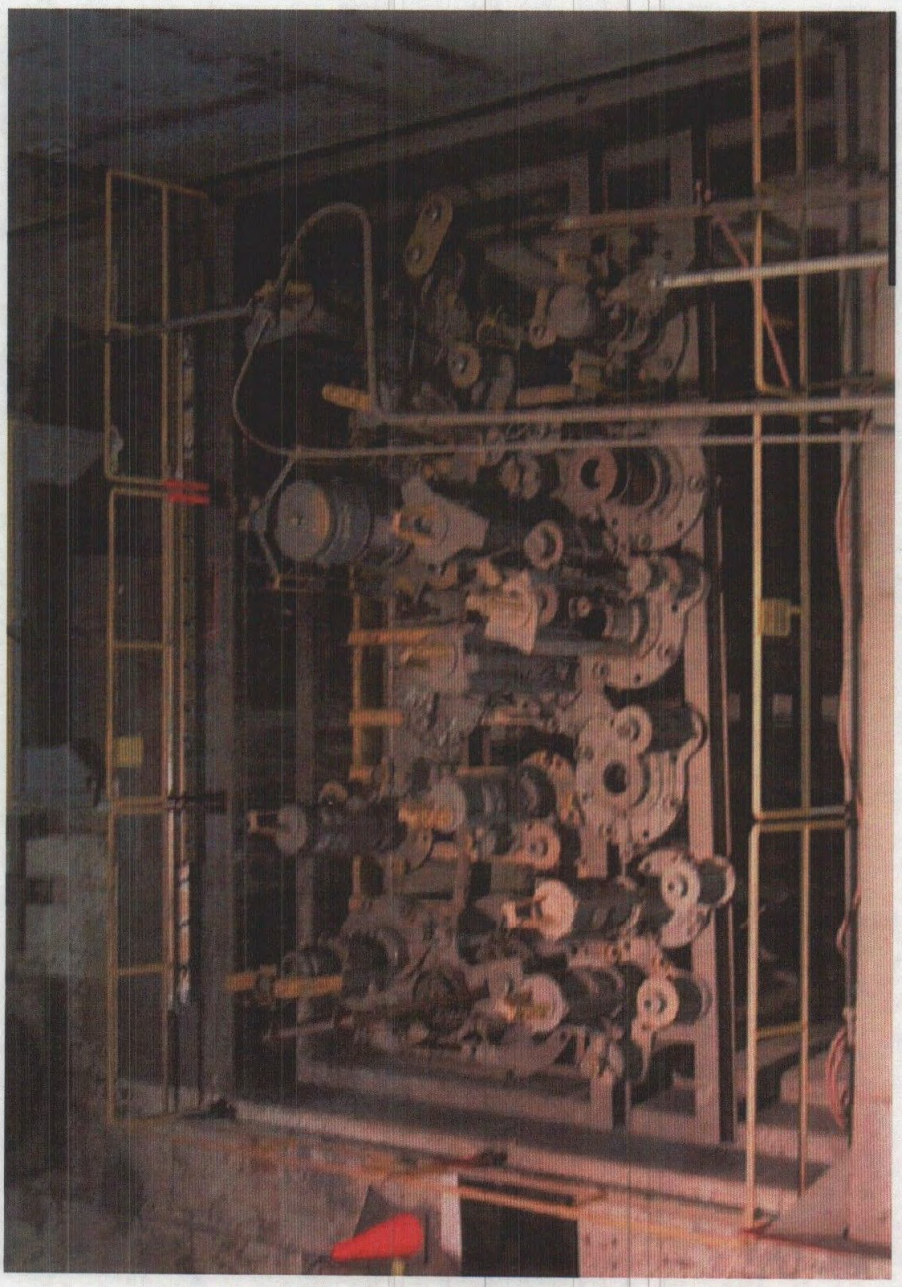


Cell 6L 1986

Attachment 2

2-16

HNF-3812, Rev. 1



Cell 6R 1986

Attachment 2

2-17

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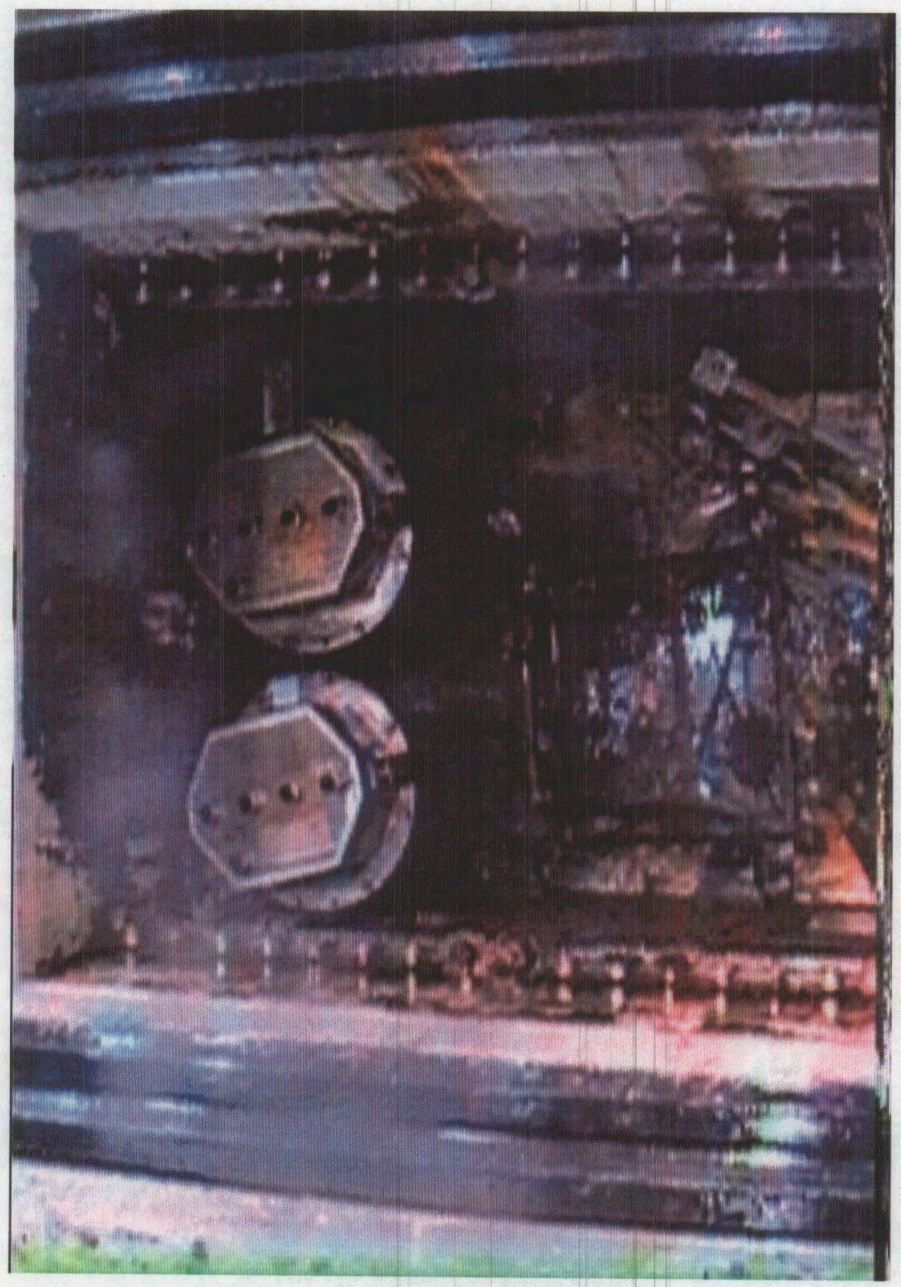

Cell 7L 1986

Attachment 2

2-18

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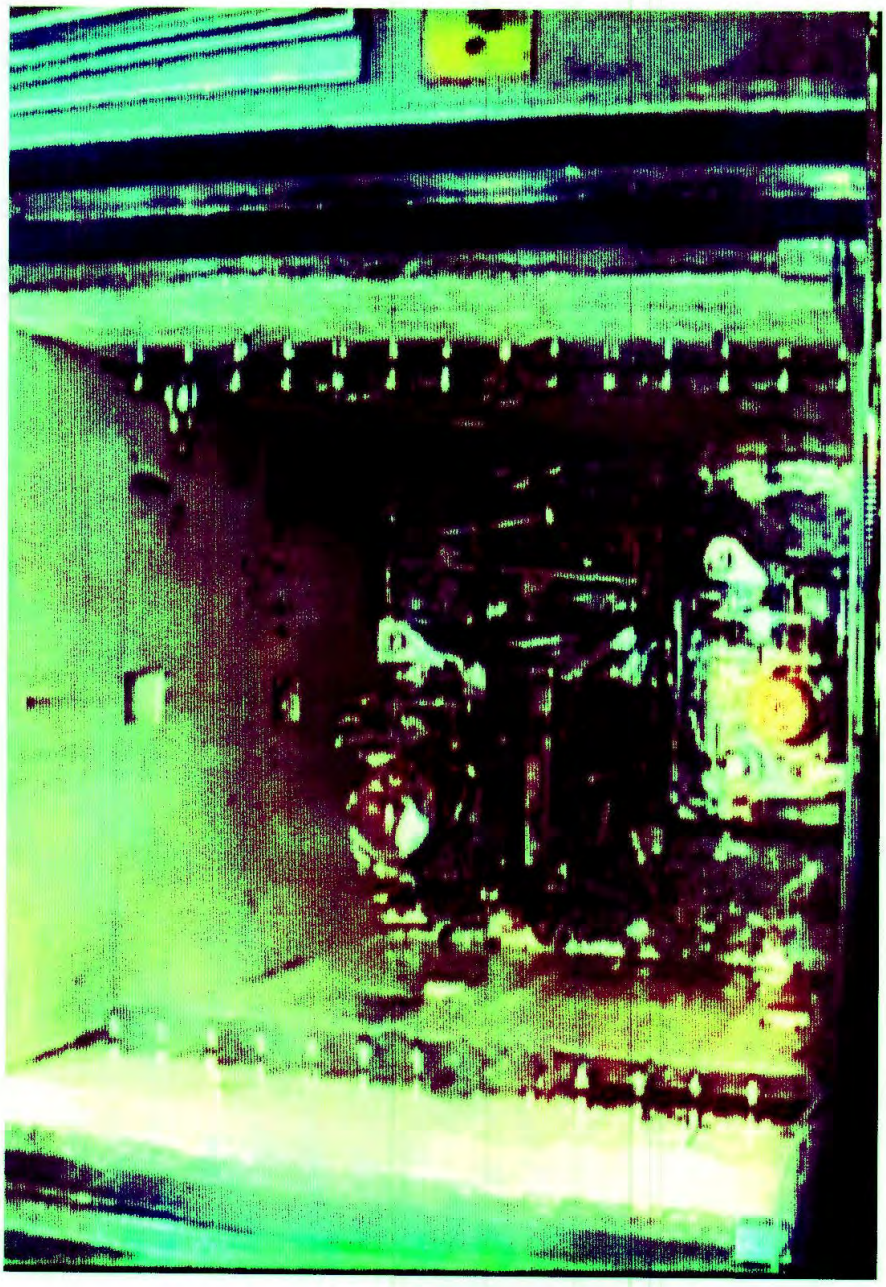


Cell 7R 1986

2-19

Attachment 2

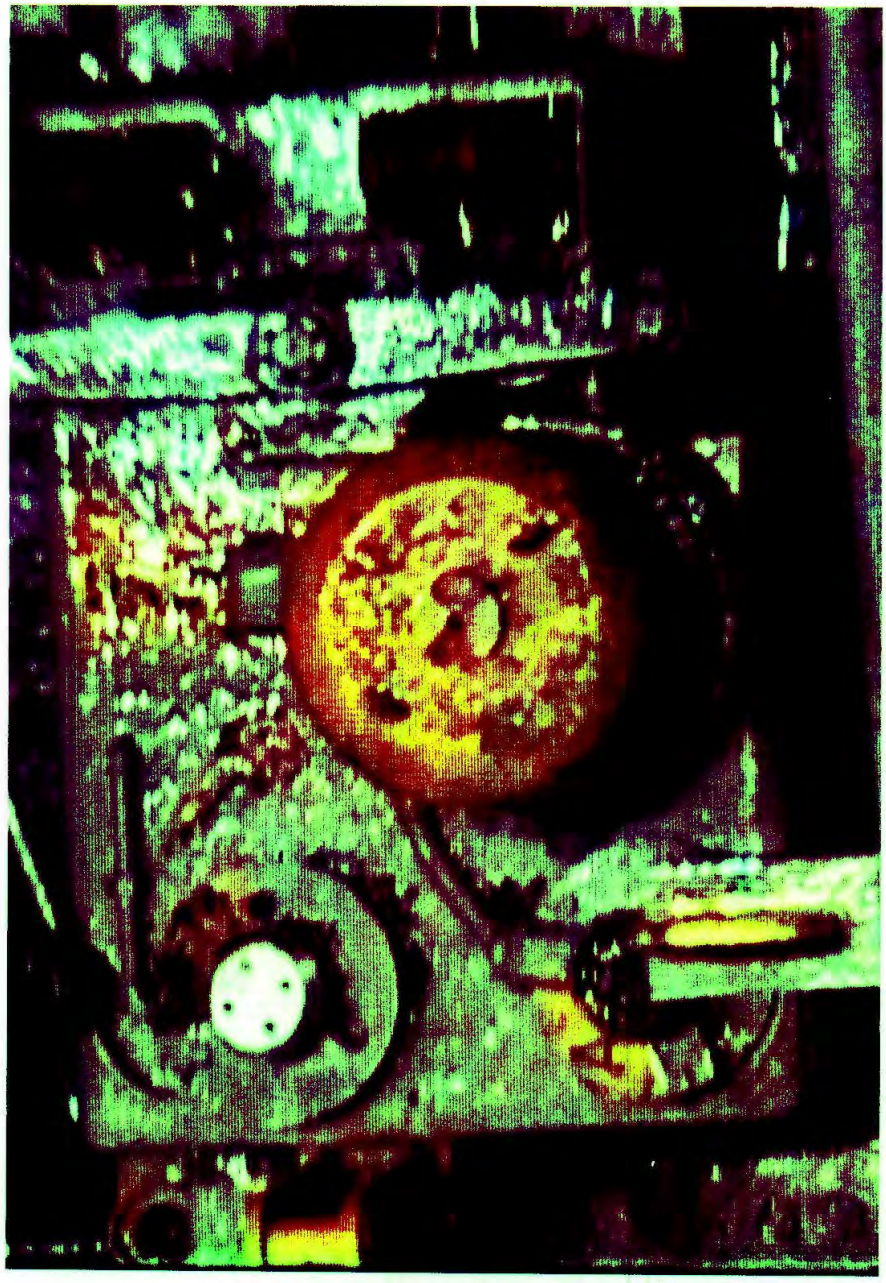
HNF-3312 Rev. 1

Cell 7R 1986

Attachment 2

2-20

HNF-8812, Rev. 1



Cell 7R 1986

Attachment 2

2-21

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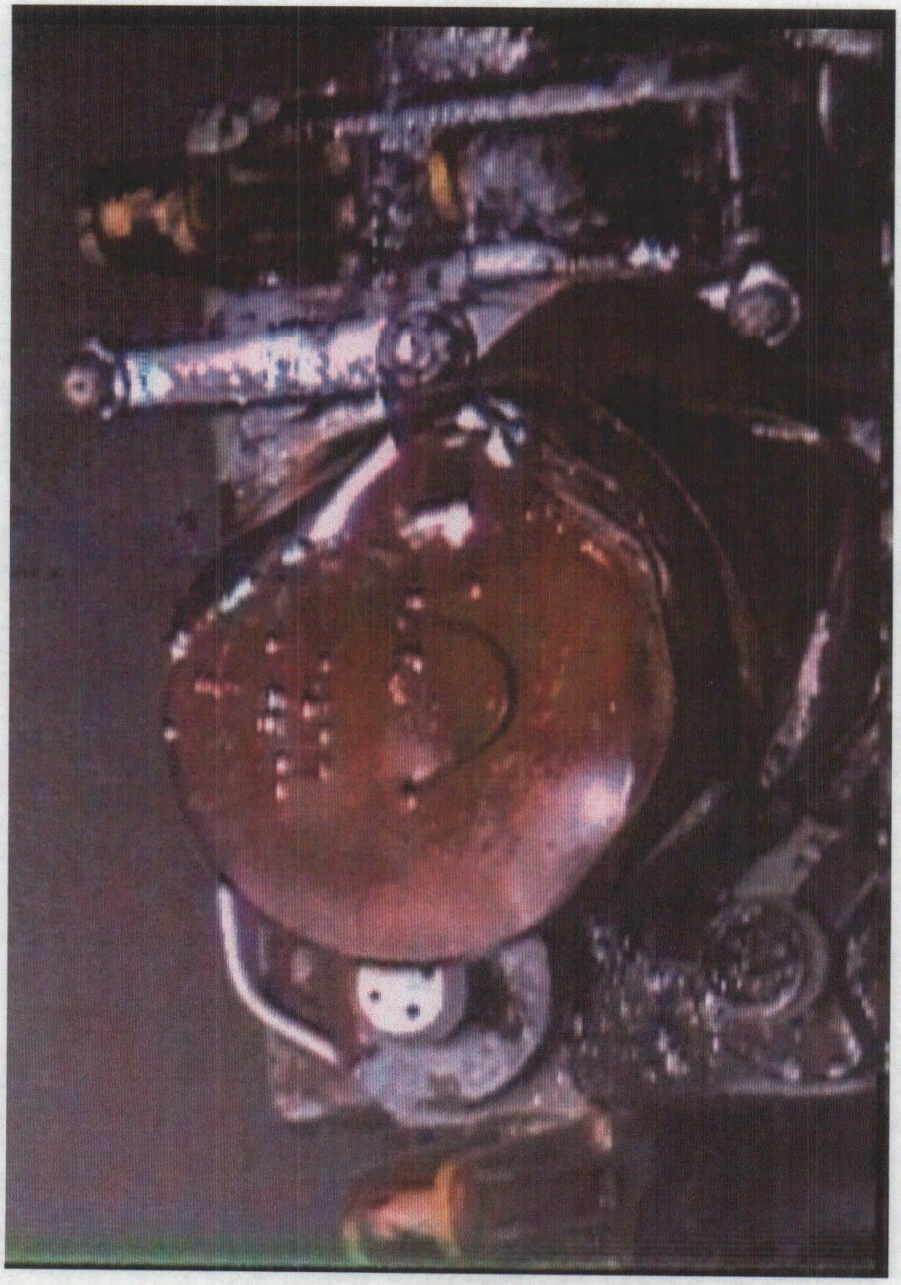


Cell 7R 1986

Attachment 2

2-22

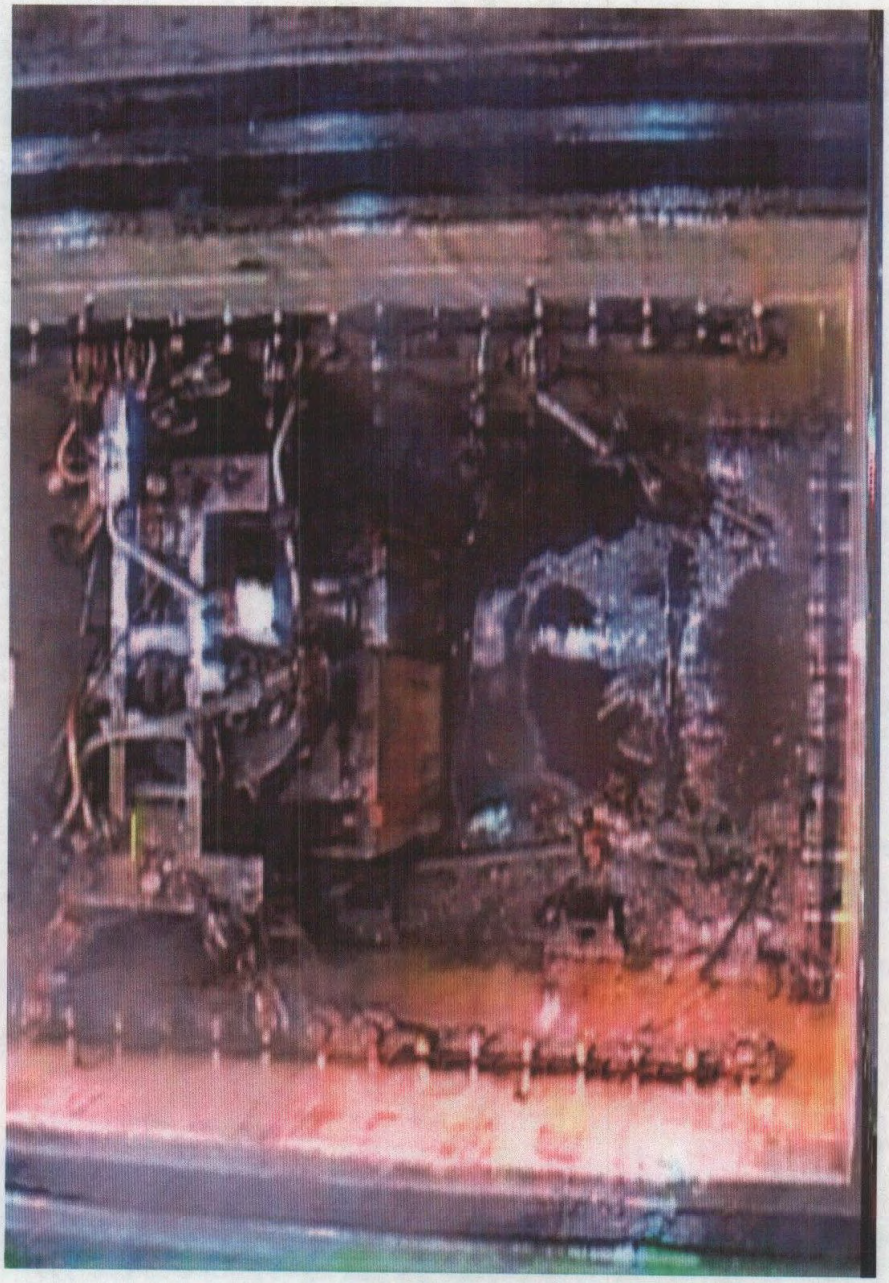
HNF-3812 Rev. 1

Cell 8L 1986

Attachment 2

2-23

HNF-8812 Rev. 1

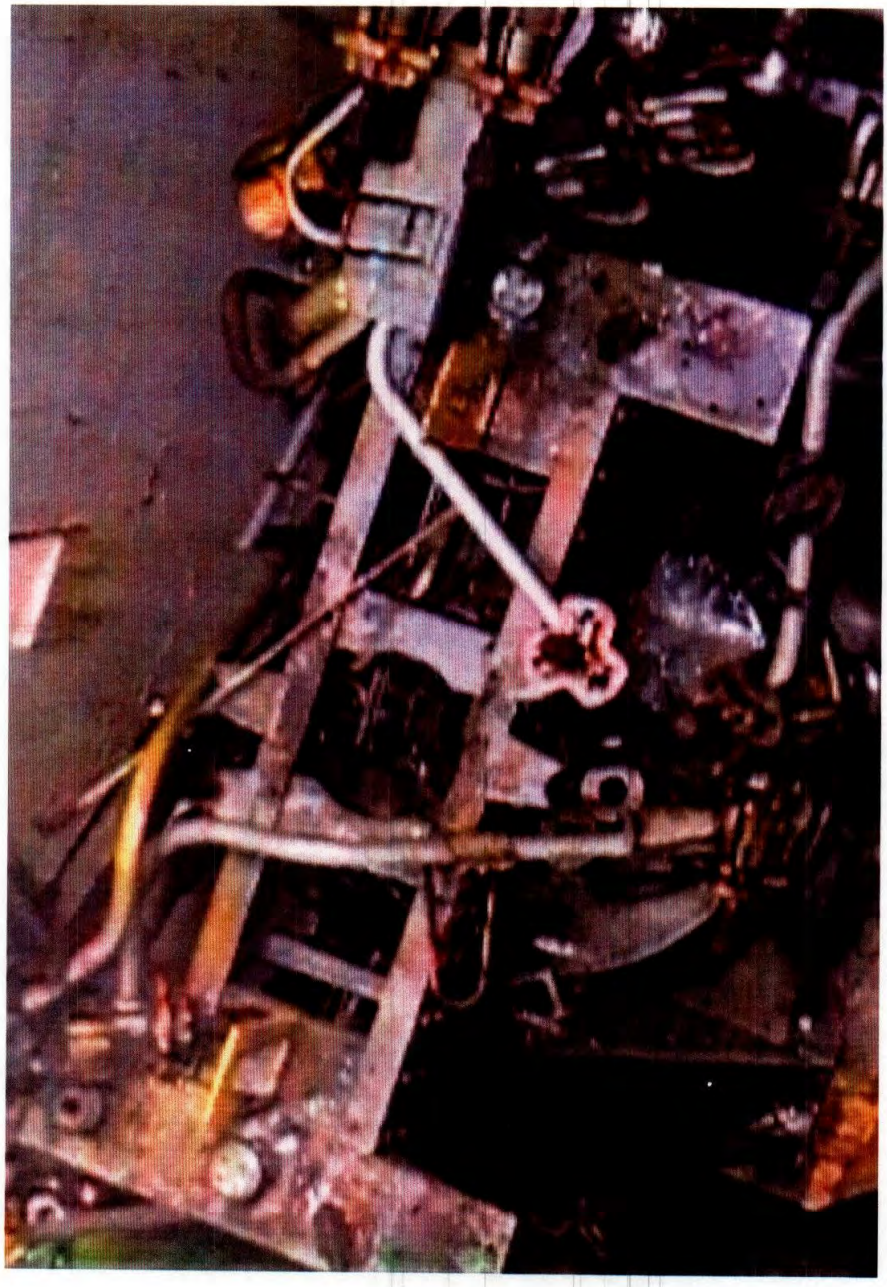


Cell 8R 1986

Attachment 2

2-24

HNF-8812 Rev. 1



Cell 8R, 1986

Attachment 2

2-25

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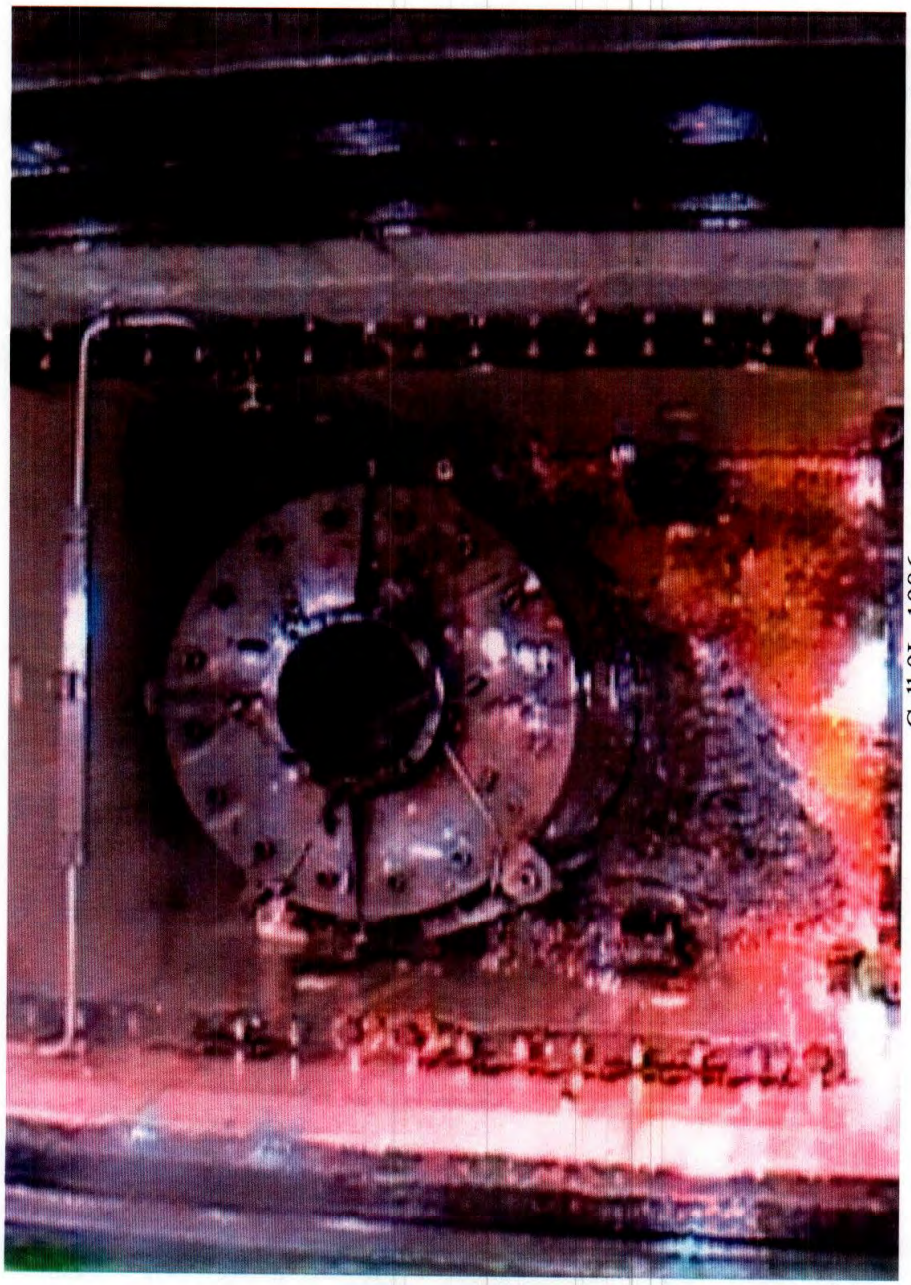
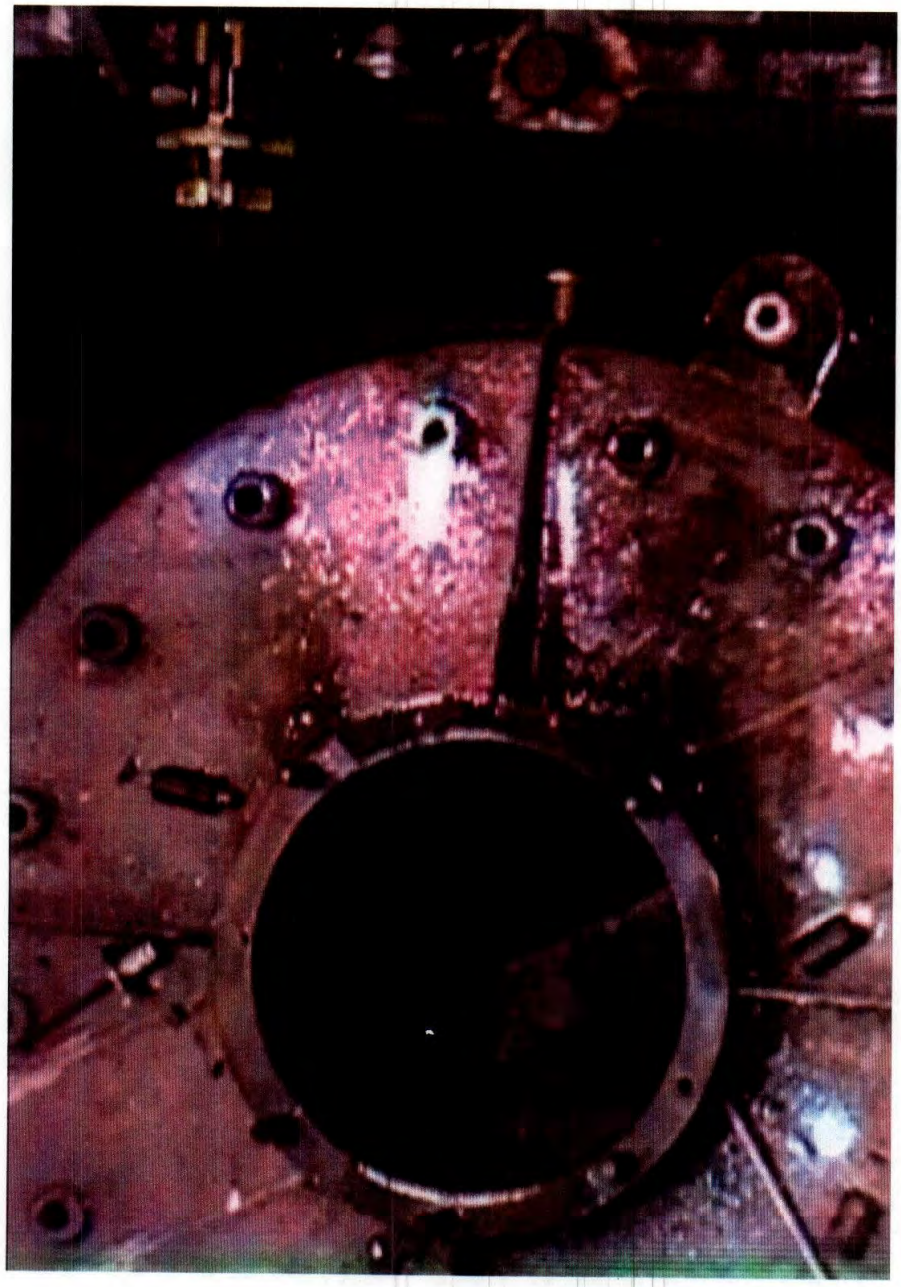


Cell 9L, 1986

Attachment 2

2-26

HNF-8812 Rev. 1

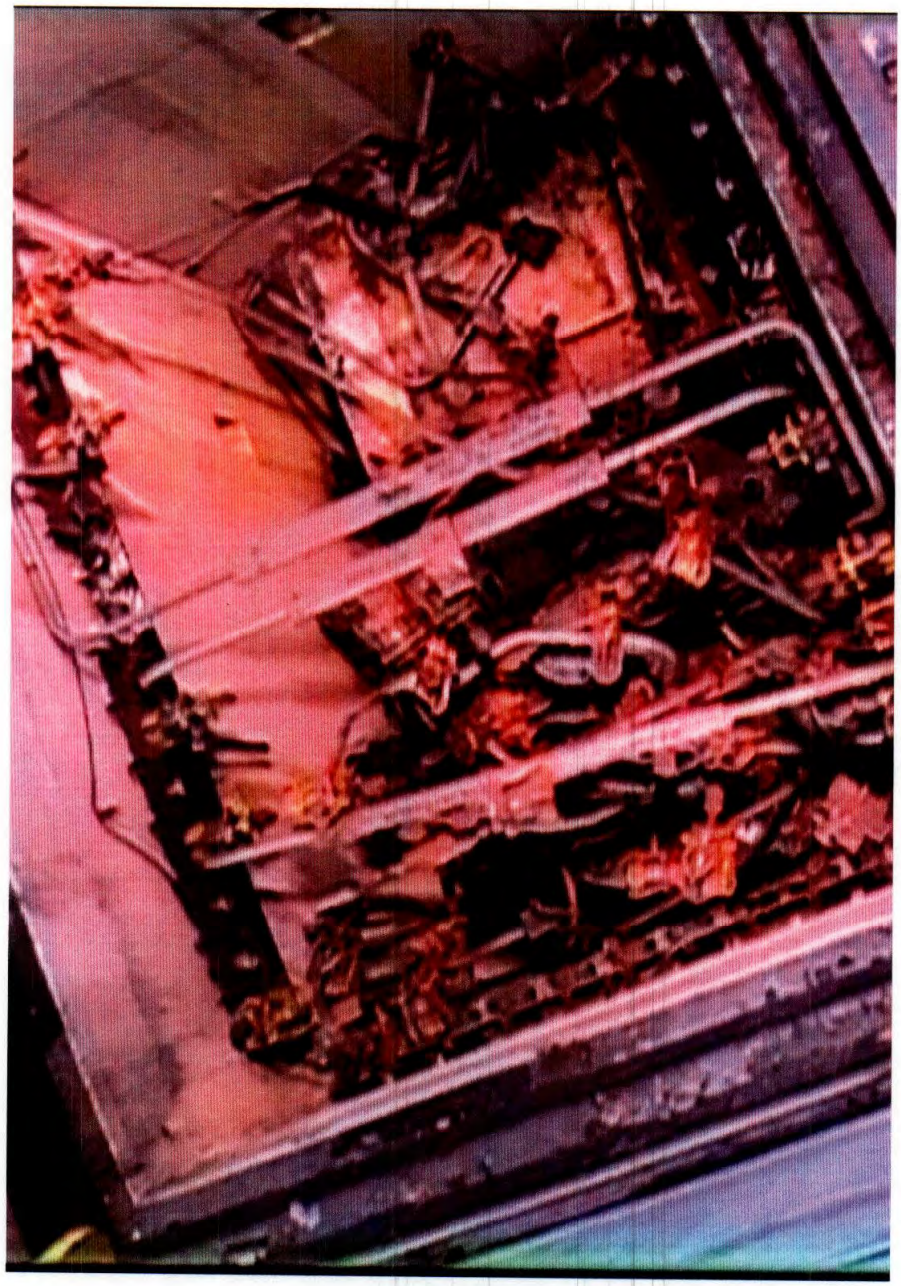


Cell 9L 1986

Attachment 2

2-27

HNF-8812 Rev. 1



Cell 9R 1986

2-28

Attachment 2

HNF-3812 Rev. 1

Cell 9R 1896

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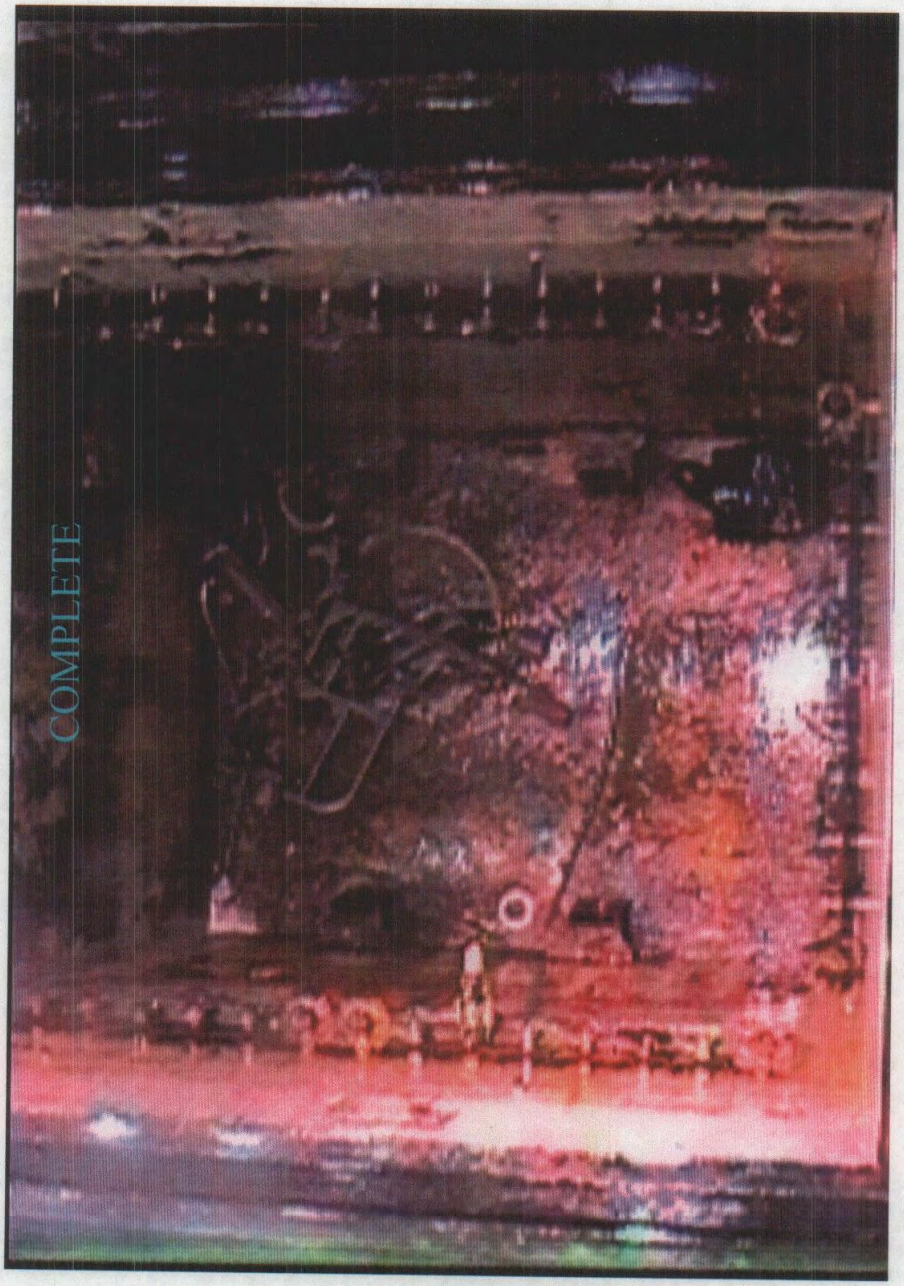
Attachment 2

HNF-8812 Rev. 1



Attachment 2

2-30

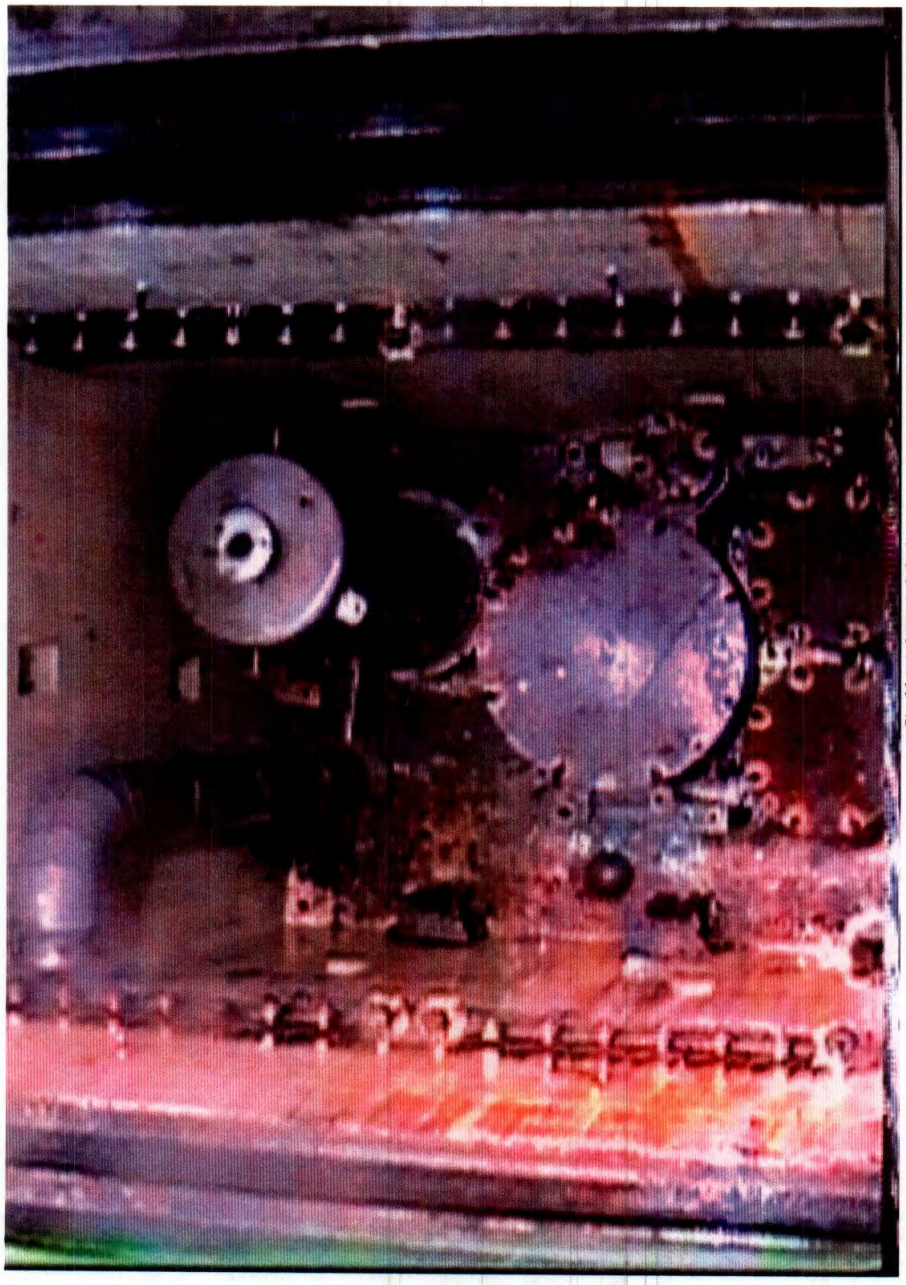
HNF-8812 Rev 1

Cell 10L 2002

Attachment 2

2-31

HNF-8812 Rev. 1



Cell 10R 1986

Attachment 2

2-32

HNF-8812 Rev. 1

Cell 10R 1986

Attachment 2

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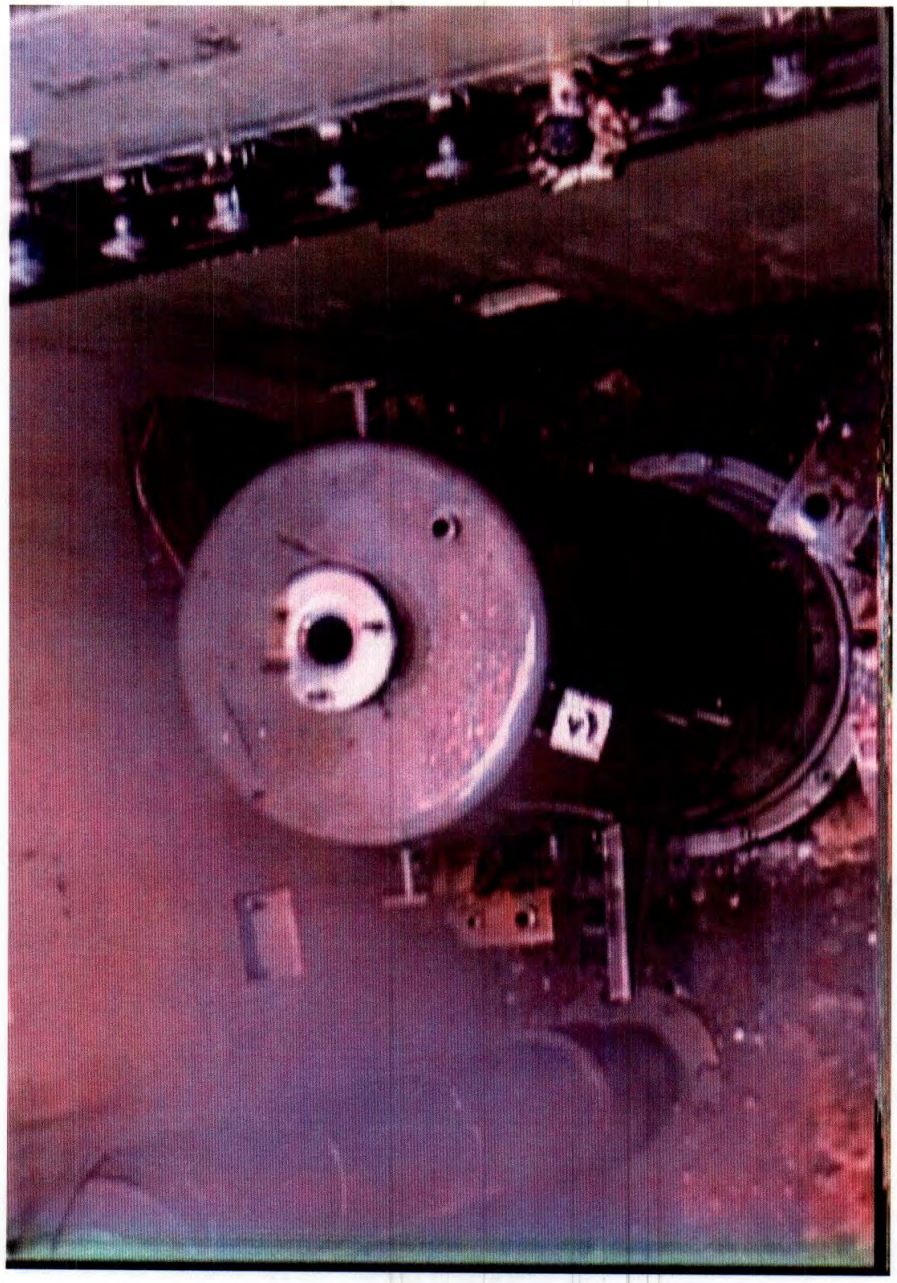
HNF-3812 Rev. 1



Cell 10R 1986

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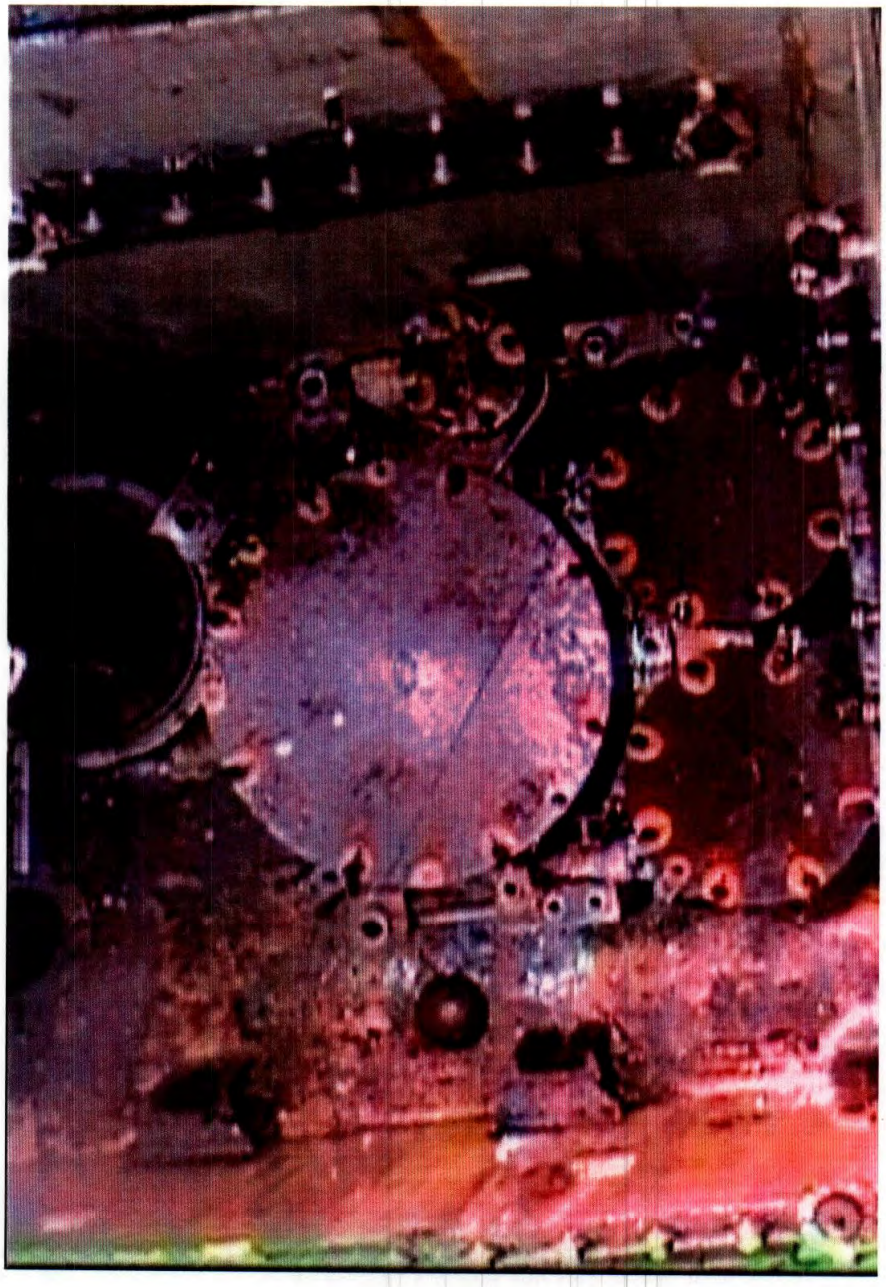
2-34

HNF-8812 Rev. 1



Cell 10R 1986

Attachment 2

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HNF-8812 Rev. 1

Cell 10R 1986

Attachment 2

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HNF-8812 Rev. 1

Cell 11L 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 11L 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 11L 2001

Attachment 2

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HNF-3812 Rev. 1

Cell 11L 2001

Attachment 2

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HNF-8812 Rev, 1

Cell 12R 2001

Attachment 2

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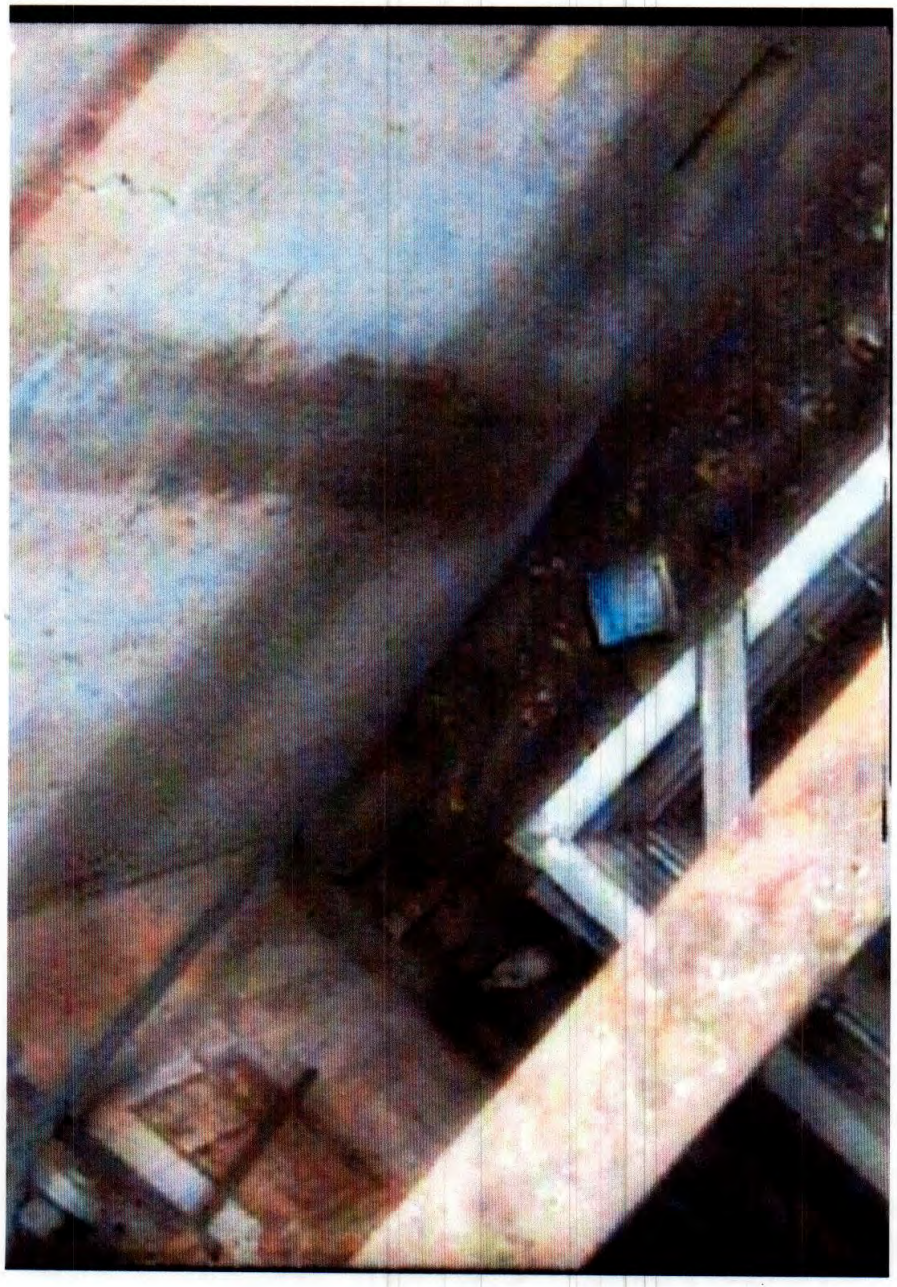
HNF-8812 Rev. 1



Cell 12R 2001

Attachment 2

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HNF-3812 Rev. 1

Cell 12R 2001

Attachment 2

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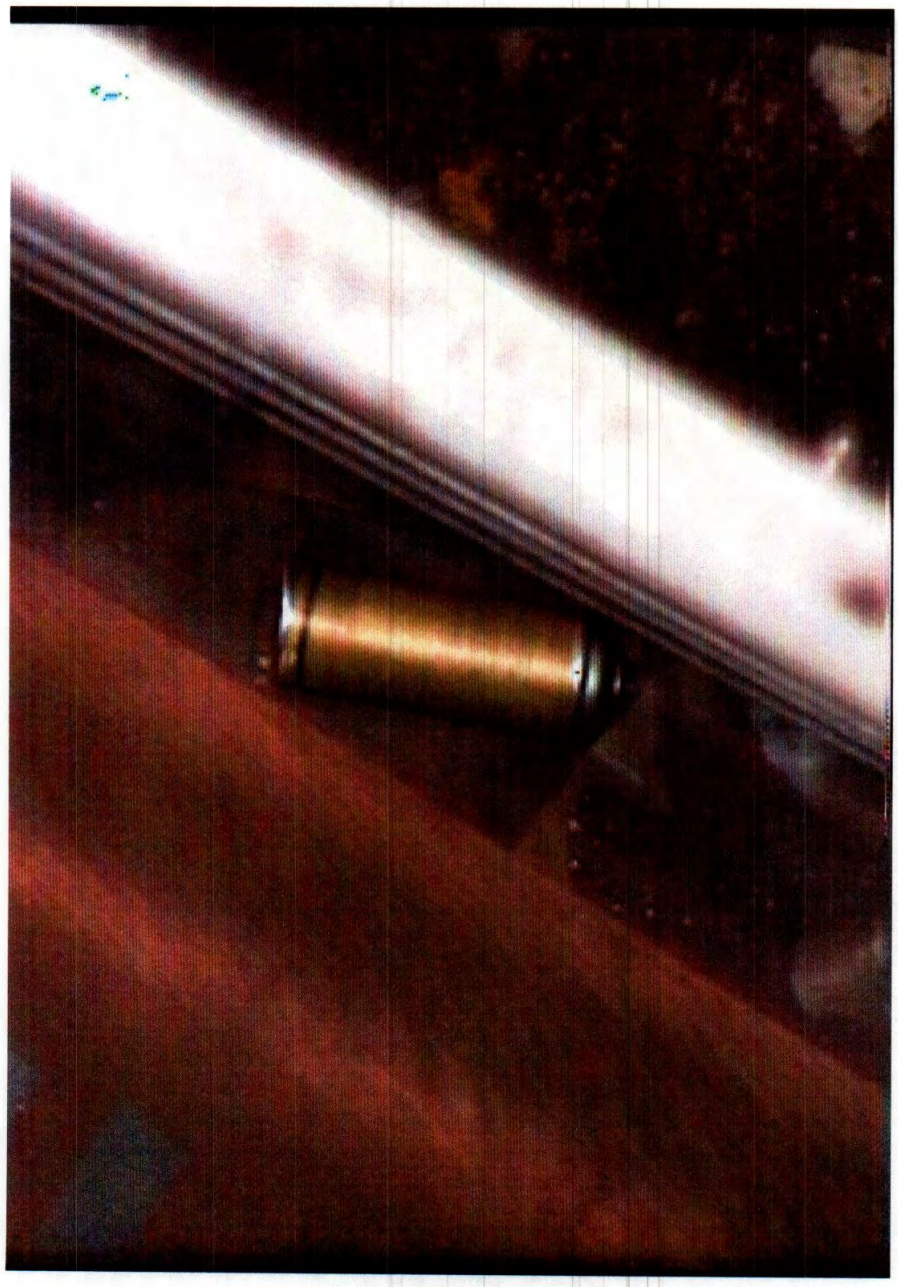
HNF-8812 Rev. 1



Cell 12R 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 12R 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 13L 1986

Attachment 2

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HNF-8812 Rev. 1

Cell 13L 2001

Attachment 2

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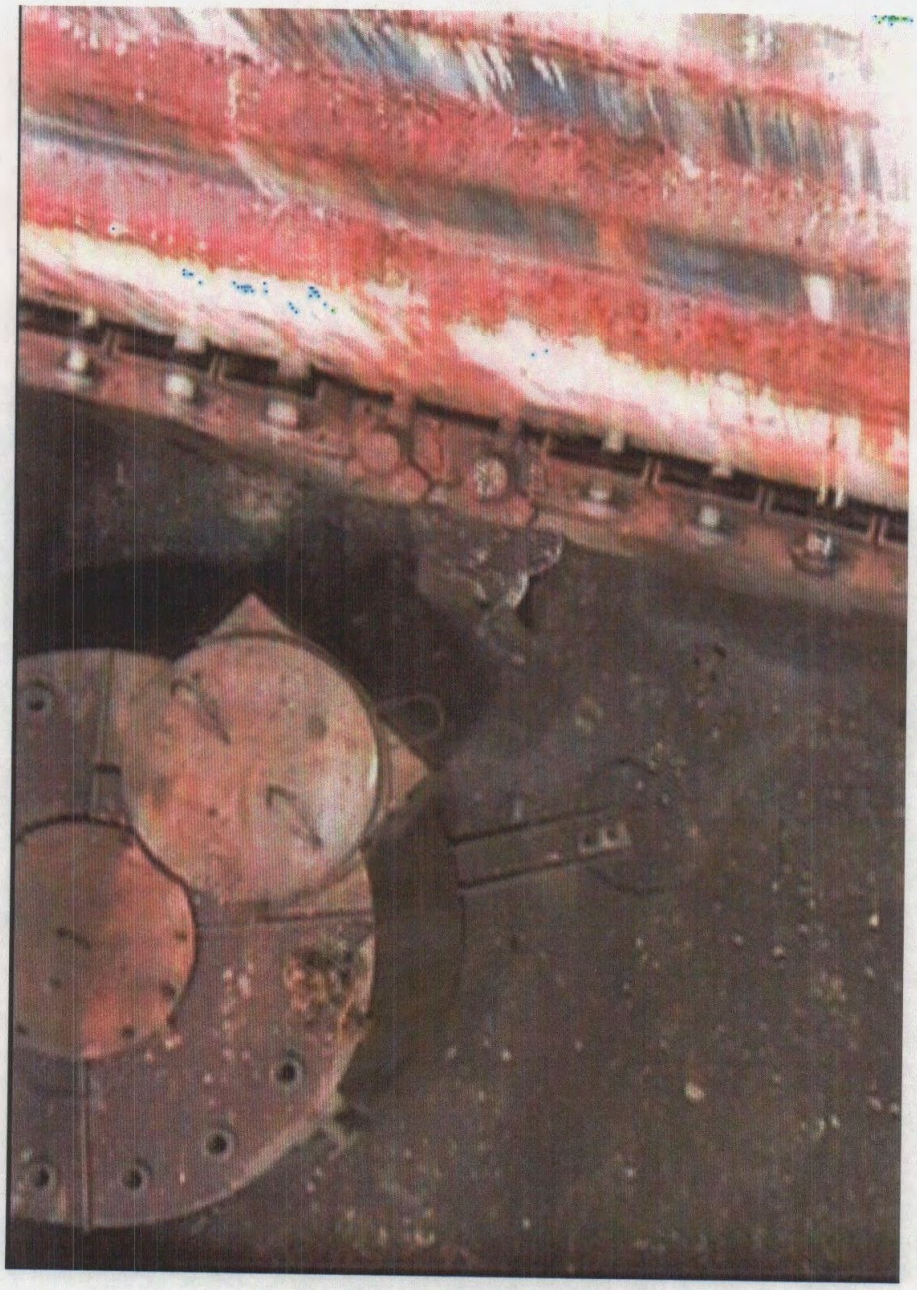
HNF-8812 Rev. 1



Cell 13L 2001

Attachment 2

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HNF-3812 Rev. 1

Cell 13L, 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 13L 2001

Attachment 2

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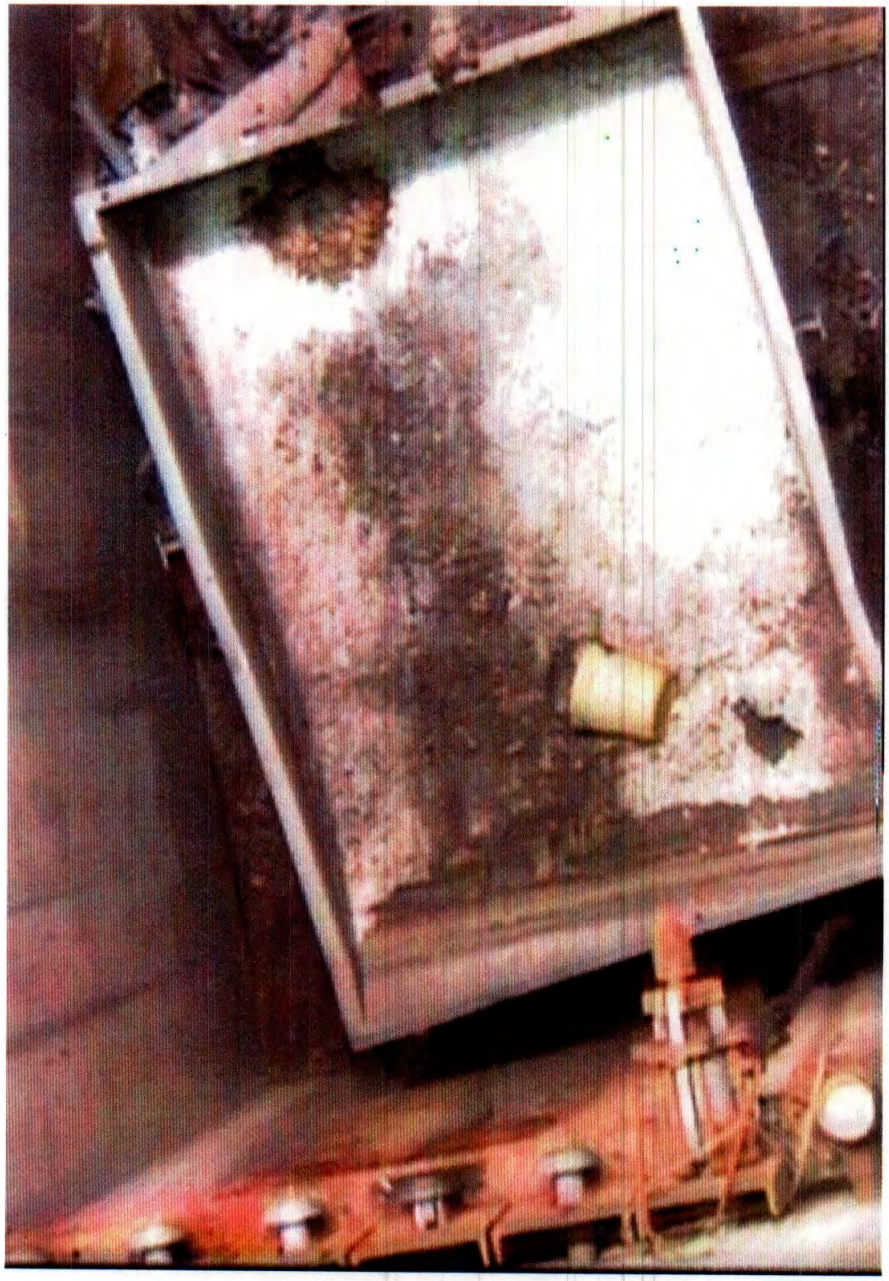
HNF-8812 Rev. 1



Cell 13R 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 13R 1986

Attachment 2

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HNF-8812 Rev. 1

Cell 13R 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 13R 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 13R, 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 13R 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 13R 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 14 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 14, 2001

Attachment 2

2-5-9

HNF-8812 Rev. 1

Cell 14, 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 14, 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 14, 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 14, 2001

Attachment 2

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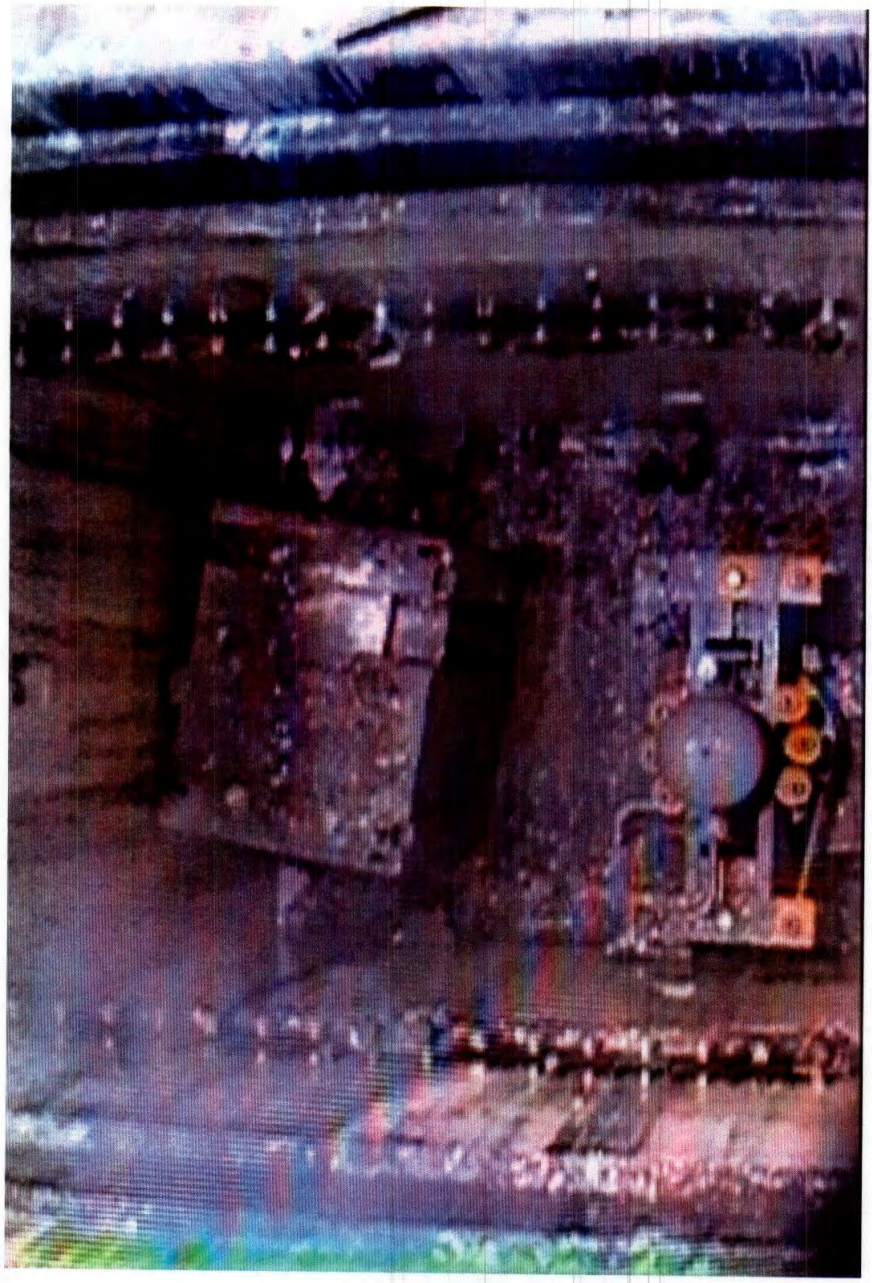
HNF-8812 Rev. 1



Cell 14R 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 15L 1986

Attachment 2

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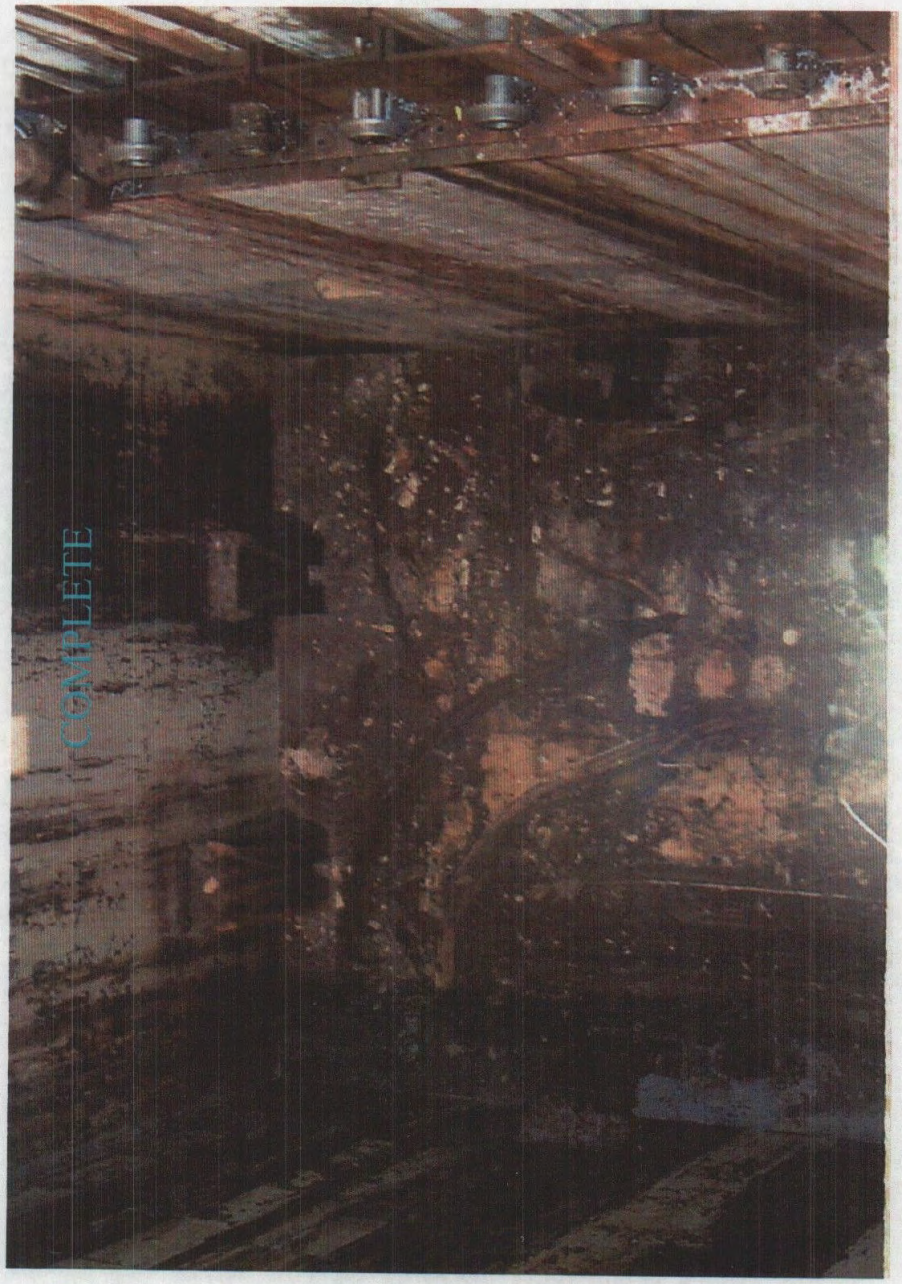
HNF-8812 Rev. 1



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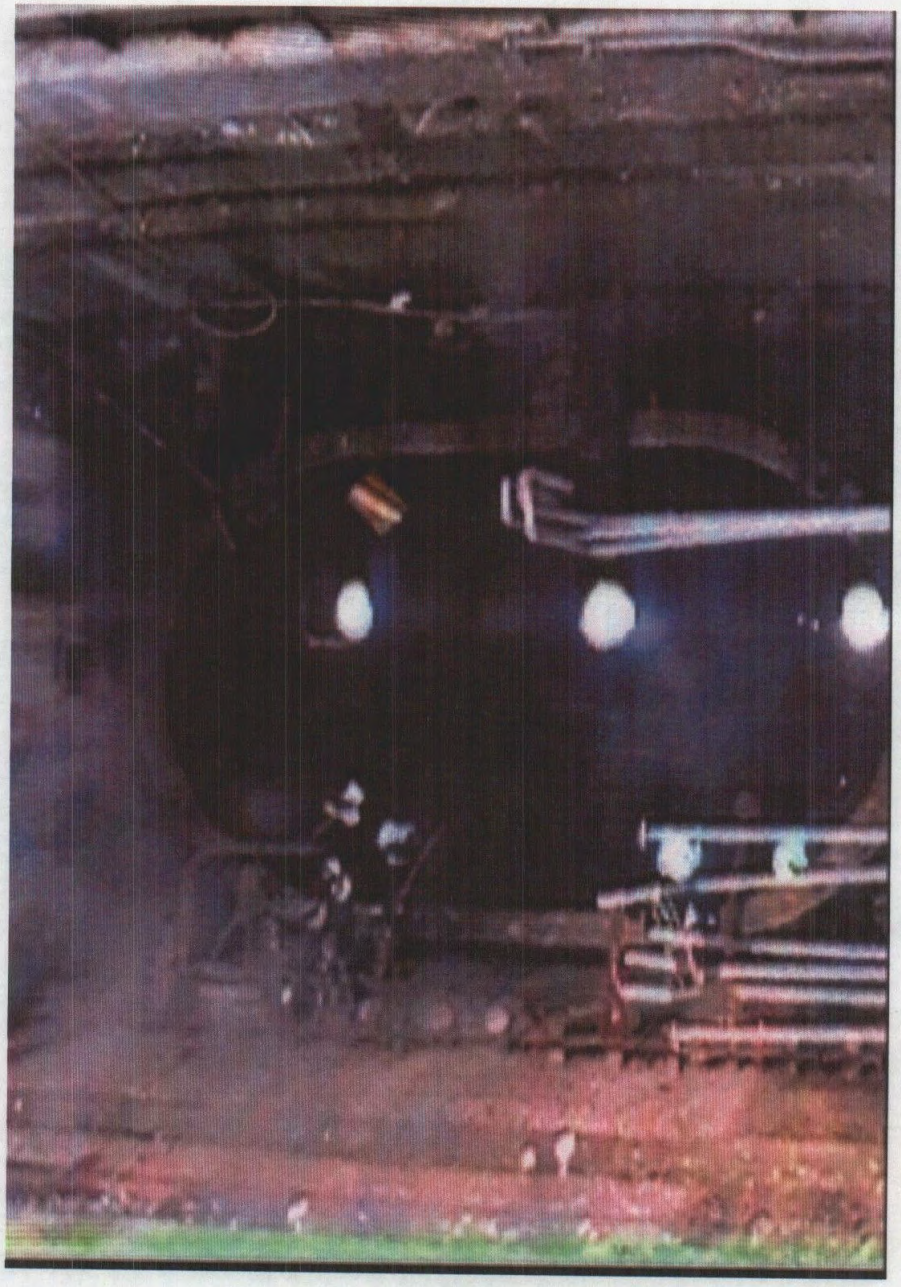
2-66

HNF-8812 Rev. 1



Cell 15R 1986

Attachment 2

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HNF-8812 Rev. 1

Cell 16R

Attachment 2

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HNF-9812 Rev. 1

Cell 17L 1986

Attachment 2

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HNF-8812, Rev. 1

Cell 17L 1986

Attachement 2

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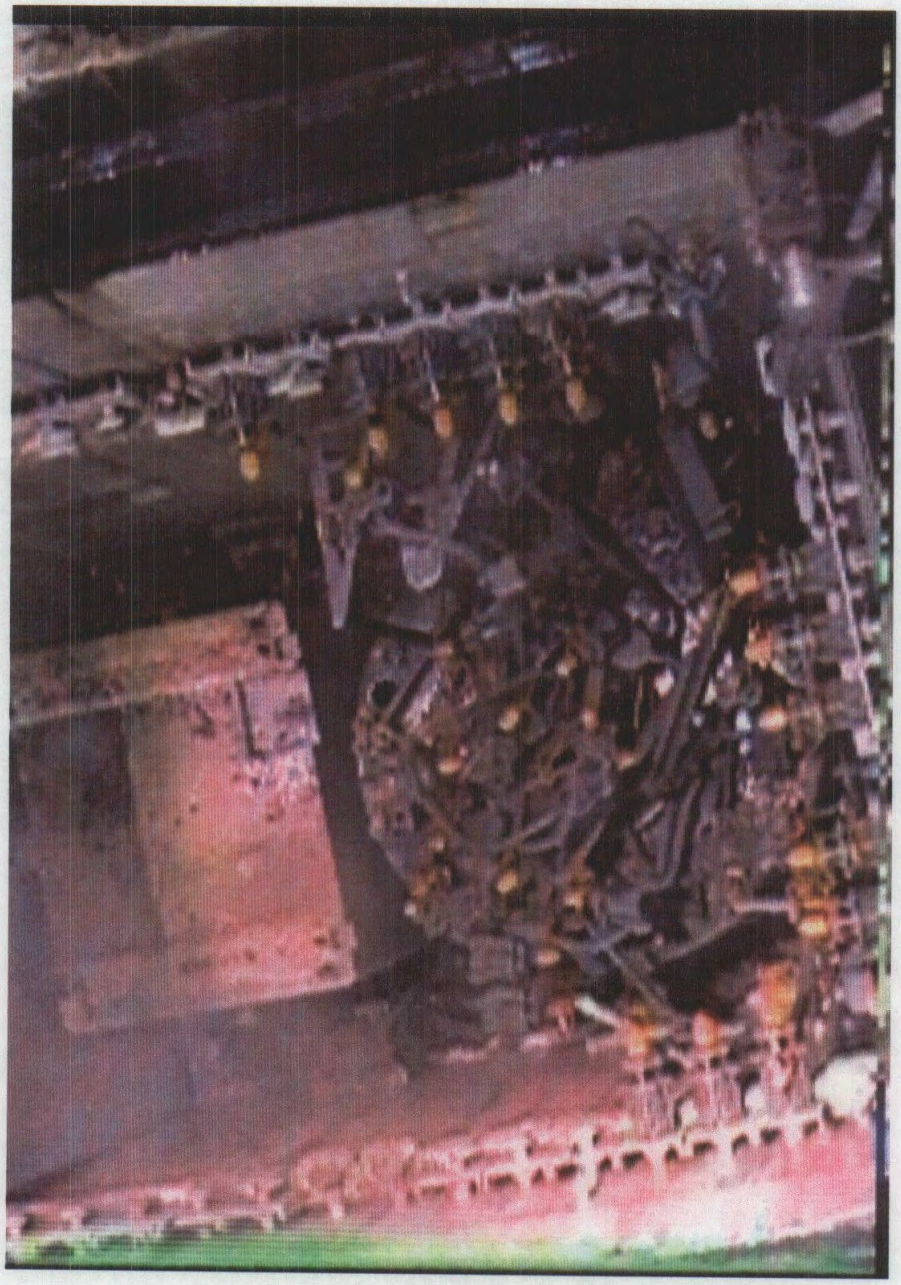
HNF-8812 Rev. 1

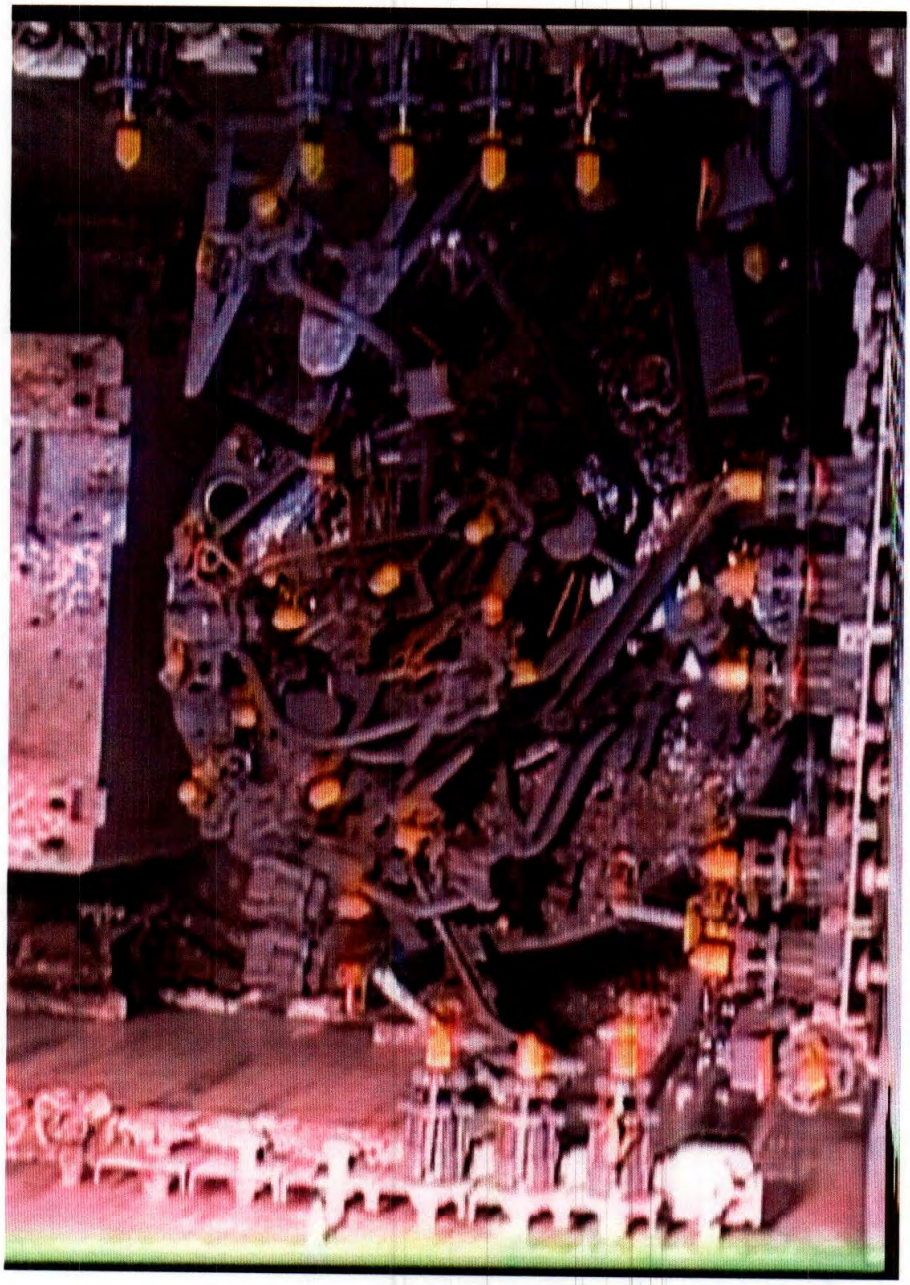


CELL 17R, 1986

Attachment 2

2-71

HNF-3812 Rev. 1

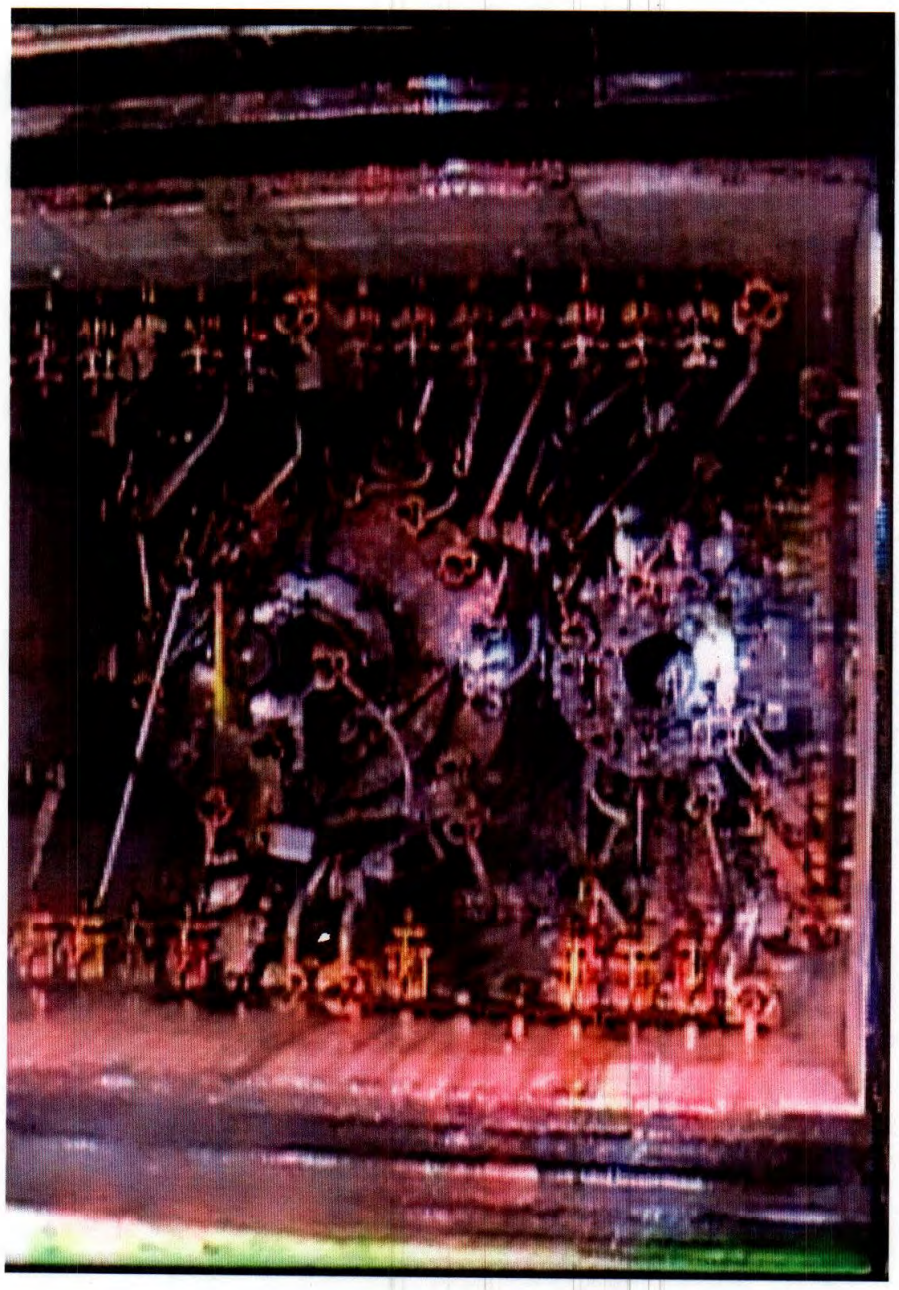


Cell 17R 2001

Attachment 2

2-72

HNF-8812 Rev. 1



Cell 18L 1986

Attachment 2

2-73

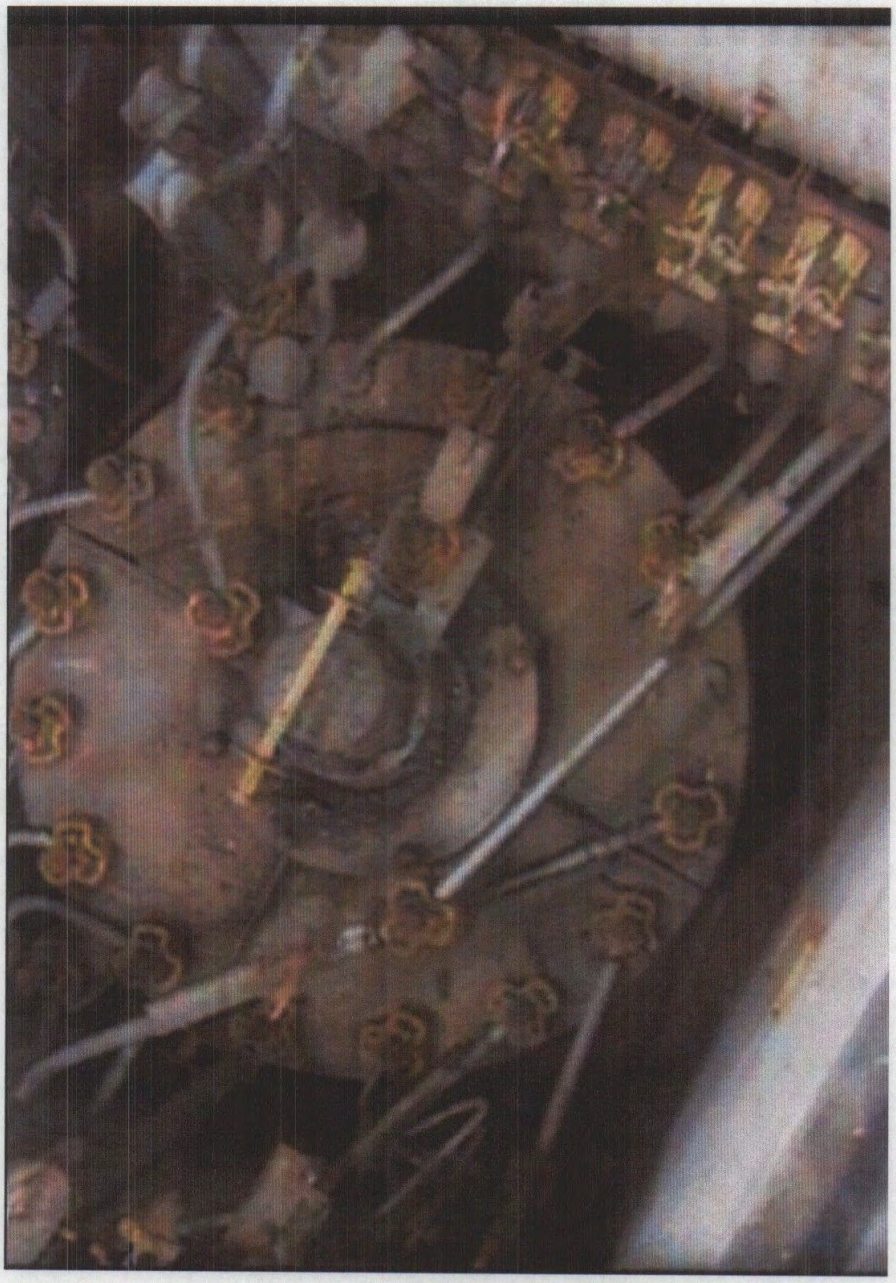
HNF-8812 Rev. 1

Cell 18L 1986

Attachment 2

2-74

HNF-8812 Rev. 1



Cell 18L 2001

Attachment 2

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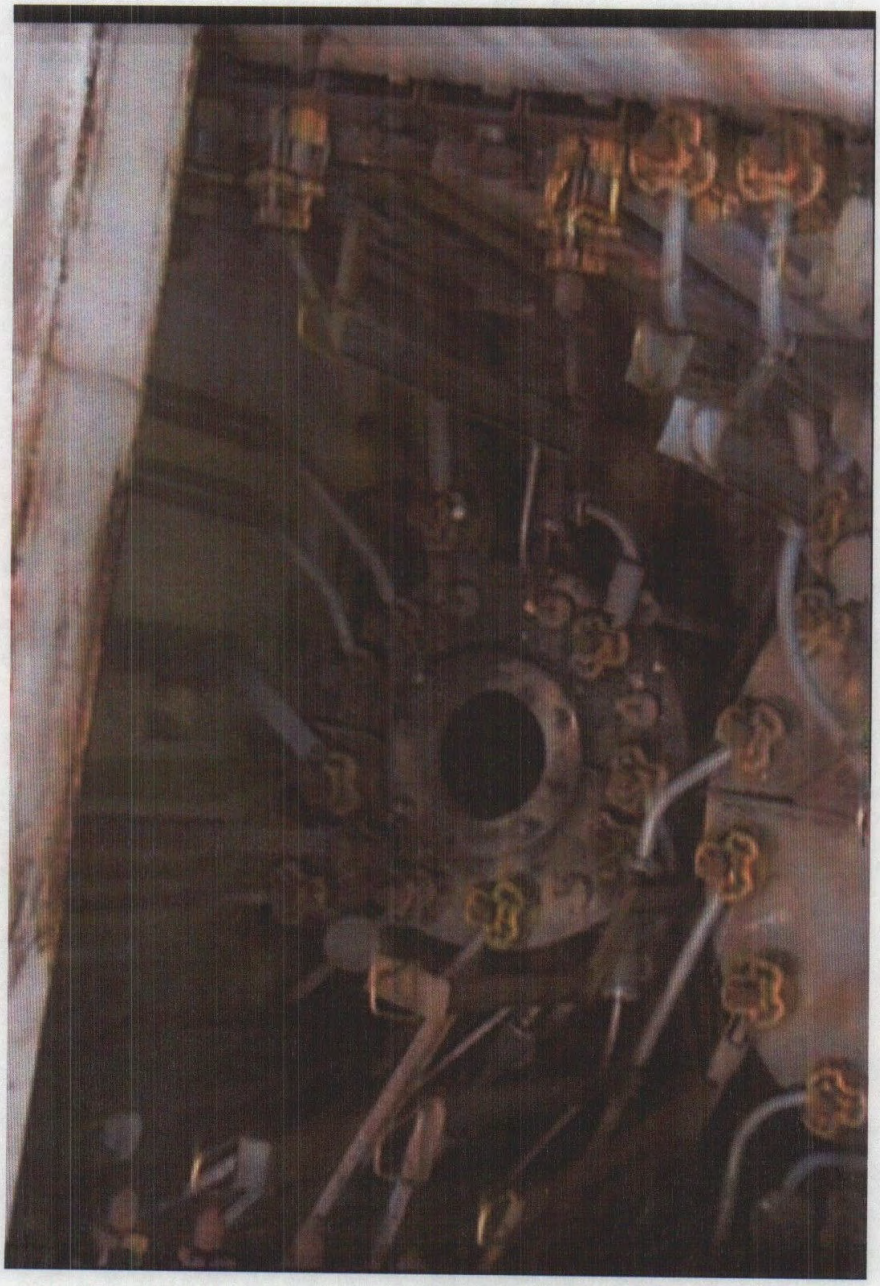
HNF-3812 Rev. 1



Cell 18L 2001

Attachment 2

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HNF-8812 Rev. 1

Cell 18R 1986

Attachment 2

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HNF-8812 Rev. 1

Cell 19L 1986

Attachment 2

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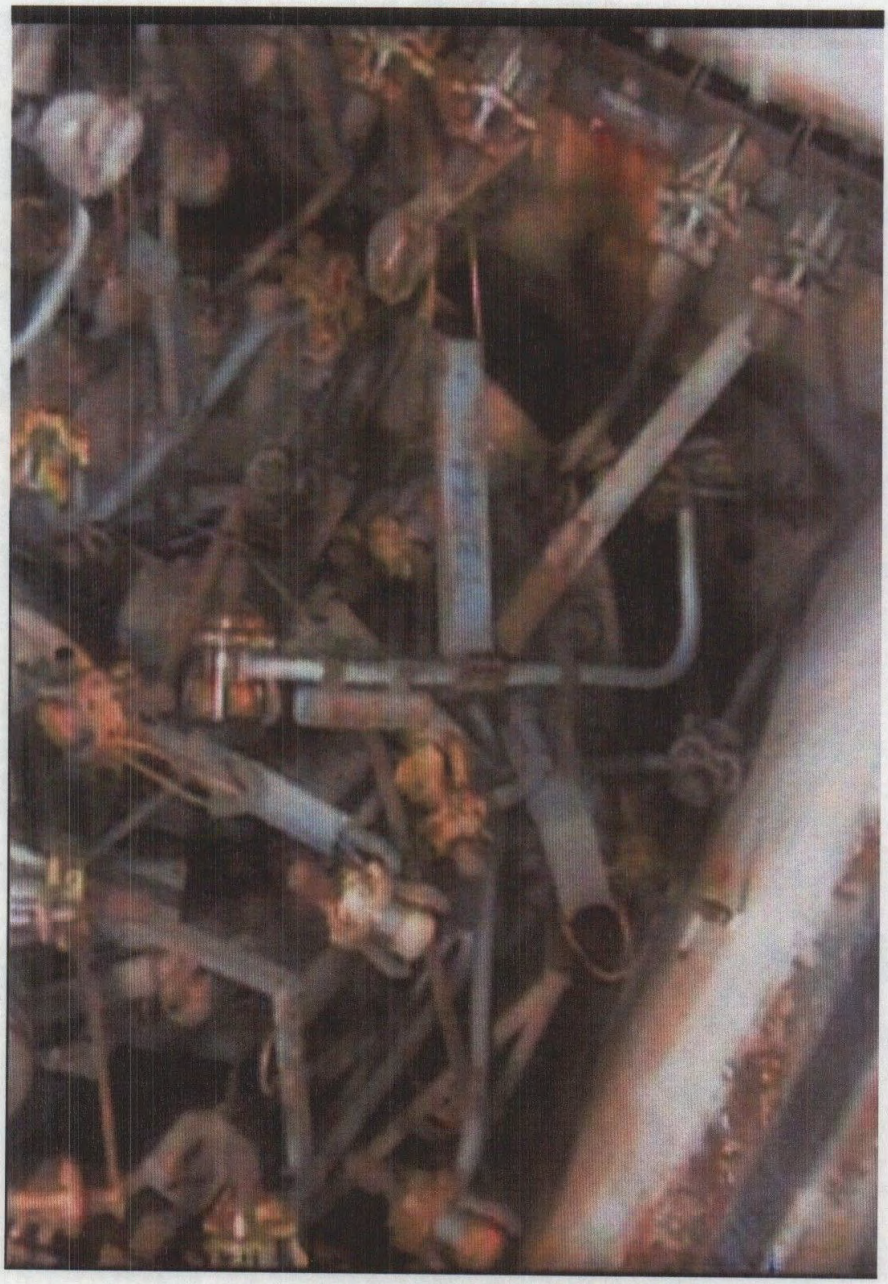
HNF-8812 Rev. 1



Cell 19L 1986

Attachment 2

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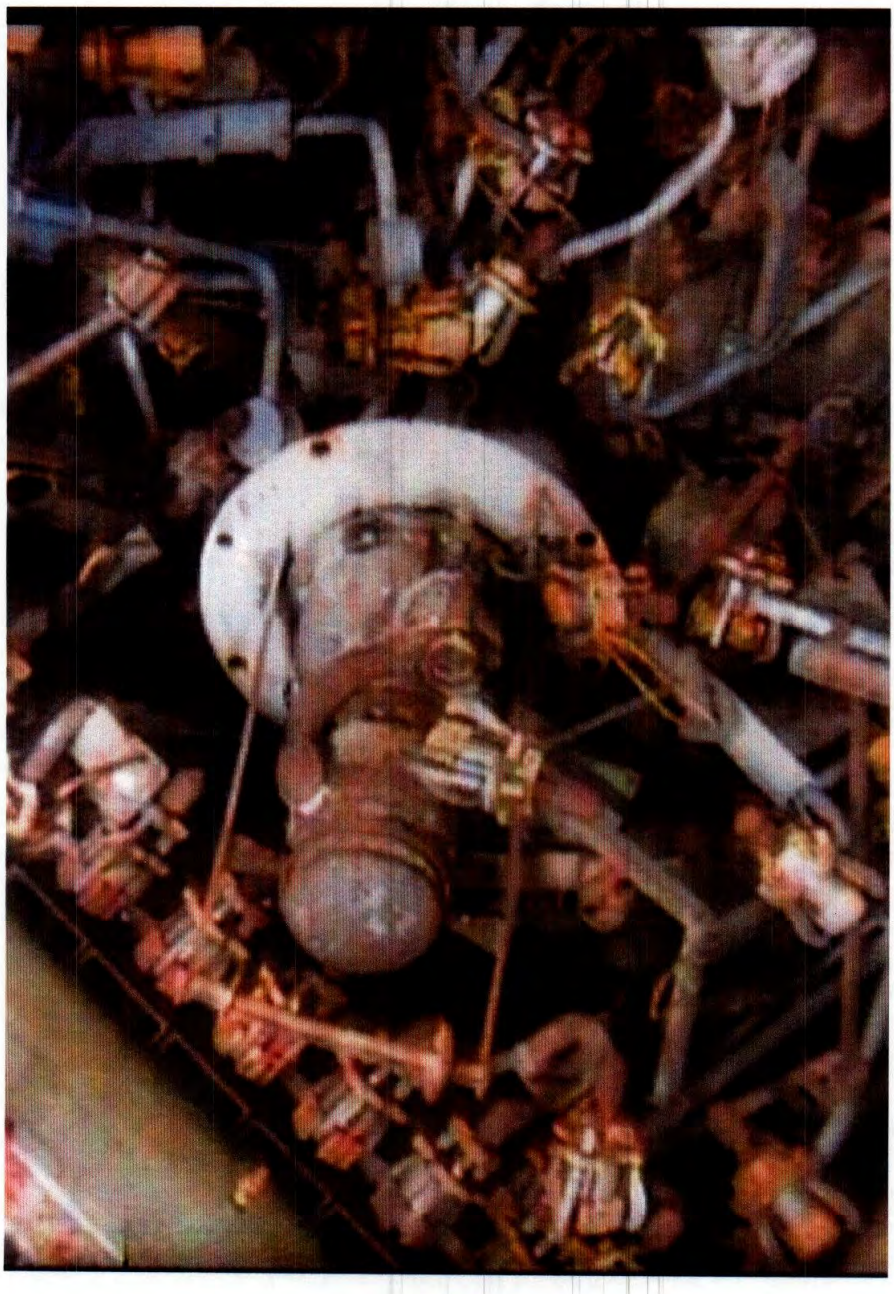
HNF-8812 Rev. 1

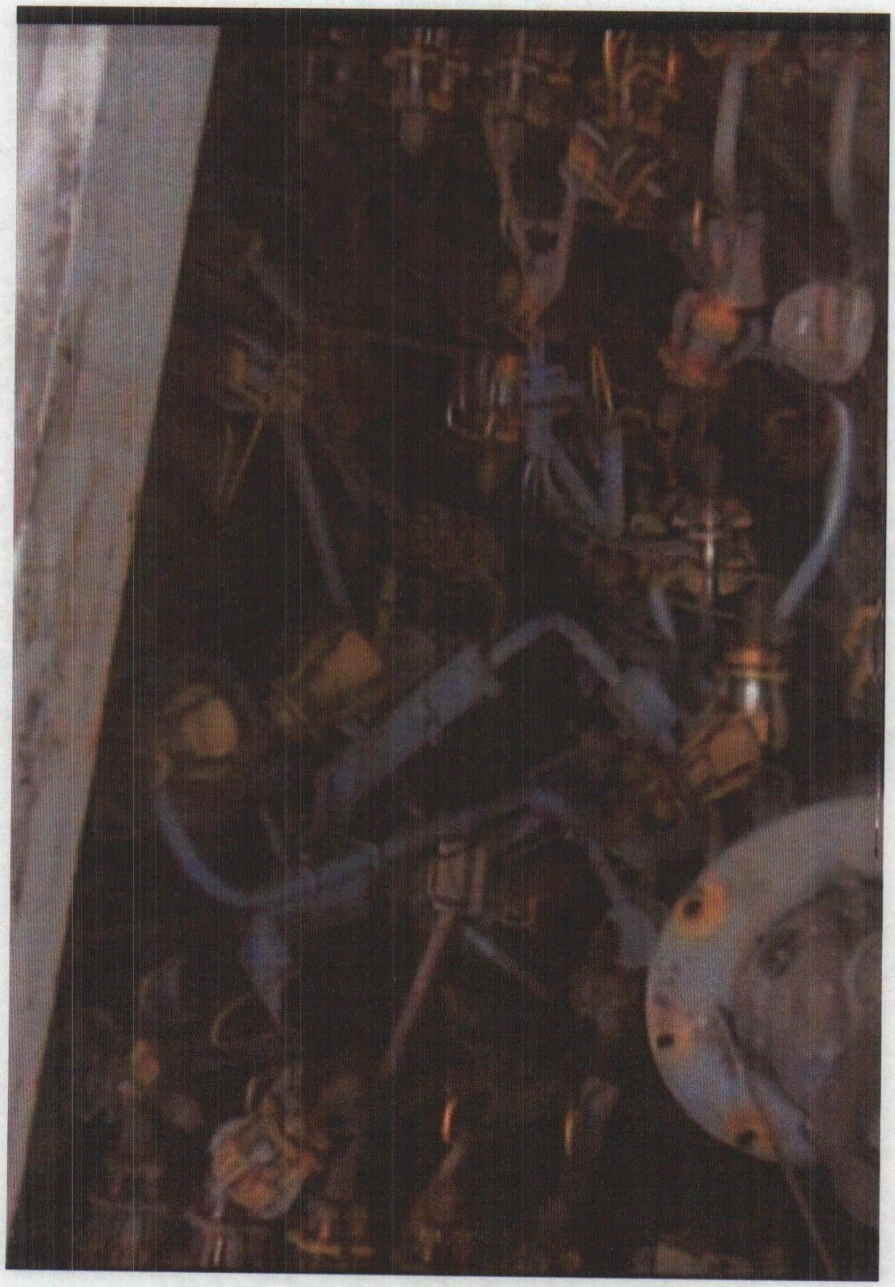


Cell 19L 1986

Attachment 2

2-80

HNF-8812 Rev. 1



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Attachment 2

2-81

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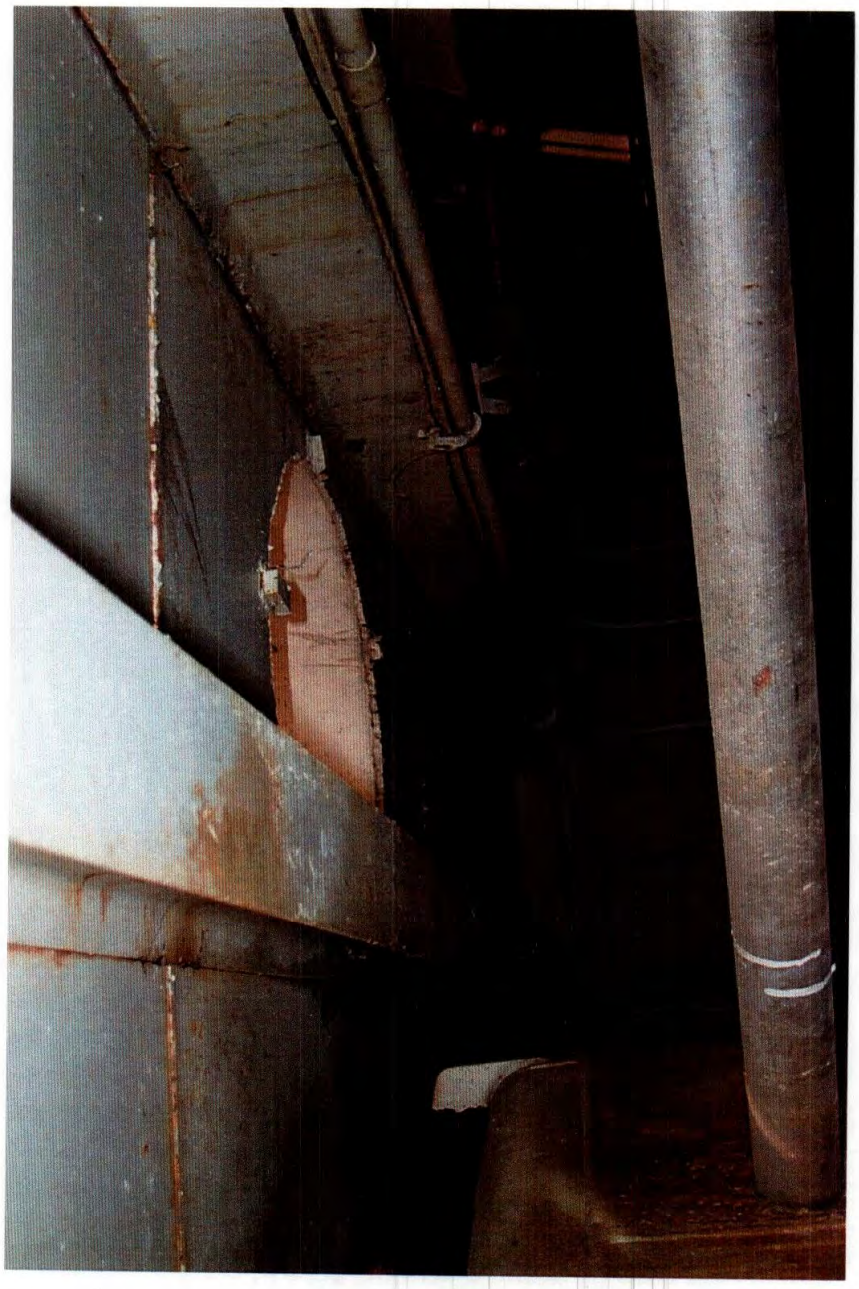

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2-82

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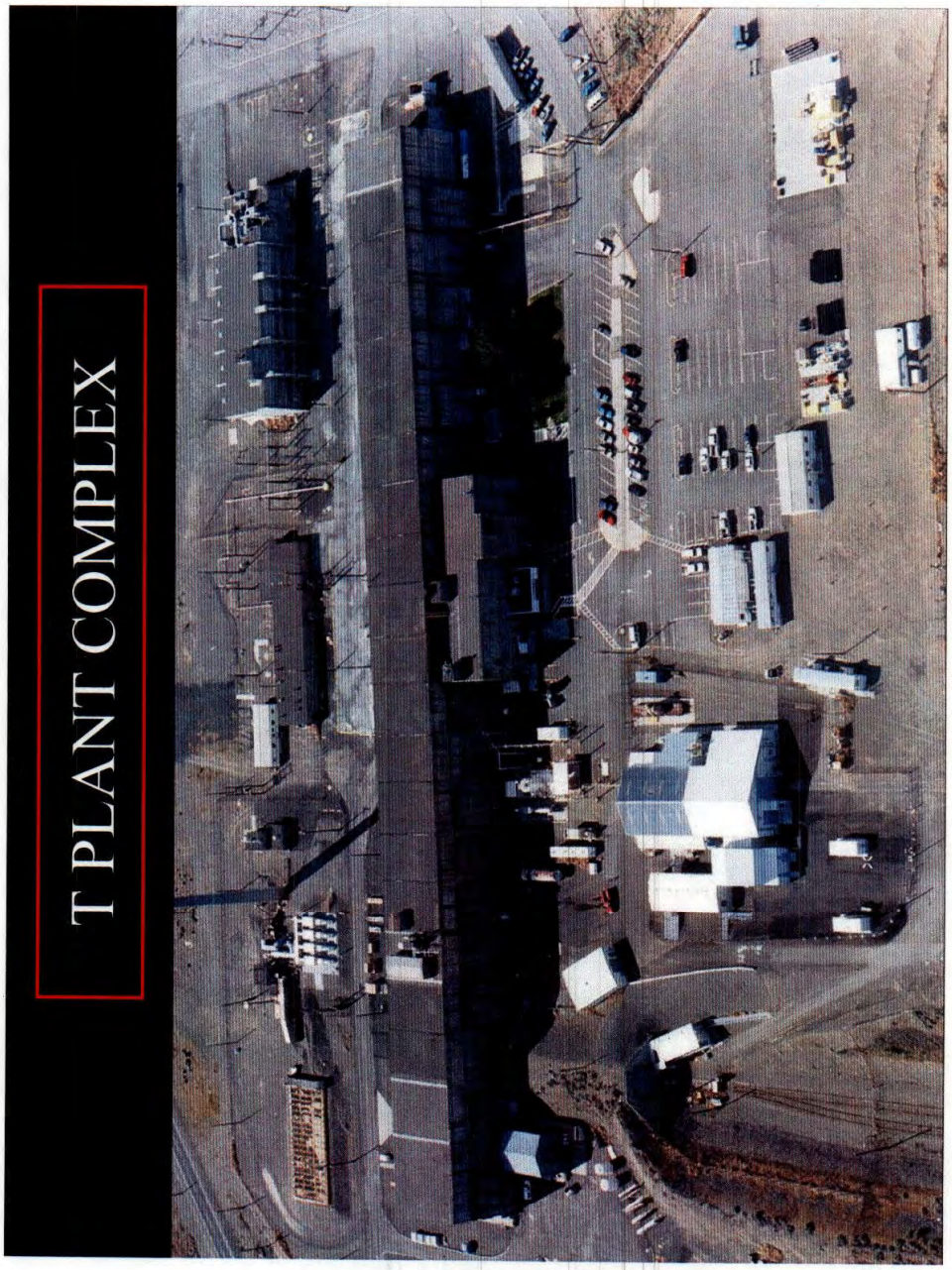

Attachment 2

2-83

Addendum H – SWOC Closure Units

H2 T-Plant Complex

H2.G. Appendix G – 2706-TB Tank System

G1 Introduction

This appendix discusses closure activities for the T-Plant Complex Operating Unit Group (OUG) (T-Plant Complex) 2706-TB Tank System dangerous waste management unit (DWMU), hereinafter referred to as the 2706-TB Tank System. The Permittee has concluded that the 2706-TB Tank System will no longer be utilized for future receipts of dangerous waste and has, therefore, decided to coordinate closure of the DWMU with final closure of the T-Plant Complex OUG. Closure will be performed in accordance with the included schedule.

This closure plan complies with WAC 173-303-640(8), "Dangerous Waste Regulations," "Tank Systems," "Closure and Post-Closure Care," and WAC 173-303-610(2) through WAC 173-303-610(6), "Dangerous Waste Regulations," "Closure and Post-Closure," and represents the baseline for closure. Amendments to this closure plan will be submitted as a permit modification in accordance with WAC 173-303-610(3)(b).

G1.1 Unit Description

The 2706-TB Tank System (Figure A-1) includes the following components:

- Storage tank T-XX-2706-220
- Storage tank T-XX-2706-221
- 2706-TB enclosure building (including built-in sump)
- Piping
- Ancillary equipment

The 2706-TB Tank System enclosure was constructed to enclose the 2706-TB tanks that managed liquid mixed waste generated in the 2706-T and 2706-TA Buildings. The 2706-TB enclosure primary purpose is enclosure of the tank system; therefore, it is included in this closure plan.

The 2706-TB Tank System enclosure is 9.5 m (31 ft) wide, 14 m (46 ft) long, and 9.6 m (31 ft) high. The building is constructed of prefabricated steel and has a concrete foundation and floor. The 2706-TB Tank System enclosure contains the two storage and treatment tanks, provides secondary containment, and includes a chemical addition room located at the north end of the enclosure. The chemical addition room is not included in the closing portion of the 2706-TB Tank System.

The two stainless steel storage tanks were removed from service and will no longer be utilized for waste storage. T-XX-2706-T-220 was removed from service after the tank corroded. As part of removal of the tanks from active service, both tanks have been confirmed to be empty and have had their inlets and outlets blanked to prevent any addition of material to the tanks. The pipe blanking was witnessed by the Washington State Department of Ecology and documented with pictures.

Secondary containment for the 2706-TB Tank System consists of a concrete berm with an external liner made of a high-density epoxy coating that is free of crack and gaps. The 2706-TB Building contains a sump that provides secondary containment for liquid decontamination waste and other compatible and accepted liquid mixed waste. The secondary containment sump is fully functional, and liquids can be removed manually, if needed.

Waste transfer piping is either located over secondary containment structures or double contained using prefabricated pipe-in-pipe systems. The inner sleeve piping provides primary containment, and the outer sleeve provides secondary containment.

All valves and associated non-encased piping located above the storage tanks are inside a foundation with a special protective coating system that serves as the secondary containment.

The 2706-TB Tank System does not currently manage dangerous or mixed waste. Future acceptance of dangerous or mixed waste is not authorized within the 2706-TB Tank System DWMU. The 2706-TB Tank System is located near the 221-T Canyon facility, which is part of the Canyon Disposition Initiative (CDI). In addition, the T-Plant Complex is included in the Tri-Party Agreement (TPA) (*Hanford Federal Facility Agreement and Consent Order* [Ecology et al., 1989a]) Action Plan (*Hanford Federal Facility Agreement and Consent Order Action Plan* [Ecology et al., 1989b]), Section 6, "Treatment, Storage, and Disposal Unit Process," and Section 8, "Facility Disposition Process."

> TPA Action Plan Section 6.1:
> *Some of the TSD groups/units (primarily those located within large processing facilities) will be integrated with the disposition of the facility, and therefore closed in accordance with the process defined in Section 8.0. These units are those that have physical closure actions that need to be done in conjunction with the physical disposition actions in the facility (e.g. removal of structural components).*

The strategy for the entire T-Plant Complex is a coordinated closure for both *Resource Conservation and Recovery Act of 1976* (RCRA) closing units and the CDI activities. The 2706-TB Tank System is in a safe configuration for an extended closure period. Final clean closure verification will occur during CDI activities for the T-Plant Complex.

G1.1.1 Maximum Waste Inventory

No incompatible wastes have been added into the 2706-TB Tank System. The maximum waste inventory of the 2706-TB Tank System is the maximum capacity of the 2706-TB Tank System as identified in Table G-1.

Table G-1. Maximum Waste Inventory of the 221-T Tank System

Tank Number	Maximum Waste Inventory
T-XX-2706-220	56,781 Liters (15,000 Gallons)
T-XX-2706-221	22,712 Liters (6,000 Gallons)
2706-TB Enclosure Sump	60,300 Liters (15,930 Gallons)

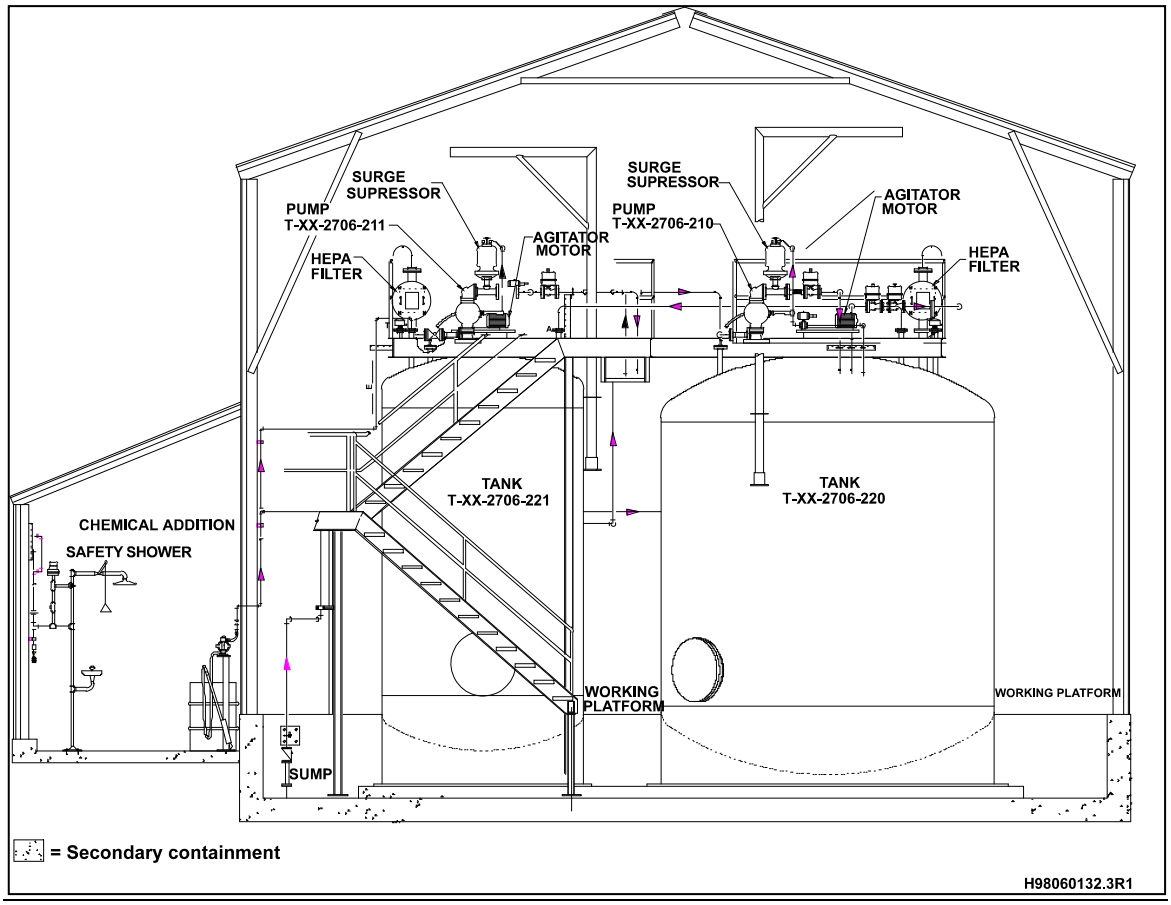

Figure G-1. T-Plant Complex Operating Unit Group 2706-TB Tank System

G2 Closure Performance Standard

Closure performance standards for the 2706-TB Tank System will be based on requirements found in WAC 173-303-640(8) and WAC 173-303-610(2). WAC 173-303-640(8) states:

> *At the closure of a tank system, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment contaminated with waste, and manage them as dangerous waste.*

WAC 173-303-610(2) requires closure of the facility in a manner that:

- Minimizes the need for further maintenance
- Controls, minimizes, or eliminates, to the extent necessary, to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere
- Returns the land to the appearance and use of surrounding land areas, to the degree possible, given the nature of the previous dangerous waste activity.

These performance standards are addressed in Sections G2.1 and G3.11 of this closure plan.

G2.1 Clean Closure Levels

The 2706-TB Tank System will be clean closed to the performance standards identified in WAC 173-303-610 and WAC 173-303-640(8) in coordination with T-Plant CDI activities. The 2706-TB Tank System, including the enclosure, will be removed as part of the T-Plant CDI activities. Removal of the tanks, piping, enclosure, and ancillary equipment will control, minimize, or eliminate the potential release of any dangerous waste constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or atmosphere. Final closure of the 2706-TB Tank System will be achieved in conjunction with T-Plant Complex CDI activities.

G3 Closure Activities

As a waste management unit, a clean closure determination for the 2706-TB Tank System will be based on a review of the operational history and removal of the tanks, piping, ancillary equipment, and enclosure. Based on a review of the operational history, the 2706-TB Tank System is concluded to be in a safe configuration and will be clean closed under RCRA in conjunction with CDI activities. Final removal to demonstrate clean closure will be performed during the T-Plant Complex cleanup activities consistent with the CDI activities.

Due to the extended closure period that will be required to complete closure activities, closure activities have been divided into near-term and extended period activities.

The near-term closure activity required to achieve and verify clean closure is as follows:

- Review operational history (completed; see Section G3.3.).

Extended closure activity includes :

- Removal of the 2706-TB Tank System to confirm RCRA clean closure standards in coordination with CDI activities for the T-Plant Complex OUG.

G3.1 Health and Safety Requirements

Closure will be performed to ensure safety of personnel and the surrounding environment. Qualified personnel will perform any necessary closure activities in compliance with established safety and environmental procedures. Personnel will be equipped with appropriate personal protective equipment. Qualified personnel will be trained in applicable safety and environmental procedures in accordance with the Solid Waste Operations Complex T-Plant, Addendum G, “Personnel Training,” and will have appropriate training and experience in sampling activities. Field operations will be performed in accordance with applicable health and safety requirements.

The Permittees have instituted training or qualification programs to meet training requirements imposed by regulations, DOE orders, and national standards such as those published by the American National Standards Institute/American Society of Mechanical Engineers. For example, the environmental, safety, and health training program provides workers with the knowledge and skills necessary to execute assigned duties safely. Field personnel typically have completed the following training before starting work:

- Occupational Safety and Health Administration 40-Hour Hazardous Waste Worker Training
- 8-Hour Hazardous Waste Worker Refresher Training (as required)
- Hanford General Employee Training

Project-specific safety training addressed explicitly to the project and the day's activity will include training that provides the knowledge and skills needed for sampling personnel to perform work safely and in accordance with quality assurance requirements.

In addition, pre-job briefings will be performed to evaluate activities and associated hazards by considering the following factors:

- Objective of the activities
- Individual tasks to be performed
- Hazards associated with the planned tasks
- Environment in which the job will be performed
- Facility where the job will be performed
- Equipment and material required
- Safety protocols applicable to the job
- Training requirements for individuals assigned to perform the work
- Level of management control
- Proximity of emergency contacts

Training records are maintained for each employee in an electronic training record database. The Permittees training organization maintains the training records system.

G3.2 Removal of Wastes and Waste Residues

The 2706-TB Tank System does not currently contain wastes or waste residues and has been blinded off; therefore, it is no longer able to accept dangerous or mixed waste. The last waste was removed in April 2004. During T-Plant CDI activities, the tanks, piping, enclosure, and ancillary equipment will be removed. A waste determination will be performed, and the 2706-TB Tank System components will be disposed of at an approved treatment, storage, and disposal (TSD) facility, as necessary. The 2706-TB Tank System is in a safe configuration for an extended closure period.

G3.3 Unit Components, Parts, and Ancillary Equipment

The 2706-TB Tank System includes the two tanks, piping, enclosure, and ancillary equipment. The 2706-TB Tank System will not be removed as part of the near-term closure activities and will remain in place pending final disposition under the CDI activities and RCRA corrective actions associated with the T-Plant Complex OUG.

G3.4 Inspection of Units Before Decontamination

Decontamination activities are not planned for the 2706-TB Tank System.

G3.5 Decontamination

Decontamination activities are not planned for the 2706-TB Tank System.

G3.6 Identifying and Managing Contaminated Environmental Media

The 2706-TB Tank System enclosure provides secondary containment for the tanks. Piping and ancillary equipment are located over secondary containment. Contaminated environmental media is not anticipated.

G3.7 Confirming Clean Closure

The 2706-TB Tank System will be clean closed. All dangerous or mixed waste has been previously removed. The tanks, piping, enclosure, and ancillary equipment will be removed, as required, for clean closure determination in accordance with WAC 173-303-640(8)(b). A waste determination will be performed, and the waste will be disposed of in an approved TSD facility. Therefore, post-closure escape of dangerous waste and any associated dangerous waste constituents, leachate, contaminated runoff, and dangerous waste decomposition products to the ground, surface water, groundwater, or air is not anticipated.

During CDI activities for the T-Plant Complex OUG, final clean closure will be confirmed for the 2706-TB Tank System.

G3.8 Sampling and Analysis and Constituents to Be Analyzed

G3.8.1 Sampling and Analysis Plan

Sampling for the 2706-TB Tank System is not anticipated. The 2706-TB Tank System has no documented releases of dangerous waste to the environment and is currently empty. Sampling and analysis of the 2706-TB Tank System, if deemed necessary for waste management and removal of the tank system, will be identified and performed in conjunction with T-Plant CDI activities and as part of the waste determination process.

After removal of the 2706-TB Tank System, if any items of concern in the area are noted, a revised closure plan will be submitted as a permit modification request and a sampling and analysis plan will be proposed.

G3.9 Role of the Independent Qualified Registered Professional Engineer

An independent, qualified, registered, professional engineer will be retained to provide certification of the closure and sign the closure certification as required by WAC 173-303-610(6). The resulting engineering report will be retained in the operating record.

G3.10 Closure Certification

In accordance with WAC 173-303-610(6), certification that the DWMU has been closed in accordance with the specifications in this closure plan will be submitted to Ecology by registered mail within 60 days of completion of 2706-TB Tank System DWMU closure. The certification will be signed by the owner or operator and by an independent, qualified, registered, professional engineer.

G3.11 Conditions that will be Achieved when Closure is Complete

Upon completion of the near-term closure activities, the 2706-TB Tank System will remain in an “as-is” state with the tanks, piping, enclosure, and ancillary equipment remaining in place under the T-Plant CDI activities. The 2706-TB Tank System will undergo final disposition under the CDI activities associated with the T-Plant Complex OUG. A permit modification request will be submitted after clean closure has been confirmed to remove the 2706-TB Tank System DWMU from the sitewide permit active DWMUs.

G4 Closure Schedule and Time Frame

This DWMU is located near the T-Plant Canyon building, a large operating facility that currently serves as both waste treatment and storage at Hanford for multiple waste streams. The TPA Action Plan (Ecology et al., 1989b) identified some TSD groups/units (primarily those located within large processing

facilities) that will be integrated with the disposition of the facility. Those units have physical closure actions that need to be done in conjunction with the physical disposition actions in the facility (e.g., removal of structural components).

Ecology Publication 94-111, *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Section 11.0, "Coordination of Closure and Corrective Action or Other Cleanup Activities"), allows for the use of alternative requirements when coordinating RCRA closure activities with other cleanup activities at a facility. An extended closure period is required for the 2706-TB Tank System to coordinate closure activities with the T-Plant Complex closure. The extended closure activities will occur under the CDI activities associated with T-Plant Complex OUG. T-Plant Complex OUG cleanup actions are included in the Central Plateau Cleanup Actions which are outlined in the annual Hanford Lifecycle Scope, Schedule, and Cost Report required by TPA (Ecology et al., 1989a) Milestone M-036-01.

Approval of this closure plan will grant the Hanford Site an extended closure period for performance of the removal activities, in accordance with WAC 173-303-610(4)(c), and a separate extension request will not be filed (Figure G-2).

G5 Closure Costs

An annual report outlining updated projections of anticipated closure costs for the Hanford Facility TSD units having final status is not required per Permit Condition II.H.

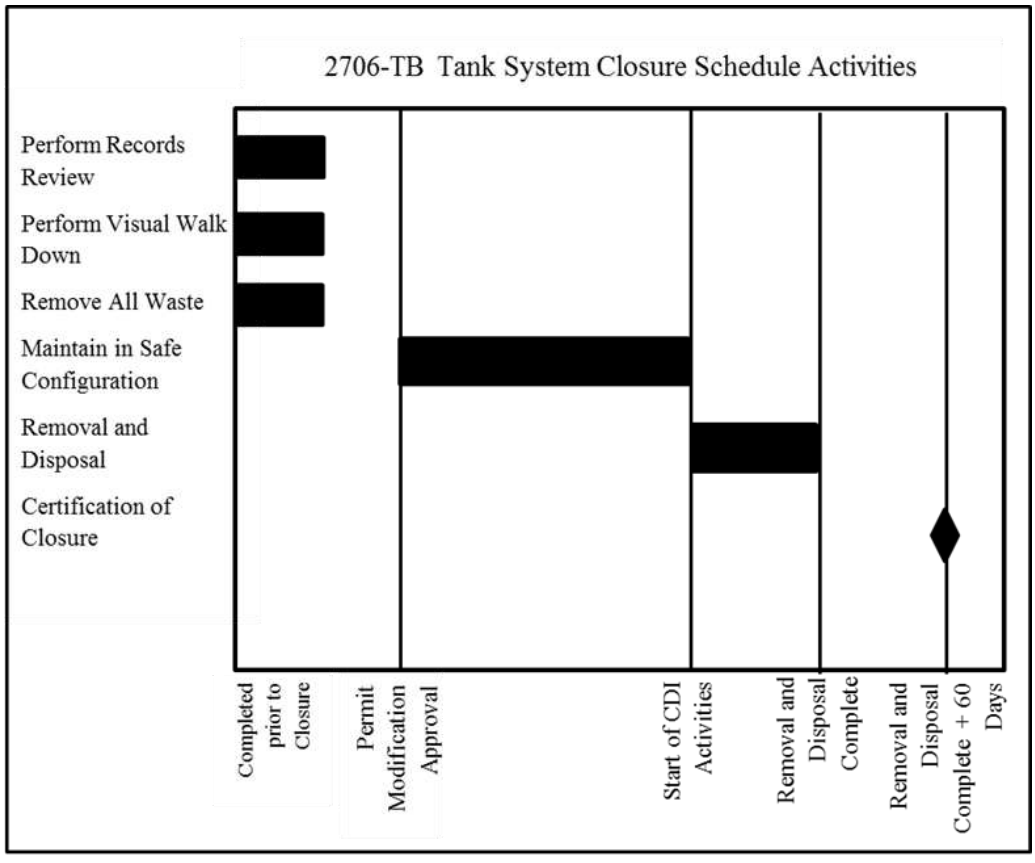

Figure G-2. 2706-TB Tank System Closure Schedule Activities

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Attachment A

T-Plant 2706-TB Tank System
RCRA Records Review and Visual Inspection Supporting Documentation

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T Plant Complex 2706-TB Building Storage Area

Purpose:

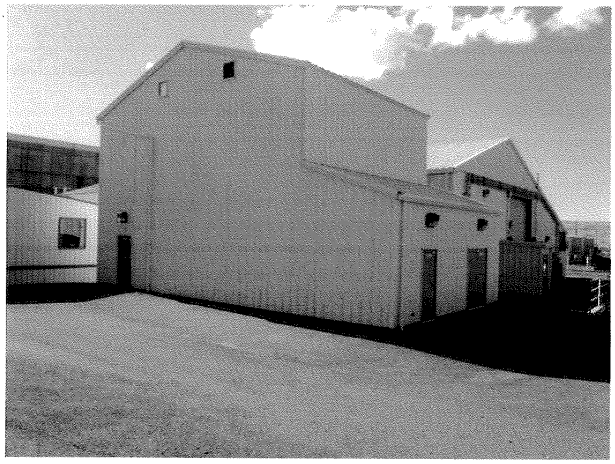
A visual inspection of the T Plant Complex 2706-TB Building Storage Area was performed to determine if there is any evidence of spills and/or leaks from waste packages containing dangerous waste that was stored at this location from past operations. The inspection was to identify and document by photographing any waste related staining of the storage area surface, and to denote any remaining waste related items.

The inspection was performed on September 18, 2013 by David Richards, Manager, T Plant (CHPRC).

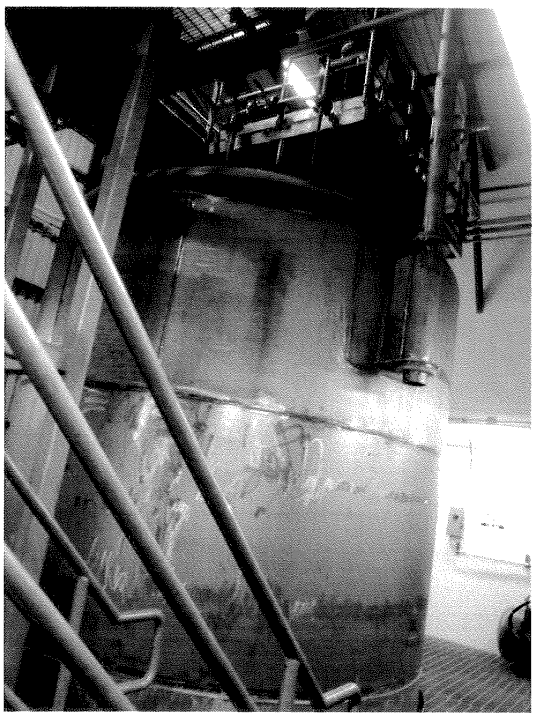
Results:

No waste is being stored in this area. The 2706-TB building tanks have been emptied and deactivated (Tank T-XX-2706-220 and T-XX-2706-221). The 2706-TB Building houses a functioning air compressor which is still required for operation of the Drum Venting Assemblies in 2706-T and 2706-TA. This compressors' Automatic 'Blow Down' drain has cause a visible spot in the 2706-TB sump (see photographs). No other spill evidence was noted.

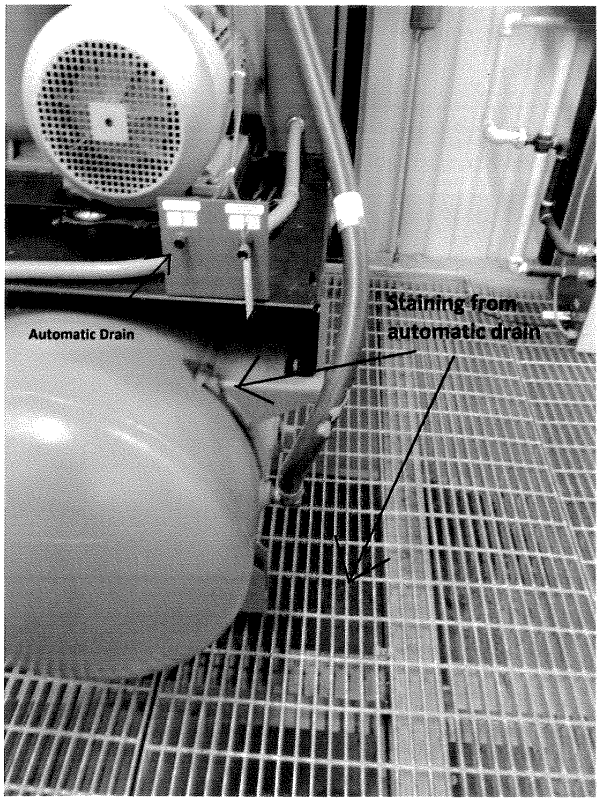
Area was photographed.



T Plant Complex 2706-TB Building Storage Area



T Plant Complex 2706-TB Building Storage Area



T Plant Complex 2706-TB Building Storage Area

Signature/date:

David E. Richards 9-26-13

T-Plant Dangerous Waste Inspection Checklist and Operations Logbook Review

Title of Forms:	See attached table and reviewer comments.
Date of Review:	October 8, 2013
Reviewer's Name:	Sarah Horn
Waste Management Units:	221-T Railroad Cut, 277-T Building, 221-T Pipe Gallery Storage, 221-T Tank System, 2706-TB Tank System (includes 2706-TB Tank System enclosure building)
Time Frame of Review:	January 1985 through June 2013
Items of Concern Noted If "YES", complete entire checklist. If "NO", skip to Reviewer's signature and date.	YES ___ NO _X_
Items of Concerns: Attach copies of Weekly Inspection sheets noting concern.	_____ _____ _____ _____
Dates of Corrective Actions: Attach copies of Weekly Inspection sheets noting concern.	_____ _____ _____ _____
Reviewer's Signature and Date:	Sarah Horn 10/8/2013

Instructions:
Review Weekly Waste Inspection checklists and operations logbooks for any references to unplanned spills, releases or discharges associated with dangerous waste containers. Anomalies that would not affect closure of the unit such as missing labels, open containers, or dented containers, do not need to be documented.

If items of concern are noted, check "YES" and complete the entire checklist. If no items of concern are noted, check "NO" and skip to the signature and date field. Note that if no items of concern are noted for an extended period of time, the "Time Frame of Weekly Inspections" can be January 1, 20xx to December 31, 20xx or even several years if no items of concern are noted.

If unplanned spills, releases or discharges are referenced on the inspection checklist, document the item of concern as "spill", "stain", "ruptured container", etc. Also note the date of the corrective action.

Attach copies of weekly waste inspection checklists noting the items of concern and corrective actions.

Complete all review fields as applicable.

Sign and date form and deliver to Stephanie Johansen.

Reviewer Comments:

The initial records review was completed in August 2013 which included applicable daily and weekly inspection checklists, and operations logbooks for the period of January 1985 through June 2013 and is detailed in Table 1 below. The August 2013 records review focused on the following dangerous waste management areas scheduled for closure:

- 271-T Cage
- 211-T Pad
- 221-T Sand Filter Pad
- 277-T Outdoor Storage Area
- 221-T R5 Waste Storage Area

The current review included the items of concern identified during the initial August 2013 records review but focused on the following areas:

- 221-T Railroad Cut
- 277-T Building
- 221-T Pipe Gallery Storage
- 221-T Tank System
- 2706-TB Tank System (including enclosure building)

No items of concern were noted for the 221-T Railroad Cut, 277-T Building, 221-T Pipe Gallery Storage, 221-T Tank System, or the 2706-TB Tank System. Below is a table that summarizes the original records review completed in August 2013.

Table 1. T-Plant Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
T-Plant Daily Operating Logbook	Logbook	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	01/02/1985	06/22/2010	No
T-Plant Operation Logbook	Logbook	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	07/27/2010	04/07/2011	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	08/29/2005	12/01/2005	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	10/01/2007	04/22/2013	No
Weekly Surveillance Log, <90-day Storage Areas and Satellite Accumulation Areas	Weekly Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	06/07/1991	12/20/1999	No

Table 1. T-Plant Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
Treatment Facility Waste Management Weekly Inspection Log Sheet Treatment Facility Waste Management Area Daily Inspection Log Sheet Treatment Facility Waste Management Area Weekly Inspection Data Sheet Treatment Facility Waste Management Area Daily Inspection Data Sheet Weekly Waste Area Surveillance T-Plant Daily Waste Management Area Inspection Data Sheet	Weekly and Daily Dangerous Waste Inspections	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	01/2000 01/2005	12/2002 12/2007	No
Waste Management Area Daily Inspection Report Weekly Waste Area Surveillance	Weekly and Daily Inspections	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	2003	2004	Yes*
T-Plant Weekly Waste Management Area Inspection Data Sheet	Weekly Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	10/18/2007	06/12/2013	No

* A container of Insulkote was leaking. Product was determined to be non-regulated material.

Addendum H – SWOC Closure Units

H2 T-Plant Complex

H2.H Appendix H - 221-T Railroad Cut

H1 Introduction

This appendix discusses closure activities for the T-Plant Complex Operating Unit Group (OUG) (T-Plant Complex) 221-T Railroad Cut dangerous waste management unit (DWMU). The Permittee has concluded that the 221-T Railroad Cut will no longer be utilized for future receipts of dangerous waste and will coordinate closure of the DWMU with final closure of the T-Plant Complex OUG. Closure will be performed in accordance with the included schedule.

This closure plan complies with WAC 173-303-610(2) through WAC 173-303-610(6), "Dangerous Waste Regulations," "Closure and Post-Closure," and represents the baseline for closure. Amendments to this closure plan will be submitted as a permit modification in accordance with WAC 173-303-610(3)(b).

H1.1 Unit Description

The 221-T Railroad Cut is an uncovered gravel area located on the north end of the T-Plant Canyon Building outside of the 221-T Railroad Tunnel. The 221-T Railroad Cut was used to store mixed waste in a <90-day storage or satellite accumulation area (SAA) while being transferred into or out of the 221-T Railroad Tunnel.

The 221-T Railroad Cut was used for storing containers of various sizes and volumes and a variety of waste streams to ensure adequate capacity and operational flexibility in support of T-Plant activities. The 221-T Railroad Cut is approximately 27 m (90 ft) long by 15 m (50 ft) wide at the fence and 8 m (25 ft) wide at the 221-T Railroad Tunnel end (Figure H-1).

The 221-T Railroad Cut does not currently store mixed waste. Future storage of dangerous, mixed, or *Toxic Substances Control Act of 1976* (TSCA)-polychorinated biphenyl (PCB) waste is not authorized within the 221-T Railroad Cut DWMU. The 221-T Railroad Cut is located near the 221-T Canyon facility, which is part of the Canyon Disposition Initiative (CDI). In addition, the T-Plant Complex is included in the Tri-Party Agreement (TPA) (*Hanford Federal Facility Agreement and Consent Order* [Ecology et al., 1989a) Action Plan (*Hanford Federal Facility Agreement and Consent Order Action Plan* [Ecology et al., 1989b), Section 6, "Treatment Storage and Disposal Unit Process," and Section 8, "Facility Disposition Process."

> TPA Action Plan Section 6.1:
> *Some of the TSD groups/units (primarily those located within large processing facilities) will be integrated with the disposition of the facility, and therefore closed in accordance with the process defined in Section 8.0. These units are those that have physical closure actions that need to be done in conjunction with the physical disposition actions in the facility (e.g. removal of structural components).*

The strategy for the entire T-Plant Complex is a coordinated closure for both *Resource Conservation and Recovery Act of 1976* (RCRA) closing units and CDI activities. The 221-T Railroad Cut is in a safe configuration for an extended closure period. Final clean closure verification sampling will occur during CDI activities for the T-Plant Complex.

H1.1.1 Maximum Waste Inventory

No permitted RCRA waste container storage was identified at the 221-T Railroad Cut during the T-Plant operating records review. Therefore, no maximum waste inventory is presented. Weekly inspection records of the <90-day storage area and SAA identified that the 221-T Railroad Cut stored mixed waste.

Figure H-1. T-Plant Complex Operating Unit Group 221-T Railroad Cut Outdoor Container Storage Area

H2 Closure Performance Standards

Closure performance standards for the 221-T Railroad Cut will be based on requirements found in WAC 173-303-610(2), which requires closure of the facility in a manner that:

- Minimizes the need for further maintenance
- Controls, minimizes, or eliminates, to the extent necessary, to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere; and
- Returns the land to the appearance and use of surrounding land areas, to the degree possible, given the nature of the previous dangerous waste activity

These performance standards are addressed in Sections H2.1 and H3.13 of this closure plan.

H2.1 Clean Closure Levels

The 221-T Railroad Cut will be clean closed using clean closure levels required for soil. However, confirmation sampling of clean closure levels will not be performed until the T-Plant Complex CDI is initiated. In accordance with WAC 173-303-610(2)(b)(i) for soil, clean closure levels will be the numeric cleanup levels calculated using unrestricted use exposure assumptions according to the WAC 173-340, "Model Toxics Control Act—Cleanup" (MTCA) regulations (WAC 173-340-700, "Overview of Cleanup Standards," through -760, "Sediment Cleanup Standards," excluding WAC 173-340-745, "Soil Cleanup Standards for Industrial Properties"). These numeric cleanup levels will be calculated according to the MTCA (WAC 173-340) Method B unrestricted use standards current at the time of closure.

Sampling and analysis will verify clean closure for the 221-T Railroad Cut. Sampling and analysis of the 221-T Railroad Cut will occur in conjunction with CDI activities for the T-Plant Complex OUG. If sampling and analysis activities indicate contamination above the MTCA (WAC 173-340) Method B unrestricted use standards, potential remediation or decontamination would be incorporated with the cleanup activities. Any required changes to this closure plan and the included sampling and analysis plan (SAP) will be submitted as a permit modification in accordance with WAC 173-303-610(3)(b).

H3 Closure Activities

As a container management unit, clean closure determination for the 221-T Railroad Cut is based on a review of the operational history, operating records (including any dangerous and mixed waste releases), waste management records, and visual inspection of the area to verify that waste-related staining is not present. Based on these reviews, the 221-T Railroad Cut is concluded to be in a safe configuration and will be clean closed under RCRA in conjunction with CDI activities. Final verification sampling of clean closure will be performed during T-Plant Complex cleanup activities consistent with the CDI. Sampling of the gravel area will be conducted via a SAP (Section H3.10) to demonstrate that clean closure numeric levels have been achieved.

Due to the extended closure period that will be required to complete closure activities, closure activities have been divided into near-term and extended period activities.

The following near-term closure activities are required to achieve and verify clean closure:

- Remove all mixed waste inventory (completed; see Section H3.2).
- Review waste container storage, operating, and inspection records for periods of mixed waste storage (completed; see Section H3.3).
- Perform a visual inspection of the gravel surface (completed; see Section H3.3).
- Add 221-T Railroad Cut to the Waste Information Data System (WIDS) Database (see Section H3.8).

Extended closure activities includes:

- Sampling and analysis to confirm RCRA clean closure standards in coordination with CDI activities for the T-Plant Complex OUG.

H3.1 Health and Safety Requirements

Closure will be performed to ensure safety of personnel and the surrounding environment. Qualified personnel will perform any necessary closure activities in compliance with established safety and environmental procedures. Personnel will be equipped with appropriate personal protective equipment.

Qualified personnel will be trained in applicable safety and environmental procedures in accordance with the Solid Waste Operations Complex (SWOC) T-Plant, Addendum G, "Personnel Training," and have appropriate training and experience in sampling activities. Field operations will be performed in accordance with applicable health and safety requirements.

The Permittees have instituted training or qualification programs to meet training requirements imposed by regulations, U.S. Department of Energy (DOE) orders, and national standards such as those published by the American National Standards Institute/American Society of Mechanical Engineers. For example, the environmental, safety, and health training program provides workers with the knowledge and skills necessary to execute assigned duties safely. Field personnel typically have completed the following training before starting work:

- Occupational Safety and Health Administration 40-Hour Hazardous Waste Worker Training
- 8-Hour Hazardous Waste Worker Refresher Training (as required)
- Hanford General Employee Training

The following project-specific safety training, addressed explicitly to the project and the day's activity, will be provided:

- Training will provide the knowledge and skills that sampling personnel need to perform work safely and in accordance with quality assurance requirements.
- Samplers are required to be qualified in the type of sampling being performed in the field.

In addition, pre-job briefings will be performed to evaluate activities and associated hazards by considering the following factors:

- Objective of the activities
- Individual tasks to be performed
- Hazards associated with the planned tasks
- Environment in which the job will be performed
- Facility where the job will be performed
- Equipment and material required
- Safety protocols applicable to the job
- Training requirements for individuals assigned to perform the work
- Level of management control
- Proximity of emergency contacts

Training records are maintained for each employee in an electronic training record database. The Permittees training organization maintains the training records system.

H3.2 Removal of Wastes and Waste Residues

The 221-T Railroad Cut does not currently store mixed waste. Waste management records indicate that mixed waste was previously stored in the 221-T Railroad Cut under <90-day and SAA storage. The 221-T Railroad Cut will no longer be used for dangerous, mixed, or TSCA-PCB waste storage. The 221-T Railroad Cut is in a safe configuration and will be tracked in WIDS until verification sampling is performed under the SAP.

H3.3 221-T Railroad Cut Records Review and Visual Inspection

To support development of this closure plan and the SAP, T-Plant Complex OUG operating records were reviewed (Table H-1). The records review included the following RCRA operating record documents: facility operating logbooks (including spill reports) and weekly inspections. The RCRA operating record documents that were reviewed focused on the period during which active mixed waste storage for the T-Plant Complex OUG SWOC Outdoor Container Storage Areas was addressed under the T-Plant Complex OUG SWOC Outdoor Container Storage Areas closure plans. The records review included the time period from October 1985 through July 2010. The records review indicated that no releases of mixed waste occurred in the 221-T Railroad Cut area.

A visual inspection was performed on September 18, 2013 to identify any dangerous waste-related staining in the 221-T Railroad Cut. No waste-related staining was identified during the visual inspection; therefore, only confirmation sampling and analysis to verify clean closure will be performed.

Supporting documentation for the RCRA operating records review and visual inspection is included in Attachment A.

H3.4 Unit Components, Parts, and Ancillary Equipment

The 221-T Railroad Cut gravel area will not be removed as part of the near-term closure activities. The 221-T Railroad Cut gravel area will remain in place pending final disposition under the CDI activities and RCRA corrective actions associated with the T-Plant Complex OUG.

H3.5 Inspection of Units Before Decontamination

Decontamination activities are not planned for the 221-T Railroad Cut.

H3.6 Decontamination

Decontamination activities are not planned for the 221-T Railroad Cut.

H3.7 Identifying and Managing Contaminated Environmental Media

Should contaminated media be identified as a result of confirmation sampling, contaminated materials will be addressed under the CDI activities and managed, as appropriate. As necessary, treatment or disposal of the resulting waste will be performed at an approved treatment, storage, and disposal (TSD) facility.

H3.8 Addition of 221-T Railroad Cut to the WIDS Database

As part of the near-term closure activities, the 221-T Railroad Cut will be added to the WIDS database. Addition of the 221-T Railroad Cut to the WIDS database will help ensure that the 221-T Railroad Cut is monitored and controlled until the extended closure activities and verification sampling are completed.

Addition of the 221-T Railroad Cut to the WIDS database will ensure that no unauthorized activity takes place at the 221-T Railroad Cut (i.e., waste storage and excavation).

Table H-1. Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
T-Plant Daily Operating Logbook	Logbook	221-T Railroad Cut	01/02/1985	06/22/2010	No
T-Plant Operation Logbook	Logbook	221-T Railroad Cut	07/27/2010	04/07/2011	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	221-T Railroad Cut	08/29/2005	12/01/2005	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	221-T Railroad Cut	10/01/2007	04/22/2013	No
Weekly Surveillance Log, <90-day Storage Areas and Satellite Accumulation Areas	Weekly Inspection	221-T Railroad Cut	06/07/1991	12/20/1999	No
Treatment Facility Waste Management Weekly Inspection Log Sheet Treatment Facility Waste Management Area Daily Inspection Log Sheet Treatment Facility Waste Management Area Weekly Inspection Data Sheet Treatment Facility Waste Management Area Daily Inspection Data Sheet Weekly Waste Area Surveillance T-Plant Daily Waste Management Area Inspection Data Sheet	Weekly and Daily Dangerous Waste Inspections	221-T Railroad Cut	01/2000 01/2005	12/2002 12/2007	No
Waste Management Area Daily Inspection Report Weekly Waste Area Surveillance	Weekly and Daily Inspections	221-T Railroad Cut	2003	2004	Yes*
T-Plant Weekly Waste Management Area Inspection Data Sheet	Weekly Inspection	221-T Railroad Cut	10/18/2007	06/12/2013	No

* A container of Insulkote was leaking. Product was determined to be non-regulated material.

H3.9 Confirming Clean Closure

The 221-T Railroad Cut will be clean closed. Applicable RCRA operating record documents were reviewed to determine the release history of the area. In addition to the records review, a visual inspection of the 221-T Railroad Cut was performed to identify any dangerous waste-related staining of the storage area pad. Both the records review and visual inspection are detailed in Section H3.3 and documented in Attachment A.

All mixed waste has been previously removed, and there have been no documented spills or releases of mixed waste. Therefore, post-closure escape of dangerous waste and any associated dangerous waste constituents, leachate, contaminated runoff, and dangerous waste decomposition products to the ground, surface water, groundwater, or air is not anticipated.

During CDI activities for the T-Plant Complex OUG, final clean closure will be confirmed for the 221-T Railroad Cut. Sampling and analysis of the 221-T Railroad Cut gravel and soil will occur to confirm that cleanup standards for soil have been achieved.

H3.10 Sampling and Analysis and Constituents to Be Analyzed

H3.10.1 Sampling and Analysis Plan

Final clean closure verification sampling for the 221-T Railroad Cut will occur in conjunction with the T-Plant CDI cleanup activities. All sampling and analysis will be performed in accordance with the sampling and quality standards established in the closure SAP and in conjunction with CDI activities for the T-Plant Complex OUG. Sampling and analysis of the gravel and soil of the 221-T Railroad Cut will be conducted to confirm that clean closure levels have been achieved. The closure SAP details sampling and analysis procedures in accordance with SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*; the American Society for Testing and Materials (ASTM) *Annual Book of ASTM Standards*; and applicable U.S. Environmental Protection Agency (EPA) guidance. Sampling and analysis activities will meet applicable requirements of SW-846, ASTM standards, EPA-approved methods, and DOE/RL-96-68, *Hanford Analytical Services Quality Assurance Requirements Documents (HASQARD)*.

H3.10.2 Target Analytes

Waste management records indicated that mixed waste has been stored in the 221-T Railroad Cut under <90-day or SAA storage. Based on the physical proximity of other T-Plant SWOC Outdoor Container Storage Areas that have stored dangerous waste under permitted storage, and assuming similar use during support of T-Plant Canyon operations, the target analytes for evaluation during closure sampling and analysis were determined by reviewing the waste management records of the other dangerous, mixed, or TSCA-PCB waste stored in the T-Plant SWOC Outdoor Container Storage Areas. Table H-2 provides the target analyte list.

H3.10.3 221-T Railroad Cut SAP Schedule

Confirmation closure sampling and analysis will be performed during extended closure activities in conjunction with T-Plant Complex OUG cleanup under the CDI activities.

H3.10.4 221-T Railroad Cut Project Management

The Permittees are responsible for planning, coordinating, sampling, preparing, packaging, and shipping samples to the laboratory.

Table H-2. Target Analyte List

Target Analyte	CAS Number	Target Analyte	CAS Number
Arsenic (D004)	7440-38-2	Ethyl benzene (F003)	100-41-4
Barium (D005)	7440-39-3	Ethyl ether (F003)	60-29-7
Cadmium (D006)	7440-43-9	Methanol (F003)	67-56-1
Chromium (Hexavalent) (D007)	18540-29-9	Methyl isobutyl ketone (F003)	108-10-1
Lead (D008)	7439-92-1	Xylene (F003)	1330-20-7
Mercury (D009)	7439-97-6	o-Cresol (F004)	95-48-7
Selenium (D010)	7782-49-2	Benzene, nitro (F004)	98-95-3
Silver (D011)	7440-22-4	Pyridine (F005)	110-86-1
Benzene (D018) (F005)	71-43-1	2-nitropropane (F005)	79-46-9
Carbon tetrachloride (D019) (F001) (F002)	56-23-5	Carbon disulfide (F005) (P022)	75-15-0
Chloroform (D022)	67-66-3	Isobutanol (F005)	78-83-1
2,4-Dinitrotoluene (D030)	121-14-2	2-ethoxyethanol (F005) (U359)	110-80-5
Hexachoroethane (D034)	67-72-1	Toluene (F005)	108-88-3
Methyl ethyl ketone (MEK) (D035)(F005)	78-93-3	Acetaldehyde (I) (U001)[a]	75-07-0
Pentachlorophenol (D037)	87-86-5	Acetyl chloride (C,R,T)(U006)[b]	75-36-5
Tetrachloroethylene (D039) (F001) (F002)	127-18-4	Dichloroethyl ether (U025)	111-44-4
Trichloroethylene (D040)(F001)(F002)	79-01-6	1-Butanol (I) (U031)	71-36-3
Vinyl chloride (D043)	75-01-4	1,4-Diethyleneoxide (U108)	123-91-1
1,1,1-Trichloroethane (F001) (F002) (U226)	71-55-6	Ethane, 1,1′-oxybis-(I) (U117)	60-29-7
Chlorinated fluorocarbons (F001) (F002)	N/A	Formic acid (C,T) (U123)	64-18-6
Methylene chloride (F001) (F002)	75-09-2	2-Butanone, peroxide (R,T) (U160)[b]	1338-23-4
Chlorobenzene (F002)	108-90-7	Phosphorus pentasulfide (R)(U189)[b]	1314-80-3
1,1,2-trichloro-1,2,2-trifluoroethane (F002)	73-13-1	Furan, tetrahydro-(I) (U213)[b]	109-99-9
Ortho-dichlorobenzene (F002)	95-50-1	Cyanides (soluble cyanide salts), not otherwise specified (P030)	57-12-5
1,1,2-trichloroethane (F002)	79-00-5	Acetaldehyde, chloro- (P023)[b]	107-20-0
Acetone (F003)	67-64-1	Copper cyanide (P029) (as cyanide)	544-92-3
N-butyl alcohol (F003)	71-36-3	Potassium cyanide (as cyanide) (P098)	151-50-8

Table H-2. Target Analyte List

Target Analyte	CAS Number	Target Analyte	CAS Number
Cyclohexanone (F003)	108-94-1	Sodium cyanide (as cyanide) (P106)	143-33-9
Ethyl acetate (F003)	141-78-6	Vanadium oxide V2O5 (P120)	1314-62-1
		Polychlorinated biphenyls (PCBs) (Aroclors)	1336-36-3

a. Acetaldehyde is analyzed as a gas, not as a solid. Acetaldehyde will not be analyzed.

b. There are no previous records of analysis for this on the Hanford Site. The CAS number is not listed in the U.S. Environmental Protection Agency "Cleanup Levels and Risk Calculations" (Ecology, 2009) tables.

CAS = Chemical Abstracts Service

H3.10.5 Sampling Design

Gravel and soil samples will be taken at predetermined sample locations. Sample locations will be determined using an area-wide grid sampling method run in the Visual Sample Plan (VSP) software. The 221-T Railroad Cut global positioning system (GPS) latitude and longitude coordinates were entered into VSP to determine the locations and number of samples required to achieve a 95 percent confidence interval. Using a rectangular grid method, VSP determined that 20 samples are required to achieve a 95 percent confidence interval. The 20 samples will be taken from the node locations indicated by VSP and will be assigned sample location identifications and sample numbers using the Hanford Environmental Information System (HEIS). The first node location was chosen at random by VSP, and the subsequent 19 sample locations were assigned by VSP using a triangular grid sampling method. Supporting documentation for VSP sampling designations is included in Attachment B. Grid sampling is further defined in the following paragraph. Facility records confirmed that no documented dangerous, mixed, or TSCA-PCB waste has been released to 221-T Railroad Cut, and no waste-related staining is present; therefore, judgmental sampling will not be performed.

Grid Sampling. In grid sampling, samples are collected at regularly spaced intervals over space or time. An initial location or time is chosen at random, and the remaining sampling locations are defined so that locations are at regular intervals over an area (grid). Grid sampling is used to search for hot spots and to infer means, percentiles, or other parameters. It is useful for estimating spatial patterns or trends over time. This design provides a practical method for designating sample locations and ensures uniform coverage of a site, unit, or process.

H3.10.6 Sampling Methods and Handling

The sample matrix will consist of gravel and soil collected in pre-cleaned sample containers taken at a depth of no more than 0 to 15.24 cm (0 to 6 in.) below ground surface, unless staining or discoloration indicates contamination below that depth. For the purpose of this SAP, ground surface is defined as the exposed surface layer once loose gravel has been moved aside. To gather the greatest representative sample, loose gravel will be moved aside to expose the surface soil and compacted gravel. Once the compacted gravel and soil are sampled, the sampled media will be screened to remove material larger than approximately 2 mm (0.08 in.) in diameter. Gravel and soil samples will be collected directly into containers at the chosen sample locations. To ensure sample and data usability, sampling will be performed in accordance with established sampling practices, procedures, and requirements pertaining to sample collection, collection equipment, and sample handling.

Sample container, preservation, and holding time requirements are specified in Table H-3 for soil samples. These requirements are in accordance with the analytical method specified. The final container type and volumes will be identified on the sampling authorization form and chain-of-custody form.

Table H-3. Sample Preservation, Container, and Holding Time for Soil Samples

Method	Analysis/Analytes	Preservation Requirement	Holding Time	Bottle Type	Minimum Sample Size
EPA 6010	Metals	Cool ~4°C	6 months	G/P	20 g
EPA 7471	Mercury by Cold Vapor Atomic Absorption	None	28 days	G/P	15 g
EPA 8082	Polychlorinated biphenyl (PCB)	None	1 year	aG	250 g
EPA 8260	Volatile Organic Analytes	Cool ~4°C	14 days	G	5 × 40 g
EPA 8270	Semivolatile Organic Compound	Cool ~4°C	14/40 days	aG	250 g
EPA 300.0	Anions	Cool ~4°C	48 hours/28 days	G/P	120 g
EPA 9012	Cyanide	None	14 days	G/P	120 g
EPA 9056A	Anions	None	48 hours/28 days	G/P	250 g
EPA 9010/9012/ 9013/9014	Cyanide	None	14 days	G/P	15 g
EPA 200.8	Metals by ICP-MS	None	6 months	G/P	10 g

Notes:
For EPA Method 300.0, see EPA-600/4-79-020, *Methods for Chemical Analysis of Water and Wastes.*
For the four-digit EPA methods, see SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B.*
48 hours/28 days = 48 hours for nitrate, nitrite, and phosphate; others, 28 days
aG = amber glass
G = glass
EPA = U.S. Environmental Protection Agency
ICP-MS = inductively coupled plasma-mass spectrometry
P = plastic

To prevent potential sample contamination, care will be taken to use decontaminated equipment for each sampling activity.

Level I EPA pre-cleaned sample containers will be used for samples collected for chemical analysis. Container sizes may vary, depending on laboratory-specific volumes/requirements for meeting analytical detection limits.

The sample location, depth, and corresponding HEIS numbers will be documented in the sampler's field logbook. A custody seal (e.g., evidence tape) will be affixed to each sample container and/or the sample collection package in such a way as to indicate potential tampering.

Each sample container will be labeled with the following information on firmly affixed, water resistant labels:

- Sampling authorization form and form number
- HEIS number
- Sample collection date and time

- Sampler identification
- Analysis required
- Preservation method (if applicable)

Sample records must include the following additional information:

- Sample location
- Matrix (e.g., water or soil)

Sample custody will be maintained in accordance with existing Hanford Site protocols to ensure maintenance of sample integrity throughout the analytical process. Chain-of-custody protocols will be followed throughout sample collection, transfer, analysis, and disposal to ensure that sample integrity is maintained.

All waste generated by sampling activities will be managed in accordance with applicable regulations.

H3.10.7 Analytical Methods

All analyses and testing will be performed consistent with laboratory agreements, laboratory analytical procedures, and HASQARD (DOE/RL-96-68). The approved laboratory must achieve the lowest practical quantitation limits (PQLs) consistent with the selected analytical method to confirm clean closure levels. If a target analyte is detected at or above the clean closure level but less than the PQL of the analytical method, the Washington State Department of Ecology will be notified and alternatives will be discussed to demonstrate clean closure levels.

Table H-4 outlines analytical methods and performance requirements associated with the target analytes.

H3.10.8 Quality Control

Quality control (QC) procedures must be followed in the field and laboratory to ensure that reliable data are obtained. Field QC samples will be collected to evaluate the potential for cross-contamination and provide information pertinent to field sampling variability. Field QC sampling will include the collection of full trip blank, field transfer blank, equipment rinsate blank, field duplicate, and field split samples. Laboratory QC samples estimate the precision and bias of the analytical data. Field and laboratory QC samples are summarized in Table H-5.

H3.10.9 Data Validation and Usability

Analytical results will be received from the laboratory, loaded into a database (e.g., HEIS), and verified. A data quality assessment (DQA) may be performed, if requested, on the final data. At the direction of the Project Manager (or designee), analytical data packages will be subject to final technical review by qualified personnel before submittal to the regulatory agencies or inclusion in reports.

Field paperwork, analytical data packages, and electronic files from the laboratory information management system will be reviewed to ensure that analytical and QC data from the laboratories are complete, reported correctly, and within applicable limits. Laboratory documents will be rechecked to verify the condition of the samples upon receipt at the laboratory and determine if problems arose during analysis that may have affected the data. When issues arise with samples before the analytical data are processed, resolution of those issues will be initiated.

Table H-4. Soil Analytical Performance Requirements

CAS Number	Analyte	Analytical Method	Closure Performance Standard[a] (mg/kg)		Practical Quantitation Limit[d] (mg/kg)	Accuracy Requirement (% Recovery)[b]	Precision Requirement (RPD)[b]
			Carcinogen	Non-Carcinogen			
7440-38-2	Arsenic	SW-846 Method 6010 or 200.8	0.667	24	10	±30	≤30
7440-39-3	Barium	SW-846 Method 6010	N/A	16,000	2.0	±30	≤30
7440-43-9	Cadmium	SW-846 Method 6010	N/A	80	0.5	±30	≤30
18540-29-9	Chromium (Hexavalent)	SW-846 Method 6010	N/A	240	1.0	±30	≤30
7439-92-1	Lead	SW-846 Method 6010	N/A	250	5.0	±30	≤30
7439-97-6	Mercury	SW-846 Method 7471 or 200.8	N/A	24	0.2	±30	≤30
7782-49-2	Selenium	SW-846 Method 6010 or 200.8	N/A	400	10	±30	≤30
7440-22-4	Silver	SW-846 Method 6010	N/A	400	1.0	±30	≤30
71-43-2	Benzene	SW-846 Method 8260	18.2	320	0.005	N/A[c]	≤20
56-23-5	Carbon tetrachloride	SW-846 Method 8260	14.3	320	0.005	N/A[c]	≤20
67-66-3	Chloroform	SW-846 Method 8260	164	800	0.005	N/A[c]	≤20
121-14-2	2,4-Dinitrotoluene	SW-846 Method 8270	N/A	160	0.33	N/A[c]	≤20
67-72-1	Hexachloroethane	SW-846 Method 8270	25	56	0.005	N/A[c]	N/A[c]
78-93-3	Methyl Ethyl Ketone (MEK) (2- Butanone)	SW-846 Method 8260	N/A	48,000	0.01	N/A[c]	≤20
87-86-5	Pentachlorophenol	SW-846 Method 8260	8.33	2,400	0.33	N/A[c]	N/A[c]

Table H-4. Soil Analytical Performance Requirements

CAS Number	Analyte	Analytical Method	Closure Performance Standard[a] (mg/kg)		Practical Quantitation Limit[d] (mg/kg)	Accuracy Requirement (% Recovery)[b]	Precision Requirement (RPD)[b]
			Carcinogen	Non-Carcinogen			
127-18-4	Tetrachloroethylene	SW-846 Method 8260	1.85	800	0.005	N/A[c]	≤20
79-01-6	Trichloroethylene	SW-846 Method 8260	21.7	40	0.005	N/A[c]	N/A[c]
75-01-4	Vinyl chloride	SW-846 Method 8260	66.7	240	0.01	N/A[c]	N/A[c]
71-55-6	1,1,1-Trichloroethane	SW-846 Method 8260	N/A	165,000	0.005	N/A[c]	N/A[c]
76-13-1	Chlorinated fluorocarbons (1,1,2-Trichloro-1,2,2-trifluoroethane)	SW-846 Method 8260	N/A	2,400,000	0.01	N/A[c]	N/A[c]
75-09-2	Methylene chloride	SW-846 Method 8260	133	4,800	0.005	N/A[c]	N/A[c]
108-90-7	Chlorobenzene	SW-846 Method 8260	N/A	1,600	0.005	N/A[c]	N/A[c]
95-50-1	Ortho-dichlorobenzene	SW-846 Method 8270	N/A	7,200	0.33	N/A[c]	N/A[c]
79-00-5	1,1,2-Trichloroethane	SW-846 Method 8260	17.5	320	0.005	N/A[c]	N/A[c]
67-64-1	Acetone	SW-846 Method 8260	N/A	72,000	0.02	N/A[c]	≤20
71-36-3	N-butyl alcohol	SW-846 Method 8260	N/A	8,000	0.1	N/A[c]	N/A[c]
108-94-1	Cyclohexanone	SW-846 Method 8270	N/A	400,000	200	N/A[c]	N/A[c]
141-78-6	Ethyl acetate	SW-846 Method 8015	N/A	72,000	5.0	N/A[c]	N/A[c]
100-41-4	Ethyl benzene	SW-846 Method 8260	N/A	8,000	0.005	N/A[c]	N/A[c]
60-29-7	Ethyl ether	SW-846 Method 8260	N/A	16,000	0.005	N/A[c]	N/A[c]
67-56-1	Methanol	SW-846 Method 8260	N/A	40,000	1.0	N/A[c]	≤20
108-10-1	Methyl isobutyl ketone (MIBK)	SW-846 Method 8260	N/A	6,400	0.01	N/A[c]	N/A[c]
108-38-3	m-Xylene	SW-846 Method 8260`	N/A	16,000	0.005	N/A[c]	≤20
95-47-6	o-Xylene	SW-846 Method 8260	N/A	16,000	0.005	N/A[c]	≤20
106-42-3	p-Xylene	SW-846 Method 8260	N/A	16,000	0.005	N/A[c]	≤20

Table H-4. Soil Analytical Performance Requirements

CAS Number	Analyte	Analytical Method	Closure Performance Standard[a] (mg/kg)		Practical Quantitation Limit[d] (mg/kg)	Accuracy Requirement (% Recovery)[b]	Precision Requirement (RPD)[b]
			Carcinogen	Non-Carcinogen			
108-39-4	*m*-cresol	SW-846 Method 8270	N/A	4,000	0.66	N/A[c]	≤20
95-48-7	*o*-cresol	SW-846 Method 8270	N/A	4,000	0.33	N/A[c]	≤20
106-44-5	*p*-cresol	SW-846 Method 8270	N/A	400	0.33	N/A[c]	≤20
98-95-3	Benzene, nitro	SW-846 Method 8270	N/A	160	0.33	N/A[c]	N/A[c]
110-86-1	Pyridine	SW-846 Method 8260	N/A	80	0.005	N/A[c]	≤20
79-46-9	2-Nitropropane	SW-846 Method 8260	0.105	N/A	1	N/A[c]	N/A[c]
75-15-0	Carbon disulfide	SW-846 Method 8260	N/A	8,000	0.005	N/A[c]	N/A[c]
78-83-1	Isobutanol	SW-846 Method 8260	N/A	24,000	0.5	N/A[c]	N/A[c]
110-80-5	2-Ethoxyethanol	SW-846 Method 8270	N/A	32,000	200	N/A[c]	N/A[c]
108-88-3	Toluene	SW-846 Method 8260	N/A	6,400	0.005	N/A[c]	N/A[c]
111-44-4	Dichloroethyl ether (Bis(2-chloroethyl) ether)	SW-846 Method 8270	0.909	N/A	0.33	N/A[c]	N/A[c]
71-36-3	1-Butanol	SW-846 Method 8260	N/A	8,000	0.1	N/A[c]	N/A[c]
123-91-1	1,4-Diethyleneoxide (1,4-Dioxane)	SW-846 Method 8260	10	2,400	0.5	N/A[c]	N/A[c]
60-29-7	Diethyl ether Ethane, 1,1'-oxybis-(I)	SW-846 Method 8260	N/A	16,000	0.005	N/A[c]	N/A[c]
64-18-6	Formic Acid (U123)	Modified 9056A or Modified 300.0	N/A	160,000	NA	N/A[c]	N/A[c]
57-12-5	Cyanide	SW-846 Method 9010/9012/9013/9014	N/A	48	0.5	±30	≤30
1314-62-1	Vanadium oxide (vanadium pentoxide)	SW-846 Method 6010/200.8	N/A	720	NA	N/A[c]	N/A[c]

Table H-4. Soil Analytical Performance Requirements

CAS Number	Analyte	Analytical Method	Closure Performance Standard[a] (mg/kg)		Practical Quantitation Limit[d] (mg/kg)	Accuracy Requirement (% Recovery)[b]	Precision Requirement (RPD)[b]
			Carcinogen	Non-Carcinogen			
1336-36-3	Polychlorinated biphenyl (PCB)	SW-846 Method 8082	0.5	1.6	0.16	N/A[c]	≤20

a. Closure performance standards are the numeric cleanup levels calculated using unrestricted use exposure assumptions according to "Model Toxics Control Act—"Cleanup" (MTCA) regulations (WAC 173-340-740, "Unrestricted Land Use Soil Cleanup Standards;" -747, "Deriving Soil Concentrations for Groundwater Protection;" and -7490, "Terrestrial Ecological Evaluation Procedures," through -7494, "Priority Contaminants of Ecological Concern"). These numeric cleanup levels will be calculated according to MTCA (WAC 173-340) Method B (unrestricted use standards).

b. Accuracy criteria for associated batch matrix spike percent recoveries. Evaluation based on statistical control of laboratory control samples is also performed. Precision criteria for batch laboratory replicate matrix spike analyses or replicate sample analyses.

c. Determined by the laboratory based on historical data or statistically derived control limits. Limits are reported with the data. Where specific acceptance criteria are listed, those acceptance criteria may be used in place of statistically derived acceptance criteria.

d. For these analytical performance requirements, the required detection limit and practical quantitation limit are identical.

CAS = Chemical Abstracts Service

N/A = not applicable

NA = information not available

RPD = relative percent difference

Table H-5. Project Quality Control Sampling Summary

Quality Control Sample Type	Frequency	Characteristics Evaluated
Field Quality Control		
Full trip blank (FTB)	One per 20 samples per media sampled.	Contamination from containers or transportation.
Equipment rinsate blank (EB)	As needed. If only disposable equipment is used, then an equipment blank is not required. Otherwise, one per 20 samples per media[a].	Adequacy of sampling equipment decontamination and contamination from non-dedicated equipment.
Field duplicate (DUP)	One per batch[h], 20 samples maximum of each media sampled (soil samples[b]).	Precision, including sampling and analytical variability.
Field Split Samples (SPLIT)	As needed. When needed, the minimum is one per analytical method, per media sampled, for analyses performed where detection limit and precision and accuracy criteria have been defined in the Performance Requirements tables.	Precision, including sampling, analytical, and inter-laboratory.
Laboratory Quality Control[h]		
Method Blanks	1 per batch[h]	Laboratory contamination
Lab Duplicates	[c]	Laboratory reproducibility and precision
Matrix Spikes	[c]	Matrix effect/laboratory accuracy
Matrix Spike Duplicates	[c]	Laboratory reproducibility, accuracy, and precision
Surrogates	[c]	Recovery/yield
Tracers	[c]	Recovery/yield
Laboratory Control Samples	1 per batch[h]	Evaluate laboratory accuracy
Performance Evaluation Programs[d]	Annual	Evaluate laboratory accuracy
Double-Blind Standards	Quarterly[e]	Evaluate laboratory accuracy
Audit/Assessment	Annually[f] or every 3 years[g]	Evaluate overall laboratory performance and operations

Table H-5. Project Quality Control Sampling Summary

Quality Control Sample Type	Frequency	Characteristics Evaluated

a. Whenever a new type of non-dedicated equipment is used, an equipment blank shall be collected every time sampling occurs until it can be shown that less frequent collection of equipment blanks is adequate to monitor the decontamination procedure for the non-dedicated equipment.

b. Soil grab samples are exempt from duplicate sampling.

c. As defined in the laboratory contract or quality assurance plan and/or analysis procedures.

d. Nationally recognized program, such as DOE Mixed Analyte Performance Evaluation Program or Environmental Resource Associates.

e. Soil matrix double-blind standards are submitted by request of Analytical Services.

f. DOE Quality Systems for Analytical Services requires annual audit of commercial laboratories.

g. HASQARD does not define a frequency for assessment of on-site laboratories. Three year evaluated supplier list requirement is typically applied.

h. Batching across projects is allowing for similar matrices.

DOE = U.S. Department of Energy

The format and requirements for data validation activities are based upon the most current version of USEPA-540-R-08-01, *National Functional Guidelines for Superfund Organic Methods Data Review* (OSWER 9240.1-48), and USEPA-540-R-10-011, *National Functional Guidelines for Inorganic Superfund Data Review* (OSWER 9240.1-51). A total of 5 percent of the results will undergo Level C validation, as defined by the validation guidelines.

The DQA process compares completed field activities to those in corresponding documents and provides an evaluation of the resulting data. The purpose of the DQA is to determine whether quantitative data are of the correct type and are of adequate quality and quantity to meet the project data quality objectives. The assessment will be consistent with the EPA DQA process (EPA/240/B-06/002, *Data Quality Assessment: A Reviewer's Guide* [EPA QA/G-9R]; EPA/240/B-06/003, *Data Quality Assessment: Statistical Methods for Practitioners* [EPA QA/G-9S]).

H3.10.10 Documents and Records

The Project Manager is responsible for ensuring that the current version of the SAP is being used and providing any updates to field personnel. Version control is maintained by the administrative document control process. Changes to the SAP affecting the data needs will be submitted as a permit modification in accordance with WAC 173-303-610 to DOE and the lead regulatory agency.

Logbooks are required for field activities. A logbook must be identified with a unique project name and number. The individual(s) responsible for logbooks will be identified in the front of the logbook, and only authorized persons may make entries in logbooks. Logbooks will be signed by the field work supervisor, cognizant scientist/engineer, or other responsible individual. Logbooks will be permanently bound, waterproof, and ruled with sequentially numbered pages. Pages will not be removed from logbooks for any reason. Entries will be made in indelible ink. Corrections will be made by marking through the erroneous data with a single line, entering the correct data, and initialing and dating the changes.

The Project Manager is responsible for ensuring that a project file is properly maintained. The project file will contain the records or references to their storage locations. The following items will be included in the project file, as appropriate:

- Field logbooks or operational records
- Data forms
- GPS data
- Chain-of-custody forms
- Sample receipt records
- Inspection or assessment reports and corrective action reports
- Interim progress reports
- Final reports
- Laboratory data packages
- Verification and validation reports

The laboratory is responsible for maintaining, and having available upon request, the following items:

- Analytical logbooks
- Raw data and QC sample records
- Standard reference material and/or proficiency test sample data
- Instrument calibration information

Records may be stored in either electronic or hardcopy format. Documentation and records, regardless of medium or format, are controlled in accordance with internal work requirements and processes to ensure the accuracy and retrievability of stored records. Records required by the TPA (Ecology et al., 1989a) will be managed in accordance with the requirements therein.

H3.10.11 Revisions to the Sampling and Analysis Plan and Constituents to be Analyzed

If changes to the SAP are necessary due to unexpected events during closure that will affect sampling, a revision to the SAP will be submitted no later than 30 days after the unexpected event as a permit modification as required in WAC 173-303-610(3)(b)(iii) and WAC 173-303-830, "Dangerous Waste Regulations," "Permit Changes."

H3.11 Role of the Independent Qualified Registered Professional Engineer

An independent, qualified, registered, professional engineer will be retained to provide certification of the closure and sign the closure certification, as required by WAC 173-303-610(6). The resulting engineering report will be retained in the operating record.

H3.12 Closure Certification

In accordance with WAC 173-303-610(6), within 60 days of completion of closure of the 221-T Railroad Cut DWMU, certification that the DWMU has been closed in accordance with the specifications in this closure plan will be submitted to Ecology by registered mail. The certification will be signed by the owner or operator and by an independent, qualified, registered, professional engineer.

H3.13 Conditions that will be Achieved when Closure is Complete

Upon completion of the near-term closure activities, the 221-T Railroad Cut will remain in an "as-is" state with the gravel remaining in place. The 221-T Railroad Cut will undergo final disposition under the CDI activities associated with the T-Plant Complex OUG. A permit modification request will be submitted after clean closure has been confirmed to remove the 221-T Railroad Cut DWMU from the sitewide permit active DWMUs.

H4 Closure Schedule and Time Frame

Several near-term closure activities have been completed and documented in this closure plan. Addition of the 221-T Railroad Cut to the WIDS database will be completed within 180 days of approval of the closure plan. This DWMU is located near the 221-T Canyon Building, a large operating facility that currently serves as both waste treatment and storage at Hanford for multiple waste streams. The TPA Action Plan (Ecology et al., 1989b) identified that some TSD groups/units (primarily those located within large processing facilities) will be integrated with the disposition of the facility. These units are those that have physical closure actions that need to be done in conjunction with the physical disposition actions in the facility (e.g., removal of structural components).

Ecology Publication 94-111, *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Section 11.0, "Coordination of Closure and Corrective Action or Other Cleanup Activities"), allows for the use of alternative requirements when coordinating RCRA closure activities with other cleanup activities at a facility. An extended closure period is required for the 221-T Railroad Cut to coordinate closure activities with the T-Plant Complex closure. The extended closure activities will occur under the CDI activities associated with T-Plant Complex OUG. T-Plant Complex OUG cleanup actions are included in the Central Plateau Cleanup Actions which are outlined in the annual Hanford Lifecycle Scope, Schedule, and Cost Report required by TPA (Ecology et al., 1989a) Milestone M-036-01.

Approval of this closure plan will grant the Hanford Site an extended closure period for performance of the sample and analysis activities, in accordance with WAC 173-303-610(4)(c), and a separate extension request will not be filed (Figure H-2).

H5 Closure Costs

An annual report outlining updated projections of anticipated closure costs for the Hanford Facility TSD units having final status is not required per Permit Condition II.H.

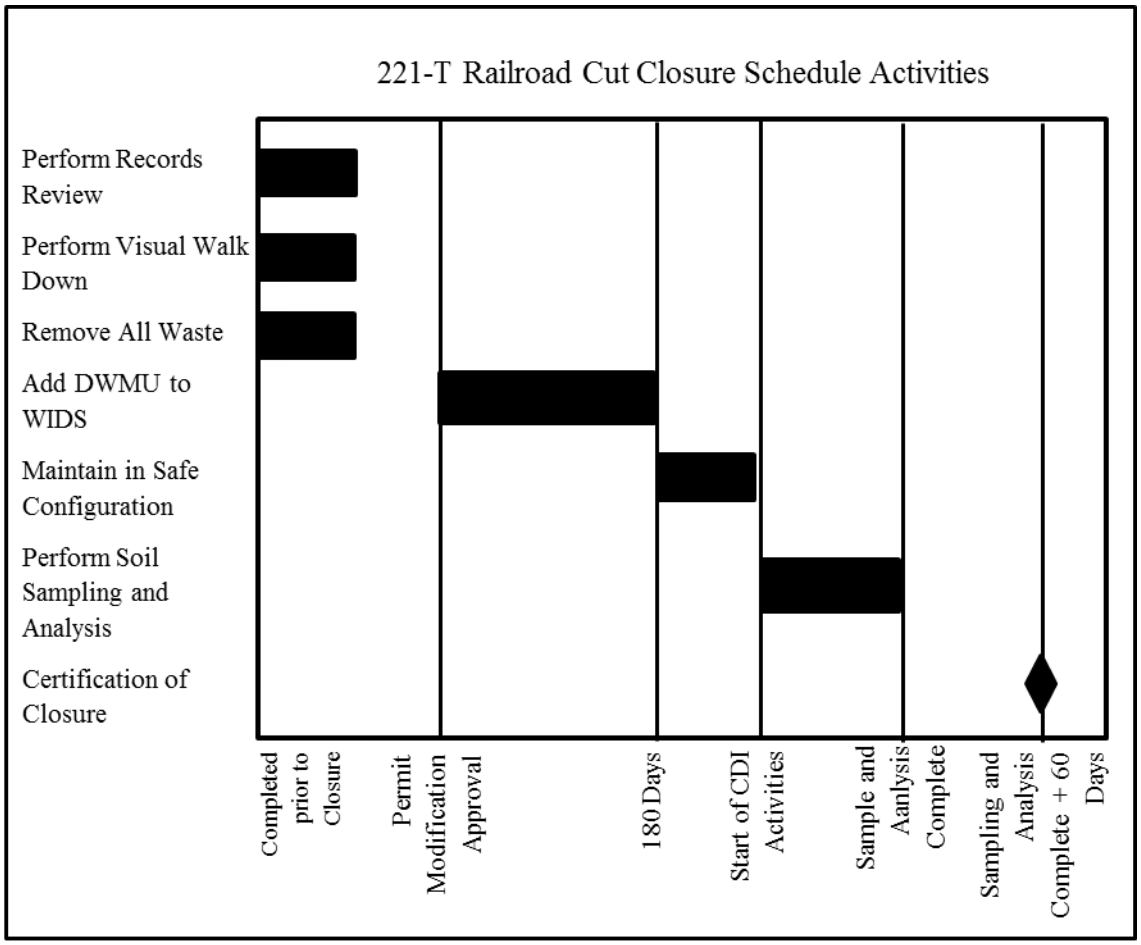


Figure H-2. 221-T Railroad Cut Closure Schedule Activities

Attachment A

T-Plant 221-T Railroad Cut RCRA Records Review and Visual Inspection Supporting Documentation

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T Plant Complex 221-T Railroad Cut Storage Area

Purpose:

A visual inspection of the T Plant Complex 221-T Railroad Cut Storage Area was performed to determine if there is any evidence of spills and/or leaks from waste packages containing dangerous waste that was stored at this location from past operations. The inspection was to identify and document by photographing any waste related staining of the storage area surface, and to denote any remaining waste related items.

The inspection was performed on September 18, 2013 by David Richards, Manager, T Plant (CHPRC).

Results:

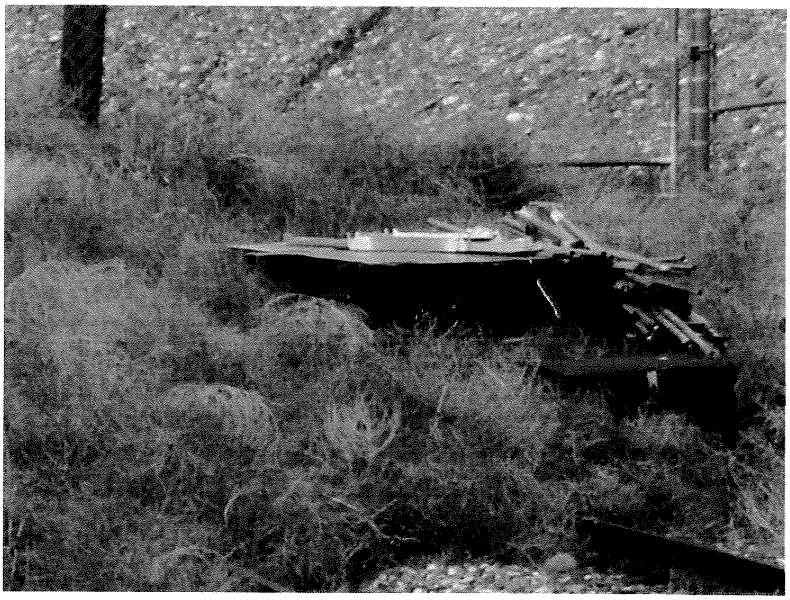
No evidence of spills or staining was noted.

No waste is being stored in this area. Area consists of abandoned rail road tracks, gravel, tumbleweeds, and an inner and outer chain link fence and gates. Some debris was noted at the Western end of the Cut. Debris consists of steel plate, steel pipe, railroad ties, and a metal storage box (see photographs).

Area was photographed.

T Plant Complex 221-T Railroad Cut Storage Area

T Plant Complex 221-T Railroad Cut Storage Area



Signature/date:

David E. Richards 9-26-13

T-Plant Dangerous Waste Inspection Checklist and Operations Logbook Review

Title of Forms:	See attached table and reviewer comments.
Date of Review:	October 8, 2013
Reviewer's Name:	Sarah Horn
Waste Management Units:	221-T Railroad Cut, 277-T Building, 221-T Pipe Gallery Storage, 221-T Tank System, 2706-TB Tank System (includes 2706-TB Tank System enclosure building)
Time Frame of Review:	January 1985 through June 2013
Items of Concern Noted If "YES", complete entire checklist. If "NO", skip to Reviewer's signature and date.	YES ___ NO _X_
Items of Concerns: Attach copies of Weekly Inspection sheets noting concern.	_____ _____ _____ _____
Dates of Corrective Actions: Attach copies of Weekly Inspection sheets noting concern.	_____ _____ _____ _____
Reviewer's Signature and Date:	Sarah Horn 10/8/2013

Instructions:

Review Weekly Waste Inspection checklists and operations logbooks for any references to unplanned spills, releases or discharges associated with dangerous waste containers. Anomalies that would not affect closure of the unit such as missing labels, open containers, or dented containers, do not need to be documented.

If items of concern are noted, check "YES" and complete the entire checklist. If no items of concern are noted, check "NO" and skip to the signature and date field. Note that if no items of concern are noted for an extended period of time, the "Time Frame of Weekly Inspections" can be January 1, 20xx to December 31, 20xx or even several years if no items of concern are noted.

If unplanned spills, releases or discharges are referenced on the inspection checklist, document the item of concern as "spill", "stain", "ruptured container", etc. Also note the date of the corrective action.

Attach copies of weekly waste inspection checklists noting the items of concern and corrective actions.

Complete all review fields as applicable.

Sign and date form and deliver to Stephanie Johansen.

Reviewer Comments:

The initial records review was completed in August 2013 which included applicable daily and weekly inspection checklists, and operations logbooks for the period of January 1985 through June 2013 and is detailed in Table 1 below. The August 2013 records review focused on the following dangerous waste management areas scheduled for closure:

- 271-T Cage
- 211-T Pad
- 221-T Sand Filter Pad
- 277-T Outdoor Storage Area
- 221-T R5 Waste Storage Area

The current review included the items of concern identified during the initial August 2013 records review but focused on the following areas:

- 221-T Railroad Cut
- 277-T Building
- 221-T Pipe Gallery Storage
- 221-T Tank System
- 2706-TB Tank System (including enclosure building)

No items of concern were noted for the 221-T Railroad Cut, 277-T Building, 221-T Pipe Gallery Storage, 221-T Tank System, or the 2706-TB Tank System. Below is a table that summarizes the original records review completed in August 2013.

Table 1. T-Plant Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
T-Plant Daily Operating Logbook	Logbook	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	01/02/1985	06/22/2010	No
T-Plant Operation Logbook	Logbook	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	07/27/2010	04/07/2011	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	08/29/2005	12/01/2005	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	10/01/2007	04/22/2013	No
Weekly Surveillance Log, <90-day Storage Areas and Satellite Accumulation Areas	Weekly Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	06/07/1991	12/20/1999	No

Page **3** of **4**

Table 1. T-Plant Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
Treatment Facility Waste Management Weekly Inspection Log Sheet Treatment Facility Waste Management Area Daily Inspection Log Sheet Treatment Facility Waste Management Area Weekly Inspection Data Sheet Treatment Facility Waste Management Area Daily Inspection Data Sheet Weekly Waste Area Surveillance T-Plant Daily Waste Management Area Inspection Data Sheet	Weekly and Daily Dangerous Waste Inspections	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	01/2000 01/2005	12/2002 12/2007	No
Waste Management Area Daily Inspection Report Weekly Waste Area Surveillance	Weekly and Daily Inspections	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	2003	2004	Yes*
T-Plant Weekly Waste Management Area Inspection Data Sheet	Weekly Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	10/18/2007	06/12/2013	No

* A container of Insulkote was leaking. Product was determined to be non-regulated material.

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Attachment B

T-Plant 221-T Railroad Cut Visual Sampling Plan Supporting Documentation

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Systematic sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

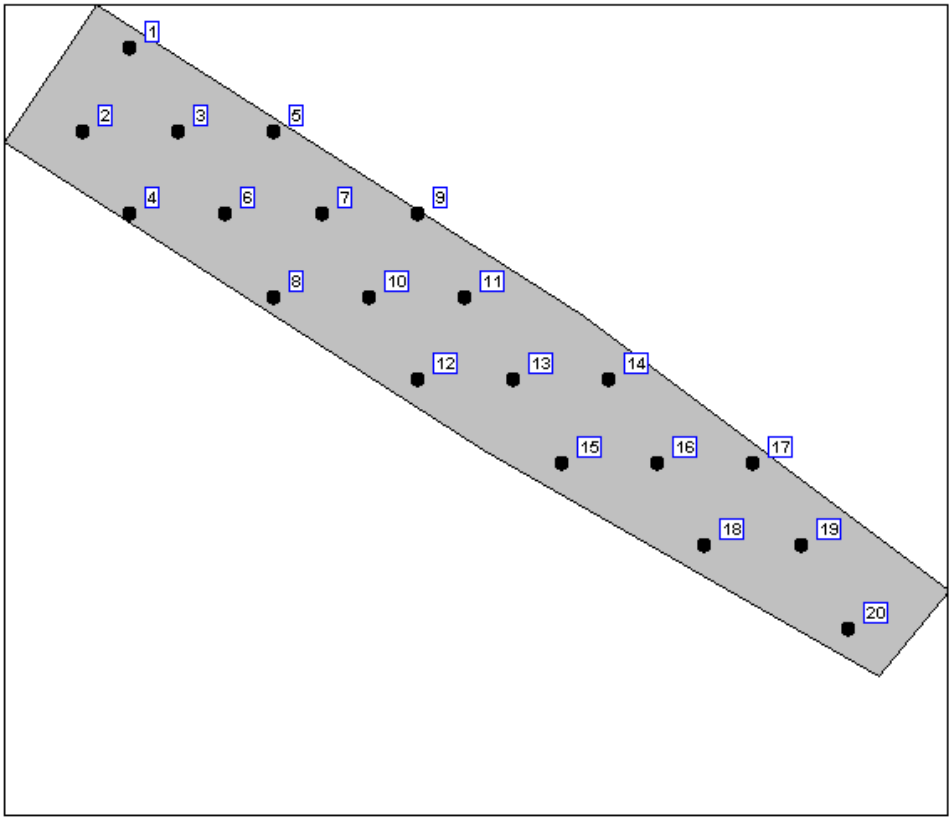
SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	20
Number of samples on map [a]	20
Number of selected sample areas [b]	1
Specified sampling area [c]	1331.91 ft^2
Size of grid / Area of grid cell [d]	8.76914 feet / 66.5954 ft^2
Grid pattern	Triangular

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.

[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.

[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.

[d] Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.



Area: Area 1					
X Coord	Y Coord	Label	Value	Type	Historical
567542.6730	136982.6029	20		Systematic	
567529.5193	136990.1972	18		Systematic	
567538.2884	136990.1972	19		Systematic	
567516.3655	136997.7915	15		Systematic	
567525.1347	136997.7915	16		Systematic	
567533.9038	136997.7915	17		Systematic	
567503.2118	137005.3858	12		Systematic	
567511.9810	137005.3858	13		Systematic	
567520.7501	137005.3858	14		Systematic	
567490.0581	137012.9801	8		Systematic	
567498.8273	137012.9801	10		Systematic	
567507.5964	137012.9801	11		Systematic	
567476.9044	137020.5744	4		Systematic	
567485.6736	137020.5744	6		Systematic	
567494.4427	137020.5744	7		Systematic	
567503.2118	137020.5744	9		Systematic	
567472.5199	137028.1687	2		Systematic	
567481.2890	137028.1687	3		Systematic	
567490.0581	137028.1687	5		Systematic	
567476.9044	137035.7630	1		Systematic	

Primary Sampling Objective
The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold. VSP calculates the number of samples required to reject the null hypothesis in favor of the alternative one, given a selected sampling approach and inputs to the associated equation.

Selected Sampling Approach
A nonparametric systematic sampling approach with a random start was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that typical parametric assumptions may not be true.

Both parametric and non-parametric equations rely on assumptions about the population. Typically, however, non-parametric equations require fewer assumptions and allow for more uncertainty about the statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usually less than if a non-parametric equation was used.

Locating the sample points over a systematic grid with a random start ensures spatial coverage of the site. Statistical analyses of systematically collected data are valid if a random start to the grid is used. One disadvantage of systematically collected samples is that spatial variability or patterns may not be discovered if the grid spacing is large relative to the spatial patterns.

Number of Total Samples: Calculation Equation and Inputs
The equation used to calculate the number of samples is based on a Sign test (see PNNL 13450 for discussion). For this site, the null hypothesis is rejected in favor of the alternative one if the median(mean) is sufficiently smaller than the threshold. The number of samples to collect is calculated so that if the inputs to the equation are true, the calculated number of samples will cause the null hypothesis to be rejected.

The formula used to calculate the number of samples is:

$$n = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(SignP - 0.5)^2}$$

where

$$SignP = \Phi\left(\frac{\Delta}{s_{total}}\right)$$

$\Phi(z)$ is the cumulative standard normal distribution on $(-\infty,z)$ (see PNNL-13450 for details),
n is the number of samples,
S_{total} is the estimated standard deviation of the measured values including analytical error,
Δ is the width of the gray region,
α is the acceptable probability of incorrectly concluding the site median(mean) is less than the threshold,
β is the acceptable probability of incorrectly concluding the site median(mean) exceeds the threshold,

$Z_{1-\alpha}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\alpha}$ is $1-\alpha$,
$Z_{1-\beta}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\beta}$ is $1-\beta$.

Note: MARSSIM suggests that the number of samples should be increased by at least 20% to account for missing or unusable data and uncertainty in the calculated value of n. VSP allows a user-supplied percent overage as discussed in MARSSIM (EPA 2000, p. 5-33).

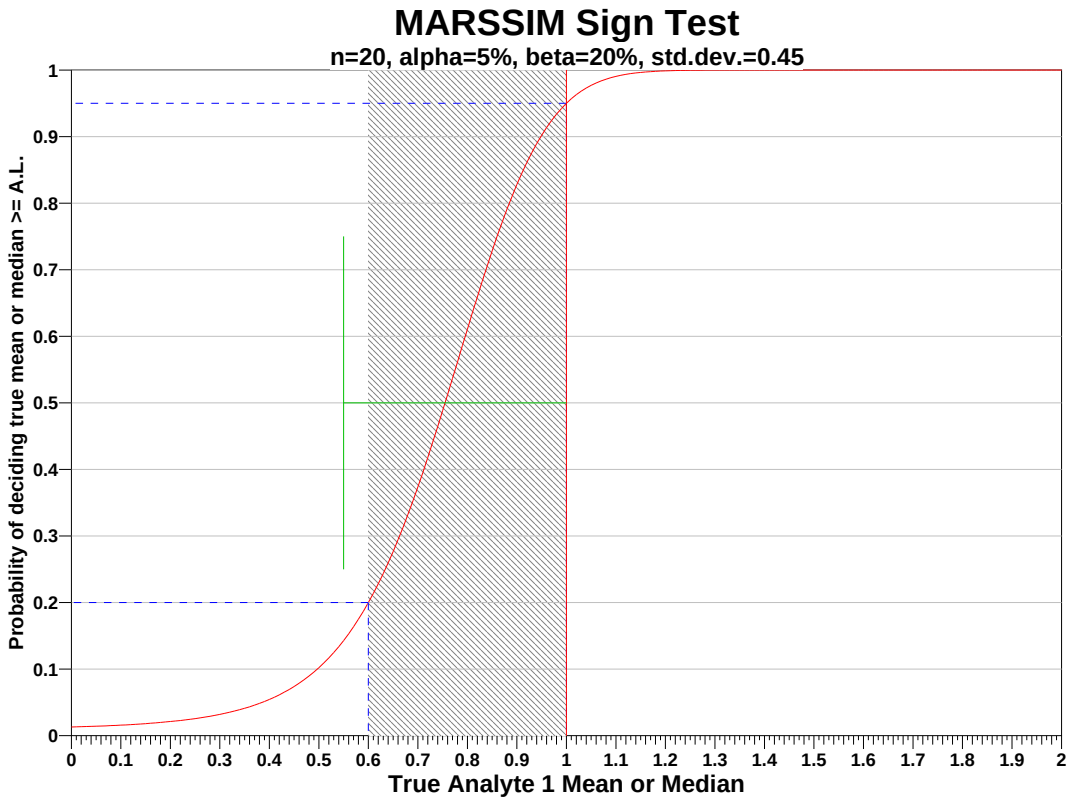
The values of these inputs that result in the calculated number of sampling locations are:

Analyte	n[a]	Parameter					
		S	Δ	α	β	$Z_{1-\alpha}$ [b]	$Z_{1-\beta}$ [c]
Analyte 1	20	0.45	0.4	0.05	0.2	1.64485	0.841621

[a] The final number of samples has been increased by the MARSSIM Overage of 20%.
[b] This value is automatically calculated by VSP based upon the user defined value of α.
[c] This value is automatically calculated by VSP based upon the user defined value of β.

The following figure is a performance goal diagram, described in EPA's QA/G-4 guidance (EPA, 2000). It shows the probability of concluding the sample area is dirty on the vertical axis versus a range of possible true median(mean) values for the site on the horizontal axis. This graph contains all of the inputs to the number of samples equation and pictorially represents the calculation.

The red vertical line is shown at the threshold (action limit) on the horizontal axis. The width of the gray shaded area is equal to Δ; the upper horizontal dashed blue line is positioned at 1-α on the vertical axis; the lower horizontal dashed blue line is positioned at β on the vertical axis. The vertical green line is positioned at one standard deviation below the threshold. The shape of the red curve corresponds to the estimates of variability. The calculated number of samples results in the curve that passes through the lower bound of Δ at β and the upper bound of Δ at 1-α. If any of the inputs change, the number of samples that result in the correct curve changes.



Statistical Assumptions

The assumptions associated with the formulas for computing the number of samples are:

1. the computed sign test statistic is normally distributed,
2. the variance estimate, S^2, is reasonable and representative of the population being sampled,
3. the population values are not spatially or temporally correlated, and
4. the sampling locations will be selected probabilistically.

The first three assumptions will be assessed in a post data collection analysis. The last assumption is valid because the gridded sample locations were selected based on a random start.

Sensitivity Analysis

The sensitivity of the calculation of number of samples was explored by varying the standard deviation, lower bound of

gray region (% of action level), beta (%), probability of mistakenly concluding that μ > action level and alpha (%), probability of mistakenly concluding that μ < action level. The following table shows the results of this analysis.

Number of Samples							
AL=1		α=5		α=10		α=15	
		s=0.9	s=0.45	s=0.9	s=0.45	s=0.9	s=0.45
LBGR=90	β=15	1103	280	825	209	659	167
	β=20	948	240	692	176	542	138
	β=25	826	209	587	149	449	114
LBGR=80	β=15	280	75	209	56	167	45
	β=20	240	64	176	47	138	36
	β=25	209	56	149	40	114	30
LBGR=70	β=15	128	36	95	27	77	22
	β=20	110	32	81	23	63	18
	β=25	95	27	69	20	52	15

s = Standard Deviation
LBGR = Lower Bound of Gray Region (% of Action Level)
β = Beta (%), Probability of mistakenly concluding that μ > action level
α = Alpha (%), Probability of mistakenly concluding that μ < action level
AL = Action Level (Threshold)

Recommended Data Analysis Activities
Post data collection activities generally follow those outlined in EPA's Guidance for Data Quality Assessment (EPA, 2000). The data analysts will become familiar with the context of the problem and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of any statistical analyses that are performed as well as to achieve a general understanding of the data. The data will be assessed to determine whether they are adequate in both quality and quantity to support the primary objective of sampling.

Because the primary objective for sampling for this site is to compare the site median(mean) value with a threshold value, the data will be assessed in this context. Assuming the data are adequate, at least one statistical test will be done to perform a comparison between the data and the threshold of interest. Results of the exploratory and quantitative assessments of the data will be reported, along with conclusions that may be supported by them.

H2 – T-Plant Complex OUG
H2.I. Appendix I – T-Plant 277-T Building

I1 Introduction

This appendix discusses closure activities for the T-Plant Complex Operating Unit Group (OUG) (T-Plant Complex) 277-T Building dangerous waste management unit (DWMU), hereinafter referred to as the 277-T Building. The Permittee has concluded that the 277-T Building will no longer be utilized for future receipts of dangerous, mixed, or *Toxic Substances Control Act of 1976* (TSCA)-polychlorinated biphenyl (PCB) waste and will coordinate closure of the DWMU with final closure of the T-Plant Complex OUG. No further waste management activities will be performed in the building. Closure will be performed in accordance with the included schedule.

This closure plan complies with WAC 173-303-610(2) through WAC 173-303-610(6), "Dangerous Waste Regulations," "Closure and Post-Closure," and represents the baseline for closure. Amendments to this closure plan will be submitted as a permit modification in accordance with WAC 173-303-610(3)(b).

I1.1 Unit Description

The 277-T Building (Figure I-1) is a single story, pre-engineered, steel structure constructed of I-beams covered with corrugated steel on a concrete slab on grade foundation. It is approximately 10 m (32 ft) wide, by 12 m (40 ft) long, by 7 m (24 ft) high. Rollup doors are located on each end for loading and unloading operations.

The 277-T Building does not currently store dangerous, mixed, or TSCA-PCB waste. The 277-T Building primarily serves as equipment and material storage to support T-Plant OUG activities. Future storage and treatment of dangerous, mixed, and TSCA-PCB waste is not authorized within the 277-T Building DWMU. The 277-T Building is located near the 221-T Canyon Building, which is part of the Canyon Disposition Initiative (CDI). In addition, the T-Plant Complex is included in the Tri-Party Agreement (TPA) (*Hanford Federal Facility Agreement and Consent Order* [Ecology et al., 1989a]), Action Plan (*Hanford Federal Facility Agreement and Consent Order* [Ecology et al., 1989b]), Section 6, "Treatment, Storage, and Disposal Unit Process," and Section 8, "Facility Disposition Process."

> TPA Action Plan Section 6.1:
> *Some of the TSD groups/units (primarily those located within large processing facilities) will be integrated with the disposition of the facility, and therefore closed in accordance with the process defined in Section 8.0. These units are those that have physical closure actions that need to be done in conjunction with the physical disposition actions in the facility (e.g. removal of structural components).*

The strategy for the entire T-Plant Complex is a coordinated closure for both *Resource Conservation and Recovery Act of 1976* (RCRA) closing units and CDI activities. The 277-T Building is in a safe configuration for an extended closure period. Final clean closure verification sampling will occur during CDI activities for the T-Plant Complex.

I1.1.1 Maximum Waste Inventory

The maximum inventory of dangerous, mixed, or TSCA-PCB waste stored in the 277-T Building over its lifetime included one container of mixed, TSCA-PCB waste with a total volume of 27 m^3 (36 yd^3). The waste was introduced into the 277-T Building in December 2002 where it was overpacked and stored until September 2003. Details on the dangerous, mixed, and TSCA-PCB waste container are presented in Section I3.3 of this closure plan.

Closure performance standards for the 277-T Building will be based on requirements found in WAC 173-303-610(2), which require closure of the facility in a manner that:

- Minimizes the need for further maintenance;
- Controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere; and
- Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.

These performance standards are addressed in Sections I2.1 and I3.12 of this closure plan.

Figure I-1. T-Plant 277-T Building

I2 Closure Performance Standards

I2.1 Clean Closure Levels

The 277-T Building will be clean closed in conjunction with the T-Plant Complex CDI activities. In accordance with WAC 173-303-610(2)(b)(ii), the clean closure standard for structures is a visually verifiable standard, which is the absence of obvious stains or residues that would indicate potential dangerous waste contamination. Surfaces must be free of indications of potential dangerous waste, except for residual waste stains consisting of light shadows, slight streaks, or minor discoloration. The standard

will be verified by the performance and documentation of visual inspections. In addition, decontamination of the flooring area will be conducted in accordance with WAC 173-303-610(b)(ii) during T-Plant Complex CDI activities. Rinsate will be analyzed, and the results will be compared to the Universal Treatment Standards in WAC 173-303-140(2)(a), "Dangerous Waste Regulations," "Land Disposal Restrictions," to verify that levels of target analytes are below regulatory levels.

I3 Closure Activities

As a waste management unit, clean closure determination for the 277-T Building will be based on a review of the operational history, operating records (including any releases), and a visual inspection of the area to verify that waste-related staining is not present. Based on these reviews, the 277-T Building is concluded to be in a safe configuration and will be clean closed under RCRA in conjunction with CDI activities. Final verification sampling of the clean closure will be performed during T-Plant Complex cleanup activities consistent with CDI activities. Sampling will be conducted via a sampling and analysis plan (SAP) (Attachment A) to demonstrate that clean closure numeric levels have been achieved.

Due to the extended closure period that will be required to complete closure activities, closure activities have been divided into near-term and extended period activities.

The following near-term closure activities are required to achieve and verify clean closure:

- Remove all dangerous waste inventory (completed; see Section I3.2).
- Review waste container storage, operating, and inspection records for periods of dangerous, mixed, and TSCA-PCB waste storage (completed; see Section I3.3).
- Perform a visual inspection of the concrete floor surface (completed; see Section I3.3).
- Add the 277-T Building to the Waste Information Data System (WIDS) database (see Section I3.8).

Extended closure activities include:

- Sampling and analysis to confirm RCRA clean closure standards in coordination with CDI activities for the T-Plant Complex OUG.

I3.1 Health and Safety Requirements

Closure will be performed to ensure the safety of personnel and the surrounding environment. Qualified personnel will perform any necessary closure activities in compliance with established safety and environmental procedures. Personnel will be equipped with appropriate personal protective equipment. Qualified personnel will be trained in applicable safety and environmental procedures in accordance with the Solid Waste Operations Complex (SWOC) T-Plant, Addendum G, "Personnel Training," and have appropriate training and experience in sampling activities. Field operations will be performed in accordance with applicable health and safety requirements.

The Permittees have instituted training or qualification programs to meet training requirements imposed by regulations, U.S. Department of Energy orders, and national standards such as those published by the American National Standards Institute/American Society of Mechanical Engineers. For example, the environmental, safety, and health training program provides workers with the knowledge and skills necessary to execute assigned duties safely. Field personnel typically have completed the following training before starting work:

- Occupational Safety and Health Administration 40-Hour Hazardous Waste Worker Training

- 8-Hour Hazardous Waste Worker Refresher Training (as required)
- Hanford General Employee Training

The following project-specific safety training, addressed explicitly to the project and the day's activity, will be provided:

- Training will provide the knowledge and skills that sampling personnel need to perform work safely and in accordance with quality assurance requirements.
- Samplers are required to be qualified in the type of sampling being performed in the field.

In addition, pre-job briefings will be performed to evaluate activities and associated hazards by considering the following factors:

- Objective of the activities
- Individual tasks to be performed
- Hazards associated with the planned tasks
- Environment in which the job will be performed
- Facility where the job will be performed
- Equipment and material required
- Safety protocols applicable to the job
- Training requirements for individuals assigned to perform the work
- Level of management control
- Proximity of emergency contacts

Training records are maintained for each employee in an electronic training record database. The Permittees training organization maintains the training records system.

I3.2 Removal of Wastes and Waste Residues

No dangerous, mixed, or TSCA-PCB waste is currently stored at the 277-T Building. The last mixed, TSCA-PCB waste was removed in September 2003, and dangerous, mixed, or TSCA-PCB waste is no longer being accepted at this area. Although the 277-T Building will no longer be used for dangerous, mixed, or TSCA-PCB waste storage, the building will be used for equipment and materials storage. The 277-T Building is in a safe configuration and will be tracked in WIDS until verification sampling is performed under the SAP.

I3.3 277-T Building Records Review and Visual Inspection

To support development of this closure plan and the SAP, the T-Plant Complex OUG operating records were reviewed (Table I-1). The records review included the following RCRA operating record documents: facility operating logbooks (including spill reports) and weekly inspections. The RCRA operating record documents that were reviewed focused on the period during which active mixed and TSCA-PCB waste storage for the T-Plant Complex OUG SWOC Outdoor Container Storage Areas was addressed under the T-Plant Complex OUG SWOC Outdoor Container Storage Areas closure plans. The records review included the time period from October 1985 through July 2010. Operating records indicate that mixed and TSCA-PCB waste has been previously stored in the 277-T Building and that nodocumented releases of mixed or TSCA-PCB waste occurred.

A visual inspection was performed on September 18, 2013 to identify any dangerous waste-related staining in the 277-T Building. No waste-related staining was identified during the visual inspection; therefore, only confirmation sampling and analysis to verify clean closure will be performed.

Supporting documentation for the RCRA operating records review and visual inspection is included in Attachment B.

I3.4 Unit Components, Parts, and Ancillary Equipment

The 277-T Building does not have any component, parts, or ancillary equipment.

I3.5 Inspection of Units Before Decontamination

Once closure activities begin, all equipment and material will be removed from the 277-T Building. A visual inspection of the floor surface will be conducted to identify any dangerous waste-related staining. General housekeeping will take place to remove all material prior to performing the closure decontamination.

I3.6 Decontamination

The 277-T Building floor will be decontaminated, in accordance with alternative treatment standards outlined in the Washington State Department of Ecology clean closure guidance, to meet the definition of a clean debris surface. Decontamination will occur during the extend closure period in conjunction with T-Plant Complex CDI activities. The rinsate will be collected and sampled in accordance with the SAP (Attachment A).

I3.7 Identifying and Managing Contaminated Environmental Media

The rinsate generated from decontamination of the floor during closure activities will be collected. The rinsate will be sampled, and the analytical results will be used to verify clean closure of the 277-T Building. Once sampling has been completed, a waste determination for the rinsate will be completed in accordance with applicable environmental and waste management procedures, and the waste will be dispositioned accordingly.

I3.8 Addition of 277-T Building to the WIDS Database

As part of the near-term closure activities, the 277-T Building will be added to the WIDS database. Addition of the 277-T Building to the WIDS database will help ensure that the 277-T Building is monitored and controlled until the extended closure activities are completed.

The addition of the 277-T Building to the WIDS database will ensure that no unauthorized activity takes place at the 277-T Building (i.e., waste storage).

I3.9 Confirming Clean Closure

The 277-T Building will be clean closed. A review of applicable RCRA operating record documents was completed to determine the release history of the area. Records verification included facility operating record/logbooks and weekly unit inspections, as outlined in Section I3.3 of this closure plan. In addition to records verification, a visual inspection of the visible areas of the floor was performed to identify any dangerous waste-related staining of the storage area flooring. The visual inspection was completed on September 18, 2013, and records reviews were completed and are documented in Attachment B.

Table I-1. Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
T-Plant Daily Operating Logbook	Logbook	277-T Building	01/02/1985	06/22/2010	No
T-Plant Operation Logbook	Logbook	277-T Building	07/27/2010	04/07/2011	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	277-T Building	08/29/2005	12/01/2005	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	277-T Building	10/01/2007	04/22/2013	No
Weekly Surveillance Log, <90-day Storage Areas and Satellite Accumulation Areas	Weekly Inspection	277-T Building	06/07/1991	12/20/1999	No
Treatment Facility Waste Management Weekly Inspection Log Sheet Treatment Facility Waste Management Area Daily Inspection Log Sheet Treatment Facility Waste Management Area Weekly Inspection Data Sheet Treatment Facility Waste Management Area Daily Inspection Data Sheet Weekly Waste Area Surveillance T-Plant Daily Waste Management Area Inspection Data Sheet	Weekly and Daily Dangerous Waste Inspections	277-T Building	01/2000 01/2005	12/2002 12/2007	No
Waste Management Area Daily Inspection Report Weekly Waste Area Surveillance	Weekly and Daily Inspections	277-T Building	2003	2004	Yes*
T-Plant Weekly Waste Management Area Inspection Data Sheet	Weekly Inspection	277-T Building	10/18/2007	06/12/2013	No

* A container of Insulkote was leaking. Product was determined to be non-regulated material.

Table I-2. Mixed Waste Container Data

Container Quantity	Facility Identification	Waste Package Type	Total Volume (m^3)	Waste Type	Beginning Storage Date	Ending Storage Date	Assigned Waste Codes
1	277-T	Box	27	MLLW/TSCA-PCB	December 2002	September 2003	D004 through D011, F001 through F005

MLLW = mixed low-level waste
PCB = polychlorinated biphenyl
TSCA = *Toxic Substances Control Act of 1976*

All dangerous, mixed, and TSCA-PCB waste has been previously removed, and there have been no documented spills or releases of dangerous, mixed, or TSCA-PCB waste. Therefore, post-closure escape of dangerous waste and any associated dangerous waste constituents, leachate, contaminated runoff, and dangerous waste decomposition products to the ground, surface water, groundwater, or air is not anticipated.

During CDI activities for the T-Plant Complex OUG, final clean closure will be confirmed for the 277-T Building. Decontamination of the 277-T Building concrete flooring and sampling and analysis of the decontamination rinsate will occur to confirm that cleanup standards have been achieved.

I3.10 Sampling and Analysis and Constituents to Be Analyzed

I3.10.1 Sampling and Analysis Plan

The final clean closure verification sampling for the 277-T Building will occur in conjunction with T-Plant Complex CDI activities. All sampling and analysis will be performed in accordance with the sampling and quality standards established in the closure SAP (Attachment A). The closure SAP details sampling and analysis procedures in accordance with SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*; the American Society for Testing and Materials (ASTM) *Annual Book of ASTM Standards*; and applicable U.S. Environmental Protection Agency (EPA) guidance. Sampling and analysis activities will meet applicable requirements of SW-846, ASTM standards, EPA-approved methods, and DOE/RL-96-68, *Hanford Analytical Services Quality Assurance Requirements Documents (HASQARD)*.

I3.11 Role of the Independent Qualified Registered Professional Engineer

An independent, qualified, registered, professional engineer will be retained to provide certification of the closure, as required by WAC 173-303-610(6). The resulting engineering report will be retained in the operating record.

I3.12 Closure Certification

In accordance with WAC 173-303-610(6), within 60 days of the 277-T Building DWMU closure, certification that the DWMU has been closed in accordance with the specifications in this closure plan will be submitted to Ecology by registered mail. The certification will be signed by the owner or operator and by an independent, qualified, registered, professional engineer.

I3.13 Conditions That Will Be Achieved When Closure Is Complete

Upon completion of near-term closure activities, the 277-T Building will remain in an “as-is” state, with the building remaining in place. The 277-T Building will continue to be used for equipment and material storage in support of the T-Plant Complex OUG operations. The 277-T Building will undergo final disposition under the CDI activities associated with the T-Plant Complex OUG. A permit modification request will be submitted after clean closure has been confirmed to remove the 277-T Building DWMU from the sitewide permit active DWMUs.

I4 Closure Schedule and Time Frame

Several near-term closure activities have been completed and documented in this closure plan. Addition of the 277-T Building to the WIDS database will be completed within 180 days of closure plan approval. This DWMU is located near the T-Plant Canyon Building, a large operating facility that currently serves as both waste treatment and storage at Hanford for multiple waste streams. The TPA Action Plan (Ecology et al., 1989b) identified that some treatment, storage, and disposal (TSD) groups/units

(primarily those located within large processing facilities) will be integrated with the disposition of the facility. Those units have physical closure actions that need to be completed in conjunction with the physical disposition actions in the facility (e.g., removal of structural components).

Ecology Publication 94-111, *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Section 11.0, "Coordination of Closure and Corrective Action or Other Cleanup Activities"), allows for the use of alternative requirements when coordinating RCRA closure activities with other cleanup activities at a facility. An extended closure period is required for the 277-T Building to coordinate closure activities with the T-Plant Complex closure. The extended closure activities will occur under the CDI activities associated with T-Plant Complex OUG. T-Plant Complex OUG cleanup actions are included in the Central Plateau Cleanup Actions which are outlined in the annual Hanford Lifecycle Scope, Schedule, and Cost Report required by TPA (Ecology et al., 1989a) Milestone M-036-01.

Approval of this closure plan will grant the Hanford Site an extended closure period for performance of the sample and analysis activities, in accordance with WAC 173-303-610(4)(c), and a separate extension request will not be filed (Figure I-2).

I5 Closure Costs

An annual report outlining updated projections of anticipated closure costs for the Hanford Facility TSD units having final status is not required per Permit Condition II.H.

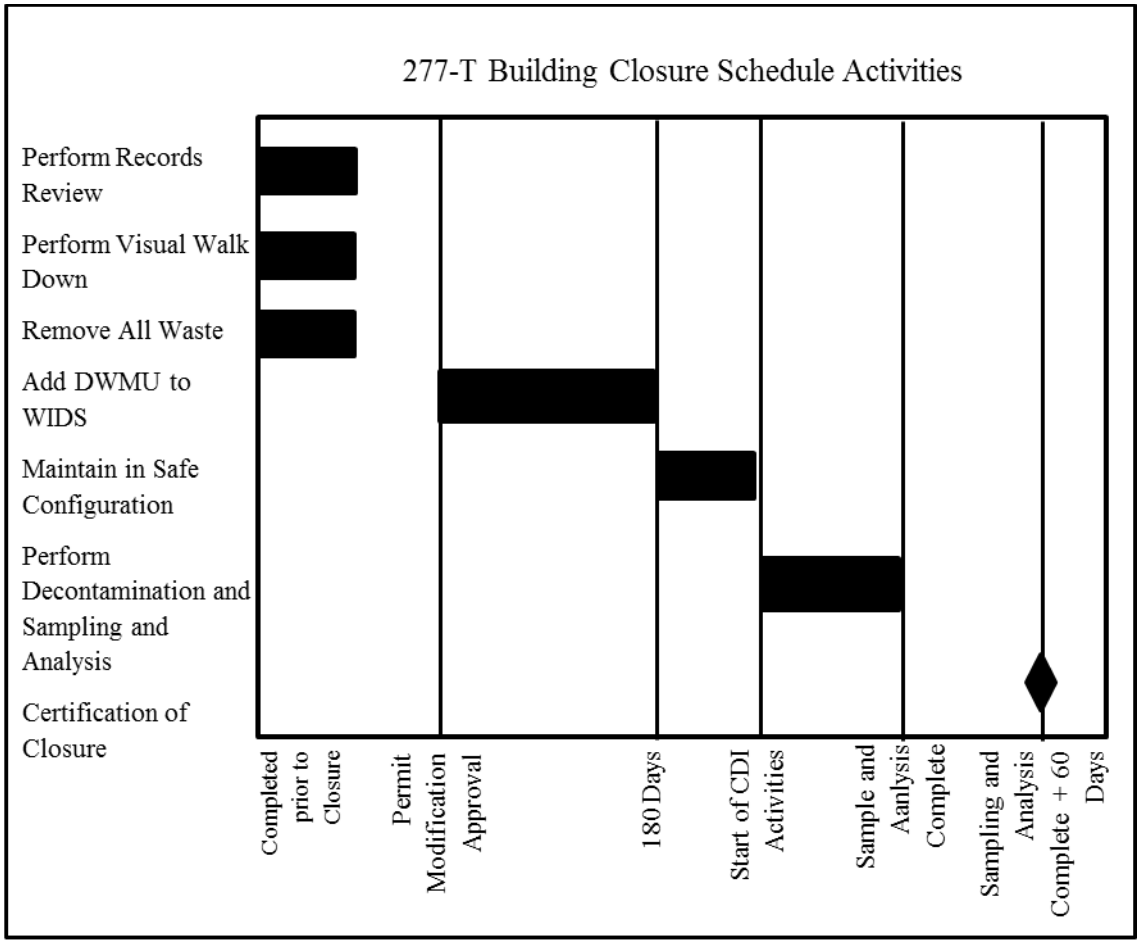


Figure I-2. 277-T Building Closure Schedule Activities

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Attachment A

T-Plant 277-T Building Sample and Analysis Plan

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277-T Building

Sample and Analysis Plan

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Contents

Figures

Tables

Terms

ASTM	American Society for Testing and Materials
CAS	Chemical Abstract Services
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
DOT	U.S. Department of Transportation
DQA	data quality assessment
DQI	data quality indicator
EB	equipment blank
ECO	Environmental Compliance Officer
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FSP	field sampling plan
FTB	full trip blank
FWS	field work supervisor
FXR	field transfer blank
HASQARD	*Hanford Analytical Services Quality Assurance Requirements Documents*
HEIS	Hanford Environmental Information System
MDA	minimum detectable activity
MDL	method detection limit
N/A	not applicable
NA	not available
POC	point of contact
QA	quality assurance
QAPjP	quality assurance project plan
QC	quality control
RPD	relative percent difference
SAF	sampling authorization form
SAP	sampling and analysis plan
TCLP	toxicity characteristic leaching procedure
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
VOA	volatile organic analysis

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1 Introduction

1.1 Purpose

The purpose of the sampling and analysis plan (SAP) is to assist in the determination that clean closure levels have been achieved for the T-Plant Complex Operating Unit Group 277-T Building.

Sampling and analysis of the containerized rinsate resulting from decontamination of the floor surface will be conducted to confirm that clean closure cleanup levels have been achieved. All sampling and analysis will be performed in accordance with the sampling and quality standards established in this closure SAP. The closure SAP details sampling and analysis procedures in accordance with SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*; the American Society for Testing and Materials (ASTM) *Annual Book of ASTM Standards*, and other U.S. Environmental Protection Agency (EPA) approved methods. Sampling and analysis activities will meet applicable requirements in SW-846, ASTM standards, EPA-approved methods, and *Hanford Analytical Services Quality Assurance Requirements Documents (HASQARD)* (DOE/RL-96-68).

1.2 Statement of the Problem

The objective of the sampling and analysis described in this document is to verify that the target analytes in rinsate resulting from decontamination of the 277-T Building floor during closure activities meet Universal Treatment Standards in accordance with WAC 173-303-140(2)(a), "Dangerous Waste Regulations," "Land Disposal Restrictions," thereby demonstrating clean closure of the 277-T Building.

1.3 Target Analytes

Target analytes were determined by reviewing waste management records for the dangerous waste stored in the 277-T Building (Table 1-1).

Table 1-1. Target Analyte List

Target Analyte	CAS Number	Target Analyte	CAS Number
Arsenic (D004)	7440-38-2	Acetone (F003)	67-64-1
Barium (D005)	7440-39-3	N-butyl alcohol (F003)	71-36-3
Cadmium (D006)	7440-43-9	Cyclohexanone (F003)	108-94-1
Chromium (Hexavalent) (D007)	18540-29-9	Ethyl acetate (F003)	141-78-6
Lead (D008)	7439-92-1	Ethyl benzene (F003)	100-41-4
Mercury (D009)	7439-97-6	Ethyl ether (F003)	60-29-7
Selenium (D010)	7782-49-2	Methanol (F003)	67-56-1
Silver (D011)	7440-22-4	Methyl isobutyl ketone (F003)	108-10-1
Carbon tetrachloride (F001) (F002)	56-23-5	Xylene (F003)	1330-20-7
Methyl ethyl ketone (MEK) (F005)	78-93-3	o-Cresol (F004)	95-48-7

Table 1-1. Target Analyte List

Target Analyte	CAS Number	Target Analyte	CAS Number
Tetrachloroethylene (F001) (F002)	127-18-4	Benzene, nitro (F004)	98-95-3
Trichloroethylene (F001)(F002)	79-01-6	Pyridine (F005)	110-86-1
1,1,1-Trichloroethane (F001) (F002)	71-55-6	2-nitropropane (F005)	79-46-9
Chlorinated fluorocarbons (F001) (F002)	Not Applicable	Carbon disulfide (F005)	75-15-0
Methylene chloride (F001) (F002)	75-09-2	Isobutanol (F005)	78-83-1
Chlorobenzene (F002)	108-90-7	2-ethoxyethanol (F005)	110-80-5
1,1,2-trichloro-1,2,2-trifluoroethane (F002)	73-13-1	Toluene (F005)	108-88-3
Ortho-dichlorobenzene (F002)	95-50-1	Benzene (F005)	71-43-1
1,1,2-trichloroethane (F002)	79-00-5	Polychlorinated biphenyls (Aroclors)	1336-36-3

CAS = Chemical Abstracts Service

1.4 Project Schedule

Sampling and analysis will follow the schedule outlined in the 277-T Building closure plan.

2 Quality Assurance Project Plan

The quality assurance project plan (QAPjP) establishes the quality requirements for environmental data collection, including planning, implementation, and assessment of sampling, field measurements, and laboratory analysis. This QAPjP complies with requirements from the following documents:

- 10 CFR 830, "Nuclear Safety Management," Subpart A, "Quality Assurance Requirements"
- DOE O 414.1D, *Quality Assurance*
- *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations* (EPA/240/B-01/003)
- *Hanford Analytical Services Quality Assurance Requirements Documents (HASQARD)* (DOE/RL-96-68)

This chapter describes the applicable quality requirements and controls. Sections 6.5 and 7.8 of the Tri-Party Agreement (TPA) (*Hanford Federal Facility Agreement and Consent Order Action Plan* [Ecology et al., 1989a]) Action Plan (*Hanford Federal Facility Agreement and Consent Order Action Plan* [Ecology et al., 1989b]) require the quality assurance (QA)/quality control (QC) and sampling and analysis activities to specify the QA requirements for treatment, storage, and disposal units, as well as for past-practice processes. Therefore, this QAPjP follows the QA elements of EPA/240/B-01/003. This QAPjP demonstrates conformance to Part B requirements of ANSI/ASQC E4-2004, *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs*.

This QAPjP is divided into the following four sections, which describe the quality requirements and controls applicable to this investigation: Project Management, Data Generation and Acquisition, Assessment and Oversight, and Data Validation and Usability.

2.1 Project Management

The following subsections address project management and ensure that the project has defined goals, the participants understand the goals and the approaches used, and the planned outputs are appropriately documented. Project management roles and responsibilities discussed in this section apply to the major activities covered under the SAP.

2.1.1 Project/Task Organization

The Permittee, or its approved subcontractor, is responsible for planning, coordinating, sampling, preparing, packaging, and shipping samples to the laboratory. The project organization (regarding sampling and characterization) is described in the following paragraphs and is shown in Figure 2-1. The Project Manager maintains a list of individuals or organizations as points of contact for each functional element in Figure 2-1.

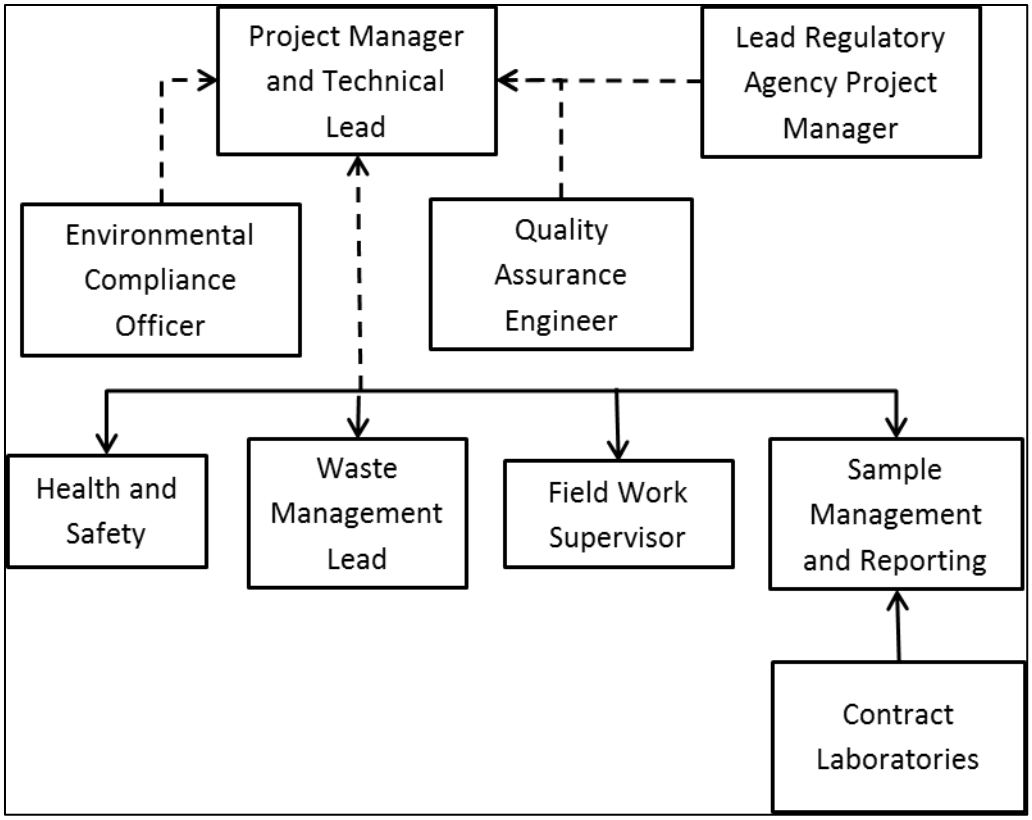

Figure 2-1. 277-T Building Closure Sampling Project Organization

The project has several key positions within the U.S. Department of Energy (DOE), Richland Operations Office (RL) organization, including the following:

- **Regulatory Project Manager:** The Washington State Department of Ecology (Ecology) has assigned project managers responsible for oversight of cleanup projects and activities. Ecology, as lead regulatory agency for the 277-T Building closure sampling project, has oversight authority for the work being performed under this SAP. Ecology will work with DOE-RL to resolve concerns over the work, as described in this SAP, in accordance with the TPA (Ecology et al., 1989a).

- **Project Manager:** The Project Manager provides oversight for activities and coordinates with DOE-RL, EPA, Ecology, and contract management. In addition, support is provided to the project technical lead to ensure that work is performed safely and cost effectively. The Project Manager (or designee) for the 277-T Building closure sampling is responsible for direct management of sampling documents and requirements, field activities, and subcontracted tasks. The Project Manager is responsible for ensuring that project personnel are working to the current version of the SAP. The Project Manager works closely with QA, Health and Safety, and the Field Work Supervisor (FWS) to integrate these and other lead disciplines in planning and implementing the work scope. The Project Manager also coordinates with DOE-RL and the primary contractor management on all sampling activities. The Project Manager supports DOE-RL in coordinating sampling activities with the regulators.

- **Environmental Compliance and Quality Assurance**. The Environmental Compliance Officer (ECO) provides technical oversight, direction, and acceptance of project and subcontracted environmental work, and develops appropriate mitigation measures with a goal of minimizing adverse

environmental impacts. The ECO also reviews plans, protocols, and technical documents to ensure that environmental requirements have been addressed; identifies environmental issues that affect operations and develops cost effective solutions; and responds to environmental/regulatory issues or concerns raised by DOE-RL and/or regulatory agencies. The ECO also oversees project implementation for compliance with applicable internal and external environmental requirements.

The QA point of contact (POC) is matrixed to the Project Manager and is responsible for QA issues on the project. Responsibilities include overseeing implementation of the project QA requirements, reviewing project documents (including the SAP and QAPjP), and participating in QA assessments on sample collection and analysis activities, as appropriate. The QA POC must be independent of the unit generating the data.

- **Health and Safety:** The Health and Safety organization is responsible for coordinating industrial safety and health support within the project, as carried out through health and safety plans, job hazard analyses, and other pertinent safety documents required by federal regulation or by internal primary contractor work requirements. In addition, Health and Safety assists project personnel in complying with applicable health and safety standards and requirements.

- **Sample Management and Reporting:** The Permittee's sampling organization coordinates laboratory analytical work, ensuring that laboratories conform to Hanford Site internal laboratory QA requirements (or their equivalent), as approved by DOE-RL, EPA, and Ecology. The sampling organization receives the analytical data from the laboratories, performs the data entry into the Hanford Environmental Information System (HEIS) database, and arranges for data validation. The sampling organization is responsible for informing the Project Manager of any issues reported by the analytical laboratory. The sampling organization develops and oversees implementation of the letter of instruction to the analytical laboratories, oversees data validation, and works with the Project Manager to prepare a characterization report on the sampling and analysis results.

- **Contract laboratories:** The contract laboratories analyze samples in accordance with established protocols and provide necessary sample reports and explanation of results in support of data validation. The laboratories must meet site-specific QA requirements and must have an approved QA plan in place.

- **Waste Management:** Waste Management communicates policies and protocols and ensures project compliance for storage, transportation, disposal, and waste tracking in a safe and cost effective manner. In addition, Waste Management is responsible for identifying waste management sampling/characterization requirements to ensure regulatory compliance, interpreting the characterization data to generate waste designations and profiles, and preparing and maintaining other documents confirming compliance with waste acceptance criteria.

- **Fieldwork Supervisor:** The FWS is responsible for planning and coordinating field sampling resources. The FWS ensures that samplers are appropriately trained and available. Additional related responsibilities include ensuring that the sampling design is understood and can be performed as specified by directing training, mock-ups, and practice sessions with field personnel.

  The FWS directs the samplers. The samplers collect rinsate samples, including replicates/duplicates, and prepare sample blanks in accordance with the SAP, corresponding protocols, and work packages. The samplers complete field logbook entries, chain-of-custody forms, and shipping paperwork and ensure delivery of the samples to the analytical laboratory.

2.1.2 Quality Objectives and Criteria

The QA objective of this plan is to develop implementation guidance providing data of known and appropriate quality. Data quality indicators (DQIs) describe data quality by evaluation against identified data needs and the work activities identified in this SAP. The applicable QC guidelines, quantitative target limits, and levels of effort for assessing data quality are dictated by the intended use of the data and the nature of the analytical method. The principal DQIs are precision, bias or accuracy, representativeness, comparability, completeness, and sensitivity. These DQIs are defined for the purposes of this document in Table 2-1. The DQIs will be evaluated during the data quality assessment (DQA) process (Section 2.4.5).

Quality objectives and project-specific measurement requirements are presented in Table 2-2. In consultation with the laboratory, the Project Manager, the sampling organization, and/or appropriate others identify applicable analytical methods.

2.1.3 Special Training/Certification

A graded approach is used to ensure that workers receive a level of training that is commensurate with responsibilities and compliant with applicable DOE orders and government regulations. The FWS, in coordination with line management, will ensure that special training requirements for field personnel are met.

Typical training requirements or qualifications have been instituted by the Permittee to meet training requirements imposed by regulations, DOE orders, and national standards such as those published by the American National Standards Institute/American Society of Mechanical Engineers. For example, the environmental, safety, and health training program provides workers with the knowledge and skills necessary to execute assigned duties safely. Field personnel typically have completed the following training before starting work:

- Occupational Safety and Health Administration 40-Hour Hazardous Waste Worker Training
- 8-Hour Hazardous Waste Worker Refresher Training (as required)
- Hanford General Employee Training

Project-specific safety training addressed explicitly to the project and the day's activity will be provided, including the following:

- Training will provide the knowledge and skills that sampling personnel need to perform work safely and in accordance with QA requirements.
- Samplers are required to be qualified in the type of sampling being performed in the field.

In addition, pre-job briefings will be performed to evaluate activities and associated hazards by considering many factors, including the following:

- Objective of the activities
- Individual tasks to be performed
- Hazards associated with the planned tasks
- Environment in which the job will be performed
- Facility where the job will be performed
- Equipment and material required
- Safety protocols applicable to the job
- Training requirements for individuals assigned to perform the work

- Level of management control
- Proximity of emergency contacts

Training records are maintained for each employee in an electronic training record database. The Permittee's training organization maintains the training records system.

2.1.4 Documents and Records

The Project Manager is responsible for ensuring that the current version of the SAP is being used and for providing any updates to field personnel. Version control is maintained by the administrative document control process. Changes to the SAP affecting the data needs will be submitted to DOE and the lead regulatory agency as a permit modification in accordance with WAC 173-303-610, "Dangerous Waste Regulations," "Closure and Post-Closure."

The FWS is responsible for ensuring that the field instructions are maintained and aligned with any revisions or approved changes to the SAP. The FWS will ensure that deviations from the SAP or problems encountered in the field are documented appropriately (e.g., in the field logbook or on nonconformance report forms) in accordance with internal corrective action protocols.

The Project Manager, FWS, or designee is responsible for communicating field corrective action requirements and ensuring that immediate corrective actions are applied to field activities.

Logbooks are required for field activities. A logbook must be identified with a unique project name and number. The individual(s) responsible for logbooks will be identified in the front of the logbook, and only authorized persons may make entries in logbooks. Logbooks will be signed by the FWS, cognizant scientist/engineer, or other responsible individual. Logbooks will be permanently bound, waterproof, and ruled with sequentially numbered pages. Pages will not be removed from logbooks for any reason. Entries will be made in indelible ink. Corrections will be made by marking through the erroneous data with a single line, entering the correct data, and initialing and dating the changes.

The Project Manager is responsible for ensuring that a project file is properly maintained. The project file will contain the records or references to their storage locations. The following items will be included in the project file, as appropriate:

- Field logbooks or operational records
- Data forms
- Global positioning system data
- Chain-of-custody forms
- Sample receipt records
- Inspection or assessment reports and corrective action reports
- Interim progress reports
- Final reports
- Laboratory data packages
- Verification and validation reports

Table 2-1. Data Quality Indicators

DQI	Definition	Example Determination Methodologies	Project-Specific Information	Corrective Actions
Precision	The measure of the degree of reproducibility of measurements under prescribed similar conditions. May be expressed as a percentage of the mean of the measurements, such as relative range, relative percent difference, or relative standard deviation (coefficient of variation).	Use the same analytical instrument to make repeated analyses on the same sample. Use the same method to make repeated measurements of the same sample within a single laboratory. Split a sample in the field and submit both for sample handling, preservation and storage, and analytical measurements. Collect, process, and analyze collocated samples for information on sample acquisition, handling, shipping, storage, preparation, and analytical processes and measurements.	Field precision: At randomly selected locations, duplicate samples will be taken one per 20 samples per media. Laboratory precision; analysis of laboratory duplicate or matrix spike duplicate.	If duplicate data do not meet objective: Evaluate apparent cause (e.g., sample heterogeneity) Request reanalysis or remeasurement Qualify the data before use
Accuracy	A measure of the overall agreement of a measurement to an accepted reference or true value. Sample accuracy is expressed as the percent recovery of a spiked sample.	Analyze a reference material or reanalyze a sample to which a material of known concentration or amount of pollutant has been added (a spiked sample).	Laboratory accuracy Determination based on matrix spikes and matrix spike duplicates.	If recovery does not meet objective: Qualify the data before use Request re-analysis or remeasurement

Table 2-1. Data Quality Indicators

DQI	Definition	Example Determination Methodologies	Project-Specific Information	Corrective Actions
Representa-tiveness	A qualitative term to express "the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition." (ANSI/ASQC S2-1995)	Evaluate whether measurements are made and physical samples collected in such a manner that the resulting data appropriately reflect the environment or condition being measured or studied.	Samples will be collected as described in the sampling design. Judgment sampling ensures areas most likely to be contaminated, based on current information, will be evaluated. Random sampling is based on ensuring all members of the group are equally likely to be chosen and allows probability statements to be made about the quality of estimates derived from the data.	If results are not representative of the system sampled: Identify the reason for the not being representative Reject the data, or, if data are otherwise usable, qualify the data for limited use and define the portion of the system that the data represent Redefine sampling and measurement requirements and protocols Resample and reanalyze
Comparability	A qualitative term expressing the measure of confidence that one data set can be compared to another and can be combined for the decision(s) to be made.	Compare sample collection and handling methods, sample preparation and analytical procedures, holding times, stability issues, and QA protocols.	Sampling personnel will use the same sampling protocols. Samples will be submitted to the same laboratories when possible (based on laboratory contracts) for analysis by the same methods, thus data results will be comparable.	If data are not comparable to other data sets: Identify appropriate changes to data collection and/or analysis methods Identify quantifiable bias, if applicable. Qualify the data as appropriate Resample and/or reanalyze if needed. Revise sampling/analysis protocols to ensure future comparability

Table 2-1. Data Quality Indicators

DQI	Definition	Example Determination Methodologies	Project-Specific Information	Corrective Actions
Completeness	A qualitative term expressing the measure of confidence that one data set can be compared to another and can be combined for the decision(s) to be made.	Compare sample collection and handling methods, sample preparation and analytical procedures, holding times, stability issues, and QA protocols.	Sampling personnel will use the same sampling protocols. Samples will be submitted to the same laboratories when possible (based on laboratory contracts) for analysis by the same methods, thus data results will be comparable.	If data are not comparable to other data sets: Identify appropriate changes to data collection and/or analysis methods Identify quantifiable bias, if applicable. Qualify the data as appropriate Resample and/or reanalyze if needed. Revise sampling/analysis protocols to ensure future comparability
Sensitivity	The capability of a method or instrument to discriminate between measurement responses representing different levels of the variable of interest.	Determine the minimum concentration or attribute to be measured by a method (method detection limit), by an instrument (instrument detection limit), or by a laboratory (quantitation limit). The practical quantitation limit is the lowest level, which can be routinely quantified and reported by a laboratory.	Ensure sensitivity, as measured detection limits, is appropriate for the action levels.	If sensitivity does not meet objective: Request reanalysis or remeasurement. Qualify/reject the data before use.

Source: ANSI/ASQC S2-1995, *Introduction to Attribute Sampling*.

DQI = data quality indicator

QA = quality assurance

Table 2-2. Water Analytical Performance Requirements

CAS Number	Analyte	Analytical Method	Closure Performance Standard[a]	Practical Quantitation Limit[e] (µg/L)	Accuracy Req't (Percent Recovery)[b]	Precision Req't (RPD)[b]
Performance Requirements for Laboratory Measurements (Nonradiological)						
7440-38-2	Arsenic	SW-846 Method 6010	5 mg/L TCLP	10	±20	≤20
7440-39-3	Barium	SW-846 Method 6010 or 200.8	21 mg/L TCLP	5.0	±20	≤20
7440-43-9	Cadmium	SW-846 Method 6010 or 200.8	0.11 mg/L TCLP	2.0	±20	≤20
18540-29-9	Chromium (Hexavalent)	SW-846 Method 6010 or 200.8	0.60 mg/L TCLP	2.0	±20	≤20
7439-91-1	Lead	SW-846 Method 6020 or 200.8	0.75 mg/L TCLP	2.0	±20	≤20
7439-97-6	Mercury	SW-846 Method 7471 or 200.8	0.2 mg/L TCLP	0.5	±20	≤20
7782-49-2	Selenium	SW-846 Method 6020 or 200.8	5.7 mg/L TCLP	50	±20	≤20
7440-22-4	Silver	SW-846 Method 6020 or 200.8	0.14 mg/L TCLP	2.0	±20	≤20
71-43-2	Benzene	SW-846 Method 8260	10 mg/L	5.0	N/A[c]	≤20
56-23-5	Carbon tetrachloride	SW-846 Method 8260	6.0 mg/L	5.0	N/A[c]	≤20
78-93-3	Methyl ethyl ketone (MEK) (2-butanone)	SW-846 Method 8260	36 mg/L	10	N/A[c]	≤20
110-86-1	Pyridine	SW-846 Method 8260	16 mg/L	5	N/A[c]	≤20
71-55-6	1,1,1-trichloroethane	SW-846 Method 8260	6 mg/L	5.0	N/A[c]	≤20
76-13-1	chlorinated fluorocarbons	SW-846 Method 8260	30 mg/L	10	N/A[c]	≤20

Table 2-2. Water Analytical Performance Requirements

CAS Number	Analyte	Analytical Method	Closure Performance Standard[a]	Practical Quantitation Limit[e] (µg/L)	Accuracy Req't (Percent Recovery)[b]	Precision Req't (RPD)[b]
75-09-2	methylene chloride	SW-846 Method 8260	30 mg/L	5	N/A[c]	≤20
67-64-1	Acetone	SW-846 Method 8260	160 mg/L	20	N/A[c]	≤20
71-36-3	n-butyl alcohol	SW-846 Method 8260	2.6 mg/L	100	N/A[c]	≤20
108-94-1	Cyclohexanone	SW-846 Method 8270	0.75 mg/L TCLP	5	N/A[c]	≤20
141-78-6	Ethyl acetate	SW-846 Method 8015	33 mg/L	5,000	N/A[c]	≤20
100-41-4	Ethyl benzene	SW-846 Method 8260	10 mg/L	4	N/A[c]	≤20
60-29-7	Ethyl ether	SW-846 Method 8015	160 mg/L	5,000	N/A[c]	≤20
67-56-1	Methanol	SW-846 Method 8015	0.75 mg/L TCLP	1,000	N/A[c]	≤20
108-10-1	Methyl isobutyl ketone	SW-846 Method 8260	33 mg/L	10	N/A[c]	≤20
127-18-4	Tetrachloroethylene	SW-846 Method 8260	6 mg/L	5	N/A[c]	≤20
79-01-6	Trichloroethylene	SW-846 Method 8260	6 mg/L	1	N/A[c]	≤20
108-38-3	m-Xylene	SW-846 Method 8260	30 mg/L[d]	5	N/A[c]	≤20
95-47-6	o-Xylene	SW-846 Method 8260	30 mg/L[d]	5	N/A[c]	≤20
106-42-3	p-Xylene	SW-846 Method 8260	30 mg/L[d]	5	N/A[c]	≤20
1336-36-3	Polychlorinated biphenyls	SW-846 Method 8082	10 mg/L	0.5	N/A[c]	≤20
95-48-7	o-Cresol	SW-846 Method 8270	5.6 mg/L	33	N/A[c]	≤20
98-95-3	Benzene, nitro	SW-846 Method 8260	14 mg/L	10	N/A[c]	≤20
108-88-3	Toluene	SW-846 Method 8260	10 mg/L	5	N/A[c]	≤20
79-46-9	2-nitropropane	SW-846 Method 8260	NA	10	N/A[c]	≤20
75-15-0	Carbon disulfide	SW-846 Method 8260	4.8 mg/L TCLP	5	N/A[c]	≤20

Table 2-2. Water Analytical Performance Requirements

CAS Number	Analyte	Analytical Method	Closure Performance Standard[a]	Practical Quantitation Limit[e] (µg/L)	Accuracy Req't (Percent Recovery)[b]	Precision Req't (RPD)[b]
78-83-1	Isobutanol	SW-846 Method 8260	170 mg/L	500	N/A[c]	≤20
110-80-5	2-ethoxyethanol	SW-846 Method 8260	NA	750	N/A[c]	≤20
108-90-7	Chlorobenzene	SW-846 Method 8260	6 mg/L	2,000,000	N/A[c]	≤20
79-00-5	1,1,2-trichloroethane	SW-846 Method 8260	6 mg/L	5	N/A[c]	≤20
76-13-1	1,1,2-trichloro-1,2,2-trifluoroethane	SW-846 Method 8260	30 mg/L	10	N/A[c]	≤20
95-50-1	Ortho-dichlorobenzene	SW-846 Method 8260	6 mg/L	10	N/A[c]	≤20

Source: SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B.*

a. Closure performance standards are the universal treatment standards for non-wastewater found in WAC 173-303-140(2)(a), "Dangerous Waste Regulations," "Land Disposal Restrictions."

b. Accuracy criteria for associated batch matrix spike percent recoveries. Evaluation based on statistical control of laboratory control samples is also performed. Precision criteria for batch laboratory replicate matrix spike analyses or replicate sample analyses.

c. Determined by the laboratory based on historical data or statistically derived control limits. Limits are reported with the data. Where specific acceptance criteria are listed, those acceptance criteria may be used in place of statistically derived acceptance criteria.

d. The 30 mg/L action level is based on the sum of the xylene isomers.

e. For these analytical performance requirements, the required detection limit and practical quantitation limit are identical.

CAS = Chemical Abstract Services
N/A = not applicable
NA = information not available
RPD = relative percent difference
TCLP = toxicity characteristic leaching procedure

The laboratory is responsible for maintaining, and having available upon request, the following:

- Analytical logbooks
- Raw data and QC sample records
- Standard reference material and/or proficiency test sample data
- Instrument calibration information

Records may be stored in either electronic or hardcopy format. Documentation and records, regardless of medium or format, are controlled in accordance with internal work requirements and processes to ensure the accuracy and retrievability of stored records. Records required by the TPA (Ecology et al., 1989a) will be managed in accordance with the requirements therein.

2.2 Data Generation and Acquisition

The following subsections present the requirements for sampling methods and identification, sample handling and custody, analytical methods, measurement and analysis, data collection or generation, data handling, and field and laboratory QC. The requirements for instrument calibration and maintenance, supply inspections, and data management are also addressed. The sampling design is presented in the field sampling plan (FSP) in Chapter 3 of this SAP.

The FWS is responsible for ensuring that all field procedures are followed completely and that field sampling personnel are adequately trained to perform sampling activities under this SAP. The field team lead must document all deviations from procedures or other problems pertaining to sample collection, chain-of-custody, sample analytes, sample transport, or noncompliant monitoring. As appropriate, such deviations or problems will be documented in the field logbook or in nonconformance report forms in accordance with internal corrective action procedures. The FWS or Project Manager is responsible for communicating field corrective action requirements and for ensuring that immediate corrective actions are applied to field activities.

2.2.1 Sampling Process Design

The sampling design consists of grab sampling of the collected rinsate. Additional sampling process design details are provided in Section 3.

2.2.2 Analytical Methods

Analytical methods and parameters are provided in Table 2-2. These analytical methods are controlled in accordance with the laboratory's QA plan and the requirements of this QAPjP. Laboratory operations and analytical services shall comply with Volume 4 of HASQARD (DOE/RL-96-68, Laboratory Technical Requirements) and any specific criteria identified in Table 2-2. Criteria in Table 2-2 take precedence over similar criteria in HASQARD (DOE/RL-96-68). In consultation with the laboratory, the Project Manager, and/or others as appropriate, changes to analytical methods can be approved as long as the method is based upon a nationally recognized standard (e.g., EPA or ASTM) method, the new method achieves project data needs as well or better than the replaced method, and the new method is required due to the nature of the sample. Oversight of offsite analytical laboratories to qualify them for performing Hanford Site analytical work is performed as necessary.

If the laboratory uses a nonstandard or unapproved method, then the laboratory must provide method validation data to confirm that the method is adequate for the intended use of the data. This includes information such as determination of detection limits, quantitation limits, typical recoveries, and analytical precision and bias. Deviations from the analytical methods noted in Table 2-2 must be approved in consultation with the Project Manager.

Issues that may affect analytical results are to be resolved in coordination with the Project Manager.

2.2.3 Quality Control

QC procedures must be followed in the field and laboratory to ensure that reliable data are obtained. Field QC samples will be collected to evaluate the potential for cross-contamination and to provide information pertinent to field sampling variability. Field QC sampling will include the collection of full trip blank, field transfer blank, equipment rinsate blank, field duplicate, and field split samples. Laboratory QC samples estimate the precision and bias of the analytical data. Field and laboratory QC samples are summarized in Table 2-3.

Table 2-3. Project Quality Control Sampling Summary

Quality Control Sample Type	Frequency	Characteristics Evaluated
Field Quality Control		
Full Trip Blank (FTB)	One per 20 samples per media sampled.	Contamination from containers or transportation
Equipment Rinsate Blank (EB)	As needed. If only disposable equipment is used, an equipment blank is not required. Otherwise, one per 20 samples per media[a].	Adequacy of sampling equipment decontamination and contamination from non-dedicated equipment
Field Duplicate (DUP)	One per batch[g], 20 samples maximum of each media sampled.	Precision, including sampling and analytical variability
Field Split Samples (SPLIT)	As needed. When needed, the minimum is one per analytical method, per media sampled, for analyses performed where detection limit and precision and accuracy criteria have been defined in the performance requirements tables.	Precision, including sampling, analytical, and inter-laboratory
Laboratory Quality Control[g]		
Method Blanks	1 per batch[g]	Laboratory contamination
Lab Duplicates	[b]	Laboratory reproducibility and precision
Matrix Spikes	[b]	Matrix effect/laboratory accuracy
Matrix Spike Duplicates	[b]	Laboratory reproducibility, accuracy, and precision
Surrogates	[b]	Recovery/yield
Tracers	[b]	Recovery/yield

Table 2-3. Project Quality Control Sampling Summary

Quality Control Sample Type	Frequency	Characteristics Evaluated
Laboratory Control Samples	1 per batch[g]	Evaluate laboratory accuracy
Performance Evaluation Programs[c]	Annual	Evaluate laboratory accuracy
Double-Blind Standards	Quarterly[d]	Evaluate laboratory accuracy
Audit/Assessment	Annually[e] or every 3 years[f]	Evaluate overall laboratory performance and operations

a. Whenever a new type of non-dedicated equipment is used, an equipment blank shall be collected every time sampling occurs until it can be shown that less frequent collection of equipment blanks is adequate to monitor the decontamination procedure for the non-dedicated equipment.

b. As defined in the laboratory contract or quality assurance plan and/or analysis procedures.

c. Nationally recognized program, such as DOE Mixed Analyte Performance Evaluation Program or Environmental Resource Associates.

d. Water matrix double-blind standards are submitted quarterly.

e. DOE Quality Systems for Analytical Services requires annual audit of commercial laboratories.

f. DOE/RL-96-68, 2007, *Hanford Analytical Services Quality Assurance Requirements Documents* (HASQARD) does not define a frequency for assessment of onsite laboratories. Three year evaluated supplier list requirement is typically applied.

g. Batching across projects is allowing for similar matrices.

DOE = U.S. Department of Energy

2.2.3.1 Field Quality Control Samples

Field QC samples will be collected to evaluate the potential for cross-contamination and to provide information pertinent to field sampling variability and laboratory performance to help ensure reliable data are obtained. Field QC samples include field duplicates, split samples, and three types of field blanks (full trip, field transfer, and equipment blanks). Field blanks are typically prepared using high-purity reagent water. Silica sand should be used, instead of reagent water, when required by the SAP. The QC samples and the required frequency for collection are described in this subsection. Particular care will be exercised to avoid the following common ways in which cross-contamination or background contamination may compromise samples:

- Improperly storing or transporting sampling equipment and sample containers
- Contaminating the equipment or sample bottles by setting the equipment/sample bottle on or near potential contamination sources (e.g., uncovered ground)
- Handling bottles or equipment with dirty hands or gloves
- Improperly decontaminating equipment before sampling or between sampling events

This number of QC samples is conservatively established based on site procedures that call for approximately one set of QC samples per 20 samples.

- **Full-trip blank (FTB):** FTBs are prepared by the sampling team prior to traveling to the sampling site. The preserved bottle set is either for volatile organic analysis (VOA) only or identical to the set that will be collected in the field. It is filled with high purity reagent water or silica sand, as appropriate to the primary sample media. The bottles are sealed and transported, unopened, to the field in the same storage containers used for samples collected the same day. FTBs are typically analyzed for the same constituents as the samples from the associated sampling event. FTBs are used to evaluate potential contamination of the samples attributable to the sample bottles, preservative, handling, storage, and transportation.

- **Field transfer blank (FXR):** FXRs are preserved VOA sample bottles filled at the sample collection site with high purity reagent water or silica sand (as appropriate to the primary sample media) that has been transported to the field. The samples are prepared during sampling to evaluate potential contamination attributable to field conditions. After collection, FXR sample bottles are sealed and placed in the same storage containers with the samples collected the same day for the associated sampling event. FXR samples will be analyzed for volatile organic compounds only.

- **Equipment blank (EB):** EBs consist of high purity reagent water or silica sand passed through or poured over the decontaminated sampling equipment identical to the sample set that will be collected and placed in sample containers, as identified on the project sampling authorization form (SAF). EB sample bottles are placed in the same storage containers with the samples from the associated sampling event. EB samples will be analyzed for the same constituents as the samples from the associated sampling event. EBs will be used to evaluate the effectiveness of the decontamination process.

  EBs are collected from reusable sampling devices on a 1-in-20 basis and are not required for disposable sampling equipment.

  For field blanks (i.e., FTB, FXR, and EB), results greater than two times the method detection limit (MDL) or minimum detectable activity (MDA) are identified as suspect contamination. However, for common laboratory contaminants such as acetone, methylene chloride, 2-butanone, toluene, and phthalate esters, the limit is five times the MDL. For radiological analytical data, blank results are flagged if they are greater than two times the total MDA.

- **Field duplicates (DUP):** DUPs are independent samples collected as close as possible to the same time and same location as the parent sample and are intended to be identical. DUPs are collected at a frequency of one in 20 samples. DUPs are two separate samples collected from the same source, placed in separate sample containers, and analyzed independently. DUPs should be collected from an area expected to have some contamination, so valid comparisons between the samples can be made (i.e., some constituents will be greater than detection limit).

  DUPs must agree within 20 percent, as measured by the RPD, to be acceptable. Only those DUPs with at least one result greater than five times the Universal Treatment Standards limit are evaluated. DUP results not satisfying evaluation criteria will be qualified and flagged in HEIS, as appropriate.

  DUPs are stored and transported together and will be analyzed for the same constituents. DUPs are used to determine precision for both sampling and laboratory measurements. Evaluation of the results can provide an indication of intra-laboratory variability. Large relative percent differences (RPDs) can be an indication of potential laboratory performance problems and should be investigated.

  Collocated samples are two samples collected as close as possible to the same time and location and are not homogenized. This sampling protocol is used when homogenizing samples for split or duplicate samples could affect the quality of data (i.e., VOA analysis).

- **Field split samples:**. Field split samples (SPLIT) are two samples collected as close as possible to the same time and same location and are intended to be identical. VOA splits will be sampled as collocated samples, as described previously. SPLITs are stored in separate containers and analyzed by different laboratories for the same or similar analytes. SPLITs are inter-laboratory comparison samples used to evaluate comparability between laboratories. Large RPDs can be an indication of potential laboratory performance problems and should be investigated.

2.2.3.2 Laboratory Quality Control Samples

Laboratory QC samples (e.g., method blanks and laboratory control sample/blank spike) are defined for the three-digit EPA methods (EPA-600/4-79-20, *Methods for Chemical Analysis of Water and Wastes*) and four-digit EPA methods (SW-846) and will be run at the frequency specified in the respective reference, unless superseded by agreement.

QC checks outside of control limits will be reflected in the narrative of the analytical report and during the DQA process, if performed.

For chemical analyses, the control limits for laboratory duplicate samples, matrix spike samples, matrix spike duplicate samples, surrogate recoveries, and laboratory control samples are typically derived from historical data at the laboratories in accordance with SW-846. Typical control limits are within 25 percent of the expected values, although the limits may vary considerably depending upon the method and analyte.

2.2.4 Equipment

Equipment used for collection, measurement, and testing should meet applicable standards (e.g., ASTM) or will have been evaluated as acceptable and valid in accordance with the procedures, requirements, and specifications. The FWS, field technical representative, or equivalent will ensure that the data generated from instructions using a software system are backed up and/or downloaded on a regular basis. Software configuration will be acceptance tested prior to use in the field.

Measurement and testing equipment used in the field or in the laboratory that directly affect the quality of analytical data will be subject to preventive maintenance measures to minimize measurement system downtime. Laboratories and onsite measurement organizations must maintain and calibrate their equipment. Maintenance requirements (e.g., documentation of routine maintenance) will be included in the individual laboratory and onsite organization's QA plan or operating procedures, as appropriate. Maintenance of laboratory instruments will be performed in a manner consistent with the three-digit EPA methods (EPA-600/4-79-020) and four-digit EPA methods (SW-846), or with auditable DOE Hanford Site and contractual requirements. Consumables, supplies, and reagents will be reviewed per SW-846 requirements and will be appropriate for their use.

2.2.5 Inspection of Consumable Supplies

Consumables, supplies, and reagents will be reviewed in accordance with the current requirements of SW-846, or other EPA method being used, or by an approved site analytical procedure. Potential contamination is monitored by field QC samples and laboratory blanks. The lot number from the manufacturer certified, pre-cleaned sample containers will be recorded in the sampler's logbook.

2.2.6 Data Management

Data resulting from implementation of the SAP will be stored in the HEIS database. Reports and supporting analytical data packages will be subject to final technical review by qualified reviewers before submittal to the regulatory agencies or before inclusion in reports or technical memoranda.

2.2.7 Field Documentation Management

Field documentation shall be maintained in the form of chain-of-custody/sample analysis request forms and logbook entries. Other documentation is described in Section 2.1.3. Approved work control packages and procedures will be used to document field activities, including nonradiological measurements, when this SAP is implemented. Field activities will be recorded in the field logbook.

2.3 Assessment and Oversight

The elements in assessment and oversight address the activities for assessing the effectiveness of project implementation and associated QA and QC activities. The purpose of assessment is to ensure that the QAPjP is implemented as prescribed.

2.3.1 Assessments and Response Actions

Contractor Management, Regulatory Compliance, QA, and/or Health and Safety organizations may conduct surveillances and assessments to verify compliance with the requirements outlined in this SAP, project work packages, the project quality management plan, procedures, and regulatory requirements. The Project Manager will determine whether a DQA will be performed for the activities identified in this SAP. The DQA process, if performed, is discussed in Section 2.4. The results of the DQA will be provided to the Project Manager. No other planned assessments have been identified.

If circumstances arise in the field dictating the need for additional assessment activities, then additional assessments would be performed. Deficiencies identified by these assessments will be reported in accordance with existing programmatic requirements. The project's line management chain coordinates the corrective actions/deficiencies in accordance with the contractor QA program, the corrective action management program, and associated procedures implementing these programs. When appropriate, corrective actions will be taken by the Project Manager.

2.3.2 Reports to Management

Management will be made aware of deficiencies identified by self-assessments, corrective actions from ECOs, and findings from QA assessments and surveillances.

2.4 Data Review, Verification, and Validation, and Usability Requirements

Analytical results will be received from the laboratory, loaded into a database (e.g., HEIS), and verified (Section 2.4.1). A total of 5 percent of the data will be validated (Section 2.4.3). A DQA may be performed, if requested, on the final data (Section 2.4.4). At the direction of the Project Manager (or designee), analytical data packages will be subject to final technical review by qualified personnel before submittal to the regulatory agencies or inclusion in reports.

2.4.1 Verification and Validation Methods

Validation activities will be based on EPA functional guidelines. Data validation may be performed by the Permittee and/or by a party independent of both the data collector and the data user. Data validation qualifiers must be compatible with the HEIS database.

When outliers or questionable results are identified, the data associated with these outliers and questionable data will be evaluated and additional data validation will be performed. The additional data validation will consist of selecting up to an additional 5 percent of the statistical outliers and/or questionable data. The additional validation will begin with Level C and may increase to Levels D and E, as needed, to ensure that data are usable. Level C validation is a review of the QC data, while Levels D and E include review of calibration data and calculations of representative samples from the data set.

Data validation results will be documented in data validation reports. An example of questionable data is a positive detection greater than the practical quantitation limit or reporting limit in soil from a site that should not have exhibited contamination. Similarly, results below background would not be expected and could trigger a validation inquiry. The determination of data usability will be conducted and documented in a DQA report.

Data validation results will be documented in data validation reports, which will be included in the project file.

2.4.2 Data Verification and Usability Methods

Review of field paperwork, analytical data packages, and electronic files from the laboratory information management system will be performed. Sampling documents include the soil sampling record, chain-of-custody forms, field logbook pages, and other paperwork associated with sampling and shipping. These documents are reviewed for completeness, approvals, and legibility. Analytical and QC data from the laboratories are verified to be complete, reported correctly, and within applicable limits. Laboratory documents will be rechecked to verify the condition of the samples upon receipt at the laboratory and determine if problems arose during analysis that may have affected the data. When issues arise with samples before the analytical data are processed, resolution of those issues will be initiated.

2.4.3 Resolution of Analytical System Errors

Errors reported by the laboratories are reported, and a sample disposition record is initiated in accordance with Permittee procedures. This process is used to document analytical errors and establish resolution with the Project Manager. In addition, the Permittee QA Engineer receives reports providing summaries and statistics of the analytical errors.

2.4.4 Data Validation

The format and requirements for data validation activities are based upon the most current version of USEPA-540-R-08-01, *National Functional Guidelines for Superfund Organic Methods Data Review* (OSWER 9240.1-48), and USEPA-540-R-10-011, *National Functional Guidelines for Inorganic Superfund Data Review* (OSWER 9240.1-51). Performance of data validation activities, typically by a party independent of the data collector, data generator, and data user is arranged. Third party data validation reports are reviewed for completeness and contractual compliance and also by Project QA personnel. A total of 5 percent of the results will undergo Level C validation, as defined by the validation guidelines.

2.4.5 Data Quality Assessment

The DQA process compares completed field activities to those in corresponding documents and provides an evaluation of the resulting data. The purpose of the DQA is to determine whether quantitative data are of the correct type and are of adequate quality and quantity to meet the project data quality objectives. The assessment will be consistent with the DQA process in EPA/240/B-06/002, *Data Quality Assessment: A Reviewer's Guide*, and EPA/240/B-06/003, *Data Quality Assessment: Statistical Methods for Practitioners*.

3 Field Sampling Plan

The FSP provides a discussion of the project sampling and analytical requirements, which includes defining the number and location of samples, sampling methods, and analyses that will be performed, overall sampling objectives, and a discussion of waste management.

3.1 Site Background and Objectives

Site background information is contained in Chapter 1. The target analytes are presented in Table 1-1. The objective of the FSP is to identify project sampling and analysis activities clearly. The FSP uses the sampling design identified during the systematic planning process and identifies sampling locations, the total number of samples to be collected and the analyses to be performed.

3.2 Sampling Design

The sampling design consists of liquid grab samples taken from the rinsate collected during the decontamination performed as part of the closure verification activities described in the 277-T Building closure plan.

3.3 Sample Location and Frequency

Table 3-1 provides the sample locations, frequencies, and sampling methods to be used. Grab samples of the rinsate will be collected using a composite liquid waste sampler, liquid grab sampler, or similar device.

3.4 Sampling Methods

To ensure sample and data usability, sampling associated with this SAP will be performed in accordance with established sampling practices, procedures, and requirements pertaining to sample collection, collection equipment, and sample handling. The Project Manager and contractor management are responsible for ensuring that all field procedures are followed completely and that field sampling personnel are adequately trained to perform sampling activities.

Grab sample matrix will consist of containerized rinsate liquid collected in pre-cleaned sample containers. To ensure sample and data usability, sampling will be performed in accordance with established sampling practices, procedures, and requirements pertaining to sample collection, collection equipment, and sample handling.

Field sampling shall comply with HASQARD (DOE/RL-96-68), Volumes 1 and 2.

Sample preservation, container, and holding time requirements are specified in Table 3-2 for liquid samples. These requirements are in accordance with the analytical method specified. The final container type and volumes will be identified on the SAF and chain-of-custody form. This monitoring plan defines a “sample” as a filled sample bottle for starting the clock for holding-time restrictions.

Table 3-1. Sample Locations, Frequencies, and Sampling Methods

Sampling Objectives	Sample Matrix	Sample Locations	Number of Samples	Number of Quality Assurance Samples	Sampling Methods	Sampling Frequency
Decision unit	Liquid	Grab samples	One sample per container of rinsate	One each of the following samples: full trip blank, field transfer blank, equipment rinsate blank, and field duplicate.	Samples will be taken using a composite liquid waste sampler, liquid grab sampler, or similar device.	Each container will be sampled one time.

Table 3-2. Sample Preservation, Container, and Holding Time for Liquid Samples

Method	Analysis/Analytes	Preservation Requirement	Holding Time	Bottle Type	Minimum Sample Size
EPA 6010	Metals	HNO_3 to pH<2	6 months	G/P	500 mL
EPA 7470	Mercury	HNO_3 to pH<2	28 days	G	500 mL
EPA 8015	Volatile organic analytes	None	14/40 days	G	3 x 40 mL
EPA 8082	Polychlorinated biphenyl	None	None	aG	1000 mL
EPA 8260	Volatile organic analytes	HCl or H_2SO_4 to pH<2	14 days	aG	3 × 40 mL
EPA 8270	Semivolatile organic compound	Cool ~4°C	7/40 days	aG	1000 mL
EPA 200.8	Metals by ICP/MS	HNO_3 to pH<2	6 months	G/P	500 mL

Note:

For four-digit EPA methods, see SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B.*

14/40 days = 14 days from sample collection to extraction; 40 days from extraction to analysis

aG = amber glass
G = glass
H_2SO_4= Sulfuric acid
HCl = Hydrochloric acid
HNO_3= Nitric acid
ICP/MS = inductively coupled plasma/mass spectrometry
P = plastic

3.4.1 Decontamination of Sampling Equipment

To prevent potential contamination of the samples, care should be taken to use decontaminated equipment for each sampling activity.

3.5 Sample Handling

A sampling and data tracking database (e.g., HEIS) is used to track the samples from the point of collection through the laboratory analysis process. Samplers should note any anomaly with a sample (e.g., sample appears unusual) and inform the Project Manager.

Laboratory analytical results are entered and maintained in the HEIS database. HEIS sample numbers are issued to the sampling organization for the project. Each sample is identified and labeled with a unique HEIS sample number.

3.5.1 Packaging

Level I EPA pre-cleaned sample containers will be used for liquid samples collected for chemical analysis. Container sizes may vary depending on laboratory-specific volumes/requirements for meeting analytical detection limits. Preliminary container types and volumes are identified in Table 3-2.

3.5.2 Container Labeling

The sample locations, depths, and corresponding HEIS numbers are documented in the sampler's field logbook. Except for VOA samples, a custody seal (i.e., evidence tape) will be affixed to the lid of each sample container and/or sample collection package in such a way as to indicate potential tampering. The custody seal will be inscribed with the sampler's initials and date. Custody tape is not applied directly to VOA sample containers based on the potential for affecting analyte results and/or fouling of laboratory equipment. Custody seals and any other required labels/documentation can be fixed to the exterior of a plastic bag holding the VOA vials in such a manner that prevents potential tampering.

Each sample container will be labeled with the following information on firmly affixed, water-resistant labels:

- SAF number
- HEIS number
- Sample collection date and time
- Sampler identification
- Analysis required
- Preservation method (if applicable)
- Chain-of-custody identification number

In addition, sample records must include the following:

- Sample location
- Matrix (e.g., water or soil)

3.5.3 Sample Custody

Sample custody will be maintained in accordance with existing Hanford Site protocols to ensure the maintenance of sample integrity throughout the analytical process. Chain-of-custody protocols will be followed throughout sample collection, transfer, analysis, and disposal to ensure that sample integrity is maintained. A chain-of-custody record is initiated in the field at the time of sampling and will accompany each set of samples shipped to any laboratory.

Shipping requirements will determine how sample shipping containers are prepared for shipment. The analyses requested for each sample will be indicated on the accompanying chain-of-custody form. Each time the responsibility changes for the custody of the sample, the new and previous custodians will sign the record and note the date and time.

The following information is required on a completed chain-of-custody form:

- Project name

- Signature of sampler
- Unique sample number
- Date and time of collection
- Matrix
- Preservatives
- Signatures of individuals involved in sample transfer
- Requested analyses (or reference thereto)

3.5.4 Sample Transportation

All packaging and transportation instructions will be in compliance with the applicable transportation regulations, DOE requirements, and contactor requirements. Regulations for classifying, describing, packaging, marking, labeling, and transporting hazardous materials, hazardous substances, and hazardous waste are mandated by the U.S. Department of Transportation (DOT) as described in 49 CFR 171, "Transportation," "General Information, Regulations, and Definitions," through 49 CFR 177, "Transportation," "Carriage By Public Highway." Carrier specific requirements should also be considered when preparing sample shipments conveyed by air freight providers.

Samples containing hazardous constituents shall be considered hazardous material in transportation and transported according to 49 CFR 173, "Transportation," "Shippers – General Requirements for Shipments and Packagings." Samples shall be screened, or relevant historical data shall be used, to determine if these values are exceeded. When screening or historical data indicate that samples are radioactive, they shall be properly classified, described, packaged, marked, labeled, and transported according to DOT requirements.

3.5.5 Corrective Actions and Deviations for Sampling Activities

The Project Manager, FWS, or designee must document deviations from procedures or other issues pertaining to sample collection, chain-of-custody, target analytes, sample transport, or noncompliance. Examples of deviations include samples not collected because of field conditions, changes in sample locations because of physical obstructions, or additions of sample depths.

As appropriate, such deviations or problems will be documented in the field logbook or on nonconformance report forms in accordance with internal corrective action procedures. The Project Manager, FWS, or designee will be responsible for communicating field corrective action requirements and for ensuring that immediate corrective actions are applied to sampling activities.

Changes in sample locations not affecting the data needs will require notification and approval of the Project Manager. Changes to sample locations affecting the data needs will require concurrence from DOE-RL and the lead regulatory agency. Changes to the SAP will be documented, as noted in Section 2.1.3.

3.6 Documentation of field activities

Logbooks or data forms are required for field activities. Requirements for the logbook are provided in Section 2.1.4. Data forms may be used to collect field information; however, the data forms must follow the same requirements as those for logbooks. The data forms must be referenced in the logbooks. A summary of information to be recorded in logbooks is as follows:

- Purpose of activity
- Day, date, time, and weather conditions
- Names, titles, and organizations of personnel present

- Deviations from the QAPjP or procedures
- All site activities, including field tests
- Materials quality documentation (e.g., certifications)
- Details of samples collected (e.g., preparation, splits, duplicates, matrix spikes, and blanks)
- Location and types of samples
- Chain-of-custody details and variances relating to chain-of-custody
- Field measurements
- Field calibrations and surveys, and equipment identification numbers, as applicable
- Equipment decontaminated, number of decontaminations, and variations to any decontamination procedures
- Equipment failures or breakdowns, and descriptions of any corrective actions

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4 Management of Waste

All waste generated during sampling activities will be managed in accordance with applicable regulations.

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5 Health and Safety

Field operations will be performed in accordance with health and safety requirements and appropriate project requirements. The project's site-specific health and safety plan will be followed. Work control documents will be prepared to control site operations further. Safety documentation will include an activity hazard analysis.

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Distribution

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2
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Attachment B

T-Plant 277-T Building RCRA Records Review and Facility Visual Inspection Supporting Documentation

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T Plant Complex 277-T Building Storage Area

Purpose:

A visual inspection of the T Plant Complex 277-T Building Storage Area was performed to determine if there is any evidence of spills and/or leaks from waste packages containing dangerous waste that was stored at this location from past operations. The inspection was to identify and document by photographing any waste related staining of the storage area surface, and to denote any remaining waste related items.

The inspection was performed on September 18, 2013 by David Richards Manager, T Plant (CHPRC).

Results:

Concrete floor inside the 277-T building shows stains from rusting equipment and motor vehicle oil/fluid.

No waste is being stored in this building. Building is currently used to house equipment and supplies: Inorganic absorbents, Perlite, mock up drums for NDA testing, new drum venting assemblies, new spill pallets, fans, vacuums, totes, ducting, new drum lids, test weights, box liners, drum dolly's, carts, and shielding etc.

Area was photographed.

T Plant Complex 277-T Building Storage Area

Signature/date:

David E. Richards 9-26-13

T-Plant Dangerous Waste Inspection Checklist and Operations Logbook Review

Title of Forms:	See attached table and reviewer comments.
Date of Review:	October 8, 2013
Reviewer's Name:	Sarah Horn
Waste Management Units:	221-T Railroad Cut, 277-T Building, 221-T Pipe Gallery Storage, 221-T Tank System, 2706-TB Tank System (includes 2706-TB Tank System enclosure building)
Time Frame of Review:	January 1985 through June 2013
Items of Concern Noted If "YES", complete entire checklist. If "NO", skip to Reviewer's signature and date.	YES ___ NO _X_
Items of Concerns: Attach copies of Weekly Inspection sheets noting concern.	_____ _____ _____ _____
Dates of Corrective Actions: Attach copies of Weekly Inspection sheets noting concern.	_____ _____ _____ _____
Reviewer's Signature and Date:	Sarah Horn 10/8/2013

Instructions:

Review Weekly Waste Inspection checklists and operations logbooks for any references to unplanned spills, releases or discharges associated with dangerous waste containers. Anomalies that would not affect closure of the unit such as missing labels, open containers, or dented containers, do not need to be documented.

If items of concern are noted, check "YES" and complete the entire checklist. If no items of concern are noted, check "NO" and skip to the signature and date field. Note that if no items of concern are noted for an extended period of time, the "Time Frame of Weekly Inspections" can be January 1, 20xx to December 31, 20xx or even several years if no items of concern are noted.

If unplanned spills, releases or discharges are referenced on the inspection checklist, document the item of concern as "spill", "stain", "ruptured container", etc. Also note the date of the corrective action.

Attach copies of weekly waste inspection checklists noting the items of concern and corrective actions.

Complete all review fields as applicable.

Sign and date form and deliver to Stephanie Johansen.

Reviewer Comments:

The initial records review was completed in August 2013 which included applicable daily and weekly inspection checklists, and operations logbooks for the period of January 1985 through June 2013 and is detailed in Table 1 below. The August 2013 records review focused on the following dangerous waste management areas scheduled for closure:

- 271-T Cage
- 211-T Pad
- 221-T Sand Filter Pad
- 277-T Outdoor Storage Area
- 221-T R5 Waste Storage Area

The current review included the items of concern identified during the initial August 2013 records review but focused on the following areas:

- 221-T Railroad Cut
- 277-T Building
- 221-T Pipe Gallery Storage
- 221-T Tank System
- 2706-TB Tank System (including enclosure building)

No items of concern were noted for the 221-T Railroad Cut, 277-T Building, 221-T Pipe Gallery Storage, 221-T Tank System, or the 2706-TB Tank System. Below is a table that summarizes the original records review completed in August 2013.

Table 1. T-Plant Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
T-Plant Daily Operating Logbook	Logbook	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	01/02/1985	06/22/2010	No
T-Plant Operation Logbook	Logbook	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	07/27/2010	04/07/2011	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	08/29/2005	12/01/2005	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	10/01/2007	04/22/2013	No
Weekly Surveillance Log, <90-day Storage Areas and Satellite Accumulation Areas	Weekly Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	06/07/1991	12/20/1999	No

Table 1. T-Plant Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
Treatment Facility Waste Management Weekly Inspection Log Sheet Treatment Facility Waste Management Area Daily Inspection Log Sheet Treatment Facility Waste Management Area Weekly Inspection Data Sheet Treatment Facility Waste Management Area Daily Inspection Data Sheet Weekly Waste Area Surveillance T-Plant Daily Waste Management Area Inspection Data Sheet	Weekly and Daily Dangerous Waste Inspections	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	01/2000 01/2005	12/2002 12/2007	No
Waste Management Area Daily Inspection Report Weekly Waste Area Surveillance	Weekly and Daily Inspections	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	2003	2004	Yes*
T-Plant Weekly Waste Management Area Inspection Data Sheet	Weekly Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	10/18/2007	06/12/2013	No

* A container of Insulkote was leaking. Product was determined to be non-regulated material.

Addendum H – SWOC Closure Units

H2 T-Plant Complex

H2.J Appendix J – 221-T Pipe Gallery Storage

J1 Introduction

This appendix discusses closure activities for the T-Plant Complex Operating Unit Group (OUG) (T-Plant Complex) 221-T Pipe Gallery Storage dangerous waste management unit (DWMU), hereinafter referred to as the 221-T Pipe Gallery Storage. The Permittee has concluded that the 221-T Pipe Gallery Storage will no longer be utilized for future receipts of dangerous waste and will coordinate closure of the DWMU with final closure of the T-Plant Complex OUG. Closure will be performed in accordance with the included schedule.

This closure plan complies with WAC 173-303-610(2) through WAC 173-303-610(6), "Dangerous Waste Regulations," "Closure and Post-Closure," and represents the baseline for closure. Amendments to this closure plan will be submitted as a permit modification in accordance with WAC 173-303-610(3)(b).

J1.1 Unit Description

The 221-T Pipe Gallery Storage is located in the 221-T Building. The 221-T Pipe Gallery Storage, installed between 1995 and 1996, was used to manage materials for recycle and dangerous waste in a <90-day storage or satellite accumulation area (SAA) until December 2012.

The 221-T Pipe Gallery Storage area is a coated concrete floor, 9 m (30 ft) long by 2 m (7 ft) wide. The 221-T Pipe Gallery Storage is defined on one side by a concrete wall of the pipe gallery and on the remaining three sides by metal chainlink cage material that includes a sliding gate (Figure J-1).

The 221-T Pipe Gallery Storage does not currently manage dangerous waste. Future storage of dangerous, mixed, or *Toxic Substances Control Act of 1976* (TSCA)-polychlorinated biphenyl (PCB) waste is not authorized within the 221-T Pipe Gallery Storage DWMU. The 221-T Pipe Gallery Storage is located inside of the 221-T Building, which is part of the Canyon Disposition Initiative (CDI). In addition, the T-Plant Complex is included in the Tri-Party Agreement (TPA) (*Hanford Federal Facility Agreement and Consent Order* [Ecology et al., 1989a]), Action Plan (*Hanford Federal Facility Agreement and Consent Order Action Plan* [Ecology et al., 1989b]), Section 6, *Treatment, Storage, and Disposal Unit Process*, and Section 8, *Facility Disposition Process*).

> TPA Action Plan Section 6.1:
> *Some of the TSD groups/units (primarily those located within large processing facilities) will be integrated with the disposition of the facility, and therefore closed in accordance with the process defined in Section 8.0. These units are those that have physical closure actions that need to be done in conjunction with the physical disposition actions in the facility (e.g. removal of structural components).*

The strategy for the entire T-Plant Complex is a coordinated closure for both *Resource Conservation and Recovery Act of 1976* (RCRA) closing units and CDI activities. The 221-T Pipe Gallery Storage is in a safe configuration for an extended closure period.

J1.1.1 Maximum Waste Inventory

No permitted RCRA-regulated waste container storage at the 221-T Pipe Gallery Storage was identified during the T-Plant operating records review. Therefore, no maximum waste inventory is presented. Weekly inspection records of <90-day storage areas and SAAs identified that the 221-T Pipe Gallery Storage managed non-dangerous, dangerous, mixed, and TSCA-PCB waste.

Figure J-1. T-Plant Complex 221-T Pipe Gallery Storage Area

J2 Closure Performance Standards

Closure performance standards for the 221-T Pipe Gallery Storage will be based on WAC 173-303-610(2), which requires closure of the facility in a manner that accomplishes the following objectives:

- Minimizes the need for further maintenance
- Controls, minimizes, or eliminates, to the extent necessary, to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere
- Returns the land to the appearance and use of surrounding land areas, to the degree possible, given the nature of the previous dangerous waste activity

Waste residue is not anticipated to be removed from the 221-T Pipe Gallery Storage; therefore, final closure activities will occur under the T-Plant CDI activities. Closure performance standards for the

221-T Pipe Gallery Storage will include the requirements outlined in WAC 173-303-610(b) concerning post-closure care for units where waste will remain after closure.

These performance standards are addressed in Sections J2.1 and J3.13 of this closure plan.

J2.1 Clean Closure Levels

The 221-T Pipe Gallery Storage will be closed to the performance standards identified in WAC 173-303-610 in coordination with T-Plant Complex CDI activities. The DWMU will close as a landfill in accordance with the requirements outlined in WAC 173-303-645(6), "Dangerous Waste Regulations," "Releases from Regulated Units," and requires post-closure care. The location of the 221-T Pipe Gallery Storage inside of the 221-T Canyon Building and any post-closure care coordinated with the T-Plant Complex CDI activities will control, minimize, or eliminate potential release of any dangerous waste constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or atmosphere. Final closure of the 221-T Pipe Gallery Storage will be achieved in conjunction with T-Plant Complex CDI activities.

J3 Closure Activities

As a waste management unit, closure determination for the 221-T Pipe Gallery Storage will be based on a review of the operational history, operating records (including any dangerous and mixed waste releases), waste management records, and visual inspection of the area to verify that waste-related staining is not present. Based on these reviews, the 221-T Pipe Gallery Storage is concluded to be in a safe configuration and will be closed under RCRA in conjunction with T-Plant Complex CDI activities.

Due to the extended closure period that will be required to complete closure activities, closure activities have been divided into near-term and extended period activities.

The following near-term closure activities are required to achieve and verify clean closure:

- Remove all dangerous waste inventory (completed; see Section J3.2).
- Review waste container storage, operating, and inspection records for periods of dangerous, mixed, and TSCA-PCB waste storage (completed; see Section J3.3).
- Perform a visual inspection of the concrete floor surface (completed; see Section J3.3).
- Add the 221-T Pipe Gallery Storage to the Waste Information Data System (WIDS) database (see Section J3.8).

Extended closure activities include the following:

- Records from August 2010 through December 2012 will be reviewed.
- The 221-T Pipe Gallery Storage will remain in place, and it will be managed under the final T-Plant Complex CDI activities.
- The 221-T Pipe Gallery Storage will be filled with grout in coordination with the T-Plant Complex CDI activities.
- A cover will be placed in coordination with T-Plant Complex CDI activities.

J3.1 Health and Safety Requirements

Closure will be performed in a manner to ensure safety of personnel and the surrounding environment. Qualified personnel will perform any necessary closure activities in compliance with established safety and environmental procedures. Personnel will be equipped with appropriate personal protective equipment. Qualified personnel will be trained in applicable safety and environmental procedures in accordance with the Solid Waste Operations Complex (SWOC) T-Plant, Addendum G, "Personnel Training," and they will have appropriate training and experience in sampling activities. Field operations will be performed in accordance with applicable health and safety requirements.

The Permittees have instituted training or qualification programs to meet training requirements imposed by regulations, U.S. Department of Energy orders, and national standards such as those published by the American National Standards Institute/American Society of Mechanical Engineers. For example, the environmental, safety, and health training program provides workers with the knowledge and skills necessary to execute assigned duties safely. Field personnel typically have completed the following training before starting work:

- Occupational Safety and Health Administration 40-Hour Hazardous Waste Worker Training
- 8-Hour Hazardous Waste Worker Refresher Training (as required)
- Hanford General Employee Training

Project-specific safety training, addressed explicitly to the project and the day's activity, will include the following:

- Training will provide the knowledge and skills needed for sampling personnel to perform work safely and in accordance with quality assurance requirements.
- Samplers are required to be qualified in the type of sampling being performed in the field.

In addition, pre-job briefings will be performed to evaluate activities and associated hazards by considering the following factors:

- Objective of the activities
- Individual tasks to be performed
- Hazards associated with the planned tasks
- Environment in which the job will be performed
- Facility where the job will be performed
- Equipment and material required
- Safety protocols applicable to the job
- Training requirements for individuals assigned to perform the work
- Level of management control
- Proximity of emergency contacts

Training records are maintained for each employee in an electronic training record database. The Permittees training organization maintains the training records system.

J3.2 Removal of Wastes and Waste Residues

The 221-T Pipe Gallery Storage does not currently manage dangerous, mixed, or TSCA-PCB waste, and removal of waste residues is not anticipated. The 221-T Pipe Gallery Storage serves as an equipment and material storage area. Waste management records indicate that dangerous waste has been previously managed in the 221-T Pipe Gallery Storage under <90-day or SAA storage. The 221-T Pipe Gallery Storage will no longer be used for dangerous, mixed, or TSCA-PCB waste management; however, the 221-T Pipe Gallery Storage will be used for equipment and materials storage. The 221-T Pipe Gallery Storage is in a safe configuration and will be tracked in WIDS until final closure in coordination with T-Plant Complex CDI activities.

J3.3 221-T Pipe Gallery Storage RCRA Operating Records Review and Visual Inspection

To support development of this closure plan, T-Plant Complex OUG operating records were reviewed (Table J-1). The records review included the following RCRA operating record documents: facility operating logbooks (including spill reports) and weekly inspections. The RCRA operating record documents that were reviewed focused on the period during active dangerous, mixed, and TSCA-PCB waste management for the T-Plant Complex OUG SWOC Outdoor Container Storage Areas addressed under the T-Plant Complex OUG SWOC Outdoor Container Storage Areas closure plans. The records review included the time period from October 1985 through July 2010. The records review indicated no releases of dangerous waste in the 221-T Pipe Gallery Storage area. A records review for the time period of August 2010 through December 2012 will be performed prior to final closure of the 221-T Pipe Gallery Storage.

A visual inspection was performed on September 18, 2013 to identify any dangerous waste-related staining in the 221-T Pipe Gallery Storage. No waste-related staining was identified during the visual inspection.

Supporting documentation for the RCRA operating records review summary and visual inspection is included in Attachment A.

J3.4 Unit Components, Parts, and Ancillary Equipment

The 221-T Pipe Gallery Storage will remain in place pending final disposition under the CDI activities and RCRA corrective actions associated with the T-Plant Complex OUG.

J3.5 Inspection of Units Before Decontamination

Decontamination activities are not planned for the 221-T Pipe Gallery Storage.

J3.6 Decontamination

Decontamination activities are not planned for the 221-T Pipe Gallery Storage.

J3.7 Identifying and Managing Contaminated Environmental Media

The 221-T Pipe Gallery Storage is located inside the 221-T Canyon Building. Contaminated environmental media are not anticipated.

J3.8 Addition of 221-T Pipe Gallery Storage to the WIDS Database

As part of the near-term closure activities, the 221-T Pipe Gallery Storage will be added to the WIDS database. Addition of the 221-T Pipe Gallery Storage to the WIDS database will help ensure that the 221-T Pipe Gallery Storage is monitored and controlled until the extended closure activities are completed and that no unauthorized activity takes place at the 221-T Pipe Gallery Storage (i.e., waste storage).

J3.9 Confirming Closure

The 221-T Piping Gallery Storage will be closed in conjunction with T-Plant CDI activities. All dangerous or mixed waste has been removed using the practices commonly employed to remove waste from the storage area. The 221-T Pipe Gallery Storage is located inside the 221-T Canyon Building; therefore, any potential releases of dangerous or mixed waste will be contained within the 221-T Canyon Building. Post-closure escape of dangerous waste and any associated dangerous waste constituents, leachate, contaminated runoff, and dangerous waste decomposition products to the ground, surface water, groundwater, or air is not anticipated. Post-closure care of the 221-T Pipe Gallery Storage will be identified for the 221-T Canyon Building during the T-Plant Complex CDI.

Both the records review and visual inspection are detailed in Section J3.3 and documented in Attachment A.

All dangerous waste has been previously removed, and there have been no documented spills or releases of dangerous waste. Therefore, post-closure escape of dangerous waste and any associated dangerous waste constituents, leachate, contaminated runoff, and dangerous waste decomposition products to the ground, surface water, groundwater, or air is not anticipated.

During CDI activities for the T-Plant Complex OUG, final clean closure will be confirmed for the 221-T Pipe Gallery Storage. Sampling and analysis of the 221-T Pipe Gallery Storage concrete flooring will occur to confirm that cleanup standards for soil have been achieved.

J3.10 Sampling and Analysis and Constituents to Be Analyzed

J3.10.1 Sampling and Analysis Plan

Sampling and analysis of the 221-T Pipe Gallery Storage waste residue, if deemed necessary, will be identified and performed in conjunction with the T-Plant Complex CDI activities. As part of the CDI, a data quality objectives (DQO) process will be conducted to determine any data needs necessary to support the final disposition of the 221-T Canyon Building. The storage area document review contains waste information that will be used during the DQO process.

Table J-1. Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
T-Plant Daily Operating Logbook	Logbook	221-T Pipe Gallery Storage	01/02/1985	06/22/2010	No
T-Plant Operation Logbook	Logbook	221-T Pipe Gallery Storage	07/27/2010	04/07/2011	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	221-T Pipe Gallery Storage	08/29/2005	12/01/2005	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	221-T Pipe Gallery Storage	10/01/2007	04/22/2013	No
Weekly Surveillance Log, <90-day Storage Areas and Satellite Accumulation Areas	Weekly Inspection	221-T Pipe Gallery Storage	06/07/1991	12/20/1999	No
Treatment Facility Waste Management Weekly Inspection Log Sheet Treatment Facility Waste Management Area Daily Inspection Log Sheet Treatment Facility Waste Management Area Weekly Inspection Data Sheet Treatment Facility Waste Management Area Daily Inspection Data Sheet Weekly Waste Area Surveillance T-Plant Daily Waste Management Area Inspection Data Sheet	Weekly and Daily Dangerous Waste Inspections	221-T Pipe Gallery Storage	01/2000 01/2005	12/2002 12/2007	No
Waste Management Area Daily Inspection Report Weekly Waste Area Surveillance	Weekly and Daily Inspections	221-T Pipe Gallery Storage	2003	2004	Yes*
T-Plant Weekly Waste Management Area Inspection Data Sheet	Weekly Inspection	221-T Pipe Gallery Storage	10/18/2007	06/12/2013	No

* A container of Insulkote was leaking. Product was determined to be non-regulated material.

J3.11 Role of the Independent Qualified Registered Professional Engineer

An independent, qualified, registered, professional engineer will be retained to provide certification of the closure and sign the closure certification as required by WAC 173-303-610(6). The resulting engineering report will be retained in the operating record.

J3.12 Closure Certification

In accordance with WAC 173-303-610(6), within 60 days of completion the 221-T Pipe Gallery Storage DWMU closure, certification that the DWMU has been closed in accordance with the specifications in this closure plan will be submitted to the Ecology by registered mail. The certification will be signed by the owner or operator and by an independent, qualified, registered, professional engineer.

J3.13 Conditions that will be Achieved when Closure is Complete

Upon completion of the near-term closure activities, the 221-T Pipe Gallery Storage will remain in an "as-is" state with the concrete flooring and metal chainlink cage material remaining in place. The 221-T Pipe Gallery Storage will continue to be used for equipment and material storage in support of the 221-T Canyon Building activities. The 221-T Pipe Gallery Storage will undergo final disposition under the CDI activities associated with the T-Plant Complex OUG. A permit modification request will be submitted after final closure to remove the 221-T Pipe Gallery Storage DWMU from the sitewide permit active DWMUs.

J4 Closure Schedule and Time Frame

Several near-term closure activities have been completed and documented in this closure plan. Addition of the 221-T Pipe Gallery Storage to the WIDS database will be completed within 180 days of closure plan approval. This DWMU is located within the 221-T Canyon Building, a large operating facility that currently serves as both waste treatment and storage at Hanford for multiple waste streams. The TPA Action Plan (Ecology et al., 1989b) identified that some treatment, storage, and disposal (TSD) groups/units (primarily those located within large processing facilities) will be integrated with the disposition of the facility. Those units have physical closure actions that need to be complete in conjunction with the physical disposition actions in the facility (e.g., removal of structural components).

Ecology Publication 94-111, *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (Section 11.0, Coordination of Closure and Corrective Action or Other Cleanup Activities), allows for the use of alternative requirements when coordinating RCRA closure activities with other cleanup activities at a facility. An extended closure period is required for the 221-T Pipe Gallery Storage to coordinate closure activities with the T-Plant Complex closure. The extended closure activities will occur under the CDI activities associated with the T-Plant Complex OUG. T-Plant Complex OUG cleanup actions are included in the Central Plateau Cleanup Actions outlined in the annual Hanford Lifecycle Scope, Schedule, and Cost Report required by TPA (Ecology et al., 1989a) Milestone M-036-01.

Approval of this closure plan will grant the Hanford Site an extended closure period for completion of closure activities, in accordance with WAC 173-303-610(4)(c), and a separate extension request will not be filed (Figure J-2).

J5 Closure Costs

An annual report outlining updated projections of anticipated closure costs for the Hanford Facility TSD units having final status is not required per Permit Condition II.H.

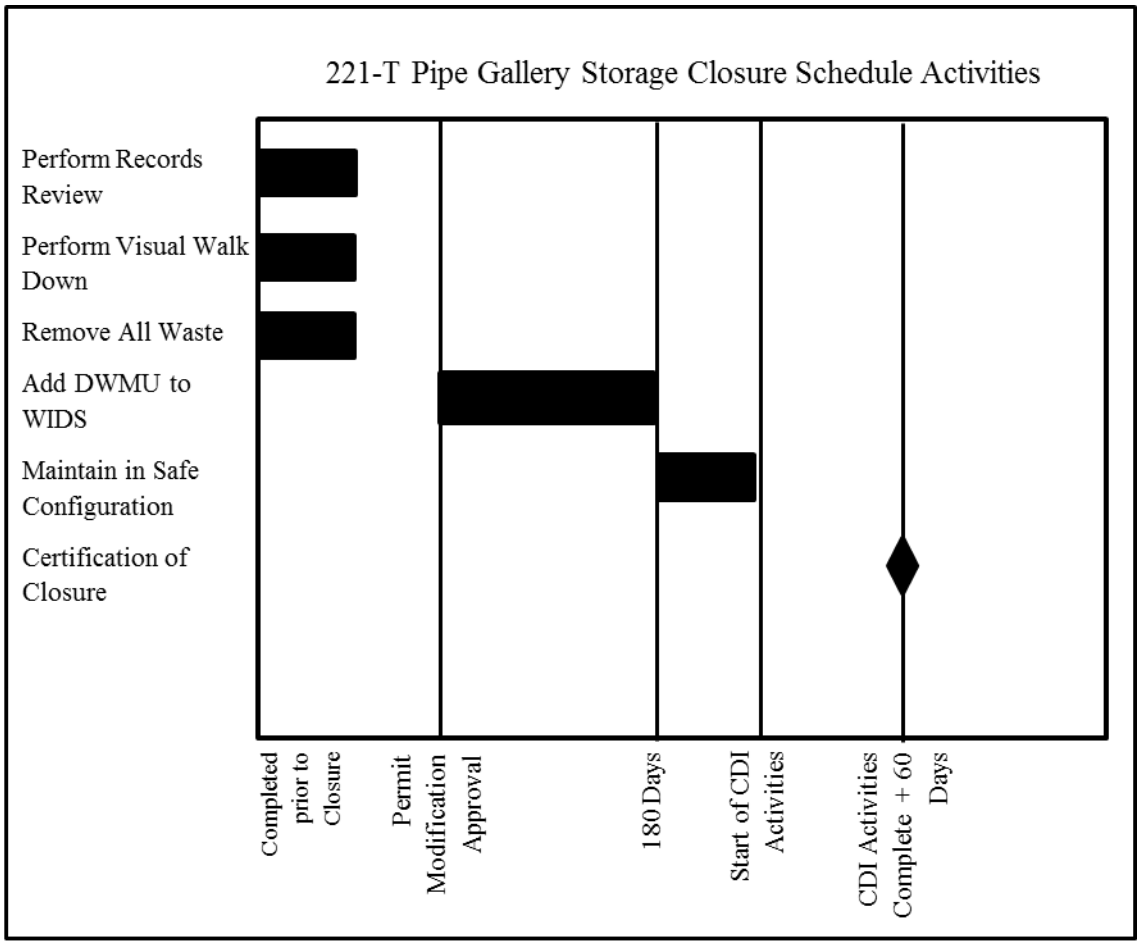

Figure J-2. 221-T Pipe Gallery Storage Closure Schedule Activities

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Attachment A

T-Plant 221-T Pipe Gallery Storage RCRA Records Review and Visual Inspection Supporting Documentation

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T Plant Complex 221-T Pipe Gallery Storage Area

Purpose:

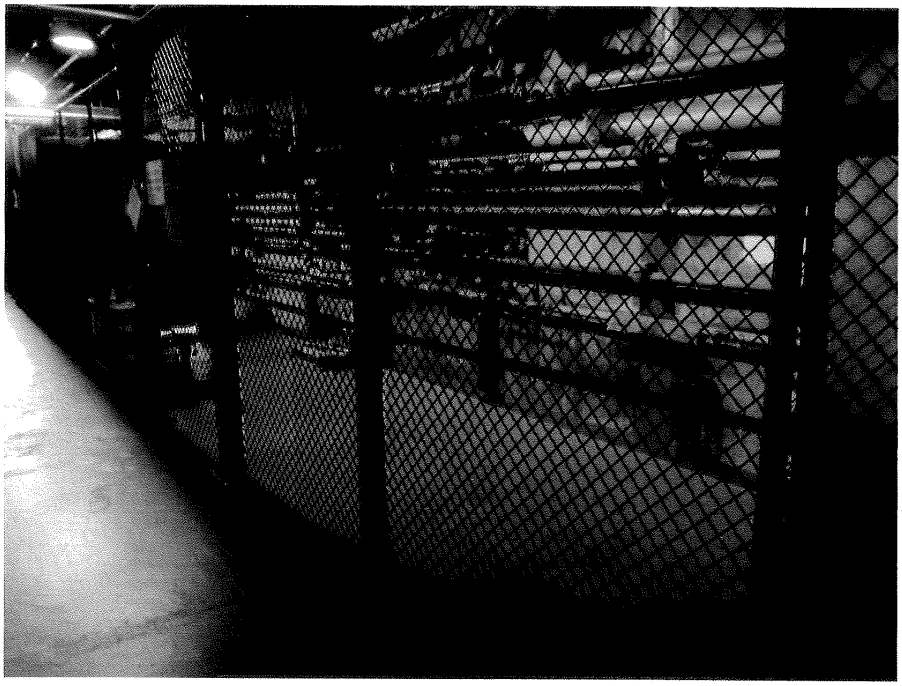
A visual inspection of the T Plant Complex 221-T Pipe Gallery Storage Area was performed to determine if there is any evidence of spills and/or leaks from waste packages containing dangerous waste that was stored at this location from past operations. The inspection was to identify and document by photographing any waste related staining of the storage area surface, and to denote any remaining waste related items.

The inspection was performed on September 18, 2013 by David Richards Manager, T Plant (CHPRC).

Results:

Concrete floor is sealed with paint no evidence of cracking or peeling. Painted floor surface shows no evidence of staining or waste spills. Area contains old process piping along the East wall. Markings on these pipes indicated they are abandoned, no evidence of leakage. No waste is being stored in this area. Area is currently storing spill cleanup material/product; kitty litter and soil cement.

Area was photographed.



T Plant Complex 221-T Pipe Gallery Storage Area

Signature/date:

David E. Richards 9-26-13

T-Plant Dangerous Waste Inspection Checklist and Operations Logbook Review

Title of Forms:	See attached table and reviewer comments.
Date of Review:	October 8, 2013
Reviewer's Name:	Sarah Horn
Waste Management Units:	221-T Railroad Cut, 277-T Building, 221-T Pipe Gallery Storage, 221-T Tank System, 2706-TB Tank System (includes 2706-TB Tank System enclosure building)
Time Frame of Review:	January 1985 through June 2013
Items of Concern Noted If "YES", complete entire checklist. If "NO", skip to Reviewer's signature and date.	YES ___ NO _X_
Items of Concerns: Attach copies of Weekly Inspection sheets noting concern.	_____ _____ _____ _____
Dates of Corrective Actions: Attach copies of Weekly Inspection sheets noting concern.	_____ _____ _____ _____
Reviewer's Signature and Date:	Sarah Horn 10/8/2013

Instructions:

Review Weekly Waste Inspection checklists and operations logbooks for any references to unplanned spills, releases or discharges associated with dangerous waste containers. Anomalies that would not affect closure of the unit such as missing labels, open containers, or dented containers, do not need to be documented.

If items of concern are noted, check "YES" and complete the entire checklist. If no items of concern are noted, check "NO" and skip to the signature and date field. Note that if no items of concern are noted for an extended period of time, the "Time Frame of Weekly Inspections" can be January 1, 20xx to December 31, 20xx or even several years if no items of concern are noted.

If unplanned spills, releases or discharges are referenced on the inspection checklist, document the item of concern as "spill", "stain", "ruptured container", etc. Also note the date of the corrective action.

Attach copies of weekly waste inspection checklists noting the items of concern and corrective actions.

Complete all review fields as applicable.

Sign and date form and deliver to Stephanie Johansen.

Reviewer Comments:

The initial records review was completed in August 2013 which included applicable daily and weekly inspection checklists, and operations logbooks for the period of January 1985 through June 2013 and is detailed in Table 1 below. The August 2013 records review focused on the following dangerous waste management areas scheduled for closure:

- 271-T Cage
- 211-T Pad
- 221-T Sand Filter Pad
- 277-T Outdoor Storage Area
- 221-T R5 Waste Storage Area

The current review included the items of concern identified during the initial August 2013 records review but focused on the following areas:

- 221-T Railroad Cut
- 277-T Building
- 221-T Pipe Gallery Storage
- 221-T Tank System
- 2706-TB Tank System (including enclosure building)

No items of concern were noted for the 221-T Railroad Cut, 277-T Building, 221-T Pipe Gallery Storage, 221-T Tank System, or the 2706-TB Tank System. Below is a table that summarizes the original records review completed in August 2013.

Table 1. T-Plant Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
T-Plant Daily Operating Logbook	Logbook	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	01/02/1985	06/22/2010	No
T-Plant Operation Logbook	Logbook	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	07/27/2010	04/07/2011	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	08/29/2005	12/01/2005	No
Waste Management Area Daily Inspection Data Sheet	Daily Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	10/01/2007	04/22/2013	No
Weekly Surveillance Log, <90-day Storage Areas and Satellite Accumulation Areas	Weekly Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	06/07/1991	12/20/1999	No

Table 1. T-Plant Operating Records Review Summary

Document Title	Document Type	Facility	Start Date	End Date	Items of Concern Noted
Treatment Facility Waste Management Weekly Inspection Log Sheet Treatment Facility Waste Management Area Daily Inspection Log Sheet Treatment Facility Waste Management Area Weekly Inspection Data Sheet Treatment Facility Waste Management Area Daily Inspection Data Sheet Weekly Waste Area Surveillance T-Plant Daily Waste Management Area Inspection Data Sheet	Weekly and Daily Dangerous Waste Inspections	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	01/2000 01/2005	12/2002 12/2007	No
Waste Management Area Daily Inspection Report Weekly Waste Area Surveillance	Weekly and Daily Inspections	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	2003	2004	Yes*
T-Plant Weekly Waste Management Area Inspection Data Sheet	Weekly Inspection	211-T Pad; 277-T Outdoor Storage Area; 271-T Cage; 221-T R5 Waste Storage Area; 221-T Sand Filter Pad	10/18/2007	06/12/2013	No

* A container of Insulkote was leaking. Product was determined to be non-regulated material.