AR TARGET SHEET

The following document was too large to scan as one unit, therefore, it has been broken down into sections.

DOCUMENT #: 01-RCA-467

TITLE: Quarterly Notification of Class One Modifications to Hanford Facility RCRA Permit Dangerous Waste Portion Quarter Ending September 30, 2001 – Permit Condition I.C.3

EDMC#: 0055559
SECTION: 1 of 2

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

0055559

OCT 09 2001

01-RCA-467

Ms. L. E. Ruud, Permit Specialist
Nuclear Waste Program
State of Washington
Department of Ecology
1315 W. Fourth Avenue
Kennewick, Washington 99336

Dear Ms. Ruud:

QUARTERLY NOTIFICATION OF CLASS 1 MODIFICATIONS TO THE HANFORD FACILITY RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PERMIT, DANGEROUS WASTE PORTION (DW PORTION) (QUARTER ENDING SEPTEMBER 30, 2001 – PERMIT CONDITION I.C.3)

In accordance with Condition I.C.3 of the Hanford Facility RCRA Permit, enclosed for your notification are the Class 1 modifications to the Hanford Facility RCRA Permit, DW Portion. Modifications this quarter included updating information in the List of Attachments, Part II, Part III, and Part V of the RCRA Permit, DW Portion. The List of Attachments Class 1 modifications pertain to Attachment 4. The Part II Class 1 modifications pertain to Condition II.B.5. The Part III Class 1 modifications pertain to the Plutonium Uranium Extraction Plant Storage Tunnels, 305-B Storage Facility, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, 242-A Evaporator, and the 325 Hazardous Waste Treatment Units. The Part V modifications pertain to the 303-K Storage Facility, 1325-N Liquid Waste Disposal Facility, 1301-N Liquid Waste Disposal Facility, 1324-N Surface Impoundment, and 1324-NA Percolation Pond. The Class 1 modifications are being made to ensure that all activities conducted are in compliance with the RCRA Permit, DW Portion.

OCT 09 2001

Should you have any questions regarding this information, please contact Astrid P. Larsen, U.S. Department of Energy, Richland Operations Office, on (509) 372-0477.

Joel Hebdon, Director
Regulatory Compliance and Analysis Division
DOE Richland Operations Office

Richard H. Gurske, Director
Environmental and Regulation
Fluor Hanford, Inc.

Roby D. Enge, Director
Environment, Safety, and Health
Pacific Northwest National Laboratory

T. E. Logan, Vice President, Operations
Bechtel Hanford, Inc.

RCA:APL

Enclosure:
Quarterly Notification of Class 1
Modifications to the Hanford Facility
RCRA Permit, DW Portion

cc w/encl:
Administrative Record, H6-08
HF Operating Record, G1-27
Ecology NWP Kennewick Library
Environmental Portal, LMSI
R. Gay, CTUIR
A. K. Ikenberry, PNNL
R. Jim, YN
R. J. Landon, BHI
P. Sobotta, NPT
S. A. Thompson, FHI
M. A. Wilson, Ecology

cc w/o encl:
M. Anderson–Moore, Ecology
F. W. Bond, Ecology
L. J. Cusack, Ecology
R. D. Enge, PNNL
R. H. Gurske, FHI
F. Jamison, Ecology
D. R. Sherwood, EPA

Hanford Facility RCRA Permit Modification Notification Forms
List of Attachments
Attachment 4, Hanford Emergency Management Plan

Index

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Hanford Emergency Management Plan	List of Attachments, Attachment 4

Description of Modification:

2.2 EMERGENCY RESPONSE ORGANIZATION STRUCTURE

Emergency response on the Hanford Site is modeled after the NFPA Incident Command System. As such, the Hanford Incident Command System is an integrated emergency management system with clearly defined responsibilities and communication pathways that allows predesignated and trained individuals to jointly determine and implement incident mitigation strategies.

The Hanford Site ERO has two distinct components – the Incident Command Organization and the DOE Hanford EOC – each with emergency direction and control responsibilities.

The Incident Command Organization consists of the Facility/Building Emergency Response Organization with responsibility for implementing emergency response activities at the event facility, and site contractor emergency response personnel (i.e., Hanford Fire Department, Hanford Patrol) with the responsibility for on-scene mitigation.

For low-hazards and hazardous facilities with a Building Emergency Director (BED) or Building Warden (BW) on the premise at the time of the incident, the BED/BW shall be responsible for implementing appropriate emergency response procedures (e.g., protective actions, event classification, notification) until arrival of the Hanford Fire Department IC or the Hanford Patrol IC for security events. Upon arrival of the Hanford Fire Department or Hanford Patrol IC, the Facility/Building Emergency Response Organization becomes part of a consolidated Incident Command Organization. The BED/BW shall retain responsibility for direct configuration control over facility systems and components while the IC assumes the overall management strategy associated with the incident and ensures that all functional areas are appropriately staffed and working cohesively towards mitigation of the incident.

If the BED/BW is not present at the low-hazards or hazardous facility at the time of an incident (e.g., during off shift hours), the IC shall perform the duties of the BED/BW in addition to his/her own duties. The respective on-call BED/BW shall be summoned to the scene based upon the BED/BW listing located in the POC or PNNL Control Room. If necessary, the BED/BW will make the classification decision (i.e., Alert, Site Area Emergency, or General Emergency) and determine if the RCRA contingency plan implementation requirements have been met prior to responding to the scene. If the on-call BED/BW is not available and timely classification is necessary, the IC may direct the ONC Duty Officer to make the classification decision and determine if the RCRA contingency plan implementation requirements have been met. Upon arrival of the BED/BW at the scene, the IC will turn over the remaining BED/BW duties.

The DOE Hanford EOC has the responsibility to monitor and provide support for the onsite response, assist with issue resolution, assess the offsite impacts, and interface with offsite agencies and the public.

Both components of the Hanford ERO are depicted on Figure 2-1 and further delineated in the respective subsections below.

For nonfacility events (e.g., onsite transportation incidents, wildland fires), the IC shall be responsible for coordinating and performing the response activities. The EDO shall have the responsibility for further classifying the event (i.e., as an Alert, Site Area Emergency, or General Emergency) and determining if the RCRA contingency plan implementation requirements have been met, if warranted. If the EDO is not available and timely classification is necessary, the IC may direct the ONC Duty Officer to make the classification decision and determine if the RCRA contingency plan implementation requirements have been met, if warranted. After the immediate threat of a release has been stabilized or eliminated, remaining duties will be delegated from the IC to the organization that offered the hazardous substance for transportation.

In all events, the Incident Command Organization shall have the authority to commit the resources needed to carry out the emergency response; and be thoroughly familiar with applicable plans and procedures, operations and activities at the facility, location and properties of all wastes handled, location of all records within the facility, and the layout of the facility.

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
G. B. Griffin	Date	G. S. Loiacono	Date	S. Moore	Date	L.E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Hanford Emergency Management Plan	List of Attachments, Attachment 4

Description of Modification:

Table 3-1, Page 12 of 16:

Table 3-1. Memorandums of Understanding

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
State of Washington	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Washington Emergency Management Division	None	01/03/01	01/03/04 ~~Continue~~ or until canceled by ~~either~~ any party ~~upon 30~~ after 60 days written notice to the other parties.	RL SES
State of Oregon	Document areas of cooperation between the state of Oregon and RL in the planning for and providing notification and *interface in the event of an* incident on the Hanford Site.	Oregon Department of Energy	None	06/21/00	Continue until canceled by either party by written notice to the other Amendments or modifications to this *Agreement may be made upon* written agreement by both parities to the Amendment.	RL SES
Benton County	Document areas of cooperation *between the parties in the* planning for and response to emergencies at the Hanford Site.	Benton County Emergency *Management*	None	03/16/00	Continue until canceled by *either party by written notice* to the other.	RL SES
Franklin County	Document areas of cooperation *between the parties in the* planning for and response to emergencies at the Hanford Site.	Franklin County Emergency *Management*	None	01/20/00	Continue until canceled by *either party by written notice* to the other.	RL SES
Grant County	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Grant County Emergency Management	None	05/25/00	Continue until canceled by either party by written notice to the other.	RL SES
Energy Northwest	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Energy Northwest Emergency Preparedness	The specific areas of assistance will be provided based upon availability, and are limited to those emergency actions necessary to protect onsite personnel, the public *health and safety, and the* environment in the event of a major emergency at the Hanford Site or Energy Northwest.	09/07/00	Continue until canceled by either of the parties upon 30 days written notice to the other party.	RL SES
Energy Northwest and HEHF	Treatment of a significantly contaminated and injured person.	Energy Northwest Emergency Preparedness and HEHF	None	09/08/00	Continue until canceled by one or more of the parties upon 30 days written notice to the other(s).	RL SES

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
G. B. Griffin Date 8/21/01	G. S. Loiacono Date 8/21/01	S. Moore Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal *modification request, and consequently implement the required Public Involvement processes when required.*

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Hanford Emergency Management Plan	List of Attachments, Attachment 4

Description of Modification:

Table 3-1, Page 13 of 16:

Table 3-1. Memorandums of Understanding

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
Framatome ANP (formerly Siemens Power Corporation (~~SPC~~)	Establishes means by which RL can provide consequence assessment and meteorological information to ~~SPC~~ Framatome ANP during an emergency at the ~~SPC~~ Framatome ANP plant in Richland, Washington	~~SPC~~ Framatome ANP	Emergencies affecting the Hanford Site or Hanford facilities takes precedence over all other uses of the UDAC facilities and/or staff.	01/19/00	Remain in effect for five years from effective date, at which time it shall be reviewed and renegotiated, reissued, or terminated. Either party may withdraw upon 30 days written notice.	RL SES
Framatome ANP (formerly Siemens Power Corporation (SPC) and HEHF	Treatment of a significantly contaminated and slightly injured person.	~~SPC~~ Framatome ANP and HEHF	~~SPC~~ Framatome ANP agrees to undertake all costs and expenses incurred that directly result from this agreement.	01/03/00	Continue until canceled by one or more of the parties by written notice to the other(s).	RL SES
Allied Technology Group, Inc. (ATG) and HEHF	Treatment of a significantly contaminated and slightly injured person.	ATG and HEHF	ATG agrees to undertake all costs and expenses incurred that directly result from this agreement.	12/22/99	Continue until canceled by one or more of the parties by written notice to the other(s).	RL SES
National Weather Service	Sharing Meteorological Information.	NWS Western Regional Headquarters.	None	10/05/94	Agreement may be terminated by either party upon thirty days written notice to the other party.	RL SES
Our Lady of Lourdes Hospital (OLOL) Pasco, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	OLOL Administrator	The responsibilities of OLOL will be limited to activities performed at the hospital.	08/17/98	Arrangements may be terminated by OLOL or by RL upon written notice to the other, which notice shall not become effective for at least 30 days after the date thereof.	RL SES
Kadlec Medical Center (KMC) Richland, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	KMC Administrator	KMC will be limited to activities performed at the hospital and at the Emergency Decontamination Facility.	08/17/98	Arrangements may be terminated by KMC or by RL upon written notice to the other, which notice shall not become effective for at least 30 days after the date thereof.	RL SES
Kennewick General Hospital (KGH) Kennewick, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	KGH Administrator	KGH will be limited to activities performed at the hospital.	08/17/98	Arrangements may be terminated by KGH or by RL upon written notice to the other, which notice shall not become effective for at least 30 days after the date thereof.	RL SES

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
G. B. Griffin Date 8/21/01	G. S. Loiacono Date 8/24/01	S. Moore Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Hanford Emergency Management Plan	List of Attachments, Attachment 4

Description of Modification:

Appendix A, Page 5 of 6:

Documentation Crosswalk Matrix

REQUIREMENT *SOURCE*	REQUIREMENT DESCRIPTION	HOW DOES REQUIREMENT *APPLY TO HANFORD?*	WHERE IS REQUIREMENT *MET IN OCUMENTATION?*
WAC 173-303-360(2)(b) (Permit requirement)	Emergency procedures. (b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials.	Hanford Incident Command System and staff with supporting on-call personnel.	Site-level: DOE/RL-94-02, sections 2.2.1.1.2(f) and 2.2.1.1.3(g).
WAC 173-303-360(2)(c) (Permit requirement)	Emergency procedures. (c) Concurrently, the emergency coordinator shall assess *possible hazards to human health and the environment (considering direct, indirect,* immediate, and long-term effects) that may result from the release, fire, or explosion.	Hanford Incident Command System and *staff with supporting on-call personnel.*	Site-level: DOE/RL-94-02, *section 4.2.*
WAC 173-303-360(2)(d) (Permit requirement)	Emergency procedures. (d) If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health or the environment, he must report his findings as follows: (i) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate *local authorities. He must be available to help appropriate officials decide whether* local areas should be evacuated; and (ii) He must immediately notify the department and either the government official designated as the on-scene coordinator, or the National Response Center (using their 24-hour toll free number (800) 424-8802).	Hanford Incident Command System and staff with supporting on-call personnel. ONC personnel notify local authorities if *evacuation is advisable on behalf of the* Hanford Incident Command Structure. Site contractor environmental single point-of-contact personnel perform the assessment report notification to Ecology ~~(Kennewick)~~ and RL (the on-scene coordinator on behalf of the Hanford Incident Command Structure. NRC is not called.	Site-level: DOE/RL-94-02, sections 2.2.1.1.2(a) &(d), 2.2.1.1.3(a)&(e), 5.1.1, 5.1.1.2, 5.1.2, and 5.1.2.1.
WAC 173-303-360(2)(e) (Permit requirement)	Emergency procedures. (e) His assessment report must include: (i) Name and telephone number of reporter; (ii) Name and address of facility; (iii) Time and type of incident (e.g., release, fire); (iv) Name and quantity of material(s) involved, to the extent known; (v) The extent of injuries, if any; and (vi) The possible hazards to human health or the environment outside the facility.	Site contractor environmental single point-of-contact personnel perform the assessment report notification to Ecology ~~(Kennewick)~~ and RL after obtaining it from location-specific personnel.	Site-level: DOE/RL-94-02, sections 2.2.1.1.2(d), 2.2.1.1.3(e), 5.1.1, 5.1.1.2, and 5.1.2.1.
WAC 173-303-360(2)(f) (Permit requirement)	Emergency procedures. (f) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.	Hanford Incident Command System and staff with supporting on-call personnel.	Site-level: DOE/RL-94-02, sections 2.2.1.1.2(f) and 2.2.1.1.3(g).
WAC 173-303-360(2)(g) (Permit requirement)	*Emergency procedures. (g) If the facility stops operations in response to a fire,* explosion, or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.	*Hanford Incident Command System and* staff with supporting on-call personnel.	*Site-level: DOE/RL-94-02,* sections 2.2.1.1.2(f) and 2.2.1.1.3(g).
WAC 173-303-360(2)(h) (Permit requirement)	Emergency procedures. (h) Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, *contaminated soil or surface water, or any other material that results from a release,* fire, or explosion at the facility.	Onsite Recovery ~~Manager~~ Director with supporting on-call personnel.	Site-level: DOE/RL-94-02, section 9.2.3.

Modification Class: [1 2 3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
G. B. Griffin 8/21/01 Date	G. S. Loiacono 8/24/01 Date	S. Moore Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Hanford Emergency Management Plan	List of Attachments, Attachment 4

Description of Modification:

Appendix A, Page 6 of 6:

Documentation Crosswalk Matrix

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	HOW DOES REQUIREMENT APPLY TO HANFORD?	WHERE IS REQUIREMENT MET IN OCUMENTATION?
WAC 173-303-360(2)(i) (Permit requirement)	Emergency procedures. (i) The emergency coordinator must ensure that, in the affected area(s) of the facility: (i) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and (ii) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.	Onsite Recovery ~~Manager~~ Director with supporting on-call personnel.	Site-level: (I) DOE/RL-94-02, section 9.2.3. Site-level: (ii) DOE/RL-94-02, section 11.2.
WAC 173-303-360(2)(j) (Permit requirement)	Emergency procedures. (j) The owner or operator must notify the department, and appropriate local authorities, that the facility is in compliance with (i) of this subsection before operations are resumed in the affected area(s) of the facility.	Site contractor environmental single point-of-contact personnel perform this notification, when applicable, on behalf of the Onsite Recovery ~~Manager~~ Director.	Site-level: DOE/RL-94-02, section 5.1.2.3.
WAC 173-303-360(2)(k) (Permit requirement)	Emergency procedures. (k) The owner or operator must note in the operating record the time, date, and details of any incident that requires implementing the contingency plan. Within fifteen days after the incident, he must submit a written report on the incident to the department. The report must include: (i) Name, address, and telephone number of the owner or operator; (ii) Name, address, and telephone number of the facility; (iii) Date, time, and type of incident (e.g., fire, explosion); (iv) Name and quantity of material(s) involved; (v) The extent of injuries, if any; (vi) An assessment *of actual or potential hazards to human health or the environment, where this is* applicable; (vii) Estimated quantity and disposition of recovered material that resulted from the incident; (viii) Cause of incident; and (ix) Description of corrective action taken to prevent reoccurrence of the incident.	Site contractor management through RL ensures the note in the operating record is performed and prepares the 15-day report to Ecology.	Site-level: DOE/RL-94-02, section 5.1.2.2.
40 CFR 761.65(c)(1)(iv) and (c)(7)(ii) *SPCC Plans for PCBs*	Temporary Storage Areas (less than 30-days). (c)(1)(iv): PCB containers containing liquid PCBs at concentrations of ≥50 ppm, *provided a Spill Prevention, Control and Countermeasure Plan has been prepared for* the temporary storage area in accordance with part 112 of this chapter and the liquid PCB waste is in packaging authorized in the DOT Hazardous Materials Regulations at 49 CFR parts 171 through 180 or stationary bulk storage tanks (including rolling stock such as, but not limited to, tanker trucks, as specified by DOT). (c)(7)(ii): The owners or operators of any facility using containers described in paragraph (c)(7)(i) of this section, shall prepare and implement a Spill Prevention *Control and Countermeasure (SPCC) Plan as described in Part 112 of this title. In* complying with 40 CFR Part 112, the owner or operator shall read "oil(s)" as "PCB(s)" whenever it appears. The exemptions for storage capacity, 40 CFR 112.1(d)(2), and the amendment of SPCC plans by the Regional Administrator, 40 CFR 112.4, shall not apply unless some fraction of the liquids stored in the container are oils as defined by section 311 of the Clean Water Act.	When SPCC plans apply to Hanford Site activities, the information not covered in site-wide documentation must be addressed in location-specific documentation.	Site-level: DOE/RL-94-02, sections 1.1 (fourth paragraph), 1.2 (first bullet, sixth dash and second bullet, fourth dash), and 2.2.1.1.2 (first paragraph). Unit-level: appropriate location-specific documentation.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
G. B. Griffin	Date	G. S. Loiacono	Date	S. Moore	Date	L.E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification

List of Attachments

Attachment 4, Hanford Emergency Management Plan

Replacement Sections

Index

2.0 EMERGENCY RESPONSE ORGANIZATION (INTERNAL)

The mission of the Hanford Site ERO is to ensure that, in the event of an emergency, actions will be taken to prevent or minimize impacts to workers, the public, site, facilities, and the environment. The Hanford Site ERO shall be structured and staffed with adequate, trained personnel, including designated alternates, to enable the most timely and effective response possible, while meeting the requirements as set forth in DOE O 151.1 and other applicable Federal and state regulations. Hanford facilities and response organizations such as the Hanford Fire Department are governed by the standards and regulations of the National Fire Protection Association (NFPA) and Code of Federal Regulations, as well as the Washington Administrative Code and Revised Code of Washington for emergency response, training, and on-scene emergency management. Responsibilities and tasks shall be assigned to individuals identified by name, title, or position.

2.1 U.S. DEPARTMENT OF ENERGY, RICHLAND OPERATIONS OFFICE/ OFFICE OF RIVER PROTECTION AND HANFORD SITE CONTRACTOR ROLES AND RESPONSIBILITIES

The Hanford Site ERO has been developed to allow RL/ORP to maintain the option to assume overall management, direction, and control of site emergencies while the site contractors continue their management and operational roles. Contractor and RL/ORP roles and responsibilities are delineated below.

2.1.1 Hanford Site Contractors

Hanford Site contractors with responsibilities for facility operations/activities or for providing site services shall coordinate with one another and participate in the development and maintenance of a comprehensive Hanford Site emergency management program that meets the mission of the Hanford Site ERO. Such programs shall contribute to DOE's comprehensive Emergency Management System by promoting effective and efficient integration of applicable requirements, including those promulgated by other agencies.

2.1.1.1 Event Contractor. The site contractor that maintains responsibility for the facility or activity with the emergency is designated as the event contractor. The event contractor responsibilities include:

- prompt and accurate categorizing of occurrences in accordance with this plan and DOE Order 232.1A (DOE 1997);
- initially classifying the emergency, if warranted;
- assisting, as necessary, in mitigating the emergency situation;

- initiating actions to protect workers within their geographic area of responsibility;
- contacting the POC and providing initial emergency information;
- requesting support from nonevent site contractors as necessary;
- establishing an initial Incident Command Post (ICP) and, as applicable, assigning other Incident Command Organization functions as delineated in Table 2-1, and other supporting entities such as radiological control technicians and industrial hygienists as available;
- arranging for employer notification (if not an event contractor employee), decontamination, and transport of a contaminated corpse;
- providing personnel to staff the Hanford EOC to include senior management staff and technical representatives;
- providing event status information to the Hanford EOC;
- ensuring proper cleanup, transportation, and storage of hazardous materials generated as a result of the event; and
- providing funding for performance of emergency response and recovery duties and replacement of supplies used by other contractors for event response.

Other site contractors shall provide support to the event contractor for actions related to the services they provide on the site, such as notifications, fire, security, or medical services.

2.1.1.2 Fluor Hanford, Inc. In addition to event contractor responsibilities for the Hanford Site facilities it operates, FHI emergency responsibilities include:

- fire suppression, emergency rescue, emergency medical, hazardous materials response, fire protection services, and incident response provided by the Hanford Fire Department;
- site security, access control, emergency service call answering and dispatching, and transportation emergency response contact provided through the Hanford Patrol;
- emergency communications including onsite and offsite notifications provided by the ONC;
- staffing of a 24-hour Emergency Duty Officer (EDO) position;
- management and staffing of the Hanford EOC;
- onsite radiation monitoring;

- environmental radiation sampling and monitoring;
- laboratory services;
- transportation;
- services in support of reentry and recovery operations, such as decontamination, engineering, equipment maintenance, utilities, procurement, and waste disposal;
- radio, telecommunications, computer, and audio/visual services; and
- managing site-wide radiological tasks which includes plume assessment and tracking; large group personnel survey, sort, and decontamination; survey of individuals evacuated from the Columbia River at the Vernita bridge and White Bluffs; and radiological control support (e.g., radiological control technicians, supervisory personnel, exposure evaluators as agreed upon by PNNL) during medical care of radiation accident patients at the local hospitals.

2.1.1.3 Pacific Northwest National Laboratory. In addition to event contractor responsibilities for the Hanford Site facilities it operates, PNNL emergency responsibilities include:

- weather information from the Hanford Site meteorology station;
- health physics technical support;
- control of nonmedical radiological operations of the Emergency Decontamination Facility (EDF);
- evaluation of radiological doses to personnel in the event of a criticality emergency; and
- senior management and technical staff support to the Hanford EOC.

2.1.1.4 Bechtel Hanford, Inc. In addition to event contractor responsibilities for the Hanford Site facilities it manages, BHI emergency responsibilities include:

- senior management and technical staff support to the Hanford EOC; and
- radiological control technician support.

2.1.1.5 Hanford Environmental Health Foundation. HEHF has no event contractor responsibilities as delineated in subsection 2.1.1.1. However, emergency services provided by HEHF include:

- minor emergency medical care and consultation;
- medical support for chemical and radiological contaminated patients;
- medical staffing and operation of the EDF;

- hostage negotiation and critical stress debriefing support;
- coordination with and support to community medical services;
- senior management and technical staff support to the Hanford EOC; and
- provide support to the Hanford Fire Department in the event of a large-scale mass casualty event on the Hanford Site as requested.

2.1.1.6 CH2M Hill Hanford Group, Inc. In addition to event contractor responsibilities for the Hanford Site facilities it manages, CHG emergency responsibilities include:

- senior management and technical staff support to the Hanford EOC;
- radiological control technician support; and
- health technician support.

2.1.2 U.S. Department of Energy, Richland Operations Office/Office of River Protection

RL/ORP shall have a trained emergency response staff and shall provide facilities/activities under their cognizance with:

- direction to implement emergency management policy and requirements;
- direction in emergency planning and preparedness activities;
- support and assistance during emergencies; and
- support and assistance in resolving issues in site/facility/activity emergency management programs, as well as assessments of site/facility/activity emergency management programs.

2.1.2.1 RL/ORP Manager. The RL/ORP Manager (or designee) is the senior official who serves as the RL/ORP Emergency Manager with decision-making responsibilities and has the ultimate responsibility and authority for Hanford Site emergency response activities to ensure that effective management is provided for response to emergencies. If the event involves an ORP facility, the ORP Manager (or designee) will assume the responsibility. The RL Manager (or designee) will assume the responsibility in all other events. The RL/ORP Manager is responsible for overseeing the performance of onsite activities necessary to place the site in a safe condition and to minimize or terminate uncontrolled releases of hazardous materials. The RL/ORP Manager is also responsible for interfaces with offsite agencies and the public.

The RL/ORP Manager shall be supported by personnel with communications, technical, and liaison and public affairs expertise and shall ensure fulfillment of his or her responsibilities through direction of the Policy Team and RL/ORP representatives assigned to offsite emergency centers. The responsibilities and staffing of the Policy Team are described in subsection 2.2.2.1.1.

2.1.2.2 RL/ORP Senior Management. As designated by the RL/ORP Manager, senior management personnel or their designees shall fill ERO positions that include:

- members of the Policy Team;
- representatives to the Site Management Team;
- representatives to state and county EOCs;
- a spokesperson in the JIC;
- liaisons to DOE emergency response assets; and
- a representative to DOE Headquarters (HQ), as requested.

2.1.2.3 DOE Facility Representative. The DOE Facility Representative serves in an oversight and liaison capacity at the ICP during declared emergencies. The primary function of the DOE Facility Representative is to observe ICP activities and, if required, report problems about facility conditions, event status, or mitigative actions to the Safety Oversight Director in the Hanford EOC.

2.1.2.4 RL Office of Chief Counsel. The RL Office of Chief Counsel is responsible for advising the RL/ORP Emergency Manager regarding legal matters associated with the emergency, using required legal resources, and administering the contractual affairs and the legal agreements required by the emergency.

2.1.2.5 RL Office of Financial Services. The RL Office of Financial Services is responsible for:

- reviewing the current budget and reallocating available funds, if required;
- reconstructing financial status as of the date of an emergency;
- administering the emergency account and payroll activities;
- managing matters related to the payment of claims under nuclear liability insurance coverage;
- arranging payment for, or otherwise resolving, expenses incurred by DOE activities associated with implementing the emergency planning, preparedness, and response program; and
- arranging for emergency travel and providing subsistence to personnel from the RL/ORP in responding to emergency assistance.

2.1.2.6 RL Office of Procurement Services. The RL Office of Procurement Services is responsible for procuring required supplies and services.

2.1.2.7 RL Office of Site Services. The RL Office of Site Services is responsible for:

- reallocating office space, if required;
- coordinating communications to include interfacing with the U.S. West Telephone Company to implement the emergency communications plan; and
- ensuring that vital records are available and accessible.

2.1.2.8 RL Office of Human Resources Management Services. The RL Office of Human Resources Management Services is responsible for supplying additional manpower required during the emergency.

2.1.2.9 RL Engineering Support Division. The RL Engineering Support Division is responsible for:

- coordinating power distribution in the event of a power failure;
- coordinating the combined efforts of the nuclear, mechanical, electrical, and civil engineers to provide technical design information for special tools, equipment, shielding, storage facilities, and other devices that may be essential during the emergency;
- assessing the extent of structural damage to DOE facilities; and
- providing liaison with onsite and offsite architectural, engineering, and construction contractors that may be called for assistance during the emergency.

2.2 EMERGENCY RESPONSE ORGANIZATION STRUCTURE

Emergency response on the Hanford Site is modeled after the NFPA Incident Command System. As such, the Hanford Incident Command System is an integrated emergency management system with clearly defined responsibilities and communication pathways that allows predesignated and trained individuals to jointly determine and implement incident mitigation strategies.

The Hanford Site ERO has two distinct components – the Incident Command Organization and the DOE Hanford EOC – each with emergency direction and control responsibilities.

The Incident Command Organization consists of the Facility/Building Emergency Response Organization with responsibility for implementing emergency response activities at the event facility, and site contractor emergency response personnel (i.e., Hanford Fire Department, Hanford Patrol) with the responsibility for on-scene mitigation.

For low-hazards and hazardous facilities with a Building Emergency Director (BED) or Building Warden (BW) on the premise at the time of the incident, the BED/BW shall be responsible for implementing appropriate emergency response procedures (e.g., protective actions, event classification, notification) until arrival of the Hanford Fire Department IC or the Hanford Patrol IC for security events. Upon arrival of the Hanford Fire Department or Hanford Patrol IC, the Facility/Building Emergency Response Organization becomes part of a consolidated Incident Command Organization. The BED/BW shall retain responsibility for direct configuration control over facility systems and components while the IC assumes the overall management strategy associated with the incident and ensures that all functional areas are appropriately staffed and working cohesively towards mitigation of the incident.

If the BED/BW is not present at the low-hazards or hazardous facility at the time of an incident (e.g., during off shift hours), the IC shall perform the duties of the BED/BW in addition to his/her own duties. The respective on-call BED/BW shall be summoned to the scene based upon the BED/BW listing located in the POC or PNNL Control Room. If necessary, the BED/BW will make the classification decision (i.e., Alert, Site Area Emergency, or General Emergency) and determine if the RCRA contingency plan implementation requirements have been met prior to responding to the scene. If the on-call BED/BW is not available and timely classification is necessary, the IC may direct the ONC Duty Officer to make the classification decision and determine if the RCRA contingency plan implementation requirements have been met. Upon arrival of the BED/BW at the scene, the IC will turn over the remaining BED/BW duties.

The DOE Hanford EOC has the responsibility to monitor and provide support for the onsite response, assist with issue resolution, assess the offsite impacts, and interface with offsite agencies and the public.

Both components of the Hanford ERO are depicted on Figure 2-1 and further delineated in the respective subsections below.

For nonfacility events (e.g., onsite transportation incidents, wildland fires), the IC shall be responsible for coordinating and performing the response activities. The EDO shall have the responsibility for further classifying the event (i.e., as an Alert, Site Area Emergency, or General Emergency) and determining if the RCRA contingency plan implementation requirements have been met, if warranted. If the EDO is not available and timely classification is necessary, the IC may direct the ONC Duty Officer to make the classification decision and determine if the RCRA contingency plan implementation requirements have been met, if warranted. After the immediate threat of a release has been stabilized or eliminated, remaining duties will be delegated from the IC to the organization that offered the hazardous substance for transportation.

In all events, the Incident Command Organization shall have the authority to commit the resources needed to carry out the emergency response; and be thoroughly familiar with applicable plans and procedures, operations and activities at the facility, location and properties of all wastes handled, location of all records within the facility, and the layout of the facility.

2.2.1 Incident Command Organization

The Hanford Incident Command System provides a graduated response mechanism for unusual conditions and emergencies on the Hanford Site.

Depending on the severity of the event, the Incident Command Organization is comprised of two main groups — the Facility/Building Emergency Response Organization, and site contractor emergency response personnel (i.e., Hanford Fire Department, Hanford Patrol). Other emergency response support personnel may be called upon to assist in the mitigation of an event depending on the type of emergency, but are not considered part of the Hanford ERO. The appropriate personnel from each group may be located at either the event scene or ICP, or staging area. A description of each group, including roles and responsibilities, is provided in the following subsections.

In its most basic form, the Incident Command Organization may be staffed in its entirety by facility or process personnel as deemed necessary by the BED or BW. In these instances, the BED or BW coordinates emergency response efforts at the scene to include oversight of mitigation efforts, use of appropriate personal protective equipment, facility protective actions, and relevant notifications. Examples of such events that do not require assistance from outside the facility (termed incidental responses) include small releases of known substances when mitigation can be accomplished by trained on-scene personnel, minor first aid cases, noninjury contamination incidents, and nonemergency plant responses.

As incidents escalate, the Hanford Incident Command System enables the use of additional site contractor emergency response personnel to mitigate the event. Requests for such additional site contractor emergency response personnel are made to the POC via the 911 emergency number (or 373-3800 for cellular telephones) and, where applicable, automated alarm systems. This level of response requires the designation of an IC. The responding Hanford Fire Department senior officer for events involving fire, medical, hazardous materials, or rescue shall be the IC and also fulfill the role of the senior emergency response official. The Hanford Patrol Shift Commander will act in the capacity of the IC during security incidents.

Additionally, an ICP shall be established as required to meet the needs of the event. The ICP shall be established in a safe location near the incident scene. Organizations supporting the ICP retain responsibility for their technical operations and provide facility expertise to the IC. The IC is responsible for the health and safety of personnel at the event scene (i.e., the impacted area under his/her direct control) and for the overall management strategy associated with the incident to ensure that functional areas are appropriately staffed and working cohesively towards mitigation of the incident.

The Incident Command Organization is staffed by pre-appointed and trained individuals as delineated in Table 2-1. Personnel working in support of the Incident Command Organization delineated in Table 2-1 must complete initial, annual, and ongoing training on their respective roles, responsibilities, and authorities within the Incident Command Organization. Drills and exercises are used to provide a format for Incident Command Organization responders to demonstrate their proficiency.

Figure 2-1. Hanford Site Emergency Response Organization.

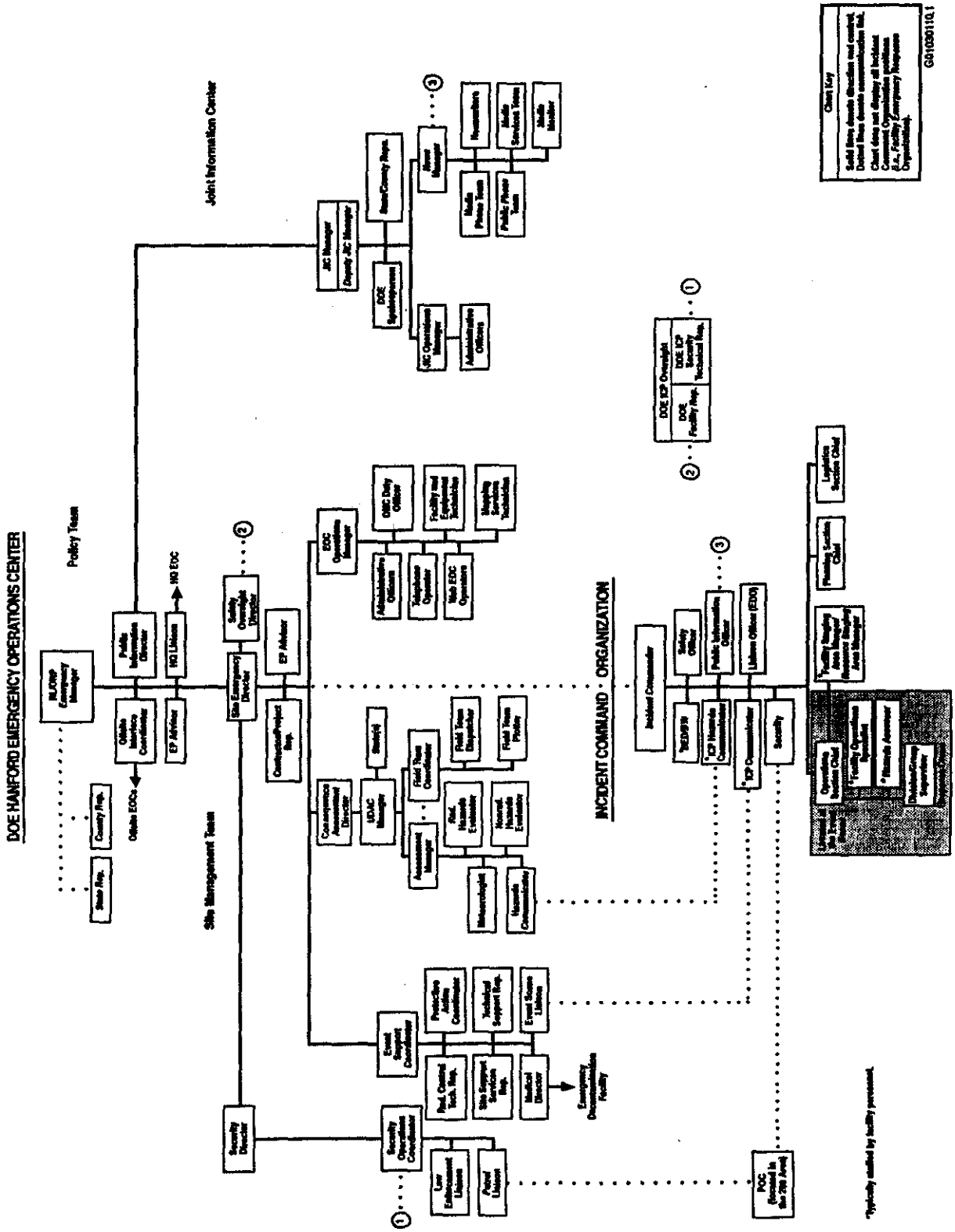


Table 2-1. Incident Command Organization Functions.

FUNCTION	RESPONSIBLE STAFFING
Incident Commander	Hanford Fire Department/Hanford Patrol
Building Emergency Director/ Building Warden	Affected facility
Public Information Officer	FHI or appropriate contractor personnel
Liaison Officer	Emergency Duty Officer
Safety Officer	Hanford Fire Department
ICP Communicator	Affected hazardous facility
ICP Hazards Communicator	Affected hazardous facility
Facility Operations Specialists	Affected facility
Operations Section Chief	Hanford Fire Department/Hanford Patrol
Radiological Hazards Assessor	Affected facility radiological control manager (or equivalent)
Chemical Hazards Assessor	Hanford Fire Department, on-call Industrial Hygienist, or affected facility
Planning Section Chief	Hanford Fire Department
Logistics Section Chief	Hanford Fire Department
Resource Staging Area Manager	Hanford Fire Department
Facility Staging Area Manager	Affected facility

Contractor personnel shall provide a BED or BW for the purpose of supporting the Incident Command Organization as soon as possible. In the event of full implementation of the Incident Command Organization, additional facility personnel shall be available to support required functions.

2.2.1.1 Facility/Building Emergency Response Organization. Hanford Site facilities are divided into one of three types – administrative, low-hazards, and hazardous – depending on the hazards associated with the facility. Personnel and resources at the facility level comprise initial response capability for an emergency. Facilities shall direct appropriate emergency response actions, as delineated in the respective sections below, within the area under their control and at the scene of the emergency, including effective coordination with the IC and the Hanford EOC. Initial direction and control of emergency response at the facility prior to establishment of an ICP is the responsibility of the Facility/Building Emergency Response Organization.

A list of all BEDs and BWs assigned to low-hazards and hazardous facilities shall be located in the ONC in accordance with the Hanford Facility RCRA Permit (Dangerous Waste Portion) General Condition II.A.4. The list shall include telephone numbers (home and work) to ensure that these individuals can be reached 24 hours per day.

2.2.1.1.1 Administrative Facilities. Administrative facilities are defined as onsite office buildings or general-purpose facilities. The governing requirement for such facilities is 29 CFR 1910.38, which means that facilities where personnel are evacuated from the danger area when an emergency occurs, and are not permitted to assist in handling the emergency, are exempt from 29 CFR 1910.120(q) requirements.

The building management for administrative facilities shall assign BWs or BEDs (primary and alternates) who shall manage and control all aspects of the initial facility response and shall direct an emergency organization made up of individuals within the facility who will assist in the protection of personnel, the environment, and property. Personnel may take emergency actions to report an emergency, initiate protective actions including personnel accountability, and control of personnel while implementing protective actions. Typically, three emergency positions are identified for these response actions: the BW/BED, Staging Area Manager, and Personnel Accountability Aides (or other contractor-designated names). These positions may also be present in low-hazards and hazardous facilities but only for emergency actions as required in 29 CFR 1910.38 and not for 29 CFR 1910.120. The BW/BED is responsible for emergency response at the event scene until arrival of the IC.

In addition, the building management, or designee, shall be responsible for:

- assigning and ensuring the training of the BW/BED, personnel accountability aides, and staging area managers (or other contractor-designated names); and
- maintaining the facility emergency response information boards/building emergency procedures.

Specific responsibilities of the BW/BED shall include, as applicable:

(a) activating internal facility alarms or communications systems, where applicable, to notify building occupants of protective actions to be taken;

(b) ensuring that a 911 telephone call is made when emergency assistance is required;

(c) assisting the IC, as necessary, in mitigating emergencies within the assigned building; and

(d) ensuring that building occupants take appropriate protective actions in response to events occurring in other onsite geographic areas or adjacent facilities.

2.2.1.1.2 Low-hazards Facilities. Low-hazards facilities are defined as facilities that cannot generate an Alert, Site Area Emergency, or General Emergency but contain hazards not found in administrative facilities. These facilities are typically subject to requirements driving preparation of an environmental, safety, and health related emergency preparedness plan/procedure, which include, but are not limited to, RCRA, CERCLA, the Toxic Substances Control Act, and the Occupational Safety and Health Administration (OSHA).

The building management for low-hazards facilities shall assign BWs or BEDs (primary and alternates) who shall manage and control all aspects of the initial facility response and direct a Facility/Building Emergency Response Organization made up of individuals within the facility who will assist in the protection of personnel, the environment, and property. The BW/BED is responsible for emergency response at the event scene until arrival of the IC.

In addition, the building management, or designee, shall be responsible for:

- assigning and ensuring the training of the Facility/Building Emergency Response Organization as necessary to support the Hanford Fire Department as the RL/ORP-designated hazardous materials emergency response agency;

- maintaining building emergency plans/procedures or facility-specific emergency response procedures, as applicable, in accordance with subsection 14.3.1;

- ensuring that facility personnel are aware of hazards; and

- ensuring that facility personnel are trained to respond to emergencies.

Specific responsibilities of the BW/BED shall include, as applicable:

(a) determining when an event has occurred or a condition exists that requires response in accordance with applicable state and Federal regulations;

(b) activating internal facility alarms or communications systems, where applicable, to notify building occupants of protective actions to be taken;

(c) ensuring that a 911 telephone call is made when emergency assistance is required;

(d) reporting events or conditions in accordance with applicable state and Federal regulations;

(e) establishing an initial ICP and assigning other Incident Command Organization functions in accordance with established procedures to provide effective control at the event scene;

(f) assisting the IC, as necessary, in the mitigation of emergencies within the assigned building by:

- identifying the character, exact source, amount, and areal extent of any released material;
- assessing possible hazards to human health and the environment that may result from the release, fire, or explosion;
- taking reasonable measures (e.g., stopping processes/operations, collecting/containing released waste, removing/isolating containers) necessary to ensure that fires, explosions and releases do not occur, recur, or spread to other dangerous waste;
- monitoring for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, as appropriate; and

(g) ensuring that building occupants take appropriate protective actions in response events occurring in other onsite geographic areas or adjacent facilities.

The duties of the Facility/Building Emergency Response Organization may include, but will not be limited to:

- assisting in the alerting of employees of an emergency situation;
- assisting in building evacuations and building sweeps;
- providing assistance to the Hanford Fire Department and/or Hanford Patrol to include meeting and directing responders to the event scene, providing safe routes of travel, and providing immediate and constant interface, coordination, and information as the emergency situation requires.

Emergency training requirements for the Facility/Building Emergency Response Organization are delineated in subsection 12.2.2.1.2.

Permit requirement: Subsection 2.2.1.1.2(d), Class 1 Modification 9/30/99
Permit requirement: Subsection 2.2.1.1.2(f), Class 1 Modification 9/30/99

2.2.1.1.3 Hazardous Facilities. Hazardous facilities are defined as facilities capable of generating an Alert, Site Area, or General Emergency as defined by DOE O 151.1. Facilities in this group include reactor or nuclear facilities, or nonnuclear hazard facilities. TSD units containing quantities of wastes or materials capable of generating an Alert or higher emergency will also be categorized as a hazardous facility.

The building management for each hazardous facility shall establish and maintain a Facility/Building Emergency Response Organization with overall responsibility for the initial and ongoing response to and mitigation of an emergency. BEDs (primary and alternates) shall be assigned to manage and control all aspects of the facility response and to direct the Facility/Building Emergency Response Organization at the event scene until arrival of the IC. Initiation of emergency lifesaving measures or support of protective actions for facilities which require self-contained breathing apparatus (SCBA) must not rely entirely on the Hanford Fire Department to provide such equipment on emergency response vehicles. The minimum assumption used for emergency planning for the Hanford Fire Department arrival shall be 10 minutes plus travel time to destination. A BED (primary or alternate) must be present onsite and within reasonable proximity to the facility (as defined by contractor policy) if work is being performed which could generate an Alert or higher emergency classification. On-call BEDs, where designated, may be used for facilities where hazardous materials is in storage and stable, and the work being performed is that of surveillance.

The organization, size, and emergency response duties assigned to the Facility/Building Emergency Response Organization shall be based on a graded approach and upon hazards at the facility and the level necessary to support the Hanford Fire Department as the RL/ORP-designated hazardous materials emergency response agency. In addition, the positions and responsibilities of the Facility/Building Emergency Response Organization shall be documented in specific building emergency plans and/or procedures. The content, distribution and organizational approval of the building emergency plan and/or procedures shall be determined by the respective contractor emergency preparedness organization.

> NOTE: Building emergency plans are not required for unoccupied hazardous facilities. However, BEDs shall be identified and trained to implement initial emergency response procedures.

The building management, or designee, shall be responsible for:

- assigning and ensuring the training of the Facility/Building Emergency Response Organization as necessary to support the Hanford Fire Department as the RL/ORP-designated hazardous materials emergency response agency;
- maintaining, reviewing, and revising the building emergency plan and applicable facility-specific emergency response procedures in accordance with subsection 14.3.1;
- ensuring that facility personnel are aware of hazards; and

- ensuring that facility personnel are trained to respond to emergencies.

Specific responsibilities of the BED shall include:

(a) determining when an event has occurred or a condition exists that requires appropriate emergency event classification;

(b) activating internal facility alarms or communications systems, where applicable, to implement actions to protect workers within their respective geographic area of responsibility as defined in the building emergency plan or procedures;

(c) assessing the potential or actual onsite and offsite consequences of the emergency;

(d) contacting the POC, via the 911 emergency number, to implement predetermined onsite protective actions and provide initial emergency and classification information in accordance with established procedures;

(e) reporting events or conditions in accordance with applicable state and Federal regulations;

(f) establishing an initial ICP and assigning other Incident Command Organization functions in accordance with established procedures to provide effective control at the event scene;

(g) assisting the IC, as necessary, in the mitigation of emergencies within the assigned building by:

- identifying the character, exact source, amount, and areal extent of any released materials;
- taking reasonable measures (e.g., stopping processes/operations, collecting/containing released waste, removing/isolating containers) necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste;
- monitoring for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, as appropriate; and

(h) ensuring that building occupants take appropriate protective actions in response to events occurring in other onsite geographic areas or adjacent facilities.

Permit requirement: Subsection 2.2.1.1.3(a), Class 1 Modification 9/30/99
Permit requirement: Subsection 2.2.1.1.3(e), Class 1 Modification 9/30/99
Permit requirement: Subsection 2.2.1.1.3(f), Class 1 Modification 9/30/99
Permit requirement: Subsection 2.2.1.1.3(g), Class 1 Modification 9/30/99

The duties of the Facility/Building Emergency Response Organization may include, but will not be limited to:

- assisting in the alerting of employees of an emergency situation;
- assisting in the safe evacuation of the incident scene hazard area;
- providing immediate first-aid if required;
- placing operating systems or controls in a safe configuration;
- implementing or supporting the implementation of protective actions for the general population to include roadblocks and building sweeps;
- assisting in emergency classification and emergency notification of such classification within established regulatory time limits;
- providing assistance to the Hanford Fire Department and/or Hanford Patrol to include meeting and directing responders to the event scene, providing safe routes of travel, and providing immediate and constant interface, coordination, and information as the emergency situation requires;
- serving as emergency response team members in support of the Hanford Fire Department for entry into the incident scene hazard area for mitigation where personnel protective equipment requirements do not specify Level A or Level B dermal protection (refer to Appendix B of CFR 1910.120);
- providing chemical monitoring and assessment, in conjunction with the Hanford Fire Department Industrial Hygienist, for emergency response;
- providing radiological monitoring and assessment for emergency response; and
- providing support for chemical and/or radiological decontamination.

Emergency training requirements for the Facility/Building Emergency Response Organization are delineated in subsection 12.2.2.1.3.

2.2.1.2 Site Contractor Emergency Response Personnel

2.2.1.2.1 Hanford Fire Department. The Hanford Fire Department is the RL/ORP-designated incident command agency for control of all hazardous materials (radiological and nonradiological) and chemical/biological incidents on the site and, as such, controls the fire, hazardous materials, and/or personnel rescue response activities associated with an emergency. In this capacity, the Hanford Fire Department shall provide a hazardous materials response team, as defined in 29 CFR 1910.120(q)(6)(i)-(v) and NFPA 472, as well as a qualified Safety Officer for all emergency response activities.

As a 24-hour operational facility/dispatch center, the Hanford Fire Department also monitors facility fire alarm systems, and coordinates and provides emergency medical services on the Hanford Site. Emergency medical support responsibilities are further delineated in subsection 8.1.1.

2.2.1.2.2 Hanford Patrol. The Hanford Patrol monitors alarm systems and provides security services including coordination of the movement of emergency personnel through security gates, evacuation assistance, and barricade establishment where needed. Additional law enforcement is available through agreements with local and Federal agencies at the request of RL. The Hanford Patrol is the designated incident command agency for security emergencies.

Additionally, the POC, a 24-hour operational facility/dispatch center, is responsible for emergency functions that include, but are not limited to:

- operating the site's enhanced 911 system;
- acting as the single point-of-contact to initiate emergency response by
  - notifying the BED/BW (when not on the premises)
  - requesting response from the Hanford Fire Department
  - notifying appropriate on-call personnel
  - activating or requesting activation of appropriate alarm signals;

  NOTE: PNNL uses 375-2400 as single point-of-contact.
- activating the ONC conference bridge upon notification of a declared emergency and implementing onsite protective actions by activating warning sirens and crash alarm telephone systems; and
- receiving emergency response telephone calls during offsite shipments of RL/ORP-owned hazardous materials.

Emergency medical support responsibilities of the Hanford Patrol are further delineated in subsection 8.1.3.

2.2.1.3 Other Emergency Response Support Personnel. Some emergency situations may require facility or site support personnel to be used for emergency response at the event scene that are not assigned positions within the Hanford ERO. These emergency response support personnel – termed either as Skilled Support Personnel or Specialist Employees – are not trained to operate within the Hanford Incident Command System and must only be used for specific tasks defined in the following subsections.

2.2.1.3.1 Skilled Support Personnel. Personnel needed to operate specific support equipment, including those within the incident scene hazard area, but are not addressed in specific emergency response procedures, may be designated as Skilled Support Personnel. Such personnel shall receive a briefing prior to commencing any work. Training requirements in accordance with 29 CFR 1910.120(q)(4) are delineated in subsection 12.2.2.3.1.

2.2.1.3.2 Specialist Employees. Safety professionals and environmental specialists who provide technical advice within their field of expertise, but are not addressed in specific emergency response procedures, may be designated as Specialist Employees. Such personnel will only provide expertise and advise to the IC when requested and may not enter the incident scene hazard area. Training requirements in accordance with 29 CFR 1910.120(q)(5) are delineated in subsection 12.2.2.3.2.

2.2.2 Hanford Emergency Operations Center

The Hanford EOC is an emergency response facility maintained by RL for the purpose of providing an area where personnel may convene during emergency conditions to provide essential response functions. These functions include public information, offsite protective action recommendations, field monitoring and sampling, hazard assessment, oversight of onsite mitigative activities, and oversight of onsite protective actions.

The Hanford EOC shall be activated and operational within one hour upon declaration of an Alert or higher emergency.

The Hanford EOC may also be fully or partially activated in the following situations.

- As directed by the RL/ORP Manager, or designees, when events occur that are not classified as an Alert or higher emergency but where action to provide monitoring or assistance to the event scene or other agencies, is requested. Such events may include:
  - Hanford Site emergency conditions that potentially involve significant onsite or offsite consequences;
  - security events;
  - natural disasters (i.e., earthquake, tornado) that could or does result in significant onsite or offsite public or environmental impact;
  - requests from other government agencies for support of regional emergencies; or
  - threats or acts of terrorism, or when a national emergency is declared by the President of the United States or the United States Congress.
- As requested by the BED/BW, IC, or EDO where action to provide monitoring or assistance to the event scene is needed.
- As requested by the RAP team leader to support a RAP response.
- In response to non-DOE emergencies that affect the Hanford Site.

- In response to TEP events involving the offsite shipment of RL/ORP-owned hazardous materials.

The Hanford EOC is made up of several organizations that are responsible for implementing defined emergency response tasks. These organizational areas are defined in the following subsections. Detailed procedures for the activation, staffing, and operation of the Hanford EOC are contained in DOE-0223, *Emergency Plan Implementing Procedures.*

2.2.2.1 Policy Team. The primary functions of the Policy Team are the oversight of onsite activities, approval and communication of offsite protective action recommendations, approval of reclassification recommendations, oversight of public information activities, and coordination with offsite agencies.

The Policy Team is staffed by the RL/ORP Emergency Manager, Public Information Director, Emergency Preparedness Advisor, Offsite Interface Coordinator, DOE-HQ Liaison, and the responding state and county representatives.

During security incidents, RL is responsible for decisions that address mitigation of the security event. This involves direction and control of Hanford Site security and patrol forces, and coordination of facility response. However, the Federal Bureau of Investigation (FBI) may exercise the option to take command of security events involving the violation of the Atomic Energy Act of 1954 or other Federal statutes. Associated response by site contractor personnel for personnel and operational safety rests with the IC and the BED.

2.2.2.1.1 Policy Team Staffing and Responsibilities. The RL/ORP Manager (or designee) shall be the RL/ORP Emergency Manager. If the event involves an ORP facility, the ORP Manager (or designee) will assume the responsibility. The RL Manager (or designee) will assume the responsibility in all other events. The RL/ORP Emergency Manager is responsible for oversight operations of the Hanford EOC and for ensuring implementation of the responsibilities of RL as the lead Federal agency. In consultation with the Hanford EOC staff, the RL/ORP Emergency Manager approves emergency reclassification and termination, offsite PARs, and notifications.

Once operational, general functions of the Policy Team include:

- overview of onsite response and mitigation actions, and providing assistance to the event contractor as needed;
- providing offsite notifications and PARs to state, local, and Federal agencies, and continuous updates to the state/counties about conditions;
- notifying the DOE-HQ Cognizant Secretarial Officer (CSO) and the DOE-HQ Emergency Management Team if facility operations were shut down as a part of the protective action response;
- providing direction and control, as appropriate, during a security incident;

- reclassifying or terminating the emergency;
- directing the activities of the JIC in providing timely and accurate release of information to the public and media, including approval of RL/ORP news releases;
- forwarding requests for additional DOE emergency response assets to the Regional Response Coordinator as needed;
- providing liaisons to offsite emergency centers and responding DOE emergency response assets;
- providing a representative to DOE-HQ as requested; and
- designating a recovery organization.

2.2.2.2 Joint Information Center. The primary function of the JIC is the dissemination of accurate and timely information to the public and employees about RL/ORP activities during declared emergencies. The JIC operates under the direction of the Public Information Director and is staffed by RL/ORP, contractor, state, and county communication professionals responsible for coordinating the release of information to the public and media.

One or more Newswriter(s) reside next to the Policy Team area in order to obtain the most current information for the development of draft press releases. Once developed, the Newswriter(s) ensures that the releases are reviewed for technical accuracy and security sensitivities prior to approval by the RL Public Information Director. Upon approval, the press releases are sent to the JIC for dissemination.

The JIC provides a single location where RL/ORP and site contractors can coordinate the release of information with other Federal agencies, state, and local jurisdictions. Provisions shall be made at the JIC for representatives from the states of Washington and Oregon, plume EPZ counties, and other Federal agencies that may be involved in the emergency response.

The functions performed at the JIC include:

- preparing and coordinating information released to the public and media;
- answering questions of the public and media; and
- rumor control.

2.2.2.3 Site Management Team. The primary functions of the SMT are to provide support to the Incident Command Organization by providing additional resources not easily obtained by the IC; tracking the status of onsite protective actions; developing and directing implementation of additional onsite protective actions away from the event scene (i.e., the area not under the direct control of the IC) as required; and providing communications support. The SMT is also responsible for hazards assessment activities, tracking personnel medical issues, developing additional offsite protective action recommendations, record keeping, and overall operation of the center.

The SMT is made up of four support organizations that are responsible for implementing defined emergency response tasks. These organizations are defined below.

2.2.2.3.1 Executive Team and Support Staff. The Site Emergency Director is responsible for the coordination of all SMT activities. In this role, the Site Emergency Director is responsible for the activities of the Event Support Coordinator, EOC Operations Manager, and the Consequence Assessment Director.

Since RL has an operational function over Hanford security forces, the Security Director is responsible for the activities of the Security Operations Coordinator. The Security Director will receive information from and provide direction to the security forces. The Security Director will communicate planned actions of security forces to the Site Emergency Director and Safety Oversight Director to ensure all safety and security issues are addressed and coordinated. The Site Emergency Director, in conjunction with the Security Director and Safety Oversight Director, is responsible for periodically providing status information to the RL/ORP Emergency Manager and the Policy Team. The Contractor Representative and SMT Emergency Preparedness Advisor provide support to the Site Emergency Director.

2.2.2.3.2 Security and Event Support. As part of the SMT staff, the Security Operations Coordinator's primary functions are security operations, which include interface with local law enforcement agencies, coordination with the Federal Bureau of Investigation (FBI), and oversight of onsite patrol activities. The Security Operation Coordinator reports directly to the Security Director.

The Event Support Coordinator is responsible for event support activities to include site support services, technical support, communications with the event scene, and coordination with the Emergency Decontamination Facility and other medical assessment activities. The Event Support Coordinator reports directly to the Site Emergency Director.

2.2.2.3.3 Unified Dose Assessment Center. As part of the SMT, the primary Unified Dose Assessment Center (UDAC) functions are monitoring and evaluating existing emergency conditions in order to develop additional protective action recommendations. The UDAC is responsible for field team activities to include plume tracking, monitoring, and sampling.

Representatives from the states of Washington and Oregon participate in the development of recommendations and provide direction for offsite environmental monitoring. The UDAC is operated by site contractor personnel with knowledge in the technical areas of meteorology, toxicology, industrial hygiene, and health physics. The Consequence Assessment Director is responsible for all UDAC activities and reports directly to the Site Emergency Director.

Specific UDAC responsibilities include:

- acquiring necessary data and measurements to evaluate personnel radiation doses and chemical exposures resulting from the event;

- assessing the potential for onsite and offsite consequences of a release of radioactive or nonradioactive materials based on meteorological conditions, source term, location and dispersal of the hazardous material;

- assisting the event contractor or other Hanford Site contractors in onsite hazard assessment or development of onsite protective actions;

- analyzing the consequences associated with evacuating versus remaining in a take cover situation for onsite personnel and recommending appropriate additional protective actions if necessary;

- developing offsite PARs in coordination with representatives from the states of Washington and Oregon; and

- coordinating and directing emergency environmental monitoring teams that are not assigned to the event facility. This may include state field teams performing offsite monitoring if requested by the states.

2.2.2.3.4 Hanford EOC Operations. As part of the SMT, the primary functions of the Hanford EOC Operations team are administration, record keeping tasks, and dissemination of information to offsite agencies (i.e., Hanford Emergency Notification Form, UDAC products, etc.). The EOC Operations Manager is responsible for these activities. In this role, the EOC Operations Manager reports directly to the Site Emergency Director.

2.2.2.4 Event Coordination Team. The Event Coordination Team is a partial staffing of the Hanford EOC that allows for a graded response to events occurring on or off the Hanford Site which are not further classified as an Alert or higher emergency. The Event Coordination Team can be used to provide resource and communications support to the ICP; to monitor abnormal conditions that could impact site workers, facilities, or operations (e.g., power outage, severe weather conditions); or for events that may require additional monitoring or distributing information to site workers and the public. The Event Coordination Team does not require that all Hanford EOC positions be filled. Instead, the on-call Site Emergency Director or Emergency Duty Officer will determine staffing and length of operation. Detailed procedures for the activation and responsibilities of the Event Coordination Team are contained in DOE-0223, *Emergency Plan Implementing Procedures*.

3.0 OFFSITE RESPONSE INTERFACES

3.1 OVERVIEW

Interfaces and coordination with offsite agencies are important in the planning, preparedness, response, and recovery elements of the Hanford emergency management program. As such, RL shall interface with Federal, tribal, state, local, and private organizations and/or agencies:

- that have a responsibility to protect the public and environment within the EPZs of the Hanford Site;
- with which RL supports as the Regional Coordinating Office for Region 8 (Oregon, Washington, and Alaska); and
- with which RL has entered into special agreements for assistance.

Where appropriate, RL shall develop and maintain agreements to formalize areas of understanding, cooperation, and support with offsite agencies.

3.1.1 Planning and Preparedness

The modes of interface for planning and preparedness activities, as is determined beneficial by the parties, may include:

- coordination of emergency plans and procedures;
- periodic meetings to share information and coordinate activities;
- training opportunities related to offsite responsibilities;
- development of agreements for support to and from offsite agencies;
- participation in annual exercises; and
- development of public information programs.

3.1.2 Response and Recovery

In the event of an emergency on or affecting the Hanford Site, RL shall interface with offsite agencies to ensure coordination and support of response and recovery activities. These interfaces include:

- notification and periodic updates to local jurisdictions within the plume EPZ, states that contain portions of the ingestion EPZ, and other agencies that may be requested to provide assistance (see respective subsections in section 5.0);

Permit requirement: Subsection 3.1, Class 1 Modification 9/30/99
Subsection 3.1.1, Class 1 Modification 9/30/99

- communication and coordination with DOE-HQ;
- RL representation in appropriate offsite emergency centers;
- offsite representation in the Hanford EOC;
- PARs to offsite agencies; and
- event scene interface with offsite responders.

Communications with state and local EOCs are depicted on Figure 3-1.

3.2 FEDERAL AGENCIES

3.2.1 U.S. Department of Energy-Headquarters

The DOE-HQ Cognizant Secretarial Officers are responsible for ensuring implementation of policy and requirements for activities conducted under their respective areas of cognizance.

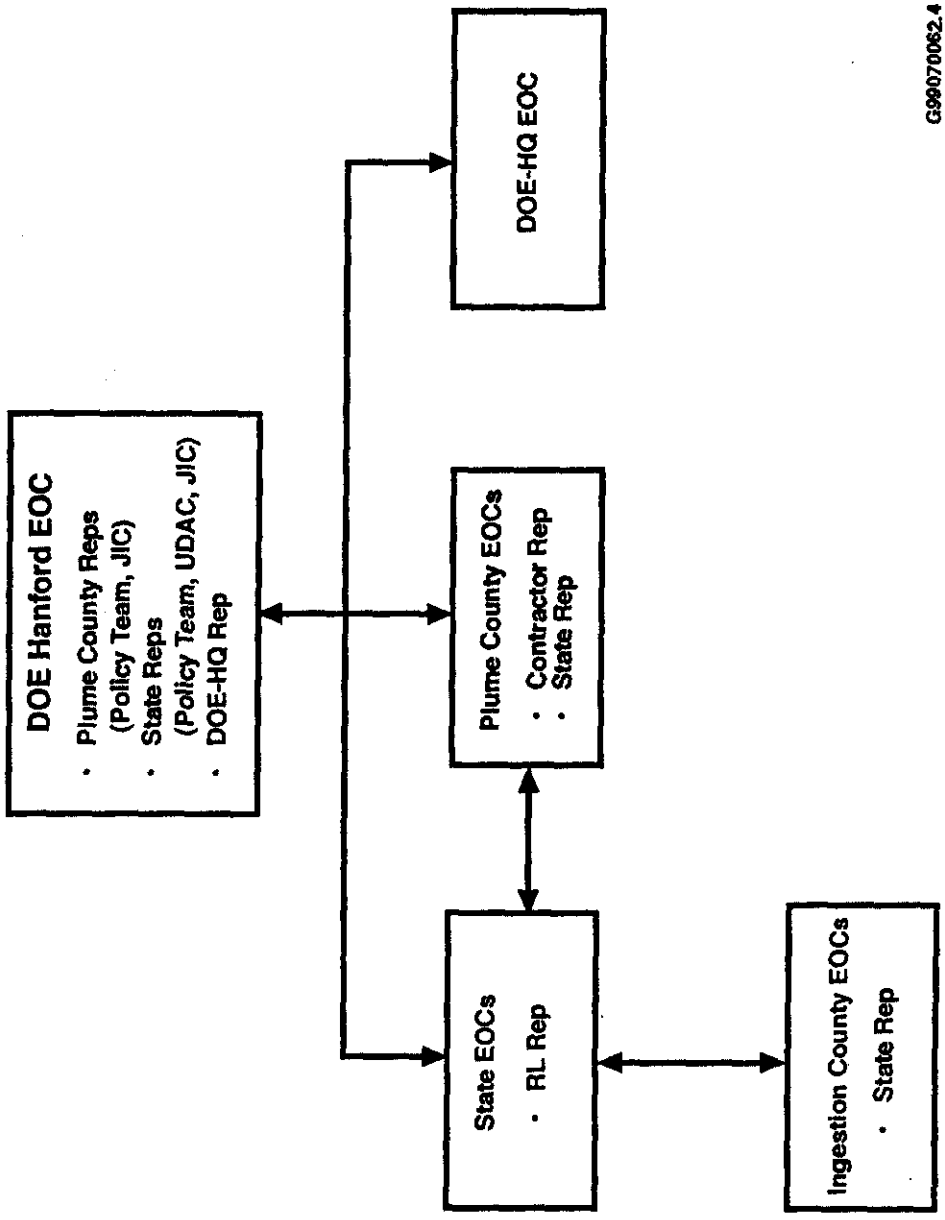
The DOE-HQ EOC serves as the point-of-contact for receipt of all emergency notifications and reports. Accordingly, the DOE-HQ EOC receives, coordinates, and disseminates emergency information to DOE-HQ elements and Program Office emergency points-of-contact, the White House Situation Room, and other Federal agencies. As such, emergency status reports shall be forwarded to the DOE-HQ EOC on a continuing basis until the emergency is terminated.

In the event of an emergency, a DOE-HQ Emergency Management Team is convened to:

- receive information on the facility, site, or area response;
- monitor the Operations/Field Office;
- provide appropriate support and assistance;
- assist with issue resolution; and
- coordinate interagency Congressional, and public information activities at the national level.

RL/ORP shall notify and provide information to the DOE-HQ EOC. Written reports shall be provided to the DOE-HQ EOC as soon as practical, but within 24 hours of emergency classification. A DOE-HQ Site Representative will respond to the Hanford EOC to provide liaison with the DOE-HQ EOC. Upon request from DOE-HQ, RL/ORP shall dispatch a liaison to support activation of the DOE-HQ EOC.

Figure 3-1. Lines of Communication Between Emergency Centers.



3.2.2 Federal Bureau of Investigation

The role of the FBI is to serve as the primary U.S. Law Enforcement Agency responsible for investigating alleged or suspected violations of the Atomic Energy Act of 1954, as amended, and other Federal statutes. As such, security events of national consequence occurring at the Hanford Site and within the jurisdiction of the U.S. Department of Justice (e.g., theft of special nuclear material, terrorist activity, weapons of mass destruction incidents) will be communicated to the FBI.

During these types of security events, the FBI becomes the Lead Federal Agency and acts as the On-scene Commander with responsibility for crisis management which may include intelligence, surveillance, tactical operations, behavioral assessments, negotiations, forensics, and investigation. The FBI will receive a complete briefing on the incident from Hanford EOC personnel and determine the need for additional regional and national FBI crisis management resources.

Command of FBI response activities, including plant security forces deployed at the event scene, will be the responsibility of the FBI Special-Agent-in-Charge when a declared security event has occurred. The FBI has the authority to assume command and control of all FBI and DOE on-scene crisis management resources, including plant security forces deployed at the event scene, when the FBI crisis management assets are in place and ready to assume their specific crisis management responsibilities. An RL Office of Security and Emergency Services (SES) representative will be assigned to provide direct support to the FBI as requested. RL will retain command and control of a security event until the FBI assumes this responsibility. Additionally, RL/ORP and site contractors will maintain operational control and authority over those site areas and resources not directly affected by the incident.

The DOE-HQ Office of Security and Emergency Operations maintains a memorandum of understanding (MOU) with the FBI Counterterrorism Division which provides mutual support guidelines concerning the contingency response planning, coordination of procedures, training and exercises, and operational cooperation required to effectively deal with actual or possible security related emergencies.

3.2.3 U.S. Coast Guard

The U.S. Coast Guard (USCG) (through the Thirteenth District Commander in Seattle, Washington and the Captain of the Port in Portland, Oregon) may regulate activities on navigable waters within the Hanford Site, when necessary, to prevent harm to persons, property, and the environment in or on those waters.

When notified of a Site Area or General Emergency, the USCG will close the appropriate portion of the Columbia River and make a broadcast to mariners.

In the event of an emergency, the ONC will make notifications and provide information to the USCG in Portland, Oregon.

3.2.4 U.S. Environmental Protection Agency

Under the provisions of the Federal Radiological Emergency Response Plan (FRERP), the EPA shall assume the lead Federal agency responsibility for coordinating the intermediate and long-term offsite radiation monitoring activities.

In the event of an emergency, the Hanford EOC shall notify and provide information to the EPA Region 10 in Seattle, Washington.

3.2.5 Federal Aviation Administration

The Federal Aviation Administration (FAA) may make flight restrictions for aircraft under their jurisdiction over the Hanford Site.

The ONC will notify and provide information to the FAA Seattle Center. At a Site Area or General Emergency the ONC may request the FAA to impose flight restrictions over the Hanford Site.

3.2.6 Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) is responsible for coordinating Federal assistance (other than monitoring resources) to the states if requested. Under the provisions of the FRERP, FEMA coordinates the offsite (nontechnical) response.

At the time of a declaration of an emergency, the Hanford EOC notifies and provides information to the FEMA Region 10 office in Bothell, Washington.

3.3 STATE GOVERNMENT

States, along with local governments, share the responsibility for the protection of the public and the environment. The responsibilities and concept of operations for state agencies are described in the emergency response plans of each state.

RL shall work with the states of Washington and Oregon to assist in development of their program and response plans for an emergency at the Hanford Site. Periodic meetings will be conducted with the states to coordinate plans and share information. General descriptions of emergency responsibilities as well as areas of cooperation and understanding between RL and the states are delineated in memoranda of understanding (MOU). Copies of the MOUs are provided in Appendix B.

3.3.1 The State of Washington

The Governor of Washington is responsible for command and control of state resources to maintain and preserve life, property, and the environment in Washington. The lead agency for emergency planning and response activities is the Emergency Management Division of the Military Department. Other state agencies that participate in the planning process and have emergency response roles include the:

- Department of Health;
- Department of Agriculture;
- State Patrol;
- Department of Ecology; and
- Department of Transportation.

An emergency response plan is maintained by the Emergency Management Division that describes the concept of operations and roles and responsibilities of the state agencies. Emergency procedures are maintained by each state agency.

Responsibilities of the state of Washington include:

- providing a 24-hour single point of contact for the receipt of emergency notifications from RL/ORP;
- disseminating information to potentially affected counties within the plume and ingestion EPZs;
- coordinating ingestion protective action decisions and public information with the counties, the state of Oregon, and RL;
- providing assistance to counties as requested;
- evaluating offsite emergency PARs made to plume EPZ counties;
- making protective action decisions to protect public health from ingestion-related impacts, such as contamination of the food chain;
- performing field environmental radiological monitoring and dose assessments;
- providing guidance on emergency worker exposure and authorizing emergency workers to exceed protective action guides;
- implementing food, milk, and animal-feed control measures; and
- requesting Federal assistance as required.

3.3.2 The State of Oregon

The Governor of Oregon is responsible for directing and controlling state activities to protect the lives and property of Oregon citizens. The lead agency for Hanford Site emergency planning is the Oregon Office of Energy. Other state agencies that participate in the planning process and have emergency response roles include the:

- State Public Information Officer;
- Health Division;
- Emergency Management Division;
- Department of Agriculture;
- Oregon State University Radiation Center;
- Military Department;
- State Police; and
- State Highway Division.

An emergency response plan is maintained by the Oregon Office of Energy that describes the concept of operations and roles and responsibilities of state agencies. Emergency procedures are maintained by each state agency.

Responsibilities of the state of Oregon include:

- providing a 24-hour single point of contact for the receipt of emergency notifications from RL/ORP;
- making protective action decisions for the state of Oregon;
- coordinating protective action decisions and public information with counties, the state of Washington, and RL;
- coordinating state and local emergency response within the state of Oregon;
- performing field environmental radiological monitoring and dose assessments;
- providing guidance on emergency worker exposure and authorizing emergency workers to exceed protective action guides;
- providing assistance to Oregon counties within the ingestion EPZ;
- implementing food, milk, and animal-feed control measures; and
- requesting Federal assistance as required.

3.4 LOCAL ORGANIZATIONS

Cities and counties are responsible for protecting the lives and property of their residents. The responsibilities and concept of operations for local governments are described in the emergency response plans of each jurisdiction.

RL shall work with local emergency response organizations through the county and state emergency management organizations. Generally, RL shall interface directly with emergency response and planning organizations providing service to those areas within a plume EPZ of a Hanford Site facility. Interface with those jurisdictions within the ingestion EPZ generally shall be accomplished through the state emergency management organization. To accomplish the necessary close coordination with local agencies, periodic meetings shall be conducted to share information and discuss concerns.

3.4.1 Plume Emergency Planning Zone Counties

Portions of Benton, Franklin, and Grant Counties are within plume EPZs of a Hanford Site facility. The Boards of County Commissioners are responsible for making emergency protective action decisions and implementing emergency response actions, as necessary, to protect their residents outside the Hanford Site boundary. The lead agency for emergency planning and coordination of emergency response is the county emergency management agency. County emergency response plans and procedures are developed by the emergency management agencies, working with county, city, and volunteer emergency response agencies, such as:

- law enforcement;
- fire and emergency medical;
- public works/road departments;
- hospitals; and
- American Red Cross.

The emergency responsibilities of the plume EPZ counties include:

- making and implementing protective action decisions to protect citizens who live within the plume EPZ;

- implementing protective action decisions, made by the state of Washington, for ingestion-related impacts to residents within the ingestion EPZ;

- disseminating alert and warnings to the public and providing emergency public information; and

- coordinating response actions and public information with neighboring counties, the state of Washington, and RL.

RL maintains agreements with Benton, Franklin, and Grant Counties that outline the areas of responsibility and cooperation (see Appendix B).

3.4.1.1 Law Enforcement. RL SES interfaces with local law enforcement agencies for support to the Hanford Site during emergencies. Via a contractual agreement, the Benton County Sheriff's Office provides law enforcement on the Hanford Site (i.e., traffic enforcement and criminal investigation), and assists in access control; and, as such, coordinates activities with RL SES and the Hanford Patrol.

RL SES maintains memorandums of understanding with the law enforcement agencies of Kennewick, Richland, West Richland, Benton County, Franklin County, and the state of Washington.

3.4.1.2 Fire and Emergency Medical. The Hanford Fire Department is signatory to the Tri-County Mutual Aid Agreement for fire agencies. The agreement, signed by 11 local fire agencies, provides mutual aid for fire or medical emergencies.

The Hanford Fire Department meets regularly with local fire agencies. The Hanford Fire Department and HEHF Representatives meet routinely with emergency medical service agencies to coordinate and share information.

3.4.1.3 Hospitals. RL maintains agreements with local hospitals, which provide for the care of injured, contaminated (chemical or radiological) Hanford Site personnel. These hospitals include:

- Our Lady of Lourdes Health Care Center;
- Kennewick General Hospital; and
- Kadlec Medical Center.

RL shall provide for training and exercise support, as needed, related to the services provided to the Hanford Site. HEHF shall provide expertise on radiological decontamination or chemical exposure and treatment as requested.

3.4.2 Ingestion Emergency Planning Zone Counties

Counties within the ingestion EPZ of the Hanford Site are responsible to implement measures to protect their residents from potential ingestion related impacts. In the state of Washington, the counties of Adams, Benton, Franklin, Grant, Kittitas, Klickitat, Walla Walla, and Yakima are within the 50-mile (80-kilometer) ingestion EPZ. In the state of Oregon, the counties of Morrow and Umatilla are included. Ingestion EPZ counties have emergency response plans that describe their responsibilities in the event of an emergency at the Hanford Site.

Permit requirement: Subsection 3.4.1.1, Class 1 Modification 3/31/00
Subsection 3.4.1.2, Class 1 Modification 9/30/99
Subsection 3.4.1.3, Class 1 Modification 9/30/99

RL shall coordinate emergency planning and preparedness for ingestion counties through the Washington State Emergency Management Division and the Oregon Office of Energy. Ingestion county responsibilities include:

- coordinating with the state and implementing decisions regarding protective measures for its residents within the ingestion EPZ; and
- consulting with the respective state EOC on the identification of access control points, food control areas, food control stations, and strategies for relocation, restoration, and recovery in contaminated areas.

3.5 TRIBAL ORGANIZATIONS

RL shall provide appropriate information to the impacted tribal organizations to coordinate planning for ingestion-related response actions of the tribe(s).

3.6 PRIVATE ORGANIZATIONS

The Hanford Site emergency management program shall address private facilities on or near the site. These facilities may be impacted by an emergency at the Hanford Site, or may impact Hanford Site facilities if they experience an emergency.

RL shall coordinate emergency planning and preparedness activities with onsite private facilities (namely Energy Northwest, US Ecology, and Richland Specialty Extrusions). In the event of an emergency at a Hanford Site facility, onsite private facilities will receive notifications and information from RL.

Where emergencies at facilities operated by private organizations may impact the Hanford Site, RL shall ensure that the emergency management program addresses actions that must be taken to protect site workers and facilities.

Areas of cooperation with private organizations shall be documented in memorandums of understanding.

3.7 MEMORANDA OF UNDERSTANDING

RL shall develop and implement mutual assistance agreements with offsite agencies to document areas of cooperation and assistance when appropriate and as identified in Federal, state, and local regulations (see Table 3-1).

RL SES is responsible for executing and maintaining MOUs related to security and emergency preparedness. The Hanford Fire Department shall execute and maintain MOUs within its area of responsibility. MOUs shall be reviewed annually and revised as needed.

Copies of MOUs shall be provided to the CSO through their inclusion in Appendix B of this plan.

Table 3-1. Memorandums of Understanding

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
State of Washington	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Washington Emergency Management Division	None	01/03/01	01/03/04 or until canceled by any party after 60 days written notice to the other parties.	RL SES
State of Oregon	Document areas of cooperation between the state of Oregon and RL in the planning for and providing notification and interface in the event of an incident on the Hanford Site.	Oregon Department of Energy	None	06/21/00	Continue until canceled by either party by written notice to the other Amendments or modifications to this Agreement my be made upon written agreement by both parities to the Amendment.	RL SES
Benton County	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Benton County Emergency Management	None	03/16/00	Continue until canceled by either party by written notice to the other.	RL SES
Franklin County	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Franklin County Emergency Management	None	01/20/00	Continue until canceled by either party by written notice to the other.	RL SES
Grant County	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Grant County Emergency Management	None	05/25/00	Continue until canceled by either party by written notice to the other.	RL SES
Energy Northwest	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Energy Northwest Emergency Preparedness	The specific areas of assistance will be provided based upon availability, and are limited to those emergency actions necessary to protect onsite personnel, the public health and safety, and the environment in the event of a major emergency at the Hanford Site or Energy Northwest.	09/07/00	Continue until canceled by either of the parties upon 30 days written notice to the other party.	RL SES
Energy Northwest and HEHF	Treatment of a significantly contaminated and injured person.	Energy Northwest Emergency Preparedness and HEHF	None	09/08/00	Continue until canceled by one or more of the parties upon 30 days written notice to the other(s).	RL SES

Table 3-1. Memorandums of Understanding

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
Framatome ANP (formerly Siemens Power Corporation)	Establishes means by which RL can provide consequence assessment and meteorological information to Framatome ANP during an emergency at the Framatome ANP plant in Richland, Washington	Framatome ANP	Emergencies affecting the Hanford Site or Hanford facilities takes precedence over all other uses of the UDAC facilities and/or staff.	01/19/00	Remain in effect for five years from effective date, at which time it shall be reviewed and renegotiated, reissued, or terminated. Either party may withdraw upon 30 days written notice.	RL SES
Framatome ANP (formerly Siemens Power Corporation) and HEHF	Treatment of a significantly contaminated and slightly injured person.	Framatome ANP and HEHF	Framatome ANP agrees to undertake all costs and expenses incurred that directly result from this agreement.	01/03/00	Continue until canceled by one or more of the parties by written notice to the other(s).	RL SES
Allied Technology Group, Inc. (ATG) and HEHF	Treatment of a significantly contaminated and slightly injured person.	ATG and HEHF	ATG agrees to undertake all costs and expenses incurred that directly result from this agreement.	12/22/99	Continue until canceled by one or more of the parties by written notice to the other(s).	RL SES
National Weather Service	Sharing Meteorological Information.	NWS Western Regional Headquarters.	None	10/05/94	Agreement may be terminated by either party upon thirty days written notice to the other party.	RL SES
Our Lady of Lourdes Hospital (OLOL) Pasco, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	OLOL Administrator	The responsibilities of OLOL will be limited to activities performed at the hospital.	08/17/98	Arrangements may be terminated by OLOL or by RL upon written notice to the other, which notice shall not become effective for at least 30 days after the date thereof.	RL SES
Kadlec Medical Center (KMC) Richland, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	KMC Administrator	KMC will be limited to activities performed at the hospital and at the Emergency Decontamination Facility.	08/17/98	Arrangements may be terminated by KMC or by RL upon written notice to the other, which notice shall not become effective for at least 30 days after the date thereof.	RL SES
Kennewick General Hospital (KGH) Kennewick, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	KGH Administrator	KGH will be limited to activities performed at the hospital.	08/17/98	Arrangements may be terminated by KGH or by RL upon written notice to the other, which notice shall not become effective for at least 30 days after the date thereof.	RL SES

Table 3-1. Memorandums of Understanding

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
Tri-County Mutual Aid Agreement	Provide mutual aid to parties hereto desire to augment the fire and emergency medical protection available in their establishments, districts, agencies, and municipalities in the event of large fires or conflagrations or other disaster.	Hanford Fire Department	Assistance under the agreement is not mandatory.	02/05/98	Remain in full force and effect until canceled by mutual agreement of the parties hereto or by written notice by one party to the other party giving ten (10) days notice of said cancellation.	Hanford Fire Department
Richland Police Department	Mutual law enforcement assistance.	Richland Police Department	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
West Richland Police Department	Mutual law enforcement assistance.	West Richland Police Department	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
Kennewick Police Department	Mutual law enforcement assistance.	Kennewick Police Department	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
Benton County Sheriff	Mutual law enforcement assistance.	Benton County Sheriff	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
Franklin County Sheriff	Mutual law enforcement assistance.	Franklin County Sheriff	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
Washington State Patrol	Mutual law enforcement assistance.	Washington State Patrol	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	02/14/00	Indefinite duration.	RL SES

Table 3-1. Memorandums of Understanding

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
Adams County Sheriff	Mutual law enforcement assistance.	Adams County Sheriff	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/27/00	Indefinite duration.	RL SES
Grant County Sheriff	Mutual law enforcement assistance.	Grant County Sheriff	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
Pasco Police Department	Mutual law enforcement assistance.	Pasco Police Department	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	04/03/00	Indefinite duration.	RL SES

This page intentionally left blank.

APPENDIX A
DOCUMENTATION CROSSWALK MATRIX

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	HOW DOES REQUIREMENT *APPLY TO HANFORD?*	WHERE IS REQUIREMENT *MET IN OCUMENTATION?*
WAC 173-303-340 Introduction	Preparedness and prevention. *Facilities must be designed, constructed, maintained,* and operated to minimize the possibility of fire, explosion, or any unplanned sudden or nonsudden release of dangerous waste or dangerous waste constituents to air, soil, or surface or ground water, which could threaten the public health or the environment. This section describes preparations and preventive measures, which help avoid or mitigate such situations.	Under the Dangerous Waste Regulations (State authorized RCRA program), the Hanford Site is a singular facility with over 60 TSD units and many more locations where generator activities take place. For the purposes of these regulations: Facility = Hanford Site	N/A
WAC 173-303-340(1) (Permit requirement)	Required equipment. Required equipment. All facilities must be equipped with the following, unless it can be demonstrated to the department that none of the hazards posed by waste handled at the facility could require a particular kind of equipment specified below: (a) An internal communications or alarm system capable of providing immediate emergency instruction to facility personnel; (b) A device, such as a telephone or a hand-held, two-way radio, capable of summoning emergency assistance from local police departments, fire departments, or state or local emergency response teams; (c) Portable fire extinguishers, fire control equipment (including special extinguishing equipment, such as that using foam, inert gas, or dry chemicals), spill control equipment, and decontamination equipment; and (d) Water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems. All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be tested and maintained as necessary to assure its proper operation in time of emergency.	Required equipment is evaluated on a site-wide basis (Hanford Fire Department) and a location-specific basis for TSD units and 90-day accumulation areas. Each location does not necessarily require each type of equipment. Lists of appropriate equipment are documented in accordance with WAC 173-303-350(3)(e).	See line item for WAC 173-303-350(3)(e).
WAC 173-303-340(2) (Permit requirement)	Access to communications or alarms. Personnel must have immediate access to the signaling devices described in the situations below: (a) Whenever dangerous waste is being poured, mixed, spread, or otherwise handled, all personnel involved must have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless such a device is not required in subsection (1) of this section; (b) If there is ever just one employee on the premises while the facility is operating, he must have immediate access to a device, such as a telephone or a hand-held, two-way radio, capable of summoning external emergency assistance, unless such a device is not required in subsection (1) of this section.	Site personnel are provided access to signaling devices.	None required to document compliance.
WAC 173-303-340(3) (Permit requirement)	Aisle space. The owner or operator must maintain aisle space to allow the unobstructed movement of personnel. fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.	This requirement is met at TSD units and 90-day accumulation area, where appropriate.	N/A

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	HOW DOES REQUIREMENT APPLY TO HANFORD?	WHERE IS REQUIREMENT MET IN OCUMENTATION?
WAC 173-303-340(4) (Permit requirement)	Arrangements with local authorities. The owner or operator must attempt to make the following arrangements, as appropriate for the type of waste handled at his facility and the potential need for the services of these organizations, unless the hazards posed by wastes handled at the facility would not require these arrangements: (a) Arrangements to familiarize police, fire departments, and emergency response teams with the layout of the facility, properties of dangerous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to roads inside the facility, and possible evacuation routes; (b) Arrangements to familiarize local hospitals with the properties of dangerous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility; (c) Agreements with state emergency response teams, emergency response contractors, and equipment suppliers; and (d) Where more than one party might respond to an emergency, agreements designating primary emergency authority and agreements with any others to provide support to the primary emergency authority.	Arrangements are addressed on a site-wide basis. Memoranda of Understanding, which RL enters into, are described in DOE/RL-94-02, Table 3-1. Hanford Site emergency responders (Hanford Fire Department and Hanford Patrol) must be familiar with items - 340(4)(a). The City of Richland, Benton County Sheriff and Washington State Patrol will be familiar as necessary.	See line item for WAC 173-303-350(3)(c).
WAC 173-303-340(5)	Where state or local authorities decline to enter into such agreements, the owner or operator must document the refusal in the operating record.	The operating record is the set of documents maintained to demonstrate compliance with WAC 173-303 and the Hanford Site RCRA Permit.	None. If authorities decline, the documentation will be maintained in accordance with DOE/RL-91-28.
WAC 173-303-350(1)	Purpose. The purpose of this section and WAC 173-303-360 is to lessen the potential impact on the public health and the environment in the event of an emergency circumstance, including a fire, explosion, or unplanned sudden or nonsudden release of dangerous waste or dangerous waste constituents to air, soil, surface water, or ground water by a facility. A contingency plan must be developed to lessen the potential impacts of such emergency circumstances, and the plan must be implemented immediately in such emergency circumstances.	DOE/RL-94-02 is the site-wide plan meeting site-wide contingency planning requirements. Location-specific/activity-specific elements are contained in documentation for operating TSD units and 90-day accumulation areas.	The contingency plan consists of portions of DOE/RL-94-02 and location-specific/activity-specific documentation.
WAC 173-303-350(2)	Each owner or operator must have a contingency plan at his facility. A contingency plan must be developed to lessen the potential impacts of such emergency circumstances, and the plan must be implemented immediately in such emergency circumstances.	Facility = Hanford Site according to the regulations. (See section 1.4.1 of this plan for definition.)	The contingency plan consists of portions of DOE/RL-94-02 and location-specific/activity-specific documentation.
WAC 173-303-350(3)(a) (Permit requirement)	The contingency plan must contain the following: (a) A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360;	The site-level description of actions is addressed in this plan. Location-specific/activity-specific documentation utilizes generic response descriptions or creates more detailed descriptions appropriate for the location.	Site-level: DOE/RL-94-02, section 1.3.4. Unit-level: location-specific documentation.
WAC 173-303-350(3)(b) (Permit requirement)	The contingency plan must contain the following: (b) A description of the actions which will be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported, pursuant to the requirements of WAC 173-303-370(5), Manifest system, reasons for not accepting dangerous waste shipments;	The site-level description of actions is addressed in this plan. For TSD units that receive offsite waste shipments, location-specific documentation addresses these circumstances.	Site-level: DOE/RL-94-02, section 1.3.4. Unit-level: location-specific documentation.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	HOW DOES REQUIREMENT APPLY TO HANFORD?	WHERE IS REQUIREMENT MET IN OCUMENTATION?
WAC 173-303-350(3)(c) (Permit requirement)	The contingency plan must contain the following: (c) A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4);	DOE/RL-94-02, section 3.7 and Table 3-1 contain this information. This requirement is met at the site level. No location-specific information is needed to meet this requirement.	Site-level: DOE/RL-94-02, sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, 3.7, and Table 3-1.
WAC 173-303-350(3)(d) (Permit requirement)	The contingency plan must contain the following: (d) A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810(14)(a)(i)), rather than as part of the permit application;	DOE/RL-94-02, section 2.2, discusses personnel job titles, which will fill duties and responsibilities of the Emergency Coordinator, described in WAC 173-303-360. Location-specific/activity-specific documentation for TSD units and 90-day accumulation areas include information on job title, work location, and work phone number for Emergency Coordinator. Emergency Coordinator names and home phone numbers are maintained separate from the contingency plan document, on file in accordance with Hanford Facility RCRA Permit, DW Portion, General Condition II.A.4 and is updated, at a minimum on a monthly basis.	*Site-level: None.* *Unit-level: location-specific* documentation.
WAC 173-303-350(3)(e) *(Permit requirement)*	The contingency plan must contain the following: (e) A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities; and	DOE/RL-94-02, Appendix C contains the list of Hanford Fire Department equipment. Location-specific documentation for TSD units and 90-day accumulation areas contain equipment lists for their respective locations.	Site-level: DOE/RL-94-02, Appendix C. Unit-level: Appropriate equipment identified in location-specific documentation.
WAC 173-303-350(3)(f) (Permit requirement)	The contingency plan must contain the following: (f) An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	The site-wide signals are delineated in DOE/RL-94-02, Table 5-1. No location signal information is required unless unique devices are used at the location. Site-wide evacuation routes are contained in DOE/RL-94-02, Figure 7-3. Location-specific evacuation routes will be provided in TSD units and 90-day accumulation area documentation. Evacuation routes for occupied buildings are provided through postings.	*Site-level:* DOE/RL-94-02, Figure 7-3 and Table 5-1. Unit-level; location-specific documentation.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	HOW DOES REQUIREMENT APPLY TO HANFORD?	WHERE IS REQUIREMENT MET IN OCUMENTATION?
WAC 173-303-350(4) (Permit requirement)	Copies of contingency plan. A copy of the contingency plan and all revisions to the plan shall be: (a) Maintained at the facility; and (b) Submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services.	Copies of DOE/RL-94-02 are maintained throughout the Hanford Site and with offsite agencies. Copies of location-specific documentation are not being provided to offsite agencies because no agency requested them when asked in 1994.	Site-level: DOE/RL-94-02, section 14.3.7.
WAC 173-303-350(5) (Permit requirement)	Amendments. The owner or operator shall review and immediately amend the contingency plan, if necessary, whenever: (a) Applicable regulations or the facility permit are revised; (b) The plan fails in an emergency; (c) The facility changes (in its design, construction, operation, maintenance, or other circumstances) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency; (d) The list of emergency coordinators changes; or (e) The list of emergency equipment changes.	DOE/RL-94-02 and location-specific documentation is revised according to these criteria. Making changes to these documents must also be accomplished in accordance with WAC 173-303-830, when applicable.	Site-level: DOE/RL-94-02, section 14.3.1.1.
WAC 173-303-355(1) (Permit requirement)	Owners or operators must coordinate preparedness and prevention planning and contingency planning efforts, conducted under WAC 173-3-3-340 and -350 with local emergency planning committees established pursuant to Title III of the 1986 Superfund Amendments and Reauthorization Act.	RL coordinates planning actions with three LEPCs: Benton County, Franklin County, and Grant County.	Site-level: DOE/RL-94-02, sections 3.1, 3.1.1, and 3.4.
WAC 173-303-355(2)	Appropriate and generally accepted computer models should be utilized to determine the impacts of a potential catastrophic air release due to fire, explosion, or other accidental releases of hazardous constituents. Evacuation plans prepared pursuant to WAC 173-303-350(3)(d) must include those effected persons and areas identified through these modeling efforts.	The DOE Hanford EOC contains modeling equipment to predict impacts of air releases.	Site-level: DOE/RL-94-02, sections 2.2.2.3.3 and 1.3.3.2.
WAC 173-303-360(1) (Permit requirement)	Emergency coordinator. At all times, there must be at least one employee either on the facility premises or on call with the responsibility for coordinating all emergency response measures. This emergency coordinator must be thoroughly familiar with all aspects of the facility's contingency plan, required by WAC 173-303-350(2), all operations and activities at the facility, the location and properties of all wastes handled, the location of all records within the facility, and the facility layout. In addition, this person must have the authority to commit the resources needed to carry out the contingency plan.	Duty met by the Hanford Incident Command Structure and staff with supporting on-call personnel.	Site-level: DOE/RL-94-02, section 1.3.4 and 2.2.
WAC 173-303-360(2)(a) (Permit requirement)	Emergency procedures. The following procedures must be implemented in the event of an emergency. (a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately: (i) Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel; and (ii) Notify appropriate state or local agencies with designated response roles if their help is needed.	Alarm activation can be accomplished by the discoverer of the event (fire/911), or the Hanford Incident Command System and staff with supporting on-call personnel. Notification made to non-Hanford agencies with designated response roles agencies are accomplished via 911 telephones to request assistance (fire, ambulance, law enforcement).	Site-level: DOE/RL-94-02, sections 1.3.4 and 5.2.1.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	HOW DOES REQUIREMENT APPLY TO HANFORD?	WHERE IS REQUIREMENT MET IN OCUMENTATION?
WAC 173-303-360(2)(b) (Permit requirement)	Emergency procedures. (b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials.	Hanford Incident Command System and staff with supporting on-call personnel.	Site-level: DOE/RL-94-02, *sections* 2.2.1.1.2(f) and 2.2.1.1.3(g).
WAC 173-303-360(2)(c) (Permit requirement)	Emergency procedures. (c) Concurrently, the emergency coordinator shall assess possible hazards to human health and the environment (considering direct, indirect, immediate, and long-term effects) that may result from the release, fire, or explosion.	Hanford Incident Command System and staff with supporting on-call personnel.	Site-level: DOE/RL-94-02, section 4.2.
WAC 173-303-360(2)(d) (Permit requirement)	Emergency procedures. (d) If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health or the environment, he must report his findings as follows: (i) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities. He must be available to help appropriate officials decide whether local areas should be evacuated; and (ii) He must immediately notify the department and either the government official designated as the on-scene coordinator, or the National Response Center (using their 24-hour toll free number (800) 424-8802).	Hanford Incident Command System and staff with supporting on-call personnel. ONC personnel notify local authorities if evacuation is advisable on behalf of the Hanford Incident Command Structure. Site contractor environmental single point-of-contact personnel perform the assessment report notification to Ecology and RL (the on-scene coordinator on behalf of the Hanford Incident Command Structure. NRC is not called.	Site-level: DOE/RL-94-02, sections 2.2.1.1.2(a) &(d), 2.2.1.1.3(a)&(e), 5.1.1, 5.1.1.2, 5.1.2, and 5.1.2.1.
WAC 173-303-360(2)(e) (Permit requirement)	Emergency procedures. (e) His assessment report must include: (i) Name and telephone number of reporter; (ii) Name and address of facility; (iii) Time and type of incident (e.g., release, fire); (iv) Name and quantity of material(s) involved, to the extent known; (v) The extent of injuries, if any; and (vi) The possible hazards to human health or the environment outside the facility.	Site contractor environmental single point-of-contact personnel perform the assessment report notification to Ecology and RL after obtaining it from location-specific personnel.	Site-level: DOE/RL-94-02, sections 2.2.1.1.2(d), 2.2.1.1.3(e), 5.1.1, 5.1.1.2, and 5.1.2.1.
WAC 173-303-360(2)(f) (Permit requirement)	Emergency procedures. (f) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.	Hanford Incident Command System and staff with supporting on-call personnel.	Site-level: DOE/RL-94-02, sections 2.2.1.1.2(f) and 2.2.1.1.3(g).
WAC 173-303-360(2)(g) (Permit requirement)	Emergency procedures. (g) If the facility stops operations in response to a fire, explosion, or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.	Hanford Incident Command System and staff with supporting on-call personnel.	Site-level: DOE/RL-94-02, sections 2.2.1.1.2(f) and 2.2.1.1.3(g).
WAC 173-303-360(2)(h) (Permit requirement)	Emergency procedures. (h) Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.	Onsite Recovery Director with supporting on-call personnel.	Site-level: DOE/RL-94-02, *section* 9.2.3.

REQUIREMENT SOURCE	REQUIREMENT DESCRIPTION	HOW DOES REQUIREMENT APPLY TO HANFORD?	WHERE IS REQUIREMENT MET IN OCUMENTATION?
WAC 173-303-360(2)(i) (Permit requirement)	Emergency procedures. (i) The emergency coordinator must ensure that, in the affected area(s) of the facility: (i) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and (ii) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.	Onsite Recovery Director with supporting on-call personnel.	Site-level: (I) DOE/RL-94-02, section 9.2.3. Site-level: (ii) DOE/RL-94-02, section 11.2.
WAC 173-303-360(2)(j) (Permit requirement)	Emergency procedures. (j) The owner or operator must notify the department, and appropriate local authorities, that the facility is in compliance with (i) of this subsection before operations are resumed in the affected area(s) of the facility.	Site contractor environmental single point-of-contact personnel perform this notification, when applicable, on behalf of the Onsite Recovery Director.	Site-level: DOE/RL-94-02, section 5.1.2.3.
WAC 173-303-360(2)(k) (Permit requirement)	Emergency procedures. (k) The owner or operator must note in the operating record the time, date, and details of any incident that requires implementing the contingency plan. Within fifteen days after the incident, he must submit a written report on the incident to the department. The report must include: (i) Name, address, and telephone number of the owner or operator; (ii) Name, address, and telephone number of the facility; (iii) Date, time, and type of incident (e.g., fire, explosion); (iv) Name and quantity of material(s) involved; (v) The extent of injuries, if any; (vi) An assessment of actual or potential hazards to human health or the environment, where this is applicable; (vii) Estimated quantity and disposition of recovered material that resulted from the incident; (viii) Cause of incident; and (ix) Description of corrective action taken to prevent reoccurrence of the incident.	Site contractor management through RL ensures the note in the operating record is performed and prepares the 15-day report to Ecology.	Site-level: DOE/RL-94-02, section 5.1.2.2.
40 CFR 761.65(c)(1)(iv) and (c)(7)(ii) SPCC Plans for PCBs	Temporary Storage Areas (less than 30-days). (c)(1)(iv): PCB containers containing liquid PCBs at concentrations of ≥50 ppm, provided a Spill Prevention, Control and Countermeasure Plan has been prepared for the temporary storage area in accordance with part 112 of this chapter and the liquid PCB waste is in packaging authorized in the DOT Hazardous Materials Regulations at 49 CFR parts 171 through 180 or stationary bulk storage tanks (including rolling stock such as, but not limited to, tanker trucks, as specified by DOT). (c)(7)(ii): The owners or operators of any facility using containers described in paragraph (c)(7)(i) of this section, shall prepare and implement a Spill Prevention Control and Countermeasure (SPCC) Plan as described in Part 112 of this title. In complying with 40 CFR Part 112, the owner or operator shall read "oil(s)" as "PCB(s)" whenever it appears. The exemptions for storage capacity, 40 CFR 112.1(d)(2), and the amendment of SPCC plans by the Regional Administrator, 40 CFR 112.4, shall not apply unless some fraction of the liquids stored in the container are oils as defined by section 311 of the Clean Water Act.	When SPCC plans apply to Hanford Site activities, the information not covered in site-wide documentation must be addressed in location-specific documentation.	Site-level: DOE/RL-94-02, sections 1.1 (fourth paragraph), 1.2 (first bullet, sixth dash and second bullet, fourth dash), and 2.2.1.1.2 (first paragraph). Unit-level: appropriate location-specific documentation.

Hanford Facility RCRA Permit Modification Notification Form
Part II, General Facility Conditions

Index

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Hanford Facility RCRA Permit	Part II General Facility Conditions

Description of Modification:
Hanford Facility RCRA Permit Condition II.B.5:

II.B.5 Based on applicable provisions of the Hanford Emergency Management Plan, as provided in Attachment 4, the Permittees shall comply with the requirements of WAC 173-303-350(4). To meet the intent of WAC 173-303-350(4)(b), the Permittees shall offer Hanford Facility contingency plan documentation to local agencies who have entered into a Memorandum of Understanding with USDOE as identified in Attachment 4, Table 3-1. The Permittees shall maintain a record of this process in the Hanford Facility Operating Record, General Information File, in accordance with WAC 173-303-340(5). The contingency plan documentation shall be offered by the Permittees on or before June 1 of odd numbered years.

Modification Class: 12 3	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
A. General Permit Provisions
1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
R. H. Gurske 25sept01 Date	J. Hebdon 10/4/01 Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate

Hanford Facility RCRA Permit Modification Notification Forms
Part III, Chapter 2 and Attachment 18
305-B Storage Facility

Index

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
305-B Storage Facility	Part III, Chapter 2 and Attachment 18

Description of Modification:

Hanford Facility RCRA Permit, Condition III.2.A:

III.2.A. COMPLIANCE WITH APPROVED PERMIT APPLICATION

The Permittees shall comply with all the requirements set forth in Attachment 18, including all Class 1 Modifications specified below, and the Amendments specified in Condition III.2.B. Enforceable portions of the application are listed below; all subsections, figures, and tables included in these portions are also enforceable, unless stated otherwise:

Part A, Form 3, Permit Application, Revision 1 and from Class 1 Modification for quarter ending June 30, 1998

Section 2.1.2	The 305-B Storage Unit, from Class 1 Modification for quarter ending June 30, 1999
Section 2.2.1	General Requirement, from Class 1 Modification for quarter ending June 30, 1999
Section 2.5	Performance Standard, from Class 1 Modification for quarter ending June 30, 1999
Section 2.6	Buffer Monitoring Zones, from Class 1 Modification for quarter ending June 30, 1999
Section 2.8	Manifest System, from Class 1 Modification for quarter ending June 30, 1999
Chapter 3.0	Waste Characteristics, from Class 1 Modification for quarter ending September 30, 2000
Chapter 4.0	Process Information, from Class 1 Modification for quarter ending March 31, 2000
Chapter 6.0	Procedures to Prevent Hazards, from Class 1 Modification for quarter ending December 31, 1999
Chapter 7.0	*Contingency Plan, from Class 1 Modification for quarter ending June 30, 2000*
Appendix 7A	Building Emergency Plan for the 305-B Storage Facility, from Class 1 Modification for quarter ending June 30, 2000
Chapter 8.0	Personnel Training, from Class 1 Modification for quarter ending September 30, 2001~~1998~~
Chapter 11.0	Closure and Post-Closure Requirements, from Class 1 Modification for quarter ending September 30, 2000
Chapter 12.0	Reporting and Recordkeeping, from Class 1 Modification for quarter ending June 30, 1999
Section 13.8	Toxic Substances Control Act, from Class 1 Modification for quarter ending September 30, 2000
Section 13.9	Other Requirements, from Class 1 Modification for quarter ending September 30, 2000
Appendix 2A	Hanford Site and 300-Area Topographic Maps, Plates 2-2 Through 2-9

Modification Class: [1][2][3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and Informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
A.K. Ikenberry 9-17-01	R.F. Christensen 10/2/01		
A.K. Ikenberry Date	R.F. Christensen Date	F. Jamison Date	L.E. Ruud Date

[1]*Class 1 modifications requiring prior Agency approval.*

[2] *This is only an advanced notification of an intended Class* [1]1, 2, or 3 *modification, this should be followed with* a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
305-B Storage Facility	**Part III, Chapter 2 and Attachment 18**

Description of Modification:

Chapter 8.0:

Remove Chapter 8 and replace with the attached Chapter 8.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
A.K. Ikenberry 9-17-01		R.F. Christensen 10/2/01					
A.K. Ikenberry	Date	R.F. Christensen	Date	F. Jamison	Date	L.E. Ruud	Date

[1]Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **305-B Storage Facility**	Permit Part & Chapter: **Part III, Chapter 2 and Attachment 18**

Description of Modification:

Appendix 8A:

Remove Appendix 8A.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and Informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
A.K. Ikenberry 9-27-01	R.F. Christensen 10/2/01		
A.K. Ikenberry Date	R.F. Christensen Date	F. Jamison Date	L.E. Ruud Date

[1]Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification
Part III, Chapter 2 and Attachment 18
305-B Storage Facility

Replacement Section

Index

CONTENTS

TABLES

This page intentionally left blank.

8.0 PERSONNEL TRAINING [H]

This chapter discusses personnel training requirements based on WAC 173-303 and the HF RCRA Permit (DW Portion). In accordance with WAC 173-303-806(4)(a)(xii), the *Hanford Facility Dangerous Waste Part B Permit Application* must contain two items: (1) "an outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330" and (2) "a brief description of how training will be designed to meet actual job tasks in accordance with the requirements in WAC 173-303-330(1)(d)." The HF RCRA Permit, (DW portion) Condition II.C (Personnel Training) contains training requirements applicable to Hanford Facility personnel and non-Facility personnel.

Compliance with these requirements at the 305-B Storage Facility is demonstrated by information contained both in Chapter 8.0 of DOE/RL-91-28, Attachment 33 of the HF RCRA Permit, and this chapter. This chapter supplements Chapter 8.0 of DOE/RL-91-28.

8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS

The introductory and continuing training programs are designed to prepare personnel to manage and maintain the TSD unit in a safe, effective, and environmentally sound manner. In addition to preparing personnel to manage and maintain TSD units under normal conditions, the training programs ensure that personnel are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response training is consistent with the description of actions contained in Chapter 7.0, Contingency Plan. The introductory and continuing training programs contain the following objectives:

- Teach Hanford Facility personnel to perform their duties in a way that ensures the Hanford Facility's compliance with WAC 173-303
- Teach Hanford Facility personnel dangerous waste management procedures (including implementation of the contingency plan) relevant to the job titles/positions in which they are employed, and
- Ensure Hanford Facility personnel can respond effectively to emergencies.

8.1.1 Introductory Training

Introductory training includes general Hanford Facility training and TSD unit-specific training. General Hanford Facility training is described in DOE/RL-91-28, Section 8.1, and is provided in accordance with the HF RCRA Permit (DW Portion), Condition II.C.2. TSD unit-specific training is provided to Hanford Facility personnel allowing those personnel to work unescorted, and in some cases is required for escorted access. Hanford Facility personnel cannot perform a task for which they are not properly trained, except to gain required experience while under the direct supervision of a supervisor or coworker who is properly trained. Hanford Facility personnel must be trained within 6 months after their employment at or assignment to the Hanford Facility, or to a new job title/position at the Hanford Facility, whichever is later.

General Hanford Facility training: Refer to description in DOE/RL-91-28, Section 8.1.

Contingency Plan training: Hanford Facility personnel receive training on applicable portions of the *Hanford Emergency Management Plan* [Attachment 4 of the HF RCRA Permit (DW Portion)] in general Hanford Facility training. In addition, Hanford Facility personnel receive training on content of the description of actions contained in contingency plan documentation in Chapter 7.0 to be able to effectively respond to emergencies.

Emergency Coordinator training: Hanford Facility personnel who perform emergency coordinator duties in WAC 173-303-360 (e.g., Building Emergency Director) in the Hanford Incident Command System receive training on implementation of the contingency plan and fulfilling the position within the Hanford Incident Command System. These Hanford Facility personnel must also become thoroughly familiar with applicable contingency plan documentation, operations, activities, location, and properties of all waste handled, location of all records, and the unit/building layout.

Operations training: Dangerous waste management operations training (e.g., waste designation training, shippers training) will be determined on a unit-by-unit basis and shall consider the type of waste management unit (e.g., container management unit) and the type of activities performed at the waste management unit (e.g., sampling). For example, training provided for management of dangerous waste in containers will be different than the training provided for management of dangerous waste in a tank system. Common training required for compliance within similar waste management units can be provided in general training and supplemented at the TSD unit. Training provided for TSD unit-specific operations will be identified in the training plan documentation based on: (1) whether a general training course exists, (2) the training needs to ensure waste management unit compliance with WAC 173-303, and (3) training commitments agreed to with Ecology.

8.1.2 Continuing Training

Continuing training meets the requirements for WAC 173-303-330(1)(b) and includes general Hanford Facility training and TSD unit-specific training.

General Hanford Facility training: Annual refresher training is provided for general Hanford Facility training. Refer to description in DOE/RL-91-28, Section 8.1.

Contingency plan training: Annual refresher training is provided for contingency plan training. Refer to description above in Section 8.1.1.

Emergency coordinator training: Annual refresher training is provided for emergency coordinator training. Refer to description above in Section 8.1.1.

Operations training: Refresher training occurs on many frequencies (i.e., annual, every other year, every 3 years) for operations training. When justified, some training will not contain a refresher course and will be identified as a one-time only training course. The TSD unit-specific training plan documentation will specify the frequency for each training course. Refer to description above in Section 8.1.1.

8.2 DESCRIPTION OF TRAINING DESIGN

Proper design of a training program ensures personnel who perform duties on the Hanford Facility related to WAC 173-303-330(1)(d) are trained to perform their duties in compliance with WAC 173-303. Actual job tasks, referred to as duties, are used to determine training requirements. The first step taken to ensure Hanford Facility personnel have received the proper training is to determine and document the waste management duties by job title/position. The second step compares waste management duties to general waste management unit training curriculum. If general waste management unit training curriculum does not address the waste management duties, the training curriculum is supplemented and/or on-the-job training is provided. The third step summarizes the content of a training course necessary to ensure that the training provided to each job title/position addresses associated waste management duties. The last step is to assign training curriculum to Hanford Facility personnel based on the previous evaluation. The training plan documentation contains this process.

Waste management duties include those specified in Section 8.1 as well as those contained in WAC 173-303-330(1)(d). Training elements of WAC 173-303-330(1)(d) applicable to the 305-B Storage Facility operations include the following:

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- Communications or alarm systems
- Response to fires or explosions
- Shutdown of operations.

Hanford Facility personnel who perform these duties receive training pertaining to their duties. The training plan documentation described in Section 8.3 contains specific information regarding the types of training Hanford Facility personnel receive based on the outline in Section 8.1.

8.3 DESCRIPTION OF TRAINING PLAN

In accordance with HF RCRA Permit (DW Portion), Condition II.C.3, the unit-specific portion of the *Hanford Facility Dangerous Waste Permit Application* must contain a description of the training plan. Training plan documentation is maintained outside of the *Hanford Facility Dangerous Waste Part B Permit Application* and the HF RCRA Permit. Therefore, changes made to the training plan documentation are not subject to the HF RCRA Permit modification process. However, the training plan documentation is prepared to comply with WAC 173-303-330(2).

Documentation prepared to meet the training plan consists of hard copy and/or electronic media as provided by HF RCRA Permit (DW Portion), Condition II.C.1. The training plan documentation consists of one or more documents and/or a training database with all the components identified in the core document.

A description of how training plan documentation meets the three items in WAC 173-303-330(2) is as follows:

1. -330(2)(a): "The job title, job description, and name of the employee filling each job. The job description must include requisite skills, education, other qualifications, and duties for each position."

   Description: The specific Hanford Facility personnel job title/position is correlated to the waste management duties. Waste management duties relating to WAC 173-303 are correlated to training courses to ensure training is properly assigned.

   Only names of Hanford Facility personnel who carry out job duties relating to TSD unit waste management operations at the 305-B Storage Facility are maintained. Names are maintained within the training plan documentation. A list of Hanford Facility personnel assigned to the 305-B Storage Facility is available upon request.

   Information on requisite skills, education, and other qualifications for job title/positions are addressed by providing a reference where this information is maintained (e.g., human resources). Specific information concerning job title, requisite skills, education, and other qualifications for personnel can be provided upon request.

2. -330(2)(b): "A written description of the type and amount of both introductory and continuing training required for each position."

   Description: In addition to the outline provided in Section 8.1, training courses developed to comply with the introductory and continuing training programs are identified and described in the training plan documentation. The type and amount of training is specified in the training plan documentation as shown in Table 8-1.

3. -330(2)(c): "Records documenting that personnel have received and completed the training required by this section. The Department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received."

Description: Training records are maintained consistent with DOE/RL-91-28, Section 8.4.

Table 8-1. 305-B Storage Facility Training Matrix

	Training Category*				
DOE/RL-91-28 Chapter 8 Training Category	General Hanford Facility Training	Contingency Plan Training	Emergency Coordinator Training	Operations Training	
305-B Storage Facility	Orientation Program	Building Emergency Plan	Building Emergency Director Training	Advanced Waste Management Training	Container Management
Staff Position					
Unit Operations Supervisor	X	X	X	X	X
Waste Management Engineers	X	X	X[1]	X	X
Waste Management Technicians and Scientist/Engineering Associates	X	X	X[1]	X	X
Waste Management Clerks	X	X		X	

[1] Required for any staff that has been assigned the duties of Building Emergency Director or alternate.

* Refer to the 305-B Storage Facility Training Plan for a complete description of coursework in each training category.

Index

Chapter 8.0

CONTENTS

TABLES

8.0 PERSONNEL TRAINING [H]

This chapter discusses personnel training requirements based on WAC 173-303 and the HF RCRA Permit (DW Portion). In accordance with WAC 173-303-806(4)(a)(xii), the *Hanford Facility Dangerous Waste Part B Permit Application* must contain two items: (1) "an outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330" and (2) "a brief description of how training will be designed to meet actual job tasks in accordance with the requirements in WAC 173-303-330(1)(d)." The HF RCRA Permit, (DW portion) Condition II.C (Personnel Training) contains training requirements applicable to Hanford Facility personnel and non-Facility personnel.

Compliance with these requirements at the 305-B Storage Facility is demonstrated by information contained both in Chapter 8.0 of DOE/RL-91-28, Attachment 33 of the HF RCRA Permit, and this chapter. This chapter supplements Chapter 8.0 of DOE/RL-91-28.

8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS

The introductory and continuing training programs are designed to prepare personnel to manage and maintain the TSD unit in a safe, effective, and environmentally sound manner. In addition to preparing personnel to manage and maintain TSD units under normal conditions, the training programs ensure that personnel are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response training is consistent with the description of actions contained in Chapter 7.0, Contingency Plan. The introductory and continuing training programs contain the following objectives:

- Teach Hanford Facility personnel to perform their duties in a way that ensures the Hanford Facility's compliance with WAC 173-303
- Teach Hanford Facility personnel dangerous waste management procedures (including implementation of the contingency plan) relevant to the job titles/positions in which they are employed, and
- Ensure Hanford Facility personnel can respond effectively to emergencies.

8.1.1 Introductory Training

Introductory training includes general Hanford Facility training and TSD unit-specific training. General Hanford Facility training is described in DOE/RL-91-28, Section 8.1, and is provided in accordance with the HF RCRA Permit (DW Portion), Condition II.C.2. TSD unit-specific training is provided to Hanford Facility personnel allowing those personnel to work unescorted, and in some cases is required for escorted access. Hanford Facility personnel cannot perform a task for which they are not properly trained, except to gain required experience while under the direct supervision of a supervisor or coworker who is properly trained. Hanford Facility personnel must be trained within 6 months after their employment at or assignment to the Hanford Facility, or to a new job title/position at the Hanford Facility, whichever is later.

General Hanford Facility training: Refer to description in DOE/RL-91-28, Section 8.1.

Contingency Plan training: Hanford Facility personnel receive training on applicable portions of the *Hanford Emergency Management Plan* [Attachment 4 of the HF RCRA Permit (DW Portion)] in general Hanford Facility training. In addition, Hanford Facility personnel receive training on content of the description of actions contained in contingency plan documentation in Chapter 7.0 to be able to effectively respond to emergencies.

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- Communications or alarm systems
- Response to fires or explosions
- Shutdown of operations.

Hanford Facility personnel who perform these duties receive training pertaining to their duties. The training plan documentation described in Section 8.3 contains specific information regarding the types of training Hanford Facility personnel receive based on the outline in Section 8.1.

8.3 DESCRIPTION OF TRAINING PLAN

In accordance with HF RCRA Permit (DW Portion), Condition II.C.3, the unit-specific portion of the *Hanford Facility Dangerous Waste Permit Application* must contain a description of the training plan. Training plan documentation is maintained outside of the *Hanford Facility Dangerous Waste Part B Permit Application* and the HF RCRA Permit. Therefore, changes made to the training plan documentation are not subject to the HF RCRA Permit modification process. However, the training plan documentation is prepared to comply with WAC 173-303-330(2).

Documentation prepared to meet the training plan consists of hard copy and/or electronic media as provided by HF RCRA Permit (DW Portion), Condition II.C.1. The training plan documentation consists of one or more documents and/or a training database with all the components identified in the core document.

A description of how training plan documentation meets the three items in WAC 173-303-330(2) is as follows:

1. -330(2)(a): "The job title, job description, and name of the employee filling each job. The job description must include requisite skills, education, other qualifications, and duties for each position."

   Description: The specific Hanford Facility personnel job title/position is correlated to the waste management duties. Waste management duties relating to WAC 173-303 are correlated to training courses to ensure training is properly assigned.

   Only names of Hanford Facility personnel who carry out job duties relating to TSD unit waste management operations at the 305-B Storage Facility are maintained. Names are maintained within the training plan documentation. A list of Hanford Facility personnel assigned to the 305-B Storage Facility is available upon request.

   Information on requisite skills, education, and other qualifications for job title/positions are addressed by providing a reference where this information is maintained (e.g., human resources). Specific information concerning job title, requisite skills, education, and other qualifications for personnel can be provided upon request.

2. -330(2)(b): "A written description of the type and amount of both introductory and continuing training required for each position."

   Description: In addition to the outline provided in Section 8.1, training courses developed to comply with the introductory and continuing training programs are identified and described in the training plan documentation. The type and amount of training is specified in the training plan documentation as shown in Table 8-1.

3. -330(2)(c): "Records documenting that personnel have received and completed the training required by this section. The Department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received."

Hanford Facility RCRA Permit Modification Notification Forms
Part III, Chapter 3 and Attachment 28
PUREX Storage Tunnels

Index

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
PUREX Storage Tunnels	**Part III, Chapter 3 and Attachment 28**

Description of Modification:

Hanford Facility RCRA Permit, Condition III.3.A:

III.3.A COMPLIANCE WITH APPROVED PERMIT APPLICATION

The Permittees shall comply with all requirements set forth in Attachment 28, including all Class 1 Modifications specified below, and the Amendments specified in Condition III.3.B, if any exist. Enforceable portions of the application are listed below; all subsections, figures, and tables included in these portions are also enforceable, unless stated otherwise:

Part A, Form 3, Permit Application, Revision 5

Section 2.1	The PUREX Storage Tunnels Description
Section 2.2	Topographic Map, including Class 1 Modifications from quarter ending June 30, 1997
Chapter 3.0	Waste Analysis
Chapter 4.0	Process Information
Chapter 6.0	Procedures to Prevent Hazards
Chapter 7.0	Contingency Plan, dated May 1998, as amended in Class 2 Modification for Revision 5
Chapter 8.0	Personnel Training, from Class 1 Modification for quarter ending September 30, 2001
Chapter 10.0	Waste Minimization
Chapter 11.0	Closure and Financial Assurance
Chapter 12.0	Reporting and Recordkeeping
Chapter 13.0	Other Federal and State Laws
Appendix 2A	Topographic Map
Appendix 3A	Waste Analysis Plan for PUREX Storage Tunnels
Appendix 4A	Engineering Drawings, including Class 1 Modifications from quarter ending December 31, 1998
Appendix 7A	Unit-Specific Contingency Plan for the 218-E-14 and 218-E-15 Storage Tunnels, dated May 1998, as amended in Class 2 Modification for Revision 5
~~Appendix 8A~~	~~Dangerous Waste Training Plan for the PUREX Facility~~

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
N. C. Boyter Date	D. T. Evans Date	F. W. Bond Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
PUREX Storage Tunnels	**Part III, Chapter 3 and Attachment 28**

Description of Modification:

Chapter 8.0:

Remove Chapter 8.0 and replace with the attached Chapter 8.0.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. *Administrative and informational changes*

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
N. C. Boyter 9.19.01	D. T. Evans 10/11/01		
N. C. Boyter Date	D. T. Evans Date	F. W. Bond Date	L.E. Ruud Date

[1]Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
PUREX Storage Tunnels	**Part III, Chapter 3 and Attachment 28**

Description of Modification:

Appendix 8A:

Remove Appendix 8A.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. *Administrative and informational changes*

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
9.19.01	10/1/01		
N. C. Boyter Date	D. T. Evans Date	F. W. Bond Date	L.E. Ruud Date

[1]Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification
Part III, Chapter 3 and Attachment 28
PUREX Storage Tunnels

Replacement Section

Index

Chapter 8.0

CONTENTS

TABLE

This page intentionally left blank.

8.0 PERSONNEL TRAINING [H]

This chapter discusses personnel training requirements based on WAC 173-303 and the HF RCRA Permit (DW Portion). In accordance with WAC 173-303-806(4)(a)(xii), the *Hanford Facility Dangerous Waste Part B Permit Application* must contain two items: (1) "an outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330" and (2) "a brief description of how training will be designed to meet actual job tasks in accordance with the requirements in WAC 173-303-330(1)(d)." The HF RCRA Permit, (DW portion) Condition II.C (Personnel Training) contains training requirements applicable to Hanford Facility personnel and non-Facility personnel.

Compliance with these requirements at the PUREX Storage Tunnels is demonstrated by information contained both in Chapter 8.0 of DOE/RL-91-28, Attachment 33 of the HF RCRA Permit, and this chapter. This chapter supplements Chapter 8.0 of DOE/RL-91-28.

8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS

The introductory and continuing training programs are designed to prepare personnel to manage and maintain the TSD unit in a safe, effective, and environmentally sound manner. In addition to preparing personnel to manage and maintain TSD units under normal conditions, the training programs ensure that personnel are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response training is consistent with the description of actions contained in Chapter 7.0, Contingency Plan. The introductory and continuing training programs contain the following objectives:

- Teach Hanford Facility personnel to perform their duties in a way that ensures the Hanford Facility's compliance with WAC 173-303
- Teach Hanford Facility personnel dangerous waste management procedures (including implementation of the contingency plan) relevant to the job titles/positions in which they are employed, and
- Ensure Hanford Facility personnel can respond effectively to emergencies.

8.1.1 Introductory Training

Introductory training includes general Hanford Facility training and TSD unit-specific training. General Hanford Facility training is described in DOE/RL-91-28, Section 8.1, and is provided in accordance with the HF RCRA Permit (DW Portion), Condition II.C.2. TSD unit-specific training is provided to Hanford Facility personnel allowing those personnel to work unescorted, and in some cases is required for escorted access. Hanford Facility personnel cannot perform a task for which they are not properly trained, except to gain required experience while under the direct supervision of a supervisor or coworker who is properly trained. Hanford Facility personnel must be trained within 6 months after their employment at or assignment to the Hanford Facility, or to a new job title/position at the Hanford Facility, whichever is later

General Hanford Facility training: Refer to description in DOE/RL-91-28, Section 8.1.

Contingency Plan training: Hanford Facility personnel receive training on applicable portions of the *Hanford Emergency Management Plan* [Attachment 4 of the HF RCRA Permit (DW Portion)] in general Hanford Facility training. In addition, Hanford Facility personnel receive training on content of the description of actions contained in contingency plan documentation in Chapter 7.0 and Appendix 7.A to be able to effectively respond to emergencies.

Emergency Coordinator training: Hanford Facility personnel who perform emergency coordinator duties in WAC 173-303-360 (e.g., Building Emergency Director) in the Hanford Incident Command System receive training on implementation of the contingency plan and fulfilling the position within the Hanford Incident Command System. These Hanford Facility personnel must also become thoroughly familiar with applicable contingency plan documentation, operations, activities, location, and properties of all waste handled, location of all records, and the unit/building layout.

Operations training: Dangerous waste management operations training (e.g., waste designation training, shippers training) is determined on a unit-by-unit basis and considers the type of waste management unit (e.g., container management unit) and the type of activities performed at the waste management unit (e.g., sampling). For example, training provided for management of dangerous waste in containers is different than the training provided for management of dangerous waste in a tank system. Common training required for compliance within similar waste management units can be provided in general training and supplemented at the TSD unit. Training provided for TSD unit-specific operations is identified in the training plan documentation based on: (1) whether a general training course exists, (2) the training needs to ensure waste management unit compliance with WAC 173-303, and (3) training commitments agreed to with Ecology.

8.1.2 Continuing Training

Continuing training meets the requirements for WAC 173-303-330(1)(b) and includes general Hanford Facility training and TSD unit-specific training.

General Hanford Facility training: Annual refresher training is provided for general Hanford Facility training. Refer to description in DOE/RL-91-28, Section 8.1.

Contingency plan training: Annual refresher training is provided for contingency plan training. Refer to description above in Section 8.1.1.

Emergency coordinator training: Annual refresher training is provided for emergency coordinator training. Refer to description above in Section 8.1.1.

Operations training: Refresher training occurs on many frequencies (i.e., annual, every other year, every 3 years) for operations training. When justified, some training will not contain a refresher course and will be identified as a one-time only training course. The TSD unit-specific training plan documentation will specify the frequency for each training course. Refer to description above in Section 8.1.1.

8.2 DESCRIPTION OF TRAINING DESIGN

Proper design of a training program ensures personnel who perform duties on the Hanford Facility related to WAC 173-303-330(1)(d) are trained to perform their duties in compliance with WAC 173-303. Actual job tasks, referred to as duties, are used to determine training requirements. The first step taken to ensure Hanford Facility personnel have received the proper training is to determine and document the waste management duties by job title/position. The second step compares waste management duties to general waste management unit training curriculum. If general waste management unit training curriculum does not address the waste management duties, the training curriculum is supplemented and/or on-the-job training is provided. The third step summarizes the content of a training course necessary to ensure that the training provided to each job title/position addresses associated waste management duties. The last step is to assign training curriculum to Hanford Facility personnel based on the previous evaluation. The training plan documentation contains this process.

Waste management duties include those specified in Section 8.1 as well as those contained in WAC 173-303-330(1)(d). Training elements of WAC 173-303-330(1)(d) applicable to the PUREX Storage Tunnels operations include the following:

- Communications or alarm systems
- Response to fires or explosions

Hanford Facility personnel who perform these duties receive training pertaining to their duties. The training plan documentation described in Section 8.3 contains specific information regarding the types of training Hanford Facility personnel receive based on the outline in Section 8.1.

8.3 DESCRIPTION OF TRAINING PLAN

In accordance with HF RCRA Permit (DW Portion), Condition II.C.3, the unit-specific portion of the *Hanford Facility Dangerous Waste Permit Application* must contain a description of the training plan. Training plan documentation is maintained outside of the *Hanford Facility Dangerous Waste Part B Permit Application* and the HF RCRA Permit. Therefore, changes made to the training plan documentation are not subject to the HF RCRA Permit modification process. However, the training plan documentation is prepared to comply with WAC 173-303-330(2).

Documentation prepared to meet the training plan consists of hard copy and/or electronic media as provided by HF RCRA Permit (DW Portion), Condition II.C.1. The training plan documentation consists of one or more documents and/or a training database with all the components identified in the core document.

A description of how training plan documentation meets the three items in WAC 173-303-330(2) is as follows:

1. -330(2)(a): "The job title, job description, and name of the employee filling each job. The job description must include requisite skills, education, other qualifications, and duties for each position."

   Description: The specific Hanford Facility personnel job title/position is correlated to the waste management duties. Waste management duties relating to WAC 173-303 are correlated to training courses to ensure training properly is assigned.

   Only names of Hanford Facility personnel who carry out job duties relating to TSD unit waste management operations at the PUREX Storage Tunnels are maintained. Names are maintained within the training plan documentation. A list of Hanford Facility personnel assigned to the PUREX Storage Tunnels is available upon request.

   Information on requisite skills, education, and other qualifications for job titles/positions are addressed by providing a reference where this information is maintained (e.g., human resources). Specific information concerning job title, requisite skills, education, and other qualifications for personnel can be provided upon request.

2. -330(2)(b): "A written description of the type and amount of both introductory and continuing training required for each position."

   Description: In addition to the outline provided in Section 8.1, training courses developed to comply with the introductory and continuing training programs are identified and described in the training plan documentation. The type and amount of training is specified in the training plan documentation as shown in Table 8-1.

3. -330(2)(c): "Records documenting that personnel have received and completed the training required by this section. The Department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received."

Description: Training records are maintained consistent with DOE/RL-91-28, Section 8.4.

Table 8-1. PUREX Storage Tunnels Training Matrix.

	Training Category*				
DOE/RL-91-28 Chapter 8 Training Category	General Hanford Facility Training	Contingency Plan Training	Emergency Coordinator Training	Operations Training	
PUREX Storage Tunnels DWTP implementing category	Orientation Program	Emergency Response (contingency plan)	Emergency Coordinator Training	General Waste Management	Miscellaneous Unit
Job title/position					
Engineers	X		X		
Operators	X	X			X
Operations Manager	X	X	X		
Environmental Compliance Officer	X			X	
Non-Resident Waste Service Provider	X			X	

* Refer to the PUREX Storage Tunnels Dangerous Waste Training Plan for a complete description of coursework in each training category.

Hanford Facility RCRA Permit Modification Notification Forms
Part III, Chapter 4 and Attachment 34
Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility

Index

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility	**Part III, Chapter 4 and Attachment 34**

Description of Modification:

Hanford Facility RCRA Permit, Condition III.4.A:

III.4.A COMPLIANCE WITH APPROVED PERMIT APPLICATION

The Permittees shall comply with all requirements set forth in Attachment 34, including the Amendments specified in Condition III.4.B, if any exist. Enforceable portions of the application are listed below (All subsections, figures, and tables included in these portions are also enforceable, unless stated otherwise):

LERF Part A, Form 3, Permit Application, Revision 6

ETF Part A, Form 3, Permit Application, Revision 3

Section 2.2	Topographic Map
Section 3.2	Waste Analysis Plan
Chapter 4.0	Process Information, from Class 1 Modification for quarter ending September 30, 20019
Chapter 5.0	Ground Water Monitoring, from Class 1 Modification for quarter ending June 30, 2000
Chapter 6.0	Procedures to Prevent Hazards, from Class 1 Modification for quarter ending September 30, 2000
Chapter 7.0	Contingency Plan, from Class 1 Modification for quarter ending September 30, 2000
Chapter 8.0	Personnel Training, from Class 1 Modification for quarter ending September 30, 2001
Chapter 11.0	Closure and Financial Assurance
Chapter 12.0	Reporting and Recordkeeping
Chapter 13.0	Other Federal and State Laws
Appendix 2A	Topographic Map
Appendix 3A	*Waste Analysis Plan for the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility*, dated May 1998, as amended in Class 2 Modification for Revision 5
Appendix 4A	Detailed Drawings for the Liquid Effluent Retention Facility, from Class 1 Modification for quarter ending March 31, 2000
Appendix 4B	Detailed Drawings for the 200 area Effluent Treatment Facility Container Storage Area and Tank Systems, from Class 1 Modification for quarter ending March 31, 2000
Appendix 5A	Liquid Effluent Retention Facility Final Ground Water Monitoring Plan, PNNL-11620, See Amendment III.4.B.c.
Appendix 7A	Building Emergency Plan for the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, from Class 2 Modification dated February. Enforceable portions include Sections 1.5, 3.1, 4.0, 7.1, 7.1.1, 7.1.2, 7.2, 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.5, 7.2.5.1, 7.3, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 11.0, 12.0, and 13.0.
~~Appendix 8A~~	~~200 Area Liquid Waste Processing Facilities Administrative Policies, Dangerous Waste Training Plan, dated May 1998, as amended in Class 2 Modification for Revision 5~~

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore 9/16/04	G. H. Sanders OCT 0 2 200	F. Jamison	L.E. Ruud
Date	Date	Date	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility	Part III, Chapter 4 and Attachment 34

Description of Modification:

Hanford Facility RCRA Permit, Condition III.4.B.a: Delete this Condition, this text has been incorporated in Attachment 34, Chapter 4.0.

III.4.B. AMENDMENTS TO THE APPROVED PERMIT APPLICATION

~~III.4.B.a. Section 4.4.6; add the following paragraph, "All tank systems holding dangerous waste are marked with labels or signs to identify the waste contained in the tanks. The labels or signs are legible at a distance of at least fifty (50) feet and bear a legend that identifies the waste in a manner which adequately warns employees, emergency response personnel, and the public, of the major risk(s) associated with the waste being stored or treated in the tank system(s)."~~

III.4.B.b. Appendix 3A, Waste Analysis Plan for the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility.

III.4.B.b.1. The Permittees shall comply with all the requirements, subsections, figures, tables, and appendices, included in the "Waste Analysis Plan for Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility," except that the "Wastewater Profile Sheet Form" is included as an example only. The actual Wastewater Profile Sheet format may vary, but will contain the same substantive information as the example form.

III.4.B.b.2. Section 6.1 Dry Powder Waste

The following terms used in this Section, including powder, dry powder, waste powder, and dry waste powder, are equivalent to the term "dry powder waste" as defined in lines 20 through 27 on page 6-1.

III.4.B.b.3. Section 6.3 Other Waste Generated at the 200 Area Effluent Treatment Facility

Insert the phrase "according to Washington State Regulatory Requirements" after the word "designated" in line 44 on page 6-4.

III.4.B.c. Interim Status Ground Water Monitoring Plan for the 200 East Area Liquid Effluent Treatment Facility. WHC-SD-EN-AP-024, Rev. 1, is an integral Part of this Permit and is to be added as Appendix 5A to the 200 Area Liquid Waste Complex Permit Application.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions
1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore 9/10/01 Date	G. H. Sanders OCT 02 2001 Date	F. Jamison Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility	Part III, Chapter 4 and Attachment 34

Description of Modification:

Chapter 4.0, Section 4.4.4.2.2.:

4.4.4.2.2 *Ancillary Equipment [D-2b(2)(c)]*

The secondary containment provided for the tanks and process systems also serves as secondary containment for the ancillary equipment associated with these systems.

Ancillary Equipment. Section 4.4.5.1 describes the secondary containment systems that also serve most of the ancillary equipment within the ETF. Between the ETF and the verification tanks, a pipeline trench provides secondary containment for four pipelines connecting the transfer pumps (i.e., discharge and return pumps) in the ETF with the verification tanks (Figure 4-1). This concrete trench crosses under the road and extends from the verification tank pumps to the verification tanks. Treated effluent flows through these pipelines from the verification tank pumps to the verification tanks. The return pump is used to return effluent to the ETF for use as service water or for reprocessing.

For all of the ancillary equipment housed within the ETF, the concrete floor, trenches, and berms form the secondary containment system. For the ancillary equipment of the surge tank and the verification tanks, secondary containment is provided by the concrete floors and dikes associated with these tanks. The concrete floor and pit provide secondary containment for the ancillary equipment of the load-in tanks.

Transfer Piping and Pipe Trenches. The two buried transfer lines between LERF and the surge tank have secondary containment in a *pipe-within-a-pipe arrangement. The 4-inch transfer line has an 8-inch outer pipe, while the 3-inch transfer line has a 6-inch outer pipe.* The pipes are fiberglass and are sloped towards the surge tank. The outer piping ends with a drain valve in the surge tank secondary containment.

These pipelines are equipped with leak detection located in the annulus between the inner and outer pipes, which have the ability to continuously 'inspect' the pipelines during aqueous waste transfers. The alarms on the leak detection system are monitored in the control room. A low-volume air purge of the annulus is provided to prevent condensation buildup and minimize false alarms by the leak detection system. *In the event that these leak detectors are not in service, the pipelines are inspected during transfers by opening a drain valve to* check for solution in the annular space between the inner and outer pipe.

The 3-inch transfer line between the load-in tanks and the surge tank has a 6-inch outer pipe in a pipe-within-a-pipe arrangement. The piping is made of fiberglass reinforced plastic and slopes towards the load-in tank secondary containment pit. The drain valve and leak detection system for the load-in tank pipelines are operated similarly to the leak detection system for the LERF to ETF pipelines.

As previously indicated, there are four reinforced concrete pipe trenches that provide secondary containment for piping under the roadway between the ETF and the verification tanks. Each trench is 1.2 meters wide and 0.76 meter deep and slopes towards the sump containing the transfer pumps to SALDS. The floor of the trenches are 30.5 centimeters thick and the sides are 15.2 centimeters thick. The concrete trenches are coated with water sealant and covered with metal gratings at ground level to allow vehicle traffic on the roadway.

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore Date	O. H. Sanders Date	F. Jamison Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility	Part III, Chapter 4 and Attachment 34

Description of Modification:

Chapter 4.0, Section 4.4.6.: Incorporated Permit Condition II.4.B.a.

4.4.6. Labels or Signs [D-2e]

Each tank or process unit in the ETF is identified by a nameplate attached in a readily visible location. Included on the nameplate are the equipment number and the equipment title. Those tanks which store or treat dangerous waste at the ETF (Section 4.4.1.1) are identified with a label which reads "PROCESS WATER/WASTE". The labels are legible at a distance of at least fifty feet or as appropriate for legibility within the ETF. Additionally, these tanks bear a legend that identifies the waste in a manner, which adequately warns employees, emergency personnel, and the public of the major risk(s) associated with the waste being stored or treated in the tank system(s).

Caution plates are used to show possible hazards and warn that precautions are necessary. Caution signs have a yellow background and black panel with yellow letters and bear the word "CAUTION". Danger signs show immediate danger and signify that special precautions are necessary. These signs are red, black, and white and bear the word "DANGER".

Tanks and vessels containing corrosive chemicals are posted with black and white signs bearing the word "CORROSIVE". "DANGER - UNAUTHORIZED PERSONNEL KEEP OUT" signs are posted on all exterior doors of the ETF, and on each interior door leading into the process area. Tank ancillary piping is also labeled "PROCESS WATER" or "PROCESS LIQUID" to alert personnel which pipes in the process area contains dangerous and/or mixed waste.

All tank systems holding dangerous waste are marked with labels or signs to identify the waste contained in the tanks. The labels or signs are legible at a distance of at least fifty (50) feet and bear a legend that identifies the waste in a manner which adequately warns employees, emergency response personnel, and the public, of the major risk(s) associated with the waste being stored or treated in the tank system(s).

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. L. Moore	Date 9/16/01	G. H. Sanders	Date OCT 02 2001	F. Jamison	Date	L.E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility	Part III, Chapter 4 and Attachment 34

Description of Modification:

Chapter 4.0, Section 4.5.5.2.:

4.5.5.2. Leak Detection System

Single-point electronic leak detection elements are installed along the transfer line at 305-meter intervals. The leak detection elements are located in the bottom of specially designed test risers. Each sensor element employs a conductivity sensor, which is connected to a cable leading back to the 242-A Evaporator control room. If a leak develops in the carrier pipe, fluid will travel down the exterior surface of the carrier pipe or the interior of the containment pipe. As moisture contacts a sensor unit, the alarm sounds in the 242-A Evaporator control room and the zone of the leak is indicated on the digital display. The pump located in the 242-A Evaporator is shut down, stopping the flow of aqueous waste through the transfer line. A low-volume air purge of the annulus between the carrier pipe and the containment pipe is provided to prevent condensation buildup and minimize false alarms by the leak detection elements.

The catch basins have conductivity leak detectors that alarm in the 242-A Evaporator control room. Leaks into the catch basins drain back to the basin through a 5.1-centimeter drain on the floor of the catch basin.

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. *Administrative and informational changes*

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore 9/16/01	OCT 02 2001		
T. L. Moore Date	G. H. Sanders Date	F. Jamison Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility	Part III, Chapter 4 and Attachment 34

Description of Modification:

Chapter 8.0:

Remove Chapter 8.0 and replace with the attached Chapter 8.0.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore 9/14/01	G. H. Sanders OCT 02 2001	F. Jamison	L.E. Ruud
T. L. Moore Date	G. H. Sanders Date	F. Jamison Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modifications
Part III, Chapter 4 and Attachment 34
Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility

Replacement Sections

Index

CONTENTS

CONTENTS (cont)

APPENDICES

FIGURES

TABLES

1
2
3
4
5 This page intentionally left blank.
6

4.0 PROCESS INFORMATION [D]

This chapter provides a detailed discussion of the LERF and ETF processes and equipment. The LERF and ETF comprise an aqueous waste treatment system located in the 200 East Area that provides storage and treatment for a variety of aqueous radioactive and/or mixed waste. This aqueous waste includes process condensate from the 242-A Evaporator and other aqueous waste generated from onsite remediation and waste management activities.

The LERF consists of three lined surface impoundments, or basins. Aqueous waste from LERF is pumped to the ETF for treatment in a series of process units, or systems, that remove or destroy essentially all of the dangerous waste and radioactive constituents except tritium. The treated effluent is discharged to a State-Approved Land Disposal Site (SALDS) north of the 200 West Area, under the authority of a Washington State Waste Discharge Permit (Ecology 1995a) and the Final Delisting (40 CFR 261, Appendix IX, Table 2).

4.1 LIQUID EFFLUENT RETENTION FACILITY PROCESS DESCRIPTION

Each of the three LERF basins has an operating capacity of 29.5-million liters. The LERF receives aqueous waste through several inlets including the following:

- A pipeline that connects LERF with the 242-A Evaporator
- A pipeline from the 200 West Area
- A pipeline that connects LERF to the Load-In Station at the ETF
- A series of sample ports located at each basin.

Figure 4-1 presents a general layout of LERF and associated pipelines. Engineering drawings for LERF are referenced in Section 4.5 and provided in Appendix 4A.

Aqueous waste from LERF is pumped to the ETF through one of two double-walled fiberglass transfer pipelines. Effluent from the ETF also can be transferred back to the LERF through one of these transfer pipelines. These pipelines are equipped with leak detection located in the annulus between the inner and outer pipes. In the event that these leak detectors are not in service, the pipelines are visually inspected during transfers for leakage by opening the secondary containment drain lines at the ETF end of the transfer pipelines.

Each basin is equipped with six available sample risers constructed of 6-inch perforated pipe. A seventh sample riser in each basin is dedicated to influent aqueous waste receipt piping (except for aqueous waste received from the 242-A Evaporator), and an eighth riser in each basin contains liquid level instrumentation. Each riser extends along the sides of each basin from the top to the bottom of the basin and allow samples to be collected from any depth. Personnel access to these sample ports is from the perimeter area of the basins.

A catch basin is provided at the northwest corner of each LERF basin for aboveground piping and manifolds for transfer pumps. Aqueous waste from the 242-A Evaporator is transferred through piping that ties into piping at the catch basins. Under routine operations, a submersible pump is used to transfer aqueous waste from a LERF basin to the ETF for processing or for basin-to-basin transfers. This pump is connected to a fixed manifold on one of four available risers.

Each basin consists of a multilayer liner system supported by a concrete anchor wall around the basin perimeter and a soil-bentonite clay underlayment. The multilayer liner system consists of a primary liner in contact with the aqueous waste, a layer of bentonite carpet, a geonet, a geotextile, a gravel layer, and a secondary liner that rests on the bentonite underlayment. Any aqueous waste leakage through the primary liner flows through the geonet to a leachate collection system. The leachate flows to a sump at the northwest corner of each basin, where the leachate is pumped up the sideslope and back into the basin above the primary liner. Each liner is constructed of high-density polyethylene. A floating cover made of very low-density polyethylene is stretched over each basin above the primary liner. These covers serve to

keep unwanted material from entering the basins, and to minimize evaporation of the liquid contents.

4.2 EFFLUENT TREATMENT FACILITY PROCESS DESCRIPTION

The ETF is designed as a flexible treatment system that provides treatment for contaminants anticipated in process condensate and other onsite aqueous waste. The design influent flow rate into the ETF is approximately 570 liters per minute with planned outages for activities such as maintenance on the ETF systems. Maintenance outages typically are scheduled between treating a batch of aqueous waste, referred to as treatment campaigns. The effluent flow (or volume) is equivalent to the influent flow (or volume).

The ETF generally receives aqueous waste directly from the LERF. However, aqueous waste also can be transferred from the Load-In Station to the ETF. Aqueous waste is treated and stored in the ETF process area in a series of tank systems, referred to as process units. Within the ETF, waste also is managed in containers through treatment and/or storage. Figure 4-1 provides the relative locations of the process and container storage areas within the ETF.

The process units are grouped in either the primary or the secondary treatment train. The primary treatment train provides for the removal or destruction of contaminants. Typically, the secondary treatment train processes the waste by-products from the primary treatment train by reducing the volume of waste. In the secondary treatment train, contaminants are concentrated and dried to a powder. The liquid fraction is routed to the primary treatment train. Figure 4-2 provides an overview of the layout of the ETF (2025E Building). Figure 4-3 presents the ETF floor plan, the relative locations of the individual process units and associated tanks within the ETF, and the location of the Load-In Station.

The dry powder waste and maintenance and operations waste are containerized and stored or treated in the container storage area or in collection or treatment areas within the Process Area. Secondary containment is provided for all containers and tank systems (including ancillary equipment) housed within the ETF. The trenches and floor of the ETF comprise the secondary containment system. The floor includes approximately a 15.2-centimeter rise (berm) along the containing walls of the process and container storage areas. Any spilled or leaked material from within the process area or container storage area is collected into trenches that feed into either sump tank 1 or sump tank 2. From these sump tanks, the spilled or leaked material (i.e., waste) is fed to either the surge tank and processed in the primary treatment train or the secondary waste receiving tanks and processed in the secondary treatment train. All tank systems outside of the ETF are provided with a secondary containment system.

In the following sections, several figures are provided that present general illustrations of the treatment units and the relation to the process. Detailed drawings of the ETF are provided in Appendix 4B.

4.2.1 Load-In Station

The ETF receives aqueous waste from LERF or the Load-In Station. The ETF Load-In Station, located due east of the surge tank and outside of the perimeter fence (Figure 4-3), was designed and constructed to provide the capability to unload, store, and transfer aqueous waste to the ETF or LERF from tanker trucks and other containers (such as drums). The Load-In Station consists of two load-in tanks, transfer pumps, filtration system, level instrumentation for tanker trucks, leak detection capabilities for the containment basin and transfer line, and an underground transfer line that connects to lines in the surge tank berm, allowing transfers to either the ETF surge tank or LERF.

Tanker trucks and other containers are used to unload aqueous waste at the Load-In Station. To perform unloading, the tanker truck is positioned on a truck pad, a 'load-in' transfer line is connected to the truck, and the tanker contents are pumped into one of the Load-In Station tanks, the surge tank, or directly to the LERF. For container unloading, the container is placed on the truck pad and the container contents are pumped into one of the Load-In Station tanks, the surge tank, or directly to the LERF.

During unloading operations, solids may be removed from the waste by pumping the contents of the tanker truck or container through a filtration system. If solids removal is not needed, the filtration system is not used and the solution is transferred directly to the Load-In Station tanks, surge tank, or to LERF.

Any leaks at the Load-In Station drain to the sump. A leak detector in the sump alarms locally and in the ETF control room. Alternatively, leaks can be visually detected.

4.2.2 Effluent Treatment Facility Operating Configuration

Because the operating configuration of the ETF can be adjusted or modified, most aqueous waste streams can be effectively treated to below Delisting and Discharge Permit limits. The operating configuration of the ETF depends on the unique chemistry of an aqueous waste stream(s). Before an aqueous waste stream is accepted for treatment, the waste is characterized and evaluated. Information from the characterization is used to adjust the treatment process or change the configuration of the ETF process units, as necessary, to optimize the treatment process for a particular aqueous waste stream.

Typically, an aqueous waste is processed first in the primary treatment train, where the ETF is configured to process an aqueous waste through the UV/OX unit first, followed by the RO unit. However, under an alternate configuration, an aqueous waste could be processed in the RO unit first. For example, high concentrations of nitrates in an aqueous waste might interfere with the performance of the UV/OX. In this case, the ETF could be configured to process the waste in the RO unit before the UV/OX unit.

The flexibility of the ETF also allows for some aqueous waste to be processed in the secondary treatment train first. For example, for small volume aqueous waste with high concentrations of some anions and metals, the approach could be to first process the waste stream in the secondary treatment train. This approach would prevent premature fouling or scaling of the RO unit. The liquid portion (i.e., untreated overheads from the ETF evaporator and thin film dryer) would be sent to the primary treatment train.

Figures 4-4 and 4-5 provide example process flow diagrams for two different operating configurations.

4.2.3 Primary Treatment Train

The primary treatment train consists of the following processes:

- Influent Receipt/Surge tank - inlet, surge capacity
- Filtration - for suspended solids removal
- UV/OX - organic destruction
- pH adjustment - waste neutralization
- Hydrogen peroxide decomposition - removal of excess hydrogen peroxide
- Degasification - removal of carbon dioxide
- RO - removal of dissolved solids and radionuclides
- IX - removal of dissolved solids and radionuclides
- Verification - holding tanks during verification.

Each of the primary treatment train process units and ancillary systems provides treatment for removal or destruction of various constituents. The primary treatment train units are operated as needed in different configurations, as determined by the characteristics of an aqueous waste stream, to protect ETF equipment and to meet discharge requirements.

Influent Receipt/Surge Tank. Depending on the configuration of the ETF, the surge tank is one inlet used to feed an aqueous waste into the ETF for treatment. In Configuration 1 (Figure 4-4), the surge tank is the first component downstream of the LERF. The surge tank provides a storage/surge volume for chemical pretreatment and controls feed flow rates from the LERF to the ETF. However, in Configuration 2 (Figure 4-5), aqueous waste from LERF is fed directly into the treatment units. In this configuration, the surge tank receives aqueous waste that has been processed in the RO units and provides the feed stream to the remaining downstream process units. In yet another configuration, some

small volume aqueous waste could be received into the secondary treatment train first for processing. In this case, the aqueous waste would be received directly into the secondary waste receiving tanks. Finally, the surge tank also receives waste extracted from various systems within the primary and secondary treatment train while in operation.

The surge tank is located outside the ETF on the south side. In the surge tank (Figure 4-6), the pH of an aqueous waste is adjusted using the metered addition of sulfuric acid and sodium hydroxide, as necessary, to prepare the waste for treatment in downstream processes. In addition, hydrogen peroxide or biocides could be added to control biological growth in the surge tank. A pump recirculates the contents in the surge tank, mixing the chemical reagents with the waste to a uniform pH.

Filtration. Two primary filter systems remove suspended particles in an aqueous waste: a rough filter removes the larger particulates, while a fine filter removes the smaller particulates. The location of these filters depends on the configuration of the primary treatment train. However, the filters normally are located upstream of the RO units.

The solids accumulating on these filter elements are backwashed to the secondary waste receiving tanks with pulses of compressed air and water, forcing water back through the filter. The backwash operation is initiated either automatically by a rise in differential pressure across the filter or manually by an operator. The filters are cleaned chemically when the backwashing process does not facilitate acceptable filter performance.

Auxiliary fine and rough filters (e.g., disposable filters) have been installed to provide additional filtration capabilitys. Depending on the configuration of the ETF, the auxiliary filters are operated either in series with the primary filters to provide additional filtration or in parallel, instead of the primary fine and rough filters, to allow cleaning of the primary fine and rough filters while the primary treatment train is in operation.

Ultraviolet Light/Oxidation. Organic compounds contained in an aqueous waste stream are destroyed in the UV/OX system (Figure 4-7). Hydrogen peroxide is mixed with the waste. The UV/OX system uses the photochemical reaction of UV light on hydrogen peroxide to form hydroxyl radicals and other reactive species oxidize the organic compounds. The final products of the complete reaction are carbon dioxide, water, and inorganic ions.

Organic destruction is accomplished in two UV/OX units operating in parallel. During the UV/OX process, the aqueous waste passes through reaction chambers where hydrogen peroxide is added. While in the UV/OX system, the temperature of an aqueous waste is monitored. Should the temperature of the waste exceed the upper limits for the UV/OX or RO systems, heat exchangers are used to reduce the temperature of the waste.

pH Adjustment. The pH of a waste stream is monitored and controlled at different points throughout the treatment process. Within the primary treatment train, the pH of a waste can be adjusted with sulfuric acid or sodium hydroxide to optimize operation of downstream treatment processes or adjusted before final discharge. For example, the pH of an aqueous waste would be adjusted in the pH adjustment tank after the UV/OX process and before the RO process. In this example, pH is adjusted to cause certain chemical species such as ammonia to form ammonium sulfate, thereby increasing the rejection rate of the RO.

Hydrogen Peroxide Decomposition. Typically, hydrogen peroxide added into the UV/OX system is not consumed completely by the system. Because hydrogen peroxide is a strong oxidizer, the residual hydrogen peroxide from the UV/OX system is removed to protect the downstream equipment. The hydrogen peroxide decomposer uses activated carbon to break down the hydrogen peroxide that is not consumed completely in the process of organic destruction. The aqueous waste is sent through a column of fluidized activated carbon that breaks down the hydrogen peroxide into water and oxygen. The gas generated by the decomposition of the hydrogen peroxide is vented to the vessel offgas system.

Degasification. The degasification column is used to purge dissolved carbon dioxide from the aqueous waste to reduce the carbonate loading to downstream dissolved solids removal processes within the ETF primary treatment train. The purged carbon dioxide is vented to the vessel offgas system.

Reverse Osmosis. The RO system (Figure 4-8) uses pressure to force clean water molecules through semi-permeable membranes while keeping the larger molecule contaminants, such as dissolved solids, radionuclides, and large molecular weight organic materials, in the membrane. The RO process uses a staged configuration to maximize water recovery. The process produces two separate streams, including a clean 'permeate' and a concentrate (or retentate), which are concentrated as much as possible to minimize the amount of secondary waste produced.

The RO process is divided into first and second stages. Aqueous waste is fed to the first RO stage from the RO feed tank. The secondary waste receiving tanks of the secondary treatment train receive the retentate removed from the first RO stage, while the second RO stage receives the permeate (i.e., 'treated' aqueous waste from the first RO stage). In the second RO stage, the retentate is sent to the first stage RO feed tank while the permeate is sent to the IX system or to the surge tank, depending on the configuration of the ETF.

Two support systems facilitate this process. An anti-scale system injects scale inhibitors as needed into the feed waste to prevent scale from forming on the membrane surface. A clean-in-place system using cleaning agents, such as descalants and surfactants, cleans the membrane pores of surface and subsurface deposits that have fouled the membranes.

Ion Exchange. Because the RO process removes most of the dissolved solids in an aqueous waste, the IX process (Figure 4-9) act as a polishing unit. The IX system consist of three columns containing beds of cation and/or anion resins. This system is designed to allow for regeneration of resins and maintenance of one column while the other two are in operation. Though the two columns generally are operated in series, the two columns also can be operated in parallel or individually.

Typically, the two columns in operation are arranged in a primary/secondary (lead/lag) configuration, and the third (regenerated) column is maintained in standby. When dissolved solids breakthrough the first IX column and are detected by a conductivity sensor, this column is removed from service for regeneration, and the second column replaces the first column and the third column is placed into service. The column normally is regenerated using sulfuric acid and sodium hydroxide. The resulting regeneration waste is collected in the secondary waste receiving tanks.

Should regeneration of the IX resins become inefficient, spent resins are transferred into a disposal container. The container is designed to provide dewatering with remote monitoring of the resin and water levels within the container. Displaced air from the vessels is exhausted through an entrainment separator (to remove water drops) and a high-efficiency particulate air filter and into the vessel offgas system. Free water is removed from the container and returned to the surge tank. Dewatered resins are transferred to a final storage/disposal point.

Verification. The three verification tanks (Figure 4-10) are used to hold the treated effluent while a determination is made that the effluent meets discharge limits. Should a treated effluent not meet Discharge Permit or Final Delisting requirements, the effluent can be returned to the primary treatment train for additional treatment or to the LERF.

The three verification tanks alternate between three operating modes: receiving treated effluent, holding treated effluent during laboratory analysis and verification, or discharging verified effluent. Treated effluent may also be returned to the ETF to provide 'clean' service water for operational and maintenance functions, e.g., for boiler water and for backwashing the filters. This recycling keeps the quantity of fresh water used to a minimum.

4.2.4 Secondary Treatment Train

The secondary treatment system typically receives and processes the following by-products generated from the primary treatment train: concentrate from the first RO stage, filter backwash, regeneration

waste from the ion exchange system, and spillage or overflow received into the process sumps. Depending on the operating configuration, however, some aqueous waste could be processed in the secondary treatment train before the primary treatment train (refer to Figures 4-4 and 4-5 for example operating configurations).

The secondary treatment train provides the following processes:

- Secondary waste receiving - tank receiving
- Evaporation - concentrates secondary waste streams
- Concentrate staging - concentrate receipt and pH adjustment in concentrate tanks
- Thin film drying - dewatering of secondary waste streams
- Container handling - packaging of dewatered secondary waste.

Secondary Waste Receiving. Waste to be processed in the secondary treatment train is received into two secondary waste receiving tanks, where the pH can be adjusted with sulfuric acid or sodium hydroxide for optimum evaporator performance.

Evaporation. The ETF evaporator is fed alternately by the two secondary waste receiving tanks. One tank serves as a waste receiver while the other tank is operated as the feed tank. The ETF evaporator vessel (also referred to as the vapor body) is the principal component of the evaporation process (Figure 4-11).

Feed from the secondary waste receiving tanks is pumped through a heater to the recirculation loop of the ETF evaporator. In this loop, concentrated waste is recirculated from the ETF evaporator, to a heater, and back into the evaporator where vaporization occurs. As water leaves the evaporator system in the vapor phase, the concentration of the waste in the evaporator increases. When the concentration of the waste reaches the appropriate density, a portion of the concentrate is pumped to one of the concentrate tanks.

The vapor that is released from the ETF evaporator is routed to the entrainment separator, where water droplets and/or particulates are separated from the vapor. The 'cleaned' vapor is routed to the vapor compressor and heater. The steam from the vapor compressor/heater is used to heat the recirculating concentrate in the ETF evaporator. From the vapor compressor/heater, the steam is condensed and fed to the distillate flash tank, where the saturated condensate received from the heater drops to atmospheric pressure and cools to the normal boiling point through partial flashing (rapid vaporization caused by a pressure reduction). The resulting distillate is routed to the surge tank. Noncondensible vapors, such as air, are exhausted by a vacuum blower to the vessel offgas system.

Concentrate Staging. The concentrate tanks make up the head end of the thin film drying process. From the ETF evaporator, concentrate is pumped into two concentrate tanks and pH adjusted. The concentrate tanks function alternately between concentrate receiver and feed tank for the thin film dryer.

Because low solubility solids (i.e., calcium and magnesium sulfate) tend to settle in the concentrate tanks, these solids must be removed to prevent fouling and to protect the thin film dryer, and to maintain concentrate tank capacity.

Thin Film Drying. From the concentrate tanks, feed is pumped through a preheater to the thin film dryer (Figure 4-12) that is heated by steam. As the concentrated waste flows down the length of the dryer, the waste is dried. The dried film, or powder, is scraped off the dryer cylinder by blades attached to a rotating shaft. The powder is funnelled through a cone-shaped powder hopper at the bottom of the dryer and into the Container Handling System.

Overhead vapor released by the drying of the concentrate is condensed in the distillate condenser. Excess heat is removed from the distillate by a water-cooled heat exchanger. Part of the distillate is circulated back to the condenser spray nozzles. The remaining distillate is pumped to the surge tank. Any noncondensible vapors and particulates from the spray condenser are exhausted to the vessel offgas system.

Container Handling. Before an empty container is moved into the Container Handling System (Figure 4-13), the lids are loosely placed on the containers and the container is placed on a conveyor. After the lid is removed, the containers are moved into the container filling area after passing through an air lock. The empty container is located under the thin film dryer, and raised into position. The container is sealed to the thin film dryer and a rotary valve begins the transfer of powder to the empty container. Air displaced from the container is vented to the entrainment separator attached to the ETF evaporator that exhausts to the vessel offgas system.

The container is filled to a predetermined level, recapped, and moved along the conveyor to the smear station airlock. At the smear station airlock, the container is moved onto the conveyor by remote control. The airlock is opened and the smear sample (surface wipe) is taken and the radionuclide contamination level counted. A 'C' ring is installed to secure the container lid. If the container has contaminated material on the outside, the container is moved to the washdown station and washed. The container wash water drains to sump tank 1. The washed container is air-dried and retested. Filled containers that pass the smear test are labeled, placed on pallets, and moved by forklift to the filled container storage area. Section 4.3 provides a more detailed discussion of container handling.

4.2.5 Other Effluent Treatment Facility Systems

The ETF is provided with support systems that facilitate treatment in the primary and secondary treatment trains and that provide for worker safety and environmental protection. An overview of the following systems is provided:

- Monitor and control system
- Vessel offgas system
- Sump collection system
- Chemical injection feed system
- Verification tank recycle system
- Utilities.

4.2.5.1 Monitor and Control System

The operation of the ETF is monitored and controlled by a centralized computer system (i.e., monitor and control system or MCS). The MCS continuously monitors data from various field indicators, such as pH, flow, tank level, temperature, pressure, conductivity, alarm status, and valve switch positions. Data gathered by the MCS enable operations and engineering personnel to document and adjust the operation of the ETF.

4.2.5.2 Vessel Offgas System

Ventilation for various tanks and vessels is provided through the vessel offgas system. The system includes a moisture separator, duct heater, pre-filter, high-efficiency particulate air filters, carbon adsorber (when required to reduce organic emissions), exhaust fans, and ductwork. Gasses ventilated from the tanks and vessels enter the exhaust system through the connected ductwork. The vessel offgas system draws vapors and gasses off the following tanks and treatment systems:

- Surge tank
- ETF evaporator
- pH adjustment tank
- Concentrate tanks
- Degasification system
- First and second RO stages
- Dry powder hopper
- Effluent pH adjustment tank
- Drum capping station
- Secondary waste receiving tanks
- Resin dewatering system
- Distillate condenser (off the thin film dryer)

- Sump tanks 1 and 2.

The vessel offgas system maintains a negative pressure with respect to the atmosphere, which produces a slight vacuum within tanks, vessels, and ancillary equipment for the containment of gas vapor. This system also provides for the collection, monitoring, and treatment of confined airborne in-vessel contaminants to preclude over-pressurization. The high-efficiency particulate air filters remove particulates and condensate from the air stream before these are discharged to the radiologically controlled heating, ventilation, and air conditioning system.

4.2.5.3 Sump Collection System

Sump tanks 1 and 2 compose the sump collection system that provides containment of waste streams and liquid overflow associated with the ETF processes. The process area floor is sloped to two separate trenches that each drain to a sump tank located under the floor of the ETF. One trench runs the length of the primary treatment train and drains to sump tank 2 located underneath the verification tank pump floor. The second trench collects spillage primarily from the secondary treatment train and flows to sump tank 1 located near the ETF evaporator. Sump tanks 1 and 2 are located below floor level (Figure 4-14). An eductor in these tanks prevents sludge from accumulating.

4.2.5.4 Chemical Injection Feed System

At several points within the primary and secondary treatment trains, sulfuric acid and sodium hydroxide (or dilute solutions of these reagents) are metered into specific process units to adjust the pH. For example, a dilute solution of 4 percent sulfuric acid and 4 percent sodium hydroxide could be added to the secondary waste receiving tanks to optimize the evaporation process.

4.2.5.5 Verification Tank Recycle System

To reduce the amount of water added to the process, verification tank water (i.e., verified effluent) is recycled throughout the ETF process. The following tanks and ancillary equipment use verification tank water:

- 4% H2SO4 solution tank and ancillary equipment
- 4% NaOH solution tank and ancillary equipment
- Clean-in-place tank and ancillary equipment
- ETF evaporator boiler and ancillary equipment
- Thin film dryer boiler and ancillary equipment.

4.2.5.6 Utilities

The ETF maintains the following utility supply systems required for the operation of the ETF:

- Cooling water system - removes heat from process water via heat exchangers and a cooling tower
- Compressed air system - provides air to process equipment and instrumentation
- Seal water system - provides cool, clean, pressurized water to process equipment for pump seal cooling and pump seal lubrication, and provides protection against failure and fluid leakage
- Demineralized water system - removes solids from raw water system to produce high-quality, low ion-content, water for steam boilers, and for the hydrogen peroxide feed system.
- Heating, ventilation, and air conditioning system - provides continuous heating, cooling, and air humidity control throughout the ETF.

The following utilities support ETF activities:

- Electrical power
- Sanitary water
- Communication systems
- Raw water.

4.3 CONTAINERS [D-1]

This section provides specific information on container storage and treatment operations at the ETF, including descriptions of containers, labeling, and secondary containment structures.

A list of dangerous and/or mixed waste managed in containers at the ETF is presented in Chapter 1.0. The types of dangerous and/or mixed waste managed in containers in the ETF could include the following secondary waste generated by the ETF processes:

- Waste generated from the treatment process
- Miscellaneous waste generated by operations and maintenance activities.

The secondary treatment train processes the waste by-products from the primary treatment train, which are concentrated and dried into a powder. Containers are filled with dry powder waste from the thin film dryer via a remotely controlled system. Miscellaneous waste generated from maintenance and operations activities also are stored at the ETF. The waste could include process waste, such as used filter elements; spent RO membranes; damaged equipment; and decontamination and maintenance waste, such as contaminated rags, gloves, and other personal protective equipment. Liquids generally are packaged with absorbents at a 2 to 1 ratio.

Several container collection areas could be located within the ETF process and container handling areas. These collection areas are used only to accumulate waste in containers. Once a container is filled, the container is transferred either to the container storage area (Figure 4-3), to another TSD unit, or to a less-than-90-day storage pad. The container storage area, a 22.9 x 8.5-meter room, is located adjacent to the ETF process area. The containers within the container storage area are clearly labeled, and access to these containers is limited by barriers and by administrative controls. The ETF floor provides secondary containment, and the ETF roof and walls protects all containers from exposure to the elements.

Waste also could be placed in containers for treatment as indicated in Chapter 1.0. For example, sludge that accumulates in the bottoms of the process tanks is removed periodically and placed into containers. In this example, the waste is solidified by decanting the supernate from the container and the remainder of the waste is allowed to evaporate, or absorbents are added, as necessary, to address remaining liquids. Following treatment, this waste either is stored at the ETF or transferred to another TSD unit.

4.3.1 Description of Containers [D-1a]

The containers used to collect and store dry powder waste are 208-liter steel containers. Most of the maintenance and operation waste is stored in 208-liter steel containers; however, in a few cases, the size of the container could vary to accommodate the size of a particular waste. For example, some process waste, such as spent filters, might not fit into a 208-liter container. In the case of spent resin from the IX columns, the resin is dewatered and could be packaged in a special disposal container. In these few cases, specially sized containers could be required. In all cases, however, only approved container are used and are compatible with the associated waste. Typically 208-liter containers are used for treatment.

Current operating practices indicate the use of new 208-liter containers that either have a polyethylene liner or a protective coating. Any reused or reconditioned container is inspected for container integrity before use. Overpack containers are available for use with damaged containers. Overpack containers typically are unlined steel or polyethylene. Per Chapter 1.0, a maximum of 147,630 liters of dangerous and/or mixed waste could be stored in containers in the ETF.

4.3.2 Container Management Practices [D-1b]

Before use, each container is checked for signs of damage such as dents, distortion, corrosion, or scratched coating. For dry powder loading, empty containers on pallets are raised by a forklift and manually placed on the conveyor that transports the containers to the automatic filling station in the container handling room (Figure 4-13). The container lids are removed and replaced automatically during the filling sequence. After filling, containers exit the container handling room via the filled drum conveyor. Locking rings are installed, the container label is affixed, and the container is moved by dolly or forklift to the container storage area.

Containers used for storing maintenance and operations secondary waste are labeled before being placed in the container storage area or in a collection area. Lids are secured on these containers when not being filled. When the containers in a collection area are full, the containers are transferred by dolly or forklift to the container storage area or to an appropriate TSD unit. Containers used for treating waste also are labeled. The lids on these containers are removed as required to allow for treatment. During treatment, access to these containers is controlled through physical barriers and/or administrative controls.

The filled containers in the container storage area are inventoried, checked for proper labeling, and placed on pallets or in a separate containment devices as necessary. Each pallet is moved by forklift. Within the container storage area, palletized containers are stacked no more then three pallets high and in rows no more than two containers wide. Rows are separated by unobstructed aisles with a minimum of 76-centimeter aisle space.

4.3.3 Container Labeling [D-1c]

Labels are affixed on containers used to store dry powder when the containers leave the container handling room. Labels are affixed on other waste containers before use. Every container is labeled with the date that the container was filled. Appropriate major risk labels, such as "corrosive", "toxic" or "F-listed", also are added. Each container also has a label with an identification number for tracking purposes.

4.3.4 Containment Requirements for Managing Containers [D-1d]

Secondary containment is provided in the container management areas. The secondary containment provided for tank systems also serves the container management areas. This section describes the design and operation of the secondary containment structure for these areas. Detailed drawings of the ETF secondary containment systems are presented in Appendix 4B.

4.3.4.1 Secondary Containment System Design [D-1d(1)(a)]

For the container management areas, secondary containment is provided by the reinforced concrete floor and a 15.2-centimeter rise (berm) along the walls of the container storage area of the ETF. The engineering assessment required for tanks (Mausshardt 1995) also describes the design and construction of the secondary containment provided for the ETF container management areas. All systems were designed to national codes and standards (e.g., American Society for Testing Materials, American Concrete Institute standards).

The floor in composed of cast-in-place and pre-formed concrete slabs and has a minimum thickness of 15.2 centimeters. All slab joints and floor and wall joints have waterstops installed at the mid-depth of the slab. In addition, filler was applied to each joint. The floor and berms are coated with a chemically resistant, high-solids epoxy coating system consisting of primer, filler, and top coating. This coating material is compatible with the waste managed in containers and is an integral part of the secondary containment system for containers.

The floor is sloped to drain any solution in the container storage area to floor drains along the west wall. Each floor drain consists of a grating over an 20.3-centimeter drain port connected to a 4-inch stainless steel transfer pipe. The pipe passes under this wall and connects to a trench running along the east wall of the adjacent process area. This trench drains solution to sump tank 1.

The container storage area is separated from the process area by a common wall and a door for access to the two areas (Figure 4-2). These two areas also share a common floor and trenches that, with the 15.2-centimeter rise of the containing walls, form the secondary containment system for the process area and the container storage area.

4.3.4.1.1 Structural Integrity of Base [D-1d(1)(b)]

Engineering calculations were performed showing the floor of the container storage area is capable of supporting the weight of containers. These calculations were reviewed and certified by a professional engineer (Mausshardt 1995). The concrete was inspected for damage during construction. Cracks were

identified and repaired to the satisfaction of the professional engineer. Documentation of these certifications is included in the engineering assessment (Mausshardt 1995) and a copy of the certification is provided in Appendix 4C.

4.3.4.1.2 Containment System Capacity [D-1d(1)(c)]

The container storage area is primarily used to store dry powder and maintenance and operation waste. Where appropriate, absorbents are added to fix any trace liquids present. Large volumes of liquid are not stored in the container storage area. However, liquids might be present in those containers that are in the treatment process. The maximum volume of waste that can be stored in containers in the container storage area is 147,630 liters.

Both the process area and the container storage area are considered in the containment system capacity. The volume available for secondary containment in the process area is approximately 68,000 liters, as discussed in the engineering assessment (Mausshardt 1995). Using the dimensions of the container storage area (22.9 by 8.5 by 0.15 meters), and assuming that 50 percent of the floor area is occupied by containers, the volume of the container storage area is 14,900 liters. The combined volume of both the container storage and process areas available for secondary containment, therefore, is 82,900 liters. This volume is greater than 10 percent of the maximum total volume of containers allowed for storage in the ETF, as discussed previously.

4.3.4.1.3 Control of Run-on [D-1d(1)(d)]

The container management areas are located within the ETF, which serves to prevent run-on of precipitation.

4.3.4.2 Removal of Liquids from Containment Systems [D-1d(2)]

The container storage area is equipped with drains that route solution to a trench in the process area, which drains to sump tank 1. The sump tanks are equipped with alarms that notify operating personnel that a leak is occurring. The sump tanks also are equipped with pumps to transfer waste to the surge tank or the secondary treatment train.

4.3.4.3 Prevention of Ignitible, Reactive, and Incompatible Wastes in Containers [D-1f]

Individual waste types, i.e., ignitable, corrosive, and reactive, are stored in separate containers. A waste that could be incompatible with other wastes is separated and protected from the incompatible waste. For example, acidic and caustic wastes are stored in separate containers. Free liquids are absorbed in containers that hold incompatible waste at a 2 to 1 ratio. Additionally, ETF-specific packaging requirements for these types of waste provide extra containment with each individual container. For example, each item of acidic waste is individually bagged and sealed within a lined container.

4.4 TANK SYSTEMS [D-2]

This section provides specific information on tank systems and process units. This section also includes a discussion on the types of waste to be managed in the tanks, tanks design information, integrity Assessments, and additional information on the ETF tanks that treat and store dangerous and/or mixed waste. Detailed drawings of the ETF tank systems are provided in Appendix 4B. The ETF dangerous waste tanks are identified in Section 4.4.1.1, and the relative locations of the tanks and process units in the ETF are presented in Figure 4-3.

4.4.1 Design Requirements [D-2a(1)]

The following sections provide an overview of the design specifications for the tanks within the ETF. A separate discussion on the design of the process units also is provided. In accordance with the new tank system requirements of WAC 173-303-640(3), the following tank components and specifications were assessed:

- Dimensions, capacities, wall thicknesses, and pipe connections
- Materials of construction and linings and compatibility of materials with the waste being processed

- Materials of construction of foundations and structural supports
- Review of design codes and standards used in construction
- Review of structural design calculations, including seismic design basis
- Waste characteristics and the affects of waste on corrosion.

This assessment was documented in the *Final RCRA Information Needs Report* (Mausshardt 1995), the engineering assessment performed for the ETF tank systems by an independent professional engineer. A similar assessment of design requirements was performed for the load-in tanks and is documented in *200 Area Effluent BAT/AKART Implementation, ETF Truck Load-In Facility, Project W-291H Integrity Assessment Report* (KEH 1994).

The specifications for the preparation, design, and construction of the tanks systems at the ETF are documented in the *Design Construction Specification, Project C-018H, 242-A Evaporator/PUREX Plant Process Condensate Treatment Facility* (WHC 1992a). The preparation, design, and construction of the load-in tanks are provided in the construction specifications in *Project W-291, 200 Area Effluent BAT/AKART Implementation ETF Truck Load-in Facility* (KEH 1994).

Most of the tanks in the ETF are constructed of stainless steel. According to the design of the ETF, it was determined that stainless steel would provide adequate corrosion protection for these tanks. Exceptions include the verification tanks, which are constructed of carbon steel with an epoxy coating. The ETF evaporator/vapor body (and the internal surfaces of the thin film dryer) are constructed of a corrosion resistant alloy, known as alloy 625, to address the specific corrosion concerns in the secondary treatment train. Finally, the hydrogen peroxide decomposer vessels are constructed of carbon steel and coated with a vinyl ester lining.

The shell thicknesses of the tanks identified in this table represent a nominal thickness of a new tank when placed into operation. The tank capacities identified in this table represent the maximum operating volumes. For certain tanks (as indicated in the table), the maximum operating volume is also the nominal (routine) operating capacity. Nominal tank volumes represent the volume between the low-level and high-level shutoffs in a tank unit.

Dangerous and/or mixed waste that can be treated or stored in the ETF tanks is presented in Chapter 1.0. Aqueous waste, in addition to process condensate, that is treated and stored at the LERF and ETF includes, but is not limited to, the following: contaminated groundwater from pump-and-treat remediation activities such as groundwater from the 200-UP-1 Operable Unit; water from deactivation activities such as water from the spent fuel storage basins at deactivated reactors (e.g., N Reactor); laboratory aqueous waste from unused samples and sample analyses; and leachate from landfills, such as the Environmental Restoration Disposal Facility.

Before accepting a new aqueous waste stream at the LERF or ETF, an evaluation of the waste characteristics is performed to determine the treatability of the aqueous waste, including the potential to corrode the ETF tanks. This acceptance evaluation is discussed in the waste analysis plan (Appendix 3A). If the evaluation indicates a new aqueous waste stream would significantly increase corrosion rates, processing actions are initiated to reduce corrosion. These actions might include blending the aqueous waste with other aqueous waste or adjusting the pH of the aqueous waste to reduce corrosion.

4.4.1.1 Codes and Standards for Tank System Construction

Specific standards for the manufacture of tanks and process systems installed in the ETF are briefly discussed in the following sections. In addition to these codes and industrial standards, a seismic analysis for each tank and process system is required [WAC 173-303-806(4)(a)(xi)]. The seismic analysis is performed in accordance with UCRL-15910 *Design and Evaluation Guidelines for Department of Energy Facilities Subjected to Natural Phenomena Hazards*, Section 4 (UCRL 1987). The results of the seismic analyses are summarized in the engineering assessment of the ETF tank systems (Mausshardt 1995).

Storage and Treatment Tanks. The following tanks store and/or treat dangerous waste at the ETF.

Tank name	Tank number
Surge tank	2025E-60A-TK-1
pH adjustment tank	2025E-60C-TK-1
Effluent pH adjustment tank	2025E-60C-TK-2
First RO feed tank	2025E-60F-TK-1
Second RO feed tank	2025E-60F-TK-2
Verification tanks (three)	2025E-60H-TK-1A/1B/1
Secondary waste receiving tanks (two)	2025E-60I-TK-1A/1B
Concentrate tanks (two)	2025E-60J-TK-1A/1B
Sump tanks (two)	2025E-20B-TK-1/2
Distillate flash tank	2025E-60I-TK-2
Load-in tanks	TK-109/117

The relative location of these tanks is presented in Figure 4-3. These tanks are maintained at or near atmospheric pressure. The codes and standards applicable to the design, construction, and testing of the above tanks and ancillary piping systems are as follows:

ASME - B31.3	Chemical Plant and Petroleum Refinery Piping (ASME 1990)
ASME Sect. VIII, Division I	Pressure Vessels (ASME 1992a)
AWS - D1.1	Structural Welding Code - Steel (AWS 1992)
ANSI - B16.5	Pipe Flanges and Flanged Fittings (ANSI 1992)
ASME Sect. IX	Welding and Brazing Qualifications (ASME 1992b)
API 620	Design and Construction of Large Welded Low Pressure Storage Tanks (API 1990)
AWWA - D100	Welded Steel Tanks for Water Storage (AWWA 1989)
AWWA - D103	Factory-Coated Bolted Steel Tanks for Water Storage (AWWA 1987)
AWWA - D120	Thermosetting Fiberglass-Reinforced Plastic Tanks (AWWA 1984).

The application of these standards to the construction of ETF tanks and independent verification of completed systems ensured that the tank and tank supports had sufficient structural strength and that seams and connections were adequate to ensure tank integrity. In addition, each tank met strict quality assurance requirements. Each tank constructed offsite was tested for integrity and leak tightness before shipment to the Hanford Facility. Following installation, the systems were inspected for damage to ensure against leakage and to verify proper operation. If a tank was damaged during shipment or installation, leak tightness testing was repeated onsite.

4.4.1.2 Design Information for Tanks Located Outside of Effluent Treatment Facility

The load-in tanks, surge tank, and verification tanks are located outside the ETF. These tanks are located within concrete structures that provide secondary containment.

Load-In Tanks and Ancillary Equipment. The load-in tanks are constructed of stainless steel, are heated, and have a nominal capacity of 37,900 liters. Ancillary equipment includes transfer pumps, a filtration system, a double-encased, fiberglass transfer pipeline, level instruments for tanker trucks, and leak detection equipment. From the Load-In Station, aqueous waste can be routed to the surge tank or to the LERF through a double-encased line. The load-in tanks, sump, pumps, and truck pad are all provided with secondary containment.

Surge Tank and Ancillary Equipment. The surge tank is constructed of stainless steel and has a nominal capacity of 379,000 liters. Ancillary equipment to the surge tank includes two underground double-encased (i.e., pipe-within-a-pipe) transfer lines connecting to LERF and three pumps for transferring aqueous waste to the primary treatment train. The surge tank is located at the south end of the ETF. The surge tank is insulated and the contents heated to prevent freezing. Eductors in the tank provide mixing.

Verification Tanks and Ancillary Equipment. The verification tanks are located north of the ETF. The verification tanks have a nominal capacity of 2,540,000 liters each. For support, the tanks have a center post with a webbing of beams that extend from the center post to the sides of the tank. The roof is constructed of epoxy covered carbon steel that is attached to the cross beams of the webbing. The tank floor also is constructed of epoxy covered carbon steel and is sloped. Eductors are installed in each tank to provide mixing.

Ancillary equipment includes a return pump that provides circulation of treated effluent through the eductors. The return pump also recycles effluent back to the ETF for retreatment and can provide service water for ETF functions. Two transfer pumps are used to discharge treated effluent to SALDS or back to the LERF.

4.4.1.3 Design Information for Tanks Located Inside the Effluent Treatment Facility Building

Most of the ETF tanks and ancillary equipment that store or treat dangerous and/or mixed waste are located within the ETF. The structure serves as secondary containment for the tank systems.

pH Adjustment Tank and Ancillary Equipment. The pH adjustment tank has a nominal capacity of 9,800 liters. Ancillary equipment for this tank includes overflow lines to a sump tank and pumps to transfer waste to other units in the main treatment train.

Effluent pH Adjustment Tank and Ancillary Equipment. The effluent pH adjustment tank has a nominal capacity of 9,500 liters. Ancillary equipment includes overflow lines to a sump tank and pumps to transfer waste to the verification tanks.

First and Second Reverse Osmosis Feed Tanks and Ancillary Equipment. The first RO feed tank is a vertical, stainless steel tank with a round bottom and has a nominal capacity of 11,400 liters. Conversely, the second RO feed tank is a rectangular vessel with the bottom of the tank sloping sharply to a single outlet in the bottom center. The second RO feed tank has a nominal capacity of 7,600 liters. Each RO tank has a pump to transfer waste to the RO arrays. Overflow lines are routed to a sump tank.

Secondary Waste Receiving Tanks and Ancillary Equipment. Two 57,000-liter secondary waste receiving tanks collect waste from the units in the main treatment train, such as reject solution (retentate) from the RO units and regeneration solution from the IX columns. These are vertical, cylindrical tanks with a semi-elliptical bottom and a flat top. Ancillary equipment includes overflow lines to a sump tank and pumps to transfer aqueous waste to the ETF evaporator.

Effluent Treatment Facility Evaporator and Ancillary Equipment. The ETF evaporator, the principal component of the evaporation process, is a cylindrical pressure vessel with a conical bottom. Aqueous waste is fed into the lower portion of the vessel. The top of the vessel is domed and the vapor outlet is configured to prevent carryover of liquid during the foaming or bumping (violent boiling) at the liquid surface. The ETF evaporator has a capacity of approximately 21,000 liters.

The ETF evaporator includes the following ancillary equipment:

- Preheater
- Recirculation pump
- Waste heater with steam level control tank
- Concentrate transfer pump
- Entrainment separator
- Vapor compressor with silencers
- Silencer drain pump.

Distillate Flash Tank and Ancillary Equipment. The distillate flash tank is a horizontal tank that has an nominal operating capacity of 570 liters. Ancillary equipment includes a pump to transfer the distillate to the surge tank for reprocessing.

Concentrate Tanks and Ancillary Equipment. Each of the two concentrate tanks has an approximate capacity of 18,900 liters. Ancillary equipment includes overflow lines to a sump tank and pumps for recirculation and transfer.

Sump Tanks. Sump tanks 1 and 2 are located below floor level. Both sump tanks are double-walled, rectangular tanks, placed inside concrete vaults. Both tanks have a working volume of 3,000 liters each. The sump tanks are located in pits belowgrade to allow gravity drain of solutions to the tanks. Each sump tank has two vertical pumps for transfer of waste to the secondary waste receiving tanks or to the surge tank for reprocessing.

4.4.1.4 Design Information for Effluent Treatment Facility Process Units

As with the ETF tanks, process units that treat and/or store dangerous and/or mixed waste are maintained at or near atmospheric pressure. These units were constructed to meet a series of design standards, as discussed in the following sections. Table 4-2 presents the materials of construction and the ancillary equipment associated with these process units. All piping systems are designed to withstand the effects of internal pressure, weight, thermal expansion and contraction, and any pulsating flow. The design and integrity of these units are presented in the engineering assessment (Mausshardt 1995).

Filters. The load-in, fine and rough filter vessels (including the auxiliary filters) are designed to comply with the ASME Section VIII, Division I, Pressure Vessels (ASME 1992a). The application of these standards to the construction of the ETF filter system and independent inspection ensure that the filter and filter supports have sufficient structural strength and that the seams and connections are adequate to ensure the integrity of the filter vessels.

Ultraviolet Oxidation System. The UV/OX reaction chamber is designed to comply with manufacturers standards.

Degasification System. The codes and standards applicable to the design, fabrication, and testing of the degasification column are identified as follows:

- ASME Section VIII, Division I, Pressure Vessels (ASME 1992a)
- ASME - B31.3, Chemical Plant and Petroleum Refinery Piping (ASME 1990)
- AWS - D1.1, Structural Welding Code - Steel (AWS 1992)
- ANSI - B16.5, Pipe Flanges and Flanged Fittings (ANSI 1992).

Reverse Osmosis System. The pressure vessels in the RO unit are designed to comply with ASME Section VIII, Division I, Pressure Vessels (ASME 1992a), and applicable codes and standards.

Ion Exchange (Polishers). The IX columns are designed in accordance with ASME Section VIII, Division I, Pressure Vessels (ASME 1992a), and applicable codes and standards. Polisher piping is fabricated of type 304 stainless steel or polyvinyl chloride (PVC) and meets the requirements of ASME B31.3, Chemical Plant and Petroleum Refinery Piping (ASME 1990).

Effluent Treatment Facility Evaporator. The ETF evaporator is designed to meet the requirements of ASME Section VIII, Division I, Pressure Vessels (ASME 1992a), and applicable codes and standards. The ETF evaporator piping meets the requirements of ASME B31.3, Chemical Plant and Petroleum Refinery Piping (ASME 1990).

Thin Film Dryer System. The thin film dryer is designed to meet the requirements of ASME Section VIII, Division I, Pressure Vessels (ASME 1992a), and applicable codes and standards. The piping meets the requirements of ASME - B31.3, Chemical Plant and Petroleum Refinery Piping (ASME 1990).

4.4.2 Integrity Assessments [D-2a(2)]

The integrity assessment for ETF (Maushardt 1995) attests to the adequacy of design and integrity of the tanks and ancillary equipment to ensure that the tanks and ancillary equipment will not collapse, rupture, or fail over the intended life considering intended uses. For the load-in tanks, a similar integrity assessment was performed (KEH 1995). Specifically, the assessment documents the following considerations:

- Adequacy of the standards used during design and construction of the facility
- Characteristics of the solution in each tank
- Adequacy of the materials of construction to provide corrosion protection from the solution in each tank
- Results of the leak tests and visual inspections.

The results of these assessments demonstrate that tanks and ancillary equipment have sufficient structural integrity and are acceptable for storing and treating dangerous and/or mixed waste. The assessments also state that the tanks and building were designed and constructed to withstand a design-basis earthquake. These tank assessments were certified by independent, qualified registered professional engineers.

The scope of the ETF tank integrity assessment was based on characterization data from process condensate. To assess the effect that other aqueous waste might have on the integrity of the ETF tanks, the chemistry of an aqueous waste will be evaluated for its potential to corrode a tank (e.g., chloride concentrations will be evaluated). The tank integrity assessment for the load-in tanks was based on characterization data from several aqueous waste streams. The chemistry of an aqueous waste stream not considered in the load-in tank integrity assessment also will be evaluated for the potential to corrode a load-in tank.

Consistent with the recommendations of the integrity assessment, a corrosion inspection program was developed. Periodic integrity assessments are scheduled for those tanks that are predicted to have the highest potential for corrosion. These inspections are scheduled annually or longer to follow the end of a treatment campaign. These 'indicator tanks' include the concentrate tanks, secondary waste receiving tanks, and verification tanks. One of each of these tanks will be inspected yearly to determine if corrosion or coating failure has occurred. Should significant corrosion or coating failure be found, an additional tank of the same type will be inspected during the same year. In the case of the verification tanks, if corrosion or coating failure is found in the second tank, the third tank also will be inspected. If significant corrosion is observed in all three sets of indicator tanks, the balance of the ETF tanks would be considered for inspection. For tanks predicted to have lower potential for corrosion, inspections also are performed nonroutinely as part of the corrective maintenance program.

4.4.3 Additional Requirements for New Tanks [D-2a(4)]

Procedures for proper installation of tanks, tank supports, piping, concrete, etc., are included in *Construction Specification, Project C-018H, 242-A Evaporator/PUREX Plant Process Condensate Treatment Facility* (WHC 1992a). For the load-in tanks, procedures are included in the construction specifications in *Project W-291, 200 Area Effluent BAT/AKART Implementation ETF Truck Load-in Facility* (KEH 1994). Following installation, the tanks and secondary containment were inspected by an independent, qualified, registered professional engineer. Deficiencies identified included damage to the surge tank, damage to the verification tank liners, and ETF secondary containment concrete surface cracking. All deficiencies were repaired to the satisfaction of the engineer. The tanks and ancillary equipment were leak tested as part of acceptance of the system from the construction contractor. Information on the inspections and leak tests are included in the engineering assessment (Maushardt 1995). No deficiencies were identified during installation of the load-in tanks and ancillary equipment.

4.4.4 Secondary Containment and Release Detection for Tank Systems [D-2b]

This section describes the design and operation of secondary containment and leak detection systems at the ETF.

4.4.4.1 Secondary Containment Requirements for All Tank Systems [D-2b(1)]

The specifications for the preparation, design, and construction of the secondary containment systems at the ETF are documented (WHC 1992a). The preparation, design, and construction of the secondary containment for the load-in tanks are provided in the construction specifications (KEH 1994). All systems were designed to national codes and standards. Constructing the ETF per these specifications ensured that foundations are capable of supporting tank and secondary containment systems and that uneven settling and failures from pressure gradients should not occur.

4.4.4.1.1 Common Elements

The following text describes elements of secondary containment that are common to all ETF tank systems. Details on the secondary containment for specific tanks, including leak detection systems and liquids removal, are provided in Section 4.4.5.1.

Foundation and Construction. For the tanks within the ETF, except for the sump tanks, secondary containment is provided by a coated concrete floor and a 15.2-centimeter rise (berm) along the containing walls. The double-wall construction of the sump tanks provides secondary containment. Additionally, trenches are provided in the floor that also provide containment and drainage of any liquid to a sump pit. For tanks outside the ETF, secondary containment also is provided with coated concrete floors in a containment pit (load-in tanks) or surrounded by concrete dikes (the surge and verification tanks).

The transfer piping that carries aqueous waste into the ETF is pipe-within-a-pipe construction, and is buried approximately 1.2 meters below ground surface. The pipes between the verification tanks and the verification tank pumps within the ETF are located in a concrete pipe trench.

For the purpose of this discussion, there are five discrete secondary containment systems associated with the following tanks and ancillary equipment that treat or store dangerous and/or waste:

- Load-in tanks
- Surge tank
- Process area (including sump tanks)
- Verification tanks
- Transfer piping and pipe trenches.

All of the secondary containment systems are designed with reinforcing steel and base and berm thickness to minimize failure caused by pressure gradients, physical contact with the waste, and climatic conditions. Classical theories of structural analysis, soil mechanics, and concrete and structural steel design were used in the design calculations for the foundations and structures. These calculations are maintained at the ETF. In each of the analyses, the major design criteria from the following documents were included:

- V-C018HC1-001 — Design Construction Specification, Project C-018H, 242A Evaporator/PUREX Plant Process Condensate Treatment Facility (WHC 1992a)
- DOE Order 6430.1A — General Design Criteria
- SDC-4.1 — Standard Architectural-Civil Design Criteria, Design Loads for Facilities (DOE-RL 1988)
- UCRL-15910 — Design and Evaluation Guidelines for Department of Energy Facilities Subjected to Natural Phenomena Hazards (UCRL 1987)
- UBC-91 — Uniform Building Code, 1991 Edition (ICBO 1991).

The design and structural analysis calculations substantiate the structural designs in the referenced drawings. The conclusions drawn from these calculations indicate that the designs are sound and that the specified structural design criteria were met. This conclusion is verified in the independent design review that was part of the engineering assessment (Mausshardt 1995).

Containment Materials. The concrete floor consists of cast-in-place and preformed concrete slabs. All slab joints and floor and wall joints have waterstops installed at the mid-depth of the slab. In addition, filler was applied to each joint.

Except for the sump tank vaults, all of the concrete surfaces in the secondary containment system, including berms, trenches, and pits, are coated with a chemical-resistant, high-solids, epoxy coating that consists of a primer, filler, and a top coating. This coating material is compatible with the waste being treated, and with the sulfuric acid, sodium hydroxide, and hydrogen peroxide additives to the process. The coating protects the concrete from contact with any chemical materials that might be harmful to concrete and prevents the concrete from being in contact with waste material. Table 4-3 summarizes the specifics types of filler, primer, second, and finish coats specified for the concrete and masonry surfaces in the ETF. The epoxy coating is considered integral to the secondary containment system for the tanks and ancillary equipment.

The concrete containment systems are maintained such that any cracks, gaps, holes, and other imperfections are repaired in a timely manner. Thus, the concrete containment systems do not allow spilled liquid to reach soil or groundwater. There are a number of personnel doorways and vehicle access points into the ETF process area. Releases of any spilled or leaked material to the environment from these access points are prevented by a 15.2-centimeter concrete curbs, sloped areas of the floor (e.g., truck ramp), or trenches.

Containment Capacity and Maintenance. Each of these containment areas is designed to contain more than 100 percent of the volume of the largest tank in each respective system. Secondary containment systems for the surge tank, and the verification tanks, which are outside the ETF, also are large enough to include the additional volume from a 100-year, 24-hour storm event; i.e., 5.3 centimeters of precipitation.

Sprinkler System. The sprinkler system within the ETF supplies fire water protection to the process area and the container storage area. This system is connected to a sitewide water supply system and has the capacity to supply sufficient water to suppress a fire at the ETF. However, in the event of failure, the sprinkler system can be hooked up to another water source (e.g., tanker truck).

4.4.4.1.2 Specific Containment Systems

The following discussion presents a description of the individual containment systems associated with specific tank systems.

Load-In Tank Secondary Containment. The load-in tanks are mounted on a 46-centimeter-thick reinforced concrete slab (Drawing H-2-817970, Appendix 4B). Secondary containment is provided by a pit with 30.5-centimeter-thick walls and a floor constructed of reinforced concrete. The load-in tank pit is sloped to drain solution to a sump. The depth of the pit varies with the slope of the floor, with an average thickness of about 1.1 meters. The volume of the secondary containment is about 79,000 liters, which is capable of containing the volume of at least one load-in tank (i.e., 37,800 liters). Leaks are detected by a leak detector that alarms locally and in the ETF control room and by visual inspection of the secondary containment.

Adjacent to the pit is a 25.4-centimeter-thick reinforced concrete pad that serves as secondary containment for the load-in tanker trucks, containers, transfer pumps, and filter system. The pad is 15.2 centimeters below grade with north and south walls gently sloped to allow truck access. The pad has drain pipes to route waste solution to the adjacent load-in tank pit.

Surge Tank Secondary Containment. The surge tank is mounted on a reinforced concrete ringwall. Inside the ringwall, the flat-bottomed tank is supported by a bed of compacted sand and gravel with a

high-density polyethylene liner bonded to the ringwall. The liner prevents galvanic corrosion between the soil and the tank. The secondary containment is reinforced concrete with a 15.2-centimeter thick floor and a 20.3-centimeter thick dike. The secondary containment area shares part of the southern wall of the main process area. The dike extends up 2.9 meters to provide a containment volume of 740,000 liters for the 379,000 liter surge tank.

The floor of the secondary containment slopes to a sump in the northwest corner of the containment area. Leaks into the secondary containment are detected by level instrumentation in the sump, which alarms in the ETF control room, and/or by routine visual inspections. A sump pump is used to transfer solution in the secondary containment to a sump tank.

Process Area Secondary Containment. The process area contains the tanks and ancillary equipment of the primary and secondary treatment trains, and has a jointed, reinforced concrete slab floor. The concrete floor of the process area provides the secondary containment. This floor is a minimum of 15.2 centimeters thick. With door sills 15.2 centimeter high, the process area has a containment volume of 76,200 liters. The largest tanks in the process area are the secondary waste receiving tanks, which each have a maximum capacity of 56,800 liters.

The floor of the process area is sloped to drain liquids to two trenches that drain to a sump. Each trench is approximately 38.1 centimeters wide with a sloped trough varying from 39.4 to 76.2 centimeters deep. Leaks into the secondary containment are detected by routine visual inspections of the floor area near the tanks, ancillary equipment, and in the trenches.

The northwest corner of the process area consists of a pump pit containing the pumps and piping for transferring treated effluent from the verification tanks to SALDS. The pit is built 1.37 meters below the process area floor level and is sloped to drain to a trench built along its north wall that routes liquid to sump tank 1. Leaks into the secondary containment of the pump pit are detected by routine visual inspections.

Sump Tanks. The sump tanks support the secondary containment system, and collect waste from several sources, including:

- Process area drain trenches
- Tank overflows and drains
- Container washing water
- Resin dewatering solution
- Steam boiler blowdown
- Sampler system drains.

These double-contained tanks are located within unlined, concrete vaults. The sump tank levels are monitored by remote level indicators or through visual inspections from the sump covers. These indicators are connected to high- and low-level alarms that are monitored in the control room. When a high-level alarm is activated, a pump is activated and the sump tank contents usually are routed to the secondary treatment train for processing. The contents also could be routed to the surge tank for treatment in the primary treatment train. In the event of an abnormally high inflow rate, a second sump pump is initiated automatically.

Verification Tank Secondary Containment. The three verification tanks are each mounted on ringwalls with high-density polyethylene liners similar to the surge tank. The secondary containment for the three tanks is reinforced concrete with a 15.2-centimeter thick floor and a 20.3-centimeter thick dike. The dike extends up 2.6 meters to provide a containment of 110 percent of the capacity of a single tank (i.e., 2,800,000 liters).

The floor of the secondary containment slopes to a sump along the southern wall of the dike. Leaks into the secondary containment are detected by level instrumentation in the sump that alarms in the control room and/or by routine visual inspections. A sump pump is used to transfer solution in the secondary containment to a sump tank.

4.4.4.2 Additional Requirements for Specific Types of Systems [D-2b(2)]

This section addresses additional requirements in WAC 173-303-640 for double-walled tanks like the sump tanks and secondary containment for ancillary equipment and piping associated with the tank systems.

4.4.4.2.1 Double-Walled Tanks [D-2b(2)(b)]

The sump tanks are the only tanks in the ETF classified as 'double-walled' tanks. These tanks are located in unlined concrete vaults and support the secondary containment system for the process area. The sump tanks are equipped with a leak detector between the walls of the tanks that provide continuous monitoring for leaks. The leak detector provides immediate notification through an alarm in the control room. The inner tanks are contained completely within the outer shells. The tanks are contained completely within the concrete structure of the ETF so corrosion protection from external galvanic corrosion is not necessary.

4.4.4.2.2 Ancillary Equipment [D-2b(2)(c)]

The secondary containment provided for the tanks and process systems also serves as secondary containment for the ancillary equipment associated with these systems.

Ancillary Equipment. Section 4.4.5.1 describes the secondary containment systems that also serve most of the ancillary equipment within the ETF. Between the ETF and the verification tanks, a pipeline trench provides secondary containment for four pipelines connecting the transfer pumps (i.e., discharge and return pumps) in the ETF with the verification tanks (Figure 4-1). This concrete trench crosses under the road and extends from the verification tank pumps to the verification tanks. Treated effluent flows through these pipelines from the verification tank pumps to the verification tanks. The return pump is used to return effluent to the ETF for use as service water or for reprocessing.

For all of the ancillary equipment housed within the ETF, the concrete floor, trenches, and berms form the secondary containment system. For the ancillary equipment of the surge tank and the verification tanks, secondary containment is provided by the concrete floors and dikes associated with these tanks. The concrete floor and pit provide secondary containment for the ancillary equipment of the load-in tanks.

Transfer Piping and Pipe Trenches. The two buried transfer lines between LERF and the surge tank have secondary containment in a pipe-within-a-pipe arrangement. The 4-inch transfer line has an 8-inch outer pipe, while the 3-inch transfer line has a 6-inch outer pipe. The pipes are fiberglass and are sloped towards the surge tank. The outer piping ends with a drain valve in the surge tank secondary containment.

These pipelines are equipped with leak detection located in the annulus between the inner and outer pipes, which have the ability to continuously 'inspect' the pipelines during aqueous waste transfers. The alarms on the leak detection system are monitored in the control room. A low-volume air purge of the annulus is provided to prevent condensation buildup and minimize false alarms by the leak detection system. In the event that these leak detectors are not in service, the pipelines are inspected during transfers by opening a drain valve to check for solution in the annular space between the inner and outer pipe.

The 3-inch transfer line between the load-in tanks and the surge tank has a 6-inch outer pipe in a pipe-within-a-pipe arrangement. The piping is made of fiberglass reinforced plastic and slopes towards the load-in tank secondary containment pit. The drain valve and leak detection system for the load-in tank pipelines are operated similarly to the leak detection system for the LERF to ETF pipelines.

As previously indicated, there are four reinforced concrete pipe trenches that provide secondary containment for piping under the roadway between the ETF and the verification tanks. Each trench is 1.2 meters wide and 0.76 meter deep and slopes towards the sump containing the transfer pumps to SALDS. The floor of the trenches are 30.5 centimeters thick and the sides are 15.2 centimeters thick. The

concrete trenches are coated with water sealant and covered with metal gratings at ground level to allow vehicle traffic on the roadway.

4.4.5 Tank Management Practices [D-2d]

When an aqueous waste stream is identified for treatment or storage at ETF, the generating unit is required to characterize the waste. Based on characterization data, the waste stream is evaluated to determine if the stream is acceptable for treatment or storage. Specific tank management practices are discussed in the following sections.

4.4.5.1 Rupture, Leakage, Corrosion Prevention

Most aqueous waste streams can be managed such that corrosion would not be a concern. For example, an aqueous waste stream with high concentrations of chloride might cause corrosion problems when concentrated in the secondary treatment train. One approach is to adjust the corrosion control measures in the secondary treatment train. An alternative might be to blend this aqueous waste in a LERF basin with another aqueous waste that has sufficient dissolved solids, such that the concentration of the chlorides in the secondary treatment train would not pose a corrosion concern.

Additionally, the materials of construction used in the tanks systems (Table 4-1) make it unlikely that a aqueous waste would corrode a tank. For more information on corrosion prevention, refer to the waste analysis plan (Appendix 3A).

When a leak in a tank system is discovered, the leak is immediately contained or stopped by isolating the leaking component. Following containment, the leaking tank system is evaluated by facility personnel to determine whether continued operation of affected system would jeopardize the safety of plant personnel, result in a release to the environment, or compromise facility equipment. If it is determined that a leak could have the aforementioned consequences, the affected system will be immediately removed from service until repairs can be implemented. If a leak would not result in the stated consequences, the tank system will be placed on a maintenance schedule for repair.

4.4.5.2 Overfilling Prevention

Operating practices and administrative controls used at the ETF to prevent overfilling a tank are discussed in the following paragraphs. The ETF process is controlled by the MCS. The MCS monitors liquid levels in the ETF tanks and has alarms that annunciate on high-liquid level to notify operators that actions must be taken to prevent overfilling of these vessels. As an additional precaution to prevent spills, many tanks are equipped with overflow lines that route solutions to sump tanks 1 and 2. These tanks include the pH adjustment tank, RO feed tanks, effluent pH adjustment tank, secondary waste receiving tanks, and concentrate tanks.

The following section discusses feed systems, safety cutoff devices, bypass systems, and pressure controls for specific tanks and process systems.

Tanks. All tanks are equipped with liquid level sensors that give a reading of the tank liquid volume. The surge tank, the verification tanks, the RO tanks, the secondary waste receiving tanks, and the concentrate tanks are equipped further with liquid level alarms that are actuated if the liquid volume is near the tank overflow capacity. In the actuation of the surge tank alarm, a liquid level switch trips, sending a signal to the valve actuator on the tank influent lines, causing the influent valves to close.

The operating mode for each verification tank, i.e., receiving, holding, or discharging, can be designated through the MCS; modes also switch automatically. When the high-level set point on the receiving verification tank is reached, the flow to this tank is diverted and another tank becomes the receiver. The full tank is switched into verification mode. The third tank is reserved for discharge mode.

The liquid levels in the first and second RO feed tanks are maintained within predetermined operating ranges. Should the second RO feed tank overflow, the excess waste is piped along with any leakage from the feed pump to a sump tank.

When waste in a secondary waste receiving tank reaches the high-level set point, the influent flow of waste is redirected to the second tank and the first tank becomes the feed tank for the ETF evaporator.

In a similar fashion, the concentrate tanks switch modes when the high-level set point of one tank is reached. The other tank switches from a discharging mode to a receiving mode and the first tank becomes the discharge tank feeding waste to the thin film dryer.

Filter Systems. All filters at ETF (i.e., the Load-In Station, rough, fine and auxiliary filter systems) are in leak-tight steel casings. For the rough and fine filters, a high differential pressure, which could damage the filter element, activates a valve that shuts off liquid flow to protect the filter element from possible damage. To prevent a high pressure situation, the filters are cleaned routinely with pulses of compressed air that force water back through the filter. Cleaning is terminated automatically by shutting off the compressed air supply if high pressure develops. The differential pressure across the auxiliary filters also is monitored. A high differential pressure in these filters would result in a system shutdown to allow the filters to be changed out.

The Load-In Station filtration system has pressure gauges for monitoring the differential pressure across each filter. A high differential pressure would result in discontinuing filter operation until the filter is replaced.

Ultraviolet Light/Oxidation System and Decomposers. A rupture disk on the inlet piping to each of the UV/OX reaction vessels relieves to the pH adjustment tank in the event of excessive pressure developing in the piping system. Should the rupture disk fail, the aqueous waste would trip the moisture sensor, shut down the UV lamps, and close the surge tank feed valve. Also provided is a level sensor to protect UV lamps against the risk of exposure to air. Should those sensors be actuated, the UV lamps would be shut down immediately.

The piping and valving for the hydrogen peroxide decomposers are configured to split the waste flow: half flows to one decomposer and half flows to the other decomposer. Alternatively, the total flow of waste can be treated in one decomposer or both decomposers can be bypassed. A safety relief valve on each decomposer vessel can relieve excess system pressure to a sump tank.

Degasification System. The degasification column is typically supplied aqueous waste feed by the pH adjustment tank feed pump. This pump transfers waste solution through the hydrogen peroxide decomposer, the fine filter, and the degasification column to the first RO feed tank.

The degasification column is designed for operation at a partial vacuum. A pressure sensor in the column detects the column pressure. The vacuum in the degasification column is maintained by a blower connected to the vessel offgas system. The column is protected from extremely low pressure developed by the column blower by the use of an intake vent that is maintained in the open position during operation. The column liquid level is regulated by a flow control system with a high- and low-level alarm. A plate-type heat exchanger cools the waste solution fed to the degasification column.

Reverse Osmosis System. The flow through the first and second RO stages is controlled to maintain constant liquid levels in the first and second stage RO feed tanks.

Polisher. Typically, two of the three columns are in operation (lead/lag) and the third (regenerated) column is in standby. When the capacity of the resin in the first column is exceeded, as detected by an increase in the conductivity of the column effluent, the third column, containing freshly regenerated IX resin, is brought online. The first column is taken offline, and the waste is rerouted to the second column, and to the third. Liquid level instrumentation and automatically operated valves are provided in the IX system to prevent overfilling.

Effluent Treatment Facility Evaporator. Liquid level instrumentation in the secondary waste receiving tanks is designed to preclude a tank overflow. A liquid level switch actuated by a high-tank liquid level causes the valves to reposition, closing off flow to the secondary waste receiving tanks. Secondary containment for these tanks routes liquids to a sump tank.

Valves in the ETF evaporator feed line can be positioned to bypass the secondary waste around the ETF evaporator and to transfer the secondary waste to the concentrate tanks.

Thin Film Dryer. The two concentrate tanks alternately feed the thin film dryer. One tank serves as a concentrate waste receiver while the other tank serves as the dryer feed tank. Liquid level instrumentation prevents tank overflow by diverting the concentrate flow from the full concentrate tank to the other concentrate tank. Secondary containment for these tanks routes liquids to a sump tank.

An alternate route is provided from the concentrate receiver tank to the secondary waste receiving tanks. Dilute concentrate in the concentrate receiver tank can be reprocessed through the ETF evaporator by transferring the concentrate back to a secondary waste receiving tank.

4.4.6 Labels or Signs [D-2e]

Each tank or process unit in the ETF is identified by a nameplate attached in a readily visible location. Included on the nameplate are the equipment number and the equipment title. Those tanks which store or treat dangerous waste at the ETF (Section 4.4.1.1) are identified with a label which reads "PROCESS WATER/WASTE". The labels are legible at a distance of at least fifty feet or as appropriate for legibility within the ETF. Additionally, these tanks bear a legend that identifies the waste in a manner, which adequately warns employees, emergency personnel, and the public of the major risk(s) associated with the waste being stored or treated in the tank system(s).

Caution plates are used to show possible hazards and warn that precautions are necessary. Caution signs have a yellow background and black panel with yellow letters and bear the word "CAUTION". Danger signs show immediate danger and signify that special precautions are necessary. These signs are red, black, and white and bear the word "DANGER".

Tanks and vessels containing corrosive chemicals are posted with black and white signs bearing the word "CORROSIVE". "DANGER - UNAUTHORIZED PERSONNEL KEEP OUT" signs are posted on all exterior doors of the ETF, and on each interior door leading into the process area. Tank ancillary piping is also labeled "PROCESS WATER" or "PROCESS LIQUID" to alert personnel which pipes in the process area contains dangerous and/or mixed waste.

All tank systems holding dangerous waste are marked with labels or signs to identify the waste contained in the tanks. The labels or signs are legible at a distance of at least fifty (50) feet and bear a legend that identifies the waste in a manner which adequately warns employees, emergency response personnel, and the public, of the major risk(s) associated with the waste being stored or treated in the tank system(s).

4.4.7 Air Emissions [D-2f]

Tank systems that contain extremely hazardous waste that is acutely toxic by inhalation must be designed to prevent the escape of such vapors. To date, no extremely hazardous waste has been managed in ETF tanks and is not anticipated. However, the ETF tanks have forced ventilation that draws air from the tank vapor spaces to prevent exposure of operating personnel to any toxic vapors that might be present. The vapor passes through a charcoal filter and two sets of high-efficiency particulate air filters before discharge to the environment.

4.4.8 Management of Ignitible or Reactive Wastes in Tanks Systems [D-2g]

Although the ETF is permitted to accept waste that is designated ignitible or reactive, such waste would be treated or blended immediately after placement in the tank system so that the resulting waste mixture is no longer ignitible or reactive. Aqueous waste received does not meet the definition of a combustible or flammable liquid given in National Fire Protection Association (NFPA) code number 30 (NFPA 1996). The buffer zone requirements in NFPA-30, which require tanks containing combustible or flammable solutions be a safe distance from each other and from public way, are not applicable.

4.4.9 Management of Incompatible Wastes in Tanks Systems [D-2h]

The ETF manages dilute solutions that can be mixed without compatibility issues. The ETF is equipped with several systems that can adjust the pH of the waste for treatment activities. Sulfuric acid and

sodium hydroxide are added to the process through the MCS for pH adjustment to ensure there will be no large pH fluctuations and adverse reactions in the tank systems.

4.5 SURFACE IMPOUNDMENTS [173-303-806-(4)(d)]

This section provides specific information on surface impoundment operations at the LERF, including descriptions of the liners and secondary containment structures, as required by WAC 173-303-650 and WAC 173-303-806(4)(d).

The LERF consists of three lined surface impoundments (basins) with a design operating capacity of 29.5 millions liters each. The maximum capacity of each basin is 34 million liters. The dimensions of each basin at the anchor wall are approximately 103 meters by 85 meters. The typical top dimensions of the wetted area are approximately 89 meters by 71 meters, while the bottom dimensions are approximately 57 by 38 meters. Total depth from the top of the dike to the bottom of the basin is approximately 7 meters. The typical finished basin bottoms lie at about 4 meters below the initial grade and 175 meters above sea level. The dikes separating the basins have a typical height of 3 meters and typical top width of 11.6 meters around the perimeter of the impoundments.

4.5.1 List of Dangerous Waste [806(4)(d)(i)]

A list of dangerous and/or mixed aqueous waste that can be stored in LERF is presented in Chapter 1.0. The waste analysis plan for the LERF and ETF (Appendix 3A) also provides a discussion of the types of waste that are managed in the LERF.

4.5.2 Construction, Operation, and Maintenance of Liner System [806(4)(d)(ii)(A)]

General information concerning the liner system is presented in the following sections. Information regarding loads on the liner, liner coverage, UV light exposure prevention, and location relative to the water table also are discussed.

4.5.2.1 Liner Construction Materials [650(2)(a)(i)(A)]

The LERF employs a double-composite liner system with a leachate detection, collection, and removal system between the primary and secondary liners. Each basin is constructed with an upper or primary liner consisting of a high-density polyethylene geomembrane laid over a bentonite carpet liner. The lower or secondary liner in each basin is a composite of a geomembrane laid over a layer of soil/bentonite admixture with a hydraulic conductivity less than 10^{-7} centimeters per second. The synthetic liners extend up the dike wall to a concrete anchor wall that completely surrounds the basin at the top of the dike. A batten system bolts the layers in place to the anchor wall (Figure 4-15).

Figure 4-16 is a schematic cross-section of the liner system. The liner components, listed from the top to the bottom of the liner system, are the following:

- Primary 1.5-millimeter high-density polyethylene geomembrane
- Bentonite carpet liner
- Geotextile
- Drainage gravel (bottom) and geonet (sides)
- Geotextile
- Secondary 1.5-millimeter high-density polyethylene geomembrane
- Soil/bentonite admixture (91 centimeters on the bottom, 107 centimeters on the sides)
- Geotextile.

The primary geomembrane, made of 1.5-millimeter high-density polyethylene, forms the basin surface that holds the aqueous waste. The secondary geomembrane, also 1.5-millimeter high-density polyethylene, forms a barrier surface for leachate that might penetrate the primary liner. The high-density polyethylene chemically is resistant to constituents in the aqueous waste and has a relatively high strength compared to other lining materials. The high-density polyethylene resin specified for the LERF contains carbon black, antioxidants, and heat stabilizers to enhance its resistance to the degrading effects

of UV light. The approach to ensuring the compatibility of aqueous waste streams with the LERF liner materials and piping is discussed in the waste analysis plan (Appendix 3A).

Three geotextile layers are used in the LERF liner system. The layers are thin, nonwoven polypropylene fabric that chemically are resistant, highly permeable, and resistant to microbiological growth. The first two layers prevent fine soil particles from infiltrating and clogging the drainage layer. The second geotextile also provides limited protection for the secondary geomembrane from the drainage rock. The third geotextile layer prevents the mixing of the soil/bentonite admixture with the much more porous and granular foundation material.

A 30.5-centimeters-thick gravel drainage layer on the bottom of the basins between the primary and secondary liners provides a flow path for liquid to the leachate detection, collection, and removal system. A geonet (or drainage net) is located immediately above the secondary geomembrane on the basin sidewalls. The geonet functions as a preferential flow path for liquid between the liners, carrying liquid down to the gravel drainage layer and subsequently to the leachate sump. The geonet is a mesh made of high-density polyethylene, with approximately 13-millimeter openings.

The soil/bentonite layer is 97 centimeters thick on the bottom of the basins and 107 centimeters thick on the basin sidewalls; its permeability is less than 10^{-7} centimeters per second. This composite liner design, consisting of a geomembrane laid over essentially impermeable soil/bentonite, is considered best available technology for solid waste landfills and surface impoundments. The combination of synthetic and clay liners is reported in the literature to provide the maximum protection from waste migration (Forseth and Kmet 1983).

A number of laboratory tests were conducted to measure the engineering properties of the soil/bentonite admixture, in addition to extensive field tests performed on three test fills constructed near the LERF site. For the purpose of establishing an optimum ratio of bentonite to soil for the soil/bentonite admixture, mixtures of various ratios were tested to determine permeability and shear strength. A mixture of 12 percent bentonite was selected for the soil/bentonite liner and tests described in the following paragraphs demonstrated that the admixture meets the desired permeability of less than 10^{-7} centimeters per second. Detailed discussion of test procedures and results is provided in *Report of Geotechnical Investigation, 242-A Evaporation and PUREX Interim Storage Basins* (Chen-Northern 1990).

Direct shear tests were performed according to ASTM D3080 test procedures (ASTM 1990) on soil/bentonite samples of various ratios. Based on these results, the conservative minimum Mohr-Coulomb shear strength value of 30 degrees was estimated for a soil/bentonite admixture containing 12 percent bentonite.

The high degree of compaction of the soil/bentonite layer [92 percent per ASTM D1557 (ASTM 1991)] was expected to maximize the bonding forces between the clay particles, thereby minimizing moisture transport through the liner. With respect to particle movement ('piping'), estimated fluid velocities in this low-permeability material are too low to move the soil particles. Therefore, piping is not considered a problem.

For the soil/bentonite layer, three test fills were constructed to demonstrate that materials, methods, and procedures used would produce a soil/bentonite liner that meets the EPA permeability requirement of less than 10^{-7} centimeters per second. All test fills met the EPA requirements. A thorough discussion of construction procedures, testing, and results is provided in *Report of Permeability Testing, Soil-bentonite Test Fill* (Chen-Northern 1991a).

The aqueous waste stored in the LERF is typically a dilute mixture of organic and inorganic constituents. Though isolated instances of soil liner incompatibility have been documented in the literature (Forseth and Kmet 1983), these instances have occurred with concentrated solutions that were incompatible with the geomembrane liners in which the solutions were contained. Considering the dilute nature of the aqueous waste that is and will be stored in LERF and the moderate pH, and test results demonstrating the

compatibility of the high-density polyethylene liners with the aqueous waste [*9090 Test Results* (WHC 1991)], gross failure of the soil/bentonite layer is not probable.

Each basin also is equipped with a floating very low-density polyethylene cover. The cover is anchored and tensioned at the concrete wall at the top of the dikes, using a patented mechanical tensioning system. Figure 4-15 depicts the tension mechanism and the anchor wall at the perimeter of each basin. Additional information on the cover system is provided in Section 4.5.2.5.

4.5.2.1.1 Material Specifications.

Material specifications for the liner system and leachate collection system, including liners, drainage gravel, and drainage net are discussed in the following sections. Material specifications are documented in the *Final Specifications 242-A Evaporator and PUREX Interim Retention Basins* (KEH 1990a) and *Construction Specifications for 242-A Evaporator and PUREX Interim Retention Basins* (KEH 1990b).

Geomembrane Liners. The high-density polyethylene resin for geomembranes for the LERF meets the material specifications listed in Table 4-4. Key physical properties include thickness (1.5 millimeters [60 mil]) and impermeability (hydrostatic resistance of over 360,000 kilogram per square meter). Physical properties meet National Sanitation Foundation Standard 54 (NSF 1985). Testing to determine if the liner material is compatible with typical dilute waste solutions was performed and documented in *9090 Test Results* (WHC 1991).

Soil/Bentonite Liner. The soil/bentonite admixture consists of 11.5 to 14.5 percent bentonite mixed into well-graded silty sand with a maximum particle size of 4.75 millimeters (No. 4 sieve). Test fills were performed to confirm the soil/bentonite admixture applied at LERF has hydraulic conductivity less than 10^{-7} centimeters per second, as required by WAC 173-303-650(2)(j) for new surface impoundments.

Bentonite Carpet Liner. The bentonite carpet liner consists of bentonite (90 percent sodium montmorillonite clay) in a primary backing of woven polypropylene with nylon filler fiber, and a cover fabric of open weave spunlace polyester. The montmorillonite is anticipated to retard migration of solution through the liner, exhibiting a favorable cation exchange for adsorption of some constituents (such as ammonium). Based on composition of the bentonite carpet and of the type of aqueous waste stored at LERF, no chemical attack, dissolution, or degradation of the bentonite carpet liner is anticipated.

Geotextile. The nonwoven geotextile layers consist of long-chain polypropylene polymers containing stabilizers and inhibitors to make the filaments resistant to deterioration from UV light and heat exposure. The geotextile layers consist of continuous geotextile sheets held together by needle-punching. Edges of the fabric are sealed or otherwise finished to prevent outer material from pulling away from the fabric or ravelling.

Drainage Gravel. The drainage layer consists of thoroughly washed and screened, naturally occurring rock meeting the size specifications for Grading Number 5 in Washington State Department of Transportation construction specifications (WSDOT 1988). The specifications for the drainage layer are given in Table 4-5. Hydraulic conductivity tests (Chen-Northern 1992a, 1992b, 1992c) showed the drainage rock used at LERF met the sieve requirements and had a hydraulic conductivity of at least 1 centimeter per second, which exceeded the minimum of at least 0.1 centimeters per second required by WAC 173-303-650(2)(j) for new surface impoundments.

Geonet. The geonet is fabricated from two sets of parallel high-density polyethylene strands, spaced 1.3 centimeters center-to-center maximum to form a mesh with minimum two strands per 2.54 centimeter in each direction. The geonet is located between the liners on the sloping sidewalls to provide a preferential flow path for leachate to the drainage gravel and subsequently to the leachate sump.

Leachate Collection Sump. Materials used to line the 3.0-meter by 1.8-meter by 0.30-meter-deep leachate sump, at the bottom of each basin in the northwest corner, include [from top to bottom (Figure 4-17)]:

- 25 millimeter high-density polyethylene flat stock (supporting the leachate riser pipe)
- Geotextile

- 1.5-millimeter high-density polyethylene rub sheet
- Secondary composite liner:
  - 1.5-millimeter high-density polyethylene geomembrane
  - 91 centimeters of soil/bentonite admixture
  - Geotextile.

Specifications for these materials are identical to those discussed previously.

Leachate System Risers. Risers for the leachate system consist of 10-inch and 4-inch pipes from the leachate collection sump to the catch basin northwest of each basin (Figure 4-17). The risers lay below the primary liner in a gravel-filled trench which also extends from the sump to the concrete catch basin (Figure 4-18).

The risers are high-density polyethylene pipes fabricated to meet the requirements in ASTM D1248 (ASTM 1989). The 10-inch riser is perforated every 20.3 centimeters with 1.3-centimeter holes around the diameter. Level sensors and leachate pump are inserted in the 10-inch riser to monitor and remove leachate from the sump. To prevent clogging of the pump and piping with fine particulate, the end of the riser is encased in a gravel-filled box constructed of high-density polyethylene geonet and wrapped in geotextile. The 4-inch riser is perforated every 10.2 centimeters with 0.64-centimeter holes around the diameter. A level detector is inserted in the 4-inch riser.

Leachate Pump. A deep-well submersible pump, designed to deliver approximately 110 liters per minute, is installed in the 10-inch leachate riser in each basin. Wetted parts of the leachate pump are made of 316L stainless steel, providing both corrosion resistance and durability.

4.5.2.1.2 Loads on Liner System.

The LERF liner system is subjected to the following types of stresses.

Stresses from Installation or Construction Operations. Contractors were required to submit construction quality control plans that included procedures, techniques, tools, and equipment used for the construction and care of liner and leachate system. Methods for installation of all components were screened to ensure that the stresses on the liner system were kept to a minimum.

Calculations were performed to estimate the risk of damage to the secondary high-density polyethylene liner during construction (*Calculations for LERF Part B Permit Application* [HNF 1997]). The greatest risk expected was from spreading the gravel layer over the geotextile layer and secondary geomembrane. The results of the calculations show that the strength of the geotextile was sufficiently high to withstand the stress of a small gravel spreader driving on a minimum of 15 centimeters of gravel over the geotextile and geomembrane. The likelihood of damage to the geomembrane lying under the geotextile was considered to be low.

To avoid driving heavy machinery directly on the secondary liner, a 28-meter conveyer was used to deliver the drainage gravel into the basins. The gravel was spread and consolidated by hand tools and a bulldozer. The bulldozer traveled on a minimum thickness of 30.5 centimeters of gravel. Where the conveyer assembly was placed on top of the liner, cribbing was placed to distribute the conveyer weight. No heavy equipment was allowed for use directly in contact with the geomembranes.

Additional calculations were performed to estimate the ability of the leachate riser pipe to withstand the static and dynamic loading imposed by lightweight construction equipment riding on the gravel layer (HNF 1997). Those calculations demonstrated that the pipe could buckle under the dynamic loading of small construction equipment; therefore, the pipe was avoided by equipment during spreading of the drainage gravel.

Installation of synthetic lining materials proceeded only when winds were less than 24 kilometers per hour, and not during precipitation. The minimum ambient air temperature for unfolding or unrolling the high-density polyethylene sheets was -10 C, and a minimum temperature of 0 C was required for seaming the high-density polyethylene sheets. Between shifts, geomembranes and geotextile were anchored with sandbags to prevent lifting by wind. Calculations were performed to determine the

appropriate spacing of sandbags on the geomembrane to resist lifting caused by 130 kilometer per hour winds (HNF 1997). All of the synthetic components contain UV light inhibitors and no impairment of performance is anticipated from the short-term UV light exposure during construction. Section 4.5.2.5 provides further detail on exposure prevention.

During laying of the soil/bentonite layer and the overlying geomembrane, moisture content of the admixture was monitored and adjusted to ensure optimum compaction and to avoid development of cracks.

4.5.2.1.3 Static and Dynamic Loads and Stresses from the Maximum Quantity of Waste

When a LERF basin is full, liquid depth is approximately 6.4 meters. Static load on the primary liner is roughly 6,400 kilograms per square meter. Load on the secondary liner is slightly higher because of the weight of the gravel drainage layer. Assuming a density of 805 kilograms per square meter for the drainage gravel [conservative estimate based on specific gravity of 2.65 (Ambrose 1988)], the secondary high-density polyethylene carries approximately 7,200 kilograms per square meter when a basin is full.

Sideslope liner stresses were calculated for each of the layers in the basin sidewalls and for the pipe trench on the northwest corner of each basin (HNF 1997). Results of these calculations indicate factors of safety against shear were 1.5 or greater for the primary geomembrane, geotextile, geonet, and secondary geomembrane.

Because the LERF is not located in an area of seismic concern, as identified in Appendix VI of 40 CFR 264 and WAC 173-303-282(6)(a)(I), discussion and calculation of potential seismic events are not required.

4.5.2.1.4 Stresses Resulting from Settlement, Subsidence, or Uplift

Uplift stresses from natural sources are expected to have negligible impact on the liner. Groundwater lies approximately 62 meters below the LERF, average annual precipitation is only 16 centimeters, and the average unsaturated permeability of the soils near the basin bottoms is high, ranging from about 5.5×10^{-4} centimeters per second to about 1 centimeter per second (Chen-Northern 1991b). Therefore, no hydrostatic uplift forces are expected to develop in the soil underneath the basins. In addition, the soil under the basins consists primarily of gravel and sand, and contains few or no organic constituents. Therefore, uplift caused by gas production from organic degradation is not anticipated.

Based on the design of the soil-bentonite liner, no structural uplift stresses are present within the lining system (Chen-Northern 1991b).

Regional subsidence is not anticipated because neither petroleum nor extractable economic minerals are present in the strata underlying the LERF basins, nor is karst (erosive limestone) topography present.

Dike soils and soil/bentonite layers were compacted thoroughly and proof-rolled during construction. Calculation of settlement potential showed that combined settlement for the foundation and soil/bentonite layer is expected to be about 2.7 centimeters. Settlement impact on the liner and basin stability is expected to be minimal (Chen-Northern 1991b).

4.5.2.1.5 Internal and External Pressure Gradients

Pressure gradients across the liner system from groundwater are anticipated to be negligible. The LERF is about 62 meters above the seasonal high water table, which prevents buildup of water pressure below the liner. The native gravel foundation materials of the LERF are relatively permeable and free draining. The 2 percent slope of the secondary liner prevents the pooling of liquids on top of the secondary liner. Finally, the fill rate of the basins is slow enough (average 190 liters per minute) that the load of the liquid waste on the primary liner is gradually and evenly distributed.

To prevent the buildup of gas between the liners, each basin is equipped with 21 vents in the primary geomembrane that allow the reduction of any excess gas pressure. Gas passing through these vents exit through a single pipe that penetrates the anchor wall into a carbon adsorption filter. This filter extracts nearly all of the organic compounds, ensuring that emissions to the air from the basins are not toxic.

4.5.2.2 Liner System Location Relative to High-Water Table

The lowest point of each LERF basin is the northwest corner of the sump, where the typical subgrade elevation is 175 meters above mean sea level. Based on data collected from the groundwater monitoring wells at the LERF site, the seasonal high-water table is located approximately 62 meters or more below the lowest point of the basins. This substantial thickness of unsaturated strata beneath the LERF provides ample protection to the liner from hydrostatic pressure because of groundwater intrusion into the soil/bentonite layer. Further discussion of the unsaturated zone and site hydrogeology is provided in Chapter 5.0.

4.5.2.3 Liner System Foundation [650(2)(a)(I)(B)]

Foundation materials are primarily gravels and cobbles with some sand and silt. The native soils onsite are derived from unconsolidated Holocene sediments. These sediments are fluvial and glaciofluvial sands and gravels deposited during the most recent glacial and postglacial event. Grain-size distributions and shape analyses of the sediments indicate that deposition occurred in a high energy environment (Chen-Northern 1990).

Analysis of five soil borings from the LERF site was conducted to characterize the natural foundation materials and to determine the suitability of onsite soils for construction of the impoundment dikes and determine optimal design factors. Well-graded gravel containing varying amounts of silt, sand, and cobbles comprises the layer in which the basins were excavated. This gravel layer extends to depths of 10 to 11 meters below land surface (Chen-Northern 1990). The basins are constructed directly on the subgrade. Excavated soils were screened to remove oversize cobbles (greater than 15 centimeters in the largest dimension) and used to construct the dikes.

Settlement potential of the foundation material and soil/bentonite layer was found to be low. The foundation is comprised of undisturbed native soils. The bottom of the basin excavation lies within the well-graded gravel layer, and is dense to very dense. Below the gravel is a layer of dense to very dense poorly-graded and well-graded sand. Settlement was calculated for the gravel foundation soils and for the soil/bentonite layer, under the condition of hydrostatic loading from 6.4 meters of fluid depth. The combined settlement for the soils and the soil/bentonite layer is estimated to be about 2.7 centimeters. This amount of settlement is expected to have minimal impact on overall liner or basin stability (Chen-Northern 1991b). Settlement calculations are provided in *Calculations for Liquid Effluent Retention Facility Part B Permit Application* (HNF 1997).

The load bearing capacity of the foundation material, based on the soil analysis discussed previously, is estimated at about 48,800 kilograms per square meter [maximum advisable presumptive bearing capacity (Hough 1969)]. Anticipated static and dynamic loading from a full basin is estimated to be less than 9,000 kilograms per square meter (Section 4.5.2.1.3), which provides an ample factor of safety.

When the basins are empty, excess hydrostatic pressure in the foundation materials under the liner system theoretically could result in uplift and damage. However, because the native soil forming the foundations is unsaturated and relatively permeable, and because the water table is located at a considerable depth beneath the basins, any infiltration of surface water at the edge of the basin is expected to travel predominantly downward and away from the basins, rather than collecting under the excavation itself. No gas is expected in the foundation because gas-generating organic materials are not present.

Subsidence of undisturbed foundation materials is generally the result of fluid extraction (water or petroleum), mining, or karst topography. Neither petroleum, mineral resources, nor karst are believed to be present in the sediments overlying the Columbia River basalts. Potential groundwater resources do exist below the LERF. Even if these sediments were to consolidate from fluid withdrawal, their depth most likely would produce a broad, gently sloping area of subsidence that would not cause significant strains in the LERF liner system. Consequently, the potential for subsidence related failures is expected to be negligible.

Borings at the LERF site, and extensive additional borings in the 200 East Area, have not identified any significant quantities of soluble materials in the foundation soil or underlying sediments (Last et al. 1989). Consequently, the potential for sinkholes is considered negligible.

4.5.2.4 Liner System Exposure Prevention

Both primary and secondary geomembranes and the floating cover are stabilized with carbon black to prevent degradation from UV light. Furthermore, none of the liner layers experience long-term exposure to the elements. During construction, thin polyethylene sheeting was used to maintain optimum moisture content and provide protection from the wind for the soil/bentonite layer until the secondary geomembrane was laid in place. The secondary geomembrane was covered by the geonet and geotextile as soon as quality control testing was complete. Once the geotextile layer was completed, drainage material immediately was placed over the geotextile. The final (upper) geotextile layer was placed over the drainage gravel and immediately covered by the bentonite carpet liner. This was covered immediately, in turn, by the primary high-density polyethylene liner.

Both high-density polyethylene liners, geotextile layers, and geonet are anchored permanently to a concrete wall at the top of the basin berm. During construction, liners were held in place with many sandbags on both the basin bottoms and sideslopes to prevent wind from lifting and damaging the materials. Calculations were performed to determine the amount of fluid needed in a basin to prevent wind lift damage to the primary geomembrane. Approximately 15 to 20 centimeters of solution are kept in each basin to minimize the potential for uplifting the primary liner (HNF 1997).

The entire lining system is covered by a very low-density polyethylene floating cover that is bolted to the concrete anchor wall. The floating cover prevents evaporation and intrusion from dust, precipitation, vegetation, animals, and birds. A patented tensioning system is employed to prevent wind from lifting the cover and to automatically accommodate changes in liquid level in the basins. The cover tension mechanism consists of a cable running from the flexible geosynthetic cover over a pulley on the tension tower (located on the concrete anchor wall) to a deadman anchor. These anchors (blocks) simply hang from the cables on the exterior side of the tension towers. The anchor wall also provides for solid attachment of the liner layers and the cover, using a 6.4-millimeter batten and neoprene gasket to bolt the layers to the concrete wall, effectively sealing the basin from the intrusion of light, precipitation, and airborne dust (Figure 4-15).

The floating cover, made of very low-density polyethylene with UV light inhibitors, is anticipated to experience no unacceptable degradation during the service life of the LERF. The very low-density polyethylene material contains carbon black for UV light protection, anti-oxidants to prevent heat degradation, and seaming enhancers to improve its ability to be welded. A typical manufacturer's limited warranty for weathering of very low-density polyethylene products is 20 years (Poly America, undated). This provides a margin of safety for the anticipated medium-term use of the LERF for aqueous waste storage.

The upper 3.4 to 4.6 meters of the sidewall liner also could experience stresses in response to temperature changes. Accommodation of thermal influences for the LERF geosynthetic layers is affected by inclusion of sufficient slack as the liners were installed. Calculations demonstrate that approximately 67 centimeters of slack is required in the long basin bottom dimension, 46 centimeters across the basin, and 34 centimeters from the bottom of the basin to the top of the basin wall (HNF 1997).

Thermal stresses also are experienced by the floating cover. As with the geomembranes, sufficient slack was included in the design to accommodate thermal contraction and expansion.

4.5.2.4.1 Liner Repairs During Operations

Should repair of a basin liner be required while the basin is in operation, the basin contents will be transferred to the ETF or another available basin. After the liner around the leaking section is cleaned, repairs to the geomembrane will be made by the application of a piece of high-density polyethylene sheeting, sufficient in size to extend approximately 8 to 15 centimeters beyond the damaged area, or as

recommended by the vendor. A round or oval patch will be installed using the same type of equipment and criteria used for the initial field installations.

4.5.2.4.2 Control of Air Emissions

The floating covers limit evaporation of aqueous waste and releases of volatile organic compounds into the atmosphere. To accommodate volumetric changes in the air between the fluid in the basin and the cover, and to avoid problems related to 'sealing' the basins too tightly, each basin is equipped with a carbon filter breather vent system. Any air escaping from the basins must pass through this vent, consisting of a pipe that penetrates the anchor wall and extends into a carbon adsorption filter unit.

4.5.2.5 Liner Coverage [650(2)(a)(I)(C)]

The liner system covers all of the ground surface that underlies the retention basins. The primary liner extends up the sideslopes to a concrete anchor wall at the top of the dike encircling the entire basin (Figure 4-15).

4.5.3 Prevention of Overtopping [806(4)(d)(ii)(B)]

Overtopping prevention is accomplished through administrative controls and liquid-level instrumentation installed in each basin. The instrumentation includes local liquid-level indication as well as remote indication at the ETF. Before an aqueous waste is transferred into a basin, administrative controls are implemented to ensure overtopping will not occur during the transfer. The volume of feed to be transferred is compared to the available volume in the receiving basin. The transfer is not initiated unless there is sufficient volume available in the receiving basin or a cut-off level is established. The transfer into the basin would be stopped when this cut-off level is reached.

In the event of a 100-year, 24-hour storm event, precipitation would accumulate on the basin covers. Through the self-tensioning design of the basin covers and maintenance of adequate freeboard, all accumulated precipitation would be contained on the covers and none would flow over the dikes or anchor walls. The 100-year, 24-hour storm is expected to deliver 5.3 centimeters of rain or approximately 61 centimeters of snow. Cover specifications include the requirement that the covers be able to withstand the load from this amount of precipitation. Because the cover floats on the surface of the fluid in the basin, the fluid itself provides the primary support for the weight of the accumulated precipitation. Through the cover self-tensioning mechanism, there is ample 'give' to accommodate the overlying load without overstressing the anchor and attachment points.

Rain water and snow evaporate readily from the cover, particularly in the arid Hanford Facility climate, where evaporation rates exceed precipitation rates for most months of the year. The black color of the cover further enhances evaporation. Thus, the floating cover prevents the intrusion of precipitation into the basin and provides for evaporation of accumulated rain or snow.

4.5.3.1 Freeboard

Under current operating conditions, 0.61 meter of freeboard is maintained at each LERF basin, which corresponds to an operating level of 6.8 meters, or 29.5 million liters.

4.5.3.2 Immediate Flow Shutoff

The mechanism for transferring aqueous waste is either through pump transfers with on/off switches or through gravity transfers with isolation valves. These methods provide positive ability to shut off transfers immediately in the event of overtopping. Overtopping a basin during a transfer is very unlikely because the low flow rates into the basin provides long response times. At a flow rate of 284 liters per minute, approximately 11 days would be required to fill a LERF basin from the 6.8 meter operating level (i.e., 0.61 meter of freeboard) to maximum capacity of 34 million liters (i.e., the 7.4-meter level).

4.5.3.3 Outflow Destination

Aqueous waste in the LERF is transferred routinely to ETF for treatment. However, should it be necessary to immediately empty a basin, the aqueous waste either would be transferred to the ETF for

treatment or transferred to another basin (or basins), whichever is faster. If the waste is transferred to another LERF basin, the single pump for normal operation can be removed, and four submersible pumps can be installed using an emergency pump manifold. This portable piping and pumping system is capable of pumping 2,700 liters per minute. Not including set-up time, it would take approximately 7.6 days to pump the contents of a full basin at this pumping rate.

4.5.4 Structural Integrity of Dikes [806(4)(d)(ii)(C)]

Written certification attesting to the structural integrity of the dikes, signed by a qualified, registered professional engineer, is included in Appendix 4D.

4.5.4.1 Dike Design, Construction, and Maintenance [650(2)(f), (g), and (h)]

The dikes of the LERF are constructed of onsite native soils, generally consisting of cobbles and gravels. Well-graded mixtures were specified, with cobbles up to 15 centimeters in the largest dimension, but not constituting more than 20 percent of the volume of the fill. The dikes are designed with a 3:1 (3 units horizontal to 1 unit vertical) slope on the basin side, and 2.25:1 on the exterior side. The dikes are approximately 8.2 meters high from the bottom of the basin, and 3 meters abovegrade.

Calculations were performed to verify the structural integrity of the dikes (HNF 1997). The calculations demonstrate that the structural strength of the dikes is such that, without dependence on any lining system, the sides of the basins can withstand the pressure exerted by the maximum allowable quantity of fluid in the impoundment. The dikes have a factor of safety greater than 2.5 against failure by sliding.

4.5.4.2 Dike Stability and Protection

In the following paragraphs, various aspects of stability for the LERF dikes and the concrete anchor wall are presented, including slope failure, hydrostatic pressure, and protection from the environment.

Failure in Dike/Impoundment Cut Slopes. A slope stability analysis was performed to determine the factor of safety against slope failure. The computer program 'PCSTABL5' from Purdue University, using the modified Janbu Method, was employed to evaluate slope stability under both static and seismic loading cases. One hundred surfaces per run were generated and analyzed. The assumptions used were as follows (Chen-Northern 1991b):

- Weight of gravel: 2,160 kilograms per cubic meter
- Maximum dry density of gravel: 2,315 kilograms per cubic meter
- Mohr-Coulomb shear strength angle for gravel: minimum 33 degrees
- Weight of soil/bentonite: 1,600 kilograms per cubic meter
- Mohr-Coulomb shear strength angle for soil/bentonite: minimum 30 degrees
- Slope: 3 horizontal:1 vertical
- No fluid in impoundment (worst case for stability)
- Soils at in-place moisture (not saturated conditions).

Results of the static stability analysis showed that the dike slopes were stable with a minimum factor of safety of 1.77 (Chen-Northern 1991b).

The standard horizontal acceleration required in the *Hanford Plant Standards*, "Standard Architectural-Civil Design Criteria, Design Loads for Facilities" (DOE-RL 1988), for structures on the Hanford Site is 0.12 g. Adequate factors of safety for cut slopes in units of this type generally are considered to be 1.5 for static conditions and 1.1 for dynamic stability (Golder 1989). Results of the stability analysis showed that the LERF basin slopes were stable under horizontal accelerations of 0.10 and 0.15 g, with minimum factors of safety of 1.32 and 1.17, respectively (Chen-Northern 1991b). Printouts from the PCSTABL5 program are provided in *Calculations for Liquid Effluent Retention Facility Part B Permit Application* (HNF 1997).

Hydrostatic Pressure. Failure of the dikes due to buildup of hydrostatic pressure, caused by failure of the leachate system or liners, is very unlikely. The liner system is constructed with two essentially impermeable layers consisting of a synthetic layer overlying a soil layer with very low-hydraulic

conductivity. It would require a catastrophic failure of both liners to cause hydrostatic pressures that could endanger dike integrity. Routine inspections of the leachate detection system, indicating quantities of leachate removed from the basins, provide an early warning of leakage or operational problems that could lead to excessive hydrostatic pressure. A significant precipitation event (e.g., a 100-year, 24-hour storm) will not create a hydrostatic problem because the interior sidewalls of the basins are covered completely by the liners. The covers can accommodate this volume of precipitation without overtopping the dike (Section 4.5.3), and the coarse nature of the dike and foundation materials on the exterior walls provides for rapid drainage of precipitation away from the basins.

Protection from Root Systems. Risk to structural integrity of the dikes as a result of penetrating root systems is minimal. Excavation and construction removed all vegetation on and around the impoundments, and native plants (such as sagebrush) grow very slowly. The large grain size of the cobbles and gravel used as dike construction material do not provide an advantageous germination medium for native plants. Should plants with extending roots become apparent on the dike walls, the plants will be controlled with appropriate herbicide application.

Protection from Burrowing Mammals. The cobble size materials that make up the dike construction material and the exposed nature of the dike sidewalls do not offer an advantageous habitat for burrowing mammals. Lack of vegetation on the LERF site discourages foraging. The risk to structural integrity of the dikes from burrowing mammals is therefore minimal. Periodic visual inspections of the dikes provide observations of any animals present. Should burrowing mammals be noted onsite, appropriate pest control methods such as trapping or application of rodenticides will be employed.

Protective Cover. Approximately 7.6 centimeters of crushed gravel serve as the cover of the exterior dike walls. This coarse material is inherently resistant to the effect of wind because of its large grain size. Total annual precipitation is low (16 centimeters) and a significant storm event (e.g., a 100-year, 24-hour storm) could result in about 5.3 centimeters of precipitation in a 24-hour period. The absorbent capacity of the soil exceeds this precipitation rate; therefore, the impact of wind and precipitation run-on to the exterior dike walls will be minimal.

4.5.5 Piping Systems

Aqueous waste from the 242-A Evaporator is transferred to the LERF using a pump located in the 242-A Evaporator and approximately 1,500 meters of pipe, consisting of a 3-inch carrier pipe within a 6-inch outer containment pipeline. Flow through the pump is controlled through a valve at flow rates from 150 to 300 liters per minute.

The pipeline exits the 242-A Evaporator belowgrade and remains belowgrade at a minimum 1.2-meter depth for freeze protection, until the pipeline emerges at the LERF catch basin, at the corner of each basin. All piping at the catch basin that is less than 1.2 meters belowgrade is wrapped with electric heat tracing tape and insulated for protection from freezing.

The transfer line from the 242-A Evaporator is centrifugally cast, fiberglass-reinforced epoxy thermoset resin pressure pipe fabricated to meet the requirements of ASME D2997 (ASME 1984). The 3-inch carrier piping is centered and supported within 6-inch containment piping. Pipe supports are fabricated of the same material as the pipe, and meet the strength requirements of ANSI B31.3 (ANSI 1987) for dead weight, thermal, and seismic loads.

A catch basin is provided at the northwest corner of each basin where piping extend from the basin to allow for basin-to-basin and basin-to-ETF liquid transfers. Drawings H-2-88766, sheets 1 through 4, in Appendix 4A, provide schematic diagrams of the piping system at LERF. Drawing H-2-79604, Appendix 4A, provides details of the piping from the 242-A Evaporator to LERF.

4.5.5.1 Secondary Containment System for Piping

The 6-inch containment piping encases the 3-inch carrier pipe from the 242-A Evaporator to the LERF. All of the piping and fittings that are not directly over a catch basin or a basin liner are of this pipe-within-a-pipe construction. A catch basin is provided at the northwest corner of each basin where the

inlet pipes, leachate risers, and transfer pipe risers emerge from the basin. The catch basin consists of a 20-centimeter-thick concrete pad at the top of the dike. The perimeter of the catch basin has a 20-centimeter-high curb, and the concrete is coated with a chemical resistant epoxy sealant. The concrete pad is sloped so that any leaks or spills from the piping or pipe connections will drain into the basin. The catch basin provides an access point for inspecting, servicing, and operating various systems such as transfer valving, leachate level instrumentation and leachate pump. Drawing H-2-79593 (Appendix 4A) provides a schematic diagram of the catch basins.

4.5.5.2 Leak Detection System

Single-point electronic leak detection elements are installed along the transfer line at 305-meter intervals. The leak detection elements are located in the bottom of specially designed test risers. Each sensor element employs a conductivity sensor, which is connected to a cable leading back to the 242-A Evaporator control room. If a leak develops in the carrier pipe, fluid will travel down the exterior surface of the carrier pipe or the interior of the containment pipe. As moisture contacts a sensor unit, the alarm sounds in the 242-A Evaporator control room and the zone of the leak is indicated on the digital display. The pump located in the 242-A Evaporator is shut down, stopping the flow of aqueous waste through the transfer line. A low-volume air purge of the annulus between the carrier pipe and the containment pipe is provided to prevent condensation buildup and minimize false alarms by the leak detection elements.

The catch basins have conductivity leak detectors that alarm in the 242-A Evaporator control room. Leaks into the catch basins drain back to the basin through a 5.1-centimeter drain on the floor of the catch basin.

4.5.5.3 Certification

Although an integrity assessment is not required for piping associated with surface impoundments, an assessment of the transfer liner was performed, including a hydrostatic leak/pressure test at 10.5 kilograms per square centimeter gauge. A statement by an independent, qualified, registered professional engineer attesting to the integrity of the piping system is included in *Integrity Assessment Report for the 242-A Evaporator/LERF Waste Transfer Piping, Project W105* (WHC 1993), along with the results of the leak/pressure test.

4.5.6 Double Liner and Leak Detection, Collection, and Removal System [806(4)(d)(ii)(D) and 650(2)(j)(iii)]

The double-liner system for LERF is discussed in Section 4.5.2. The leachate detection, collection, and removal system (Figures 4-17 and 4-18) was designed and constructed to remove leachate that might permeate the primary liner. System components for each basin include:

- 30.5-centimeter layer of drainage gravel below the primary liner at the bottom of the basin
- Geonet below the primary liner on the sidewalls to direct leachate to the gravel layer
- 3.0-meter by 1.8-meter by 0.30-meter-deep leachate collection sump consisting of a 25 millimeter high-density polyethylene flat stock, geotextile to trap large particles in the leachate, and 1.5-millimeter high-density polyethylene rub sheet set on the secondary liner
- 10-inch and 4-inch perforated leachate high-density polyethylene riser pipes from the leachate collection sump to the catch basin northwest of the basin
- Leachate collection sump level instrumentation installed in the 4-inch riser
- Level sensors, submersible leachate pump, and 1.5-inch fiberglass-reinforced epoxy thermoset resin pressure piping installed in the 10-inch riser
- Piping at the catch basin to route the leachate through 1.5-inch high-density polyethylene pipe back to the basins.

The bottom of the basins have a 2 percent slope to allow gravity flow of leachate to the leachate collection sump. This exceeds the minimum of 1 percent slope required by WAC 173-303-650(j) for new

surface impoundments. Material specifications for the leachate collection system are given in Section 4.5.2.1.1.

Calculations demonstrate that fluid from a small hole (2 millimeter) (EPA 1989, p. 122) at the furthest end of the basin, under a low head situation, would travel to the sump in less than 24 hours (HNF 1997). Additional calculations in indicate the capacity of the pump to remove leachate is sufficient to allow time to readily identify a leak and activate emergency procedures (HNF 1997).

Automated controls maintain the fluid level in each leachate sump below 33 centimeters to prevent significant liquid backup into the drainage layer. The leachate pump is activated when the liquid level in the sump reaches about 28 centimeters, and is shut off when the sump liquid level reaches about 18 centimeters. This operation prevents the leachate pump from cycling with no fluid, which could damage the pump. Liquid level control is accomplished with conductivity probes that trigger relays selected specifically for application to submersible pumps and leachate fluids. A flowmeter/totalizer on the leachate return pipe measures fluid volumes pumped and pumping rate from the leachate collection sumps, and indicates volume and flow rate on local readouts. Other instrumentation provided is real-time continuous level monitoring with a readout at the catch basin and the 242-A Evaporator control room. A sampling port is provided in the leachate piping system at the catch basin. Leak detection is provided through inspections of the leachate flow totalizer readings. For more information on inspections, refer to Chapter 6.0.

The stainless steel leachate pump is designed to deliver 110 liters per minute. The leachate pump returns draws liquid from the sump via 1.5-inch pipe and discharges into the basin through 1.5-inch high-density polyethylene pipe.

4.5.7 Construction Quality Assurance [806(4)(d)(ii)(F)]

The construction quality assurance plan and complete report of construction quality assurance inspection and testing results are provided in *242-A Evaporator Interim Retention Basin Construction Quality Assurance Plan* (KEH 1991). A general description of construction quality assurance procedures is outlined in the following paragraphs.

For excavation of the basins and construction of the dikes, regular inspections were conducted to ensure compliance with procedures and drawings, and compaction tests were performed on the dike soils.

For the soil/bentonite layer, test fills were first conducted in accordance with EPA guidance to demonstrate compaction procedures and to confirm compaction and permeability requirements can be met. The ratio of bentonite to soil and moisture content was monitored; lifts did not exceed 15 centimeters before compaction, and specific compaction procedures were followed. Laboratory and field tests of soil properties were performed for each lift and for the completed test fill. The same suite of tests was conducted for each lift during the laying of the soil/bentonite admixture in the basins.

Geotextiles and geomembranes were laid in accordance with detailed procedures and quality assurance programs provided by the manufacturers and installers. These included destructive and nondestructive tests on the geomembrane seams, and documentation of field test results and repairs.

4.5.8 Proposed Action Leakage Rate and Response Action Plan [806(4)(d)(ii)(G)]

An action leakage rate limit is established where action must be taken due to excessive leakage from the primary liner. The action leak rate is based on the maximum design flow rate the leak detection system can remove without the fluid head on the bottom liner exceeding 30 centimeters. The limiting factor in the leachate removal rate is the hydraulic conductivity of the drainage gravel. An action leakage rate (also called the rapid or large leak rate) of 20,000 liters per hectare per day was calculated for each basin (WHC 1992b).

When it is determined that the action leakage rate has been exceeded, the response action plan will follow the actions in WAC 173-303-650(11)(b) and (c), which includes notification of Ecology in writing within 7 days, assessing possible causes of the leak, and determining whether waste receipt should be curtailed and/or the basin emptied.

4.5.9 Dike Structural Integrity Engineering Certification [806(4)(d)(v)]

Written certification attesting to the structural integrity of the dikes, signed by a qualified, registered professional engineer, is included in Appendix 4D.

4.5.10 Management of Ignitible, Reactive, or Incompatible Wastes [806(4)(d)(viii and ix)]

Although ignitible or reactive aqueous waste might be received in small quantities at LERF, such aqueous waste is with dilute solutions in the basins, removing the ignitable or reactive characteristics. For compatibility requirements with the LERF liner, refer to the waste analysis plan (Appendix 3A).

4.6 AIR EMISSIONS CONTROL [D-8 and D-8a]

This section addresses the ETF requirements of Air Emission Standards for Process Vents, under 40 CFR 264, Subpart AA (incorporated by reference in WAC 173-303-690) and Subpart CC. The requirements of 40 CFR 264, Subpart BB (WAC 173-303-691) are not applicable because aqueous waste with 10 percent or greater organic concentration would not be acceptable for processing at the ETF.

4.6.1 Applicability of Subpart AA Standards [D-8a(1)]

The ETF evaporator and thin film dryer perform operations that specifically require evaluation for applicability of WAC 173-303-690. Aqueous waste in these units routinely contains greater than 10 parts per million concentrations of organic compounds and are, therefore, subject to air emission requirements under WAC 173-303-690. Organic emissions from all affected process vents on the Hanford Facility must be less than 1.4 kilograms per hour and 2.8 megagrams per year, or control devices must be installed to reduce organic emissions by 95 percent.

The vessel offgas system provides a process vent system. This system provides a slight vacuum on the ETF process vessels and tanks (refer to Section 4.2.5.2). Two vessel vent header pipes combine and enter the vessel offgas system filter unit consisting of a demister, electric heater, prefilter, high-efficiency particulate air filters, activated carbon adsorber, and two exhaust fans (one fan in service while the other is backup). The vessel offgas system filter unit is located in the high-efficiency particulate air filter room west of the process area. The vessel offgas system exhaust discharges into the larger building ventilation system, with the exhaust fans and stack located outside and immediately west of the ETF. The exhaust stack discharge point is 15.5 meters above ground level.

The annual average flow rate for the ETF stack (which is the combined vessel offgas and building exhaust flow rates) is provided in *Radionuclide Air Emissions Report for the Hanford Site - Calendar Year 1995* (DOE-RL 1996) as 220 cubic meters per minute with a total annual flow of approximately 1.2 E+08 cubic meters. During waste processing, the airflow through just the vessel offgas system is about 23 standard cubic meters per minute.

Organic emissions occur during waste processing, which occurs less than 310 days each year (i.e., 85 percent operating efficiency). This operating efficiency represents the maximum annual operating time for the ETF, as shutdowns are required during the year for planned maintenance outages and for reconfiguring the ETF to accommodate different aqueous waste.

4.6.2 Process Vents - Demonstrating Compliance [D-8a(2)]

This section outlines how the ETF complies with the requirements and includes a discussion of the basis for meeting the organic emissions limits, calculations demonstrating compliance, and conditions for re-evaluation.

4.6.2.1 Basis for Meeting Limits/Reductions [D-8a(2)(a)]

The 242-A Evaporator and the 200 Area ETF are currently the only operating TSD units that contribute to the Hanford Facility volatile organic emissions under 40 CFR 264, Subpart AA. The combined release rate is currently well below the threshold of 1.4 kilograms per hour or 2,800 kilograms per year of volatile organic compounds [General Information Portion (DOE/RL-91-28)]. As a result, the ETF meets these standards without the use of air pollution control devices.

The amount of organic emissions could change as waste streams are changed, or TSD units are brought online or are deactivated. The organic air emissions summation will be re-evaluated periodically as condition warrants. Operations of the TSD units operating under 40 CFR 264, Subpart AA, will be controlled to maintain Hanford Facility emissions below the threshold limits or pollution control device(s) will be added, as necessary, to achieve the reduction standards specified under 40 CFR 264, Subpart AA.

4.6.2.2 Demonstrating Compliance [D-8a(2)(b)]

Calculations to determine organic emissions are performed using the following assumptions:

- Maximum flow rate from LERF to ETF is 568 liters per minute.
- Emissions of organics from tanks and vessels upstream of the UV/OX process are determined from flow and transfer rates given in *Clean Air Act Requirements, WAC 173-400, As-built Documentation, Project C-018H, 242-A Evaporator/PUREX Plant Process Condensate Treatment Facility* (Adtechs 1995).
- UV/OX reaction rate constants and residence times are used to determine the amount of organics which are destroyed in the UV/OX process. These constants are given in *200 Area Effluent Treatment Facility Delisting Petition* (DOE/RL 1992).
- All organic compounds that are not destroyed in the UV/OX process are assumed to be emitted from the tanks and vessels into the vessel offgas system.
- No credit for removal of organic compounds in the vessel offgas system carbon adsorber unit is taken. The activated carbon absorbers are used if required to reduce organic emissions.

The calculation to determine organic emissions consists of the following steps:

1. Determine the quantity of organics emitted from the tanks or vessels upstream of the UV/OX process, using transfer rate values
2. Determine the concentration of organics in the waste after the UV/OX process using UV/OX reaction rates and residence times. If the ETF is configured such that the UV/OX process is not used, a residence time of zero is used in the calculations (i.e., none of the organics are destroyed)
3. Assuming all the remaining organics are emitted, determine the rate which the organics are emitted using the feed flow rate and the concentrations of organics after the UV/OX process
4. The amount of organics emitted from the vessel offgas system is the sum of the amount calculated in steps 1 and 3.

The organic emission rates and quantity of organics emitted during processing are determined using these calculations and are included in the ETF operating record.

4.6.2.3 Reevaluating Compliance with Subpart AA Standards [D-8a(2)(d)]

Calculations to determine compliance with Subpart AA will be reviewed when any of the following conditions occur at the ETF:

- Changes in the maximum feed rate to the ETF (i.e., greater than the 568 liters per minute flow rate)
- Changes in the configuration or operation of the ETF that would modify the assumptions given in Section 4.6.2.2 (e.g., taking credit for the carbon adsorbers as a control device)
- Annual operating time exceeds 310 days.

4.6.3 Applicability of Subpart CC Standards [D-8c]

The air emission standards of 40 CFR 264, Subpart CC apply to tank, surface impoundment, and container storage units that manage wastes with average volatile organic concentrations equal to or exceeding 500 parts per million by weight, based on the hazardous waste composition at the point of origination (61 FR 59972). However, TSD units that are used solely for management of mixed waste are exempt. Mixed waste is managed at the ETF and LERF and dangerous waste also could be treated and stored at these TSD units.

TSD owner/operators are not required to determine the concentration of volatile organic compounds in a hazardous waste if the wastes are placed in waste management units that employ air emission controls that are in compliance with the Subpart CC standards. Therefore, the approach to Subpart CC compliance at the ETF and LERF is to demonstrate that the ETF and LERF meet the Subpart CC control standards (40 CFR 264.1084 - 264.1086).

4.6.3.1 Demonstrating Compliance with Subpart CC for Tanks

Since the ETF tanks already have process vents regulated under 40 CFR 264, Subpart AA (WAC 173-303-690), they are exempt from Subpart CC [40 CFR 264.1080(b)(8)].

4.6.3.2 Demonstrating Compliance with Subpart CC for Containers

Container Level 1 and Level 2 standards are met at the ETF by managing all dangerous and/or mixed wastes in U.S. Department of Transportation containers [40 CFR 264.1086(f)]. Level 1 containers are those that store more than 0.1 cubic meters and less than or equal to 0.46 cubic meters. Level 2 containers are used to store more than 0.46 cubic meters of waste which are in "light material service". Light material service is defined where a waste in the container has one or more organic constituents with a vapor pressure greater than 0.3 kilopascals at 20 C, and the total concentration of such constituents is greater than or equal to 20 percent by weight.

The monitoring requirements for Level 1 and Level 2 containers include a visual inspection when the container is received at the ETF and when the waste is initially placed in the container. Additionally, at least once every 12 months when stored onsite for 1 year or more, these containers must be inspected.

If compliant containers are not used at the ETF, alternate container management practices are used that comply with the Level 1 standards. Specifically, the Level 1 standards allow for a "container equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in the closed position there are no visible holes, gaps, or other open spaces into the interior of the container. The cover may be a separate cover installed on the container...or may be an integral part of the container structural design...." [40 CFR 264.1086(c)(1)(ii)]. An organic-vapor-suppressing barrier, such as foam, may also be used [40 CFR 264.1086(c)(1)(iii)]. Section 4.3 provides detail on container management practices at the ETF.

Container Level 3 standards apply when a container is used for the "treatment of a hazardous waste by a waste stabilization process" [40 CFR 264.1086(2)]. Because treatment in containers is not provided at the ETF, these standards do not apply.

4.6.3.3 Demonstrating Compliance with Subpart CC for Surface Impoundments

The Subpart CC emission standards are met at LERF through the use of a floating membrane cover that is constructed of very-low-density polyethylene that forms a continuous barrier over the entire surface area [40 CFR 264.1085(c)]. This membrane has both organic permeability properties equivalent to a high-density polyethylene cover and chemical/physical properties that maintain the material integrity for the intended service life of the material. The additional requirements for the floating cover at the LERF have been met (Section 4.5.2.4).

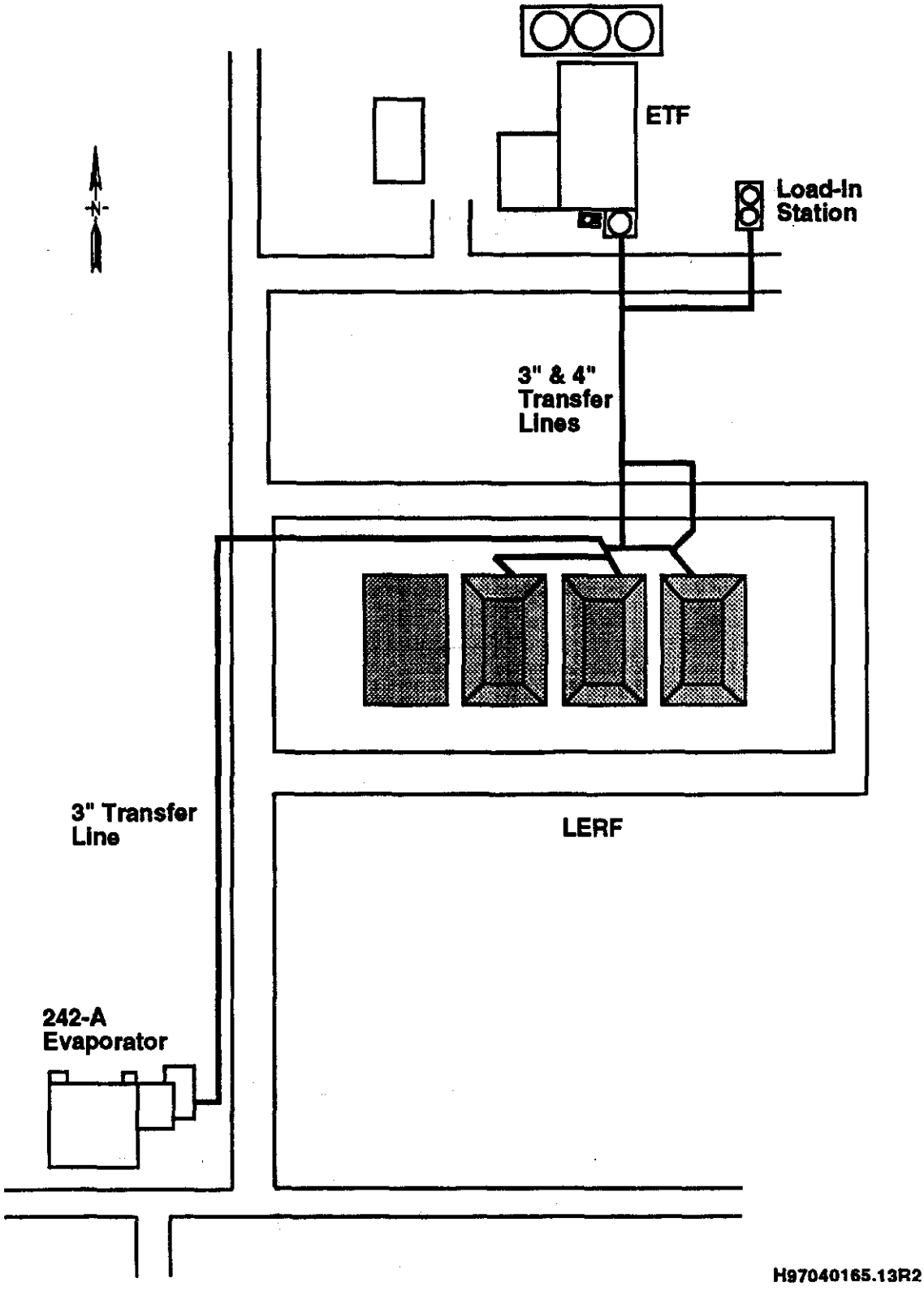


Figure 4-1. Liquid Effluent Retention Facility Layout.

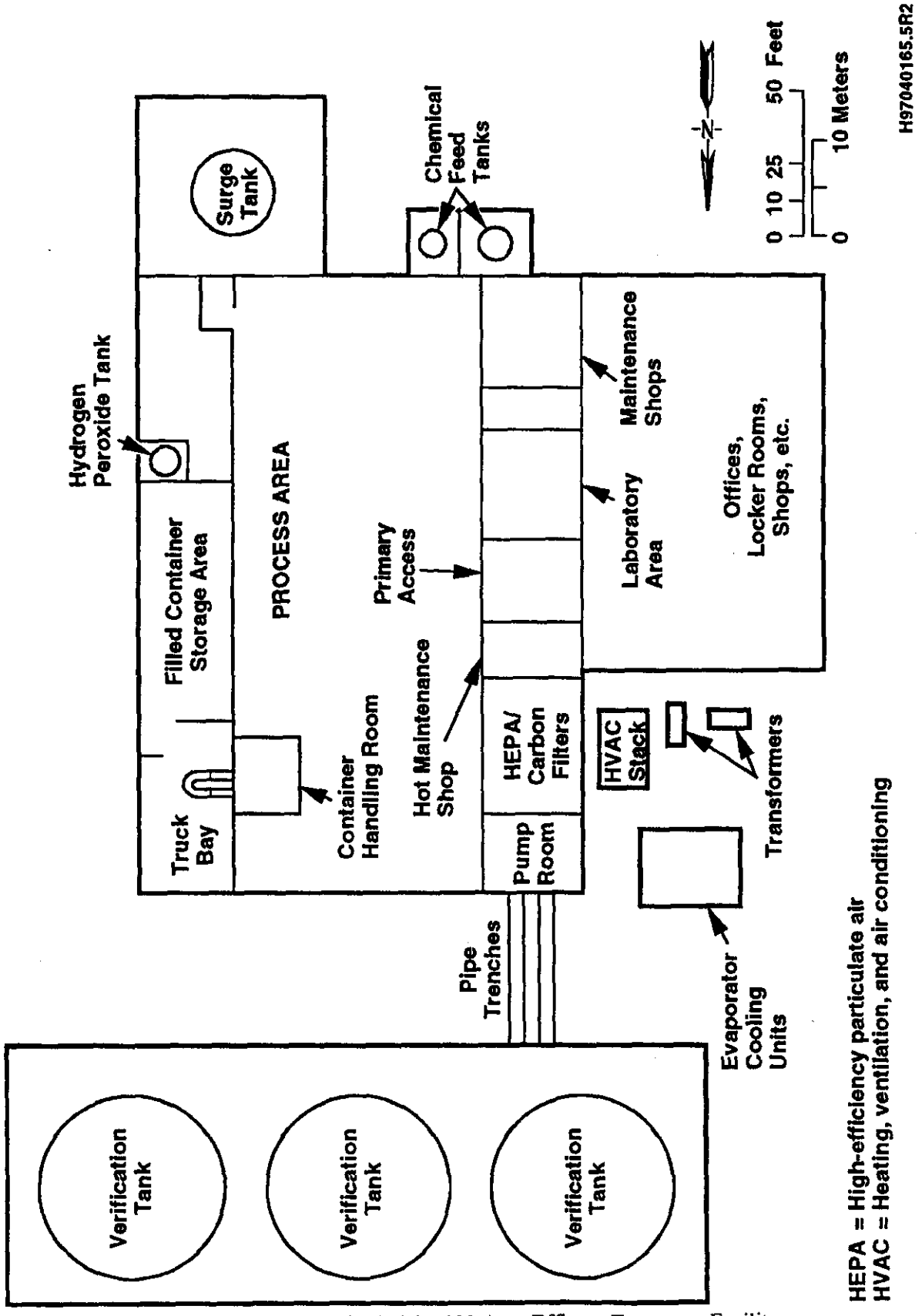


Figure 4-2. Plan View of the 200 Area Effluent Treatment Facility.

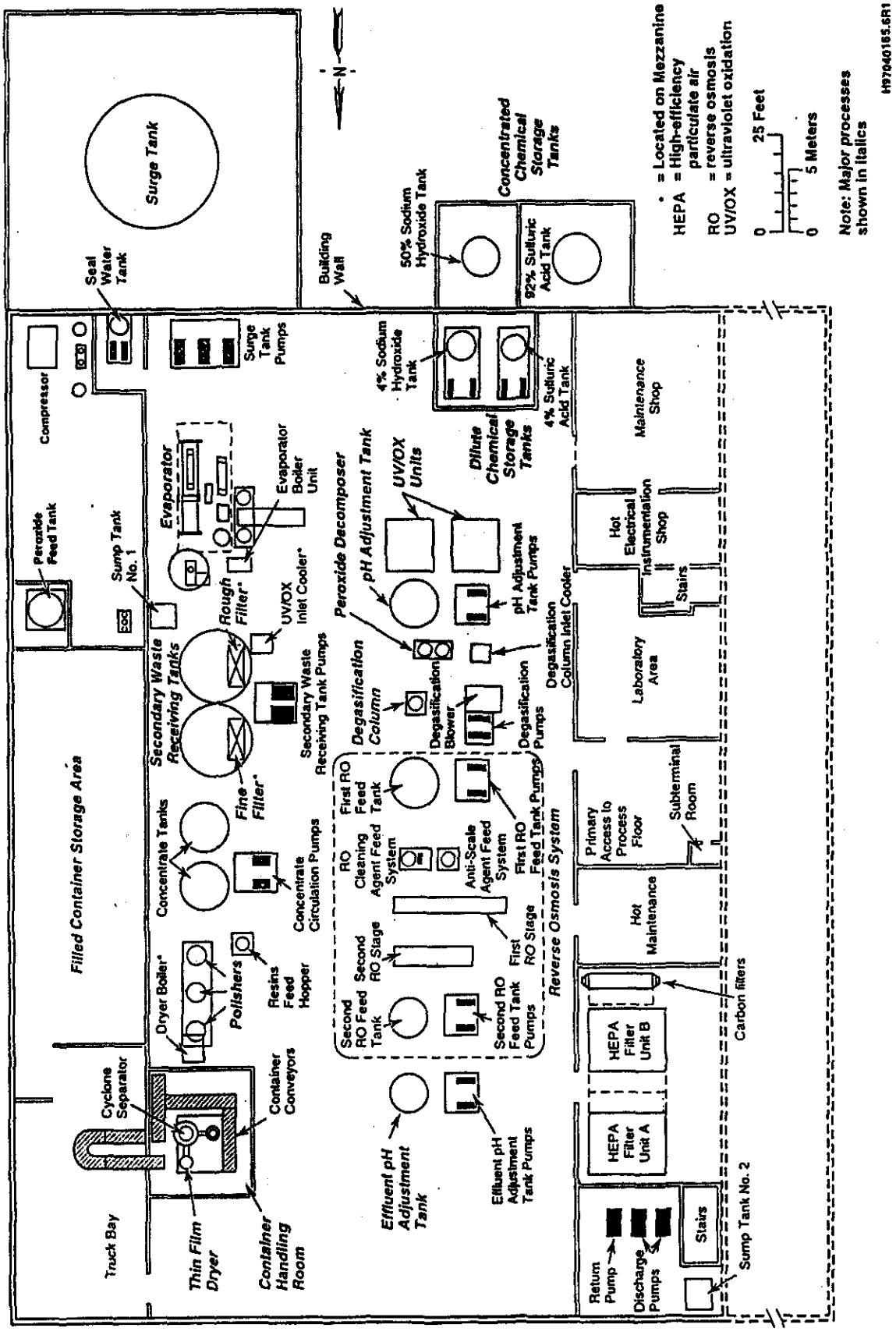


Figure 4-3. 200 Area Effluent Treatment Facility Layout.

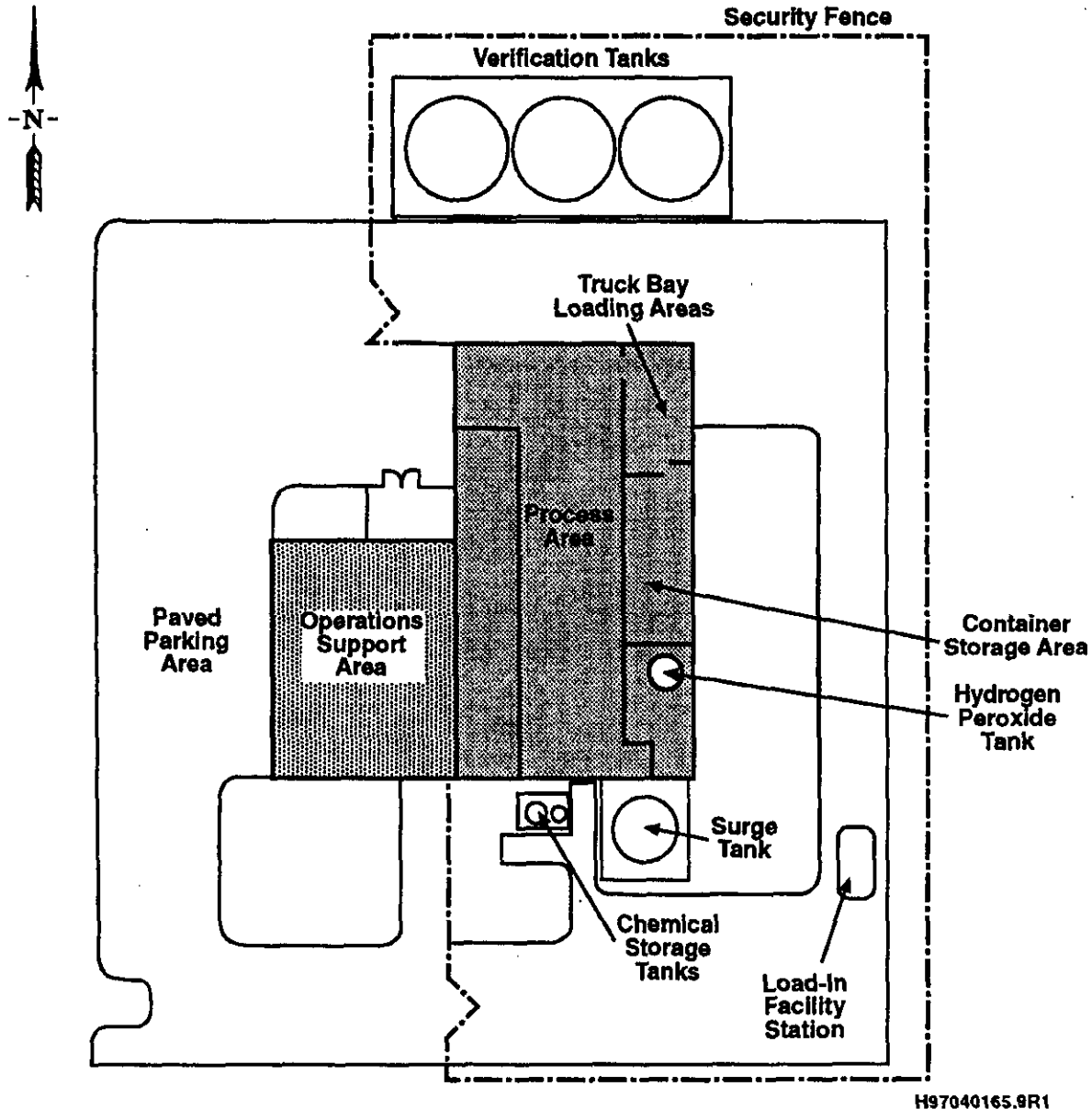


Figure 4-4. 200 Area Effluent Treatment Facility.

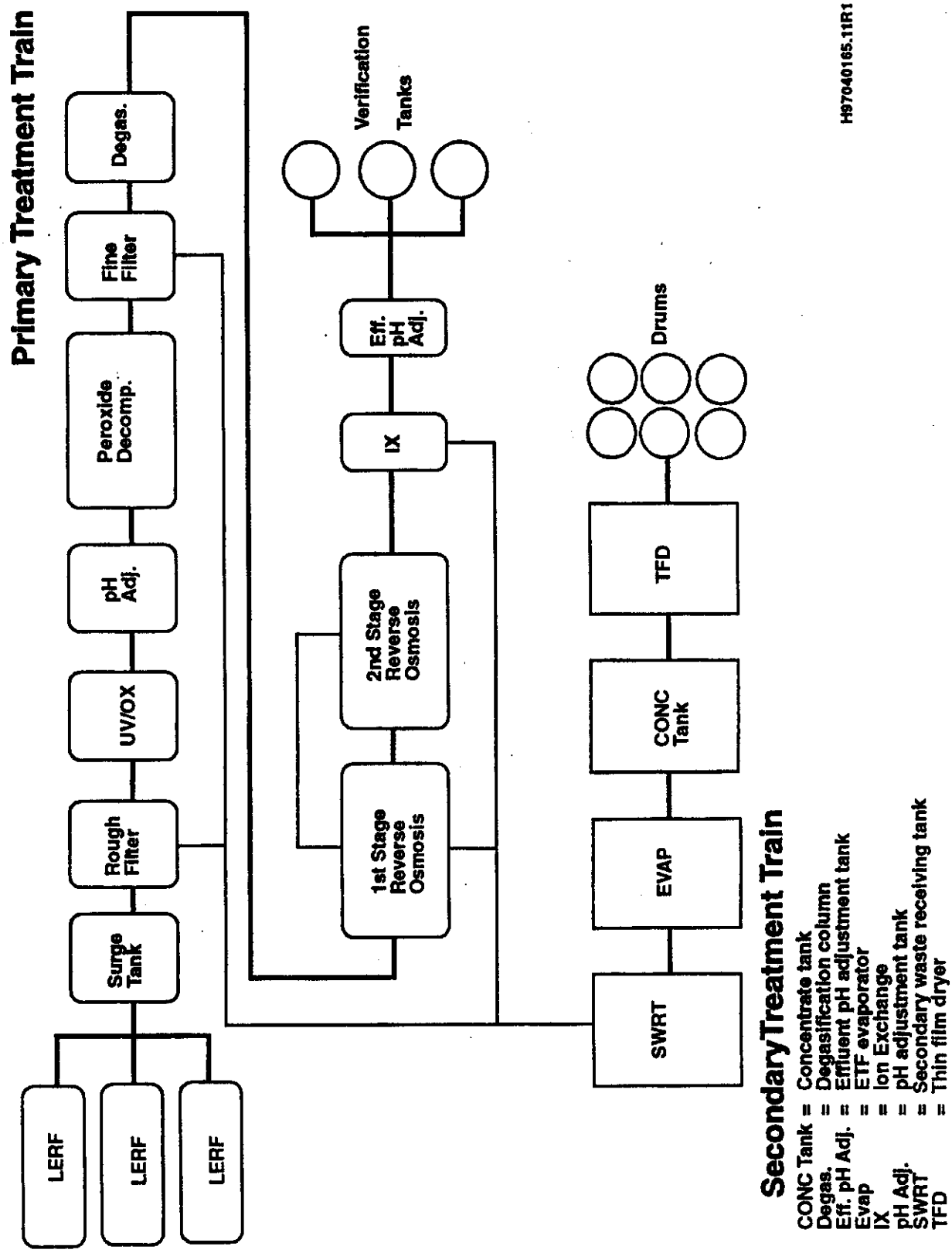


Figure 4-5. Example - 200 Area Effluent Treatment Facility Configuration 1.

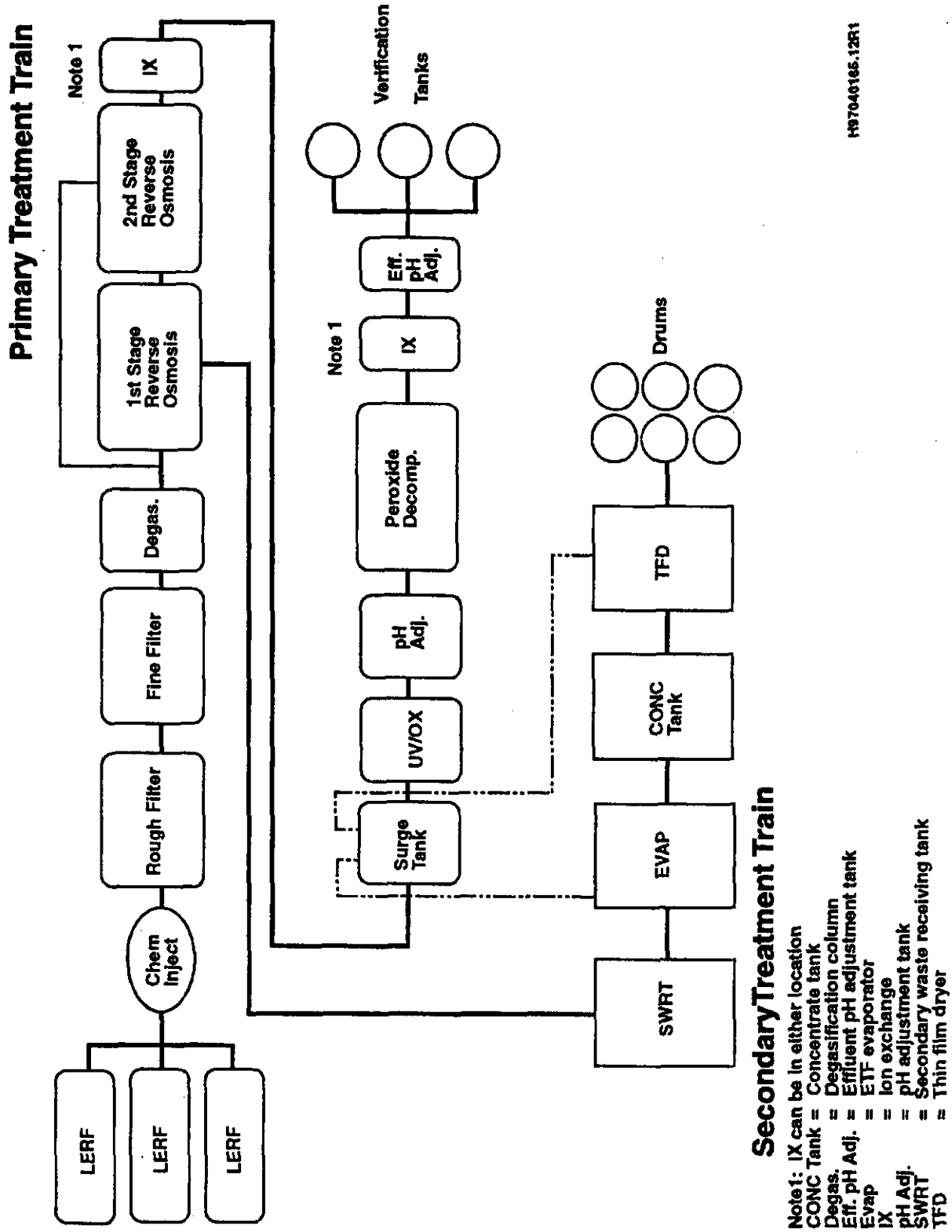


Figure 4-6. Example - 200 Area Effluent Treatment Facility Configuration 2.

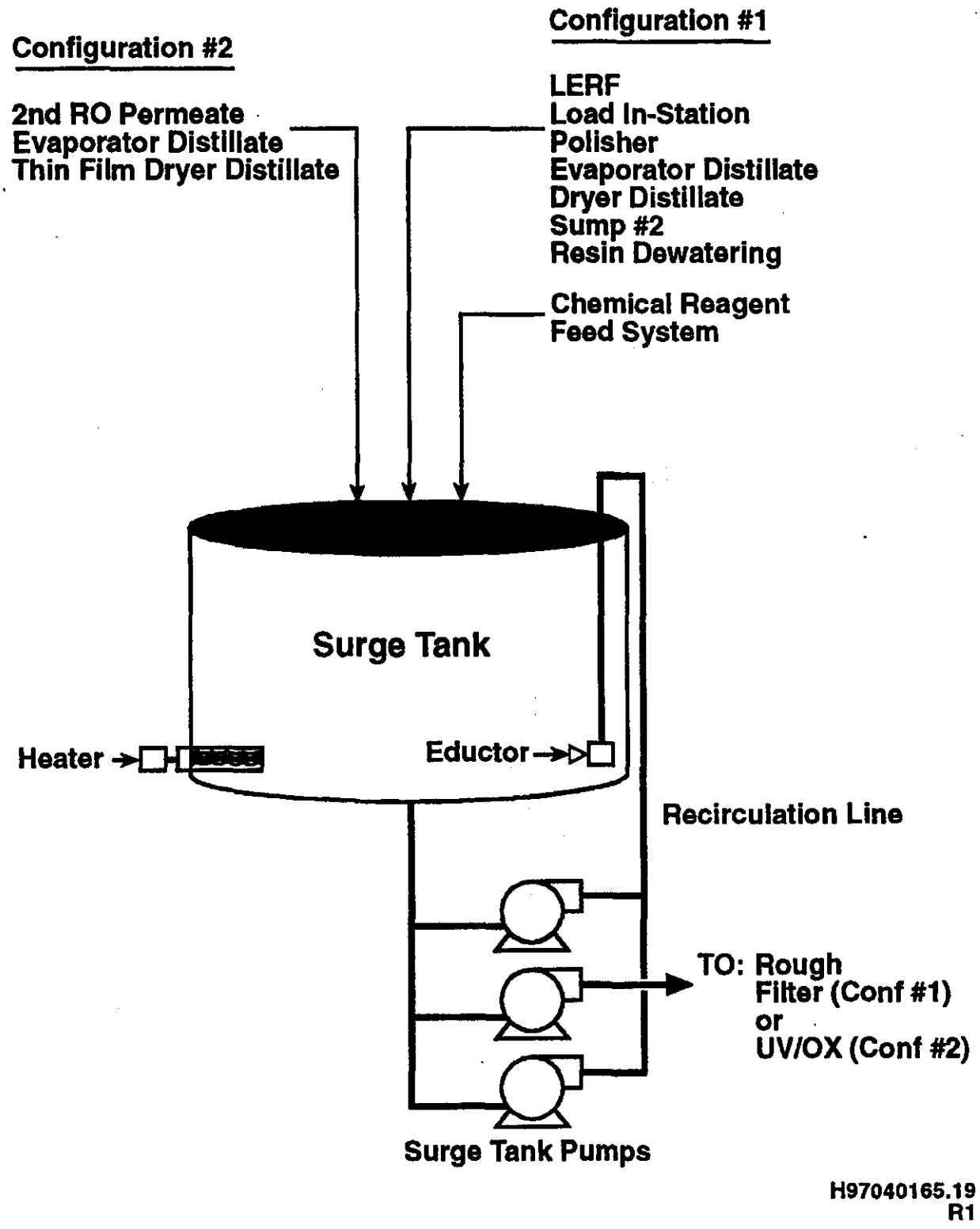


Figure 4-7. Surge Tank.

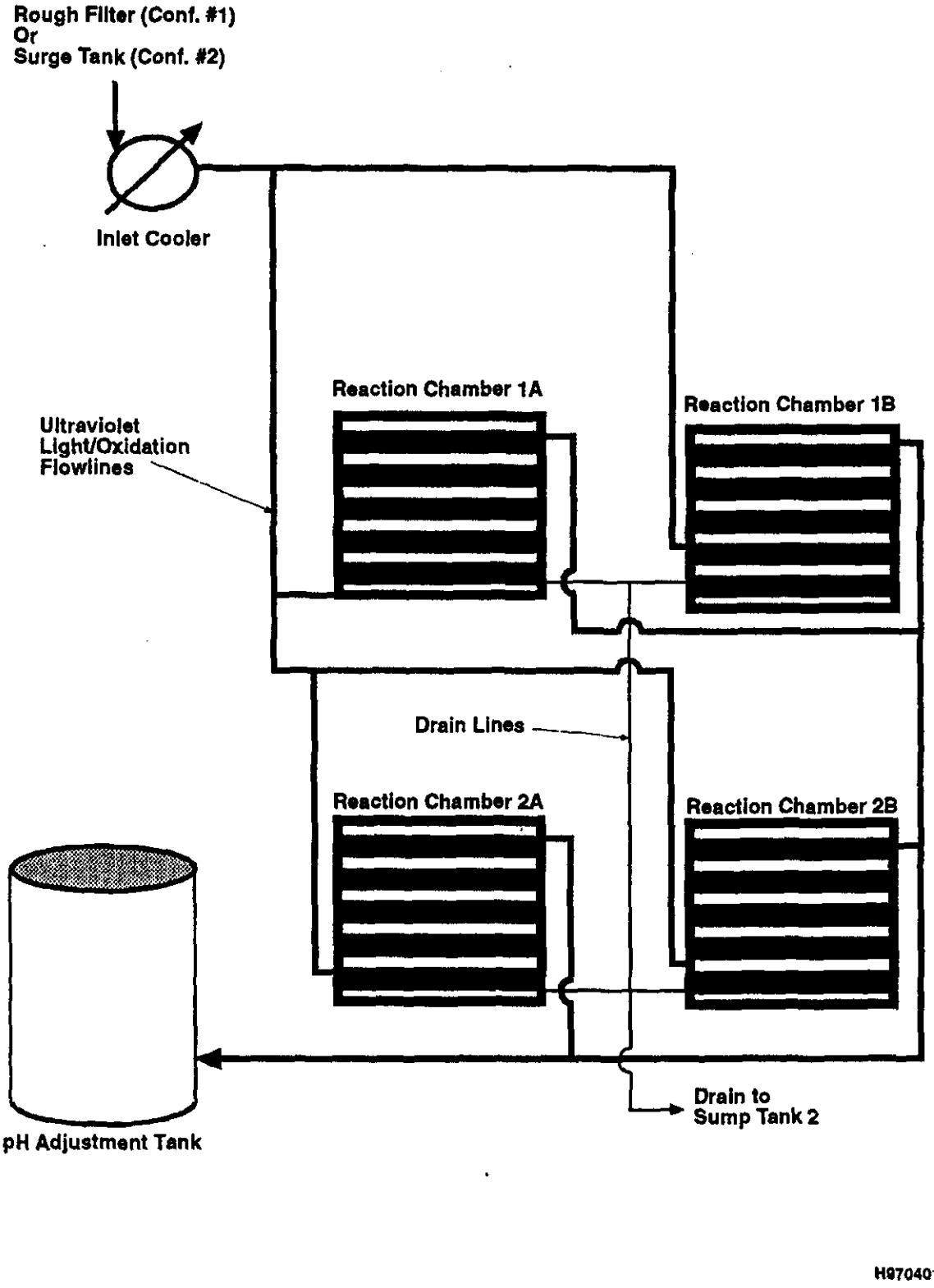


Figure 4-8. Ultraviolet Light/Oxidation Unit.

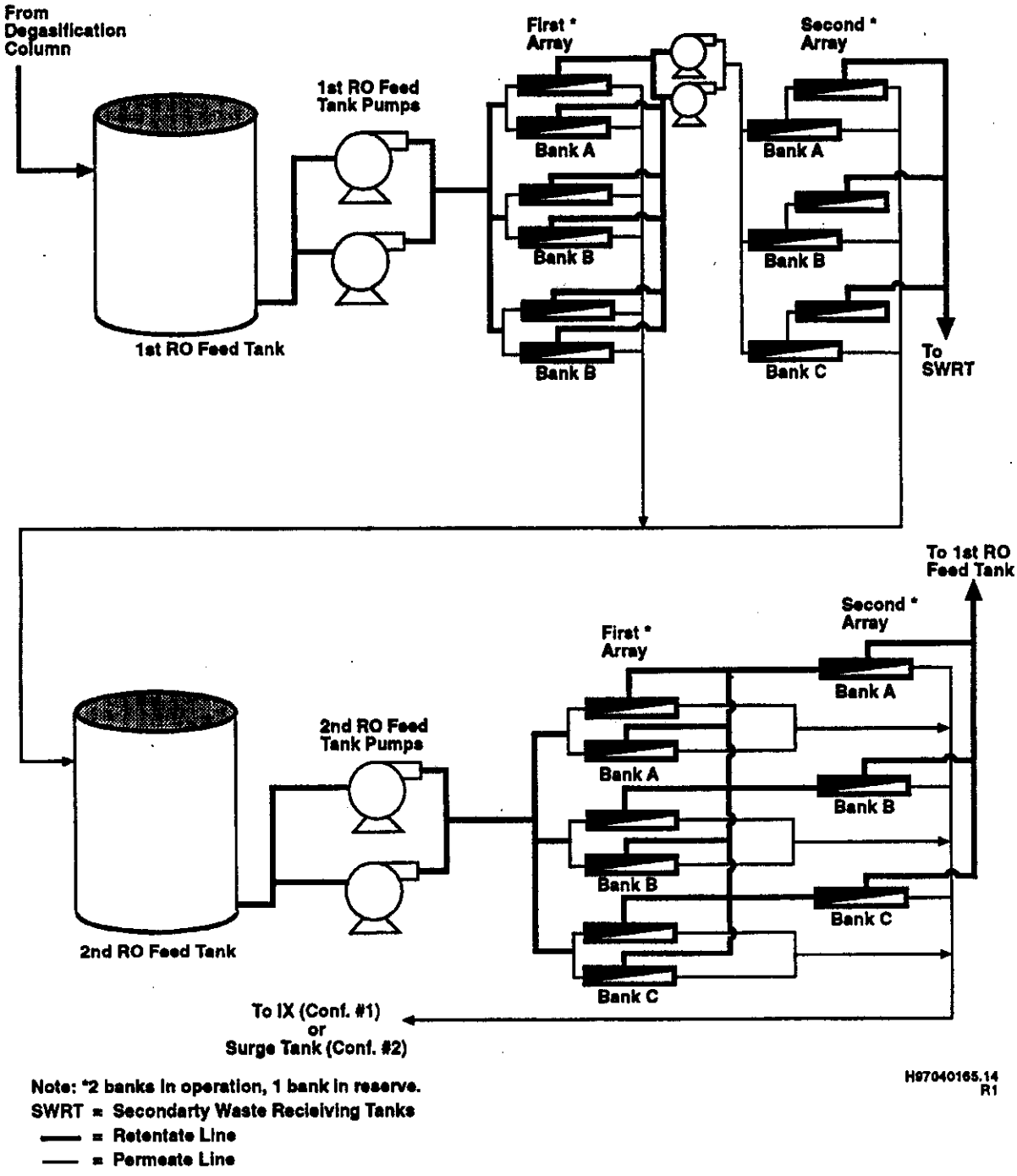


Figure 4-9. Reverse Osmosis Unit.

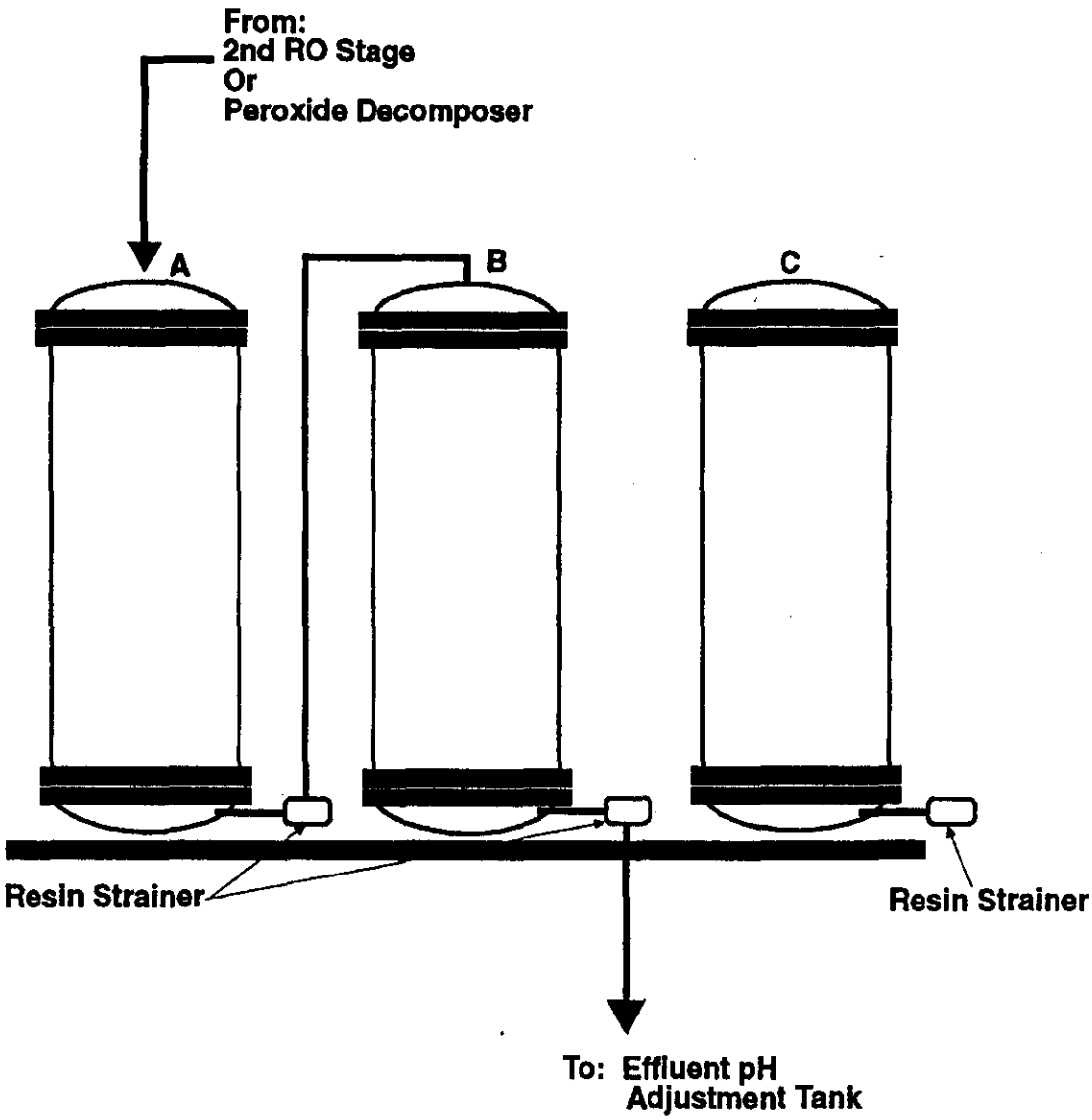


Figure 4-10. Ion Exchange Unit.

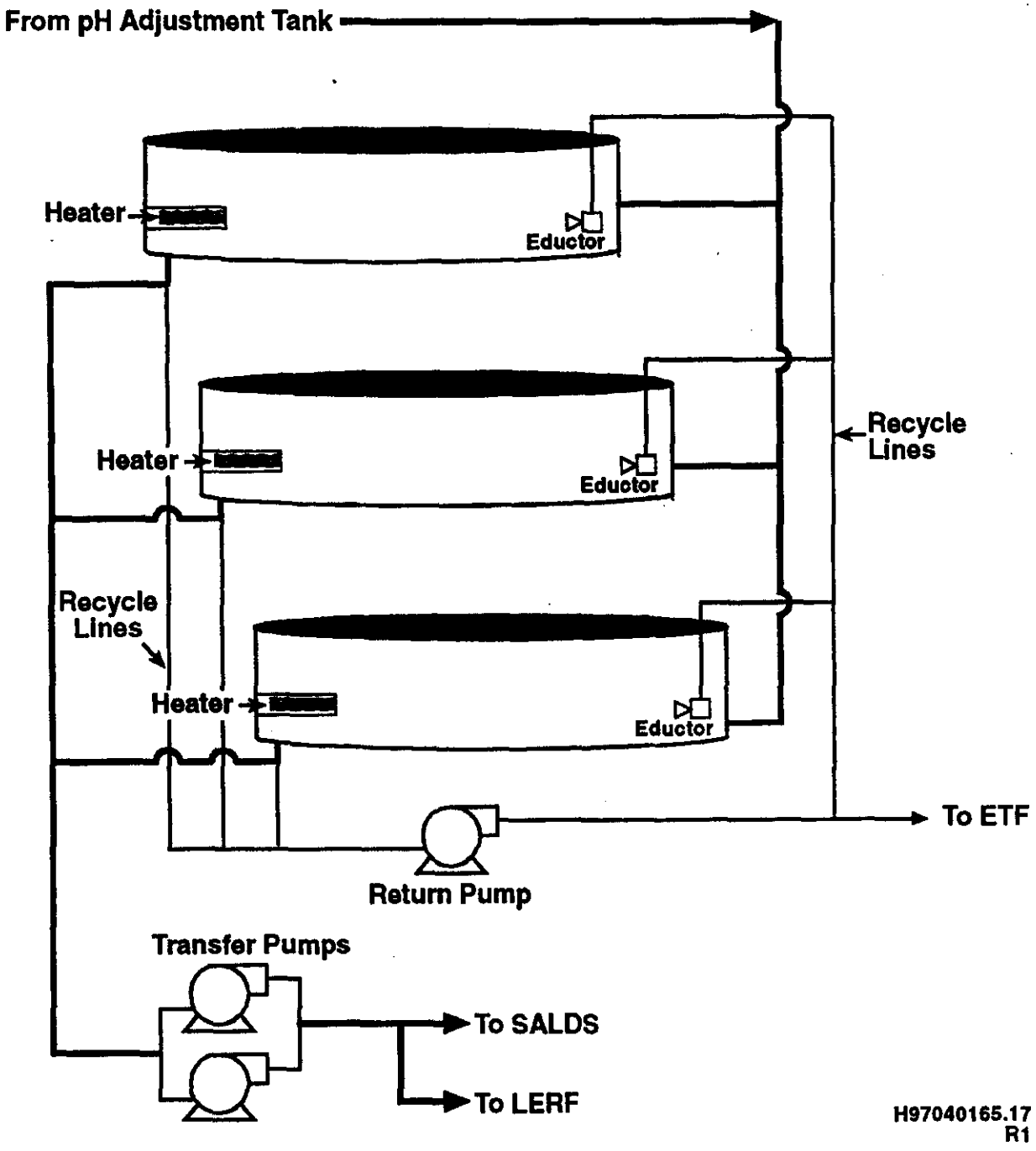


Figure 4-11. Verification Tanks.

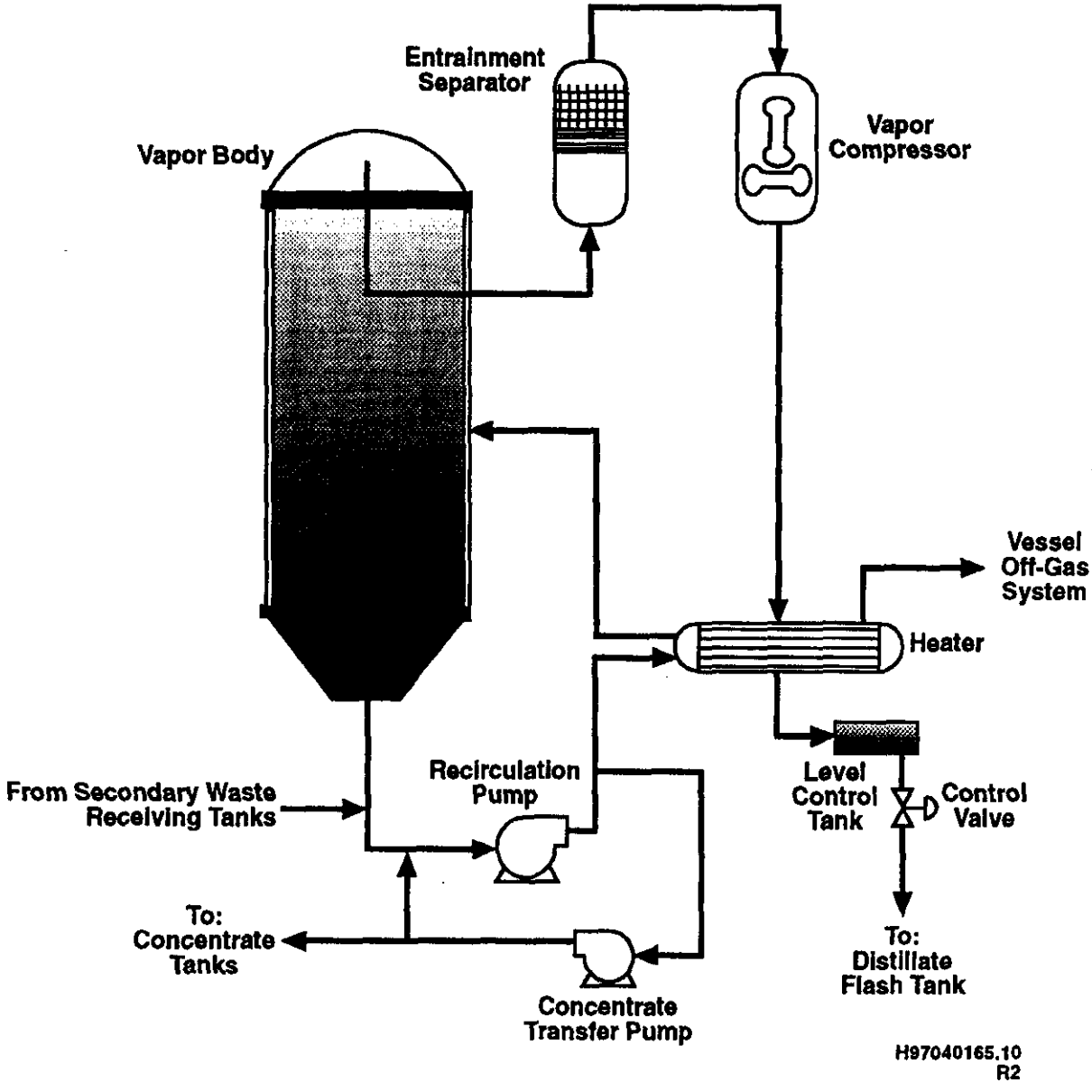


Figure 4-12. Effluent Treatment Facility Evaporator.

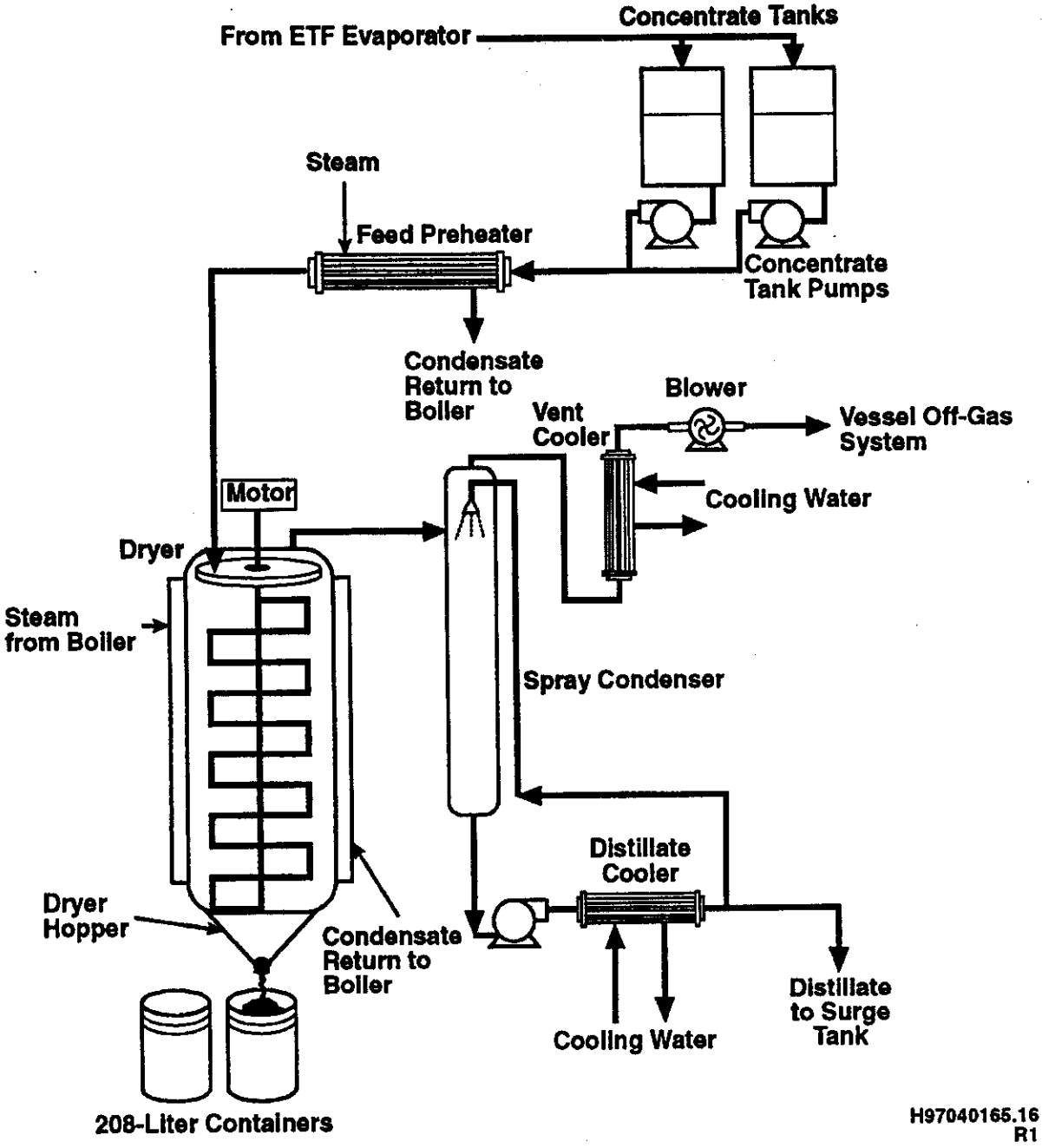


Figure 4-13. Thin Film Dryer.

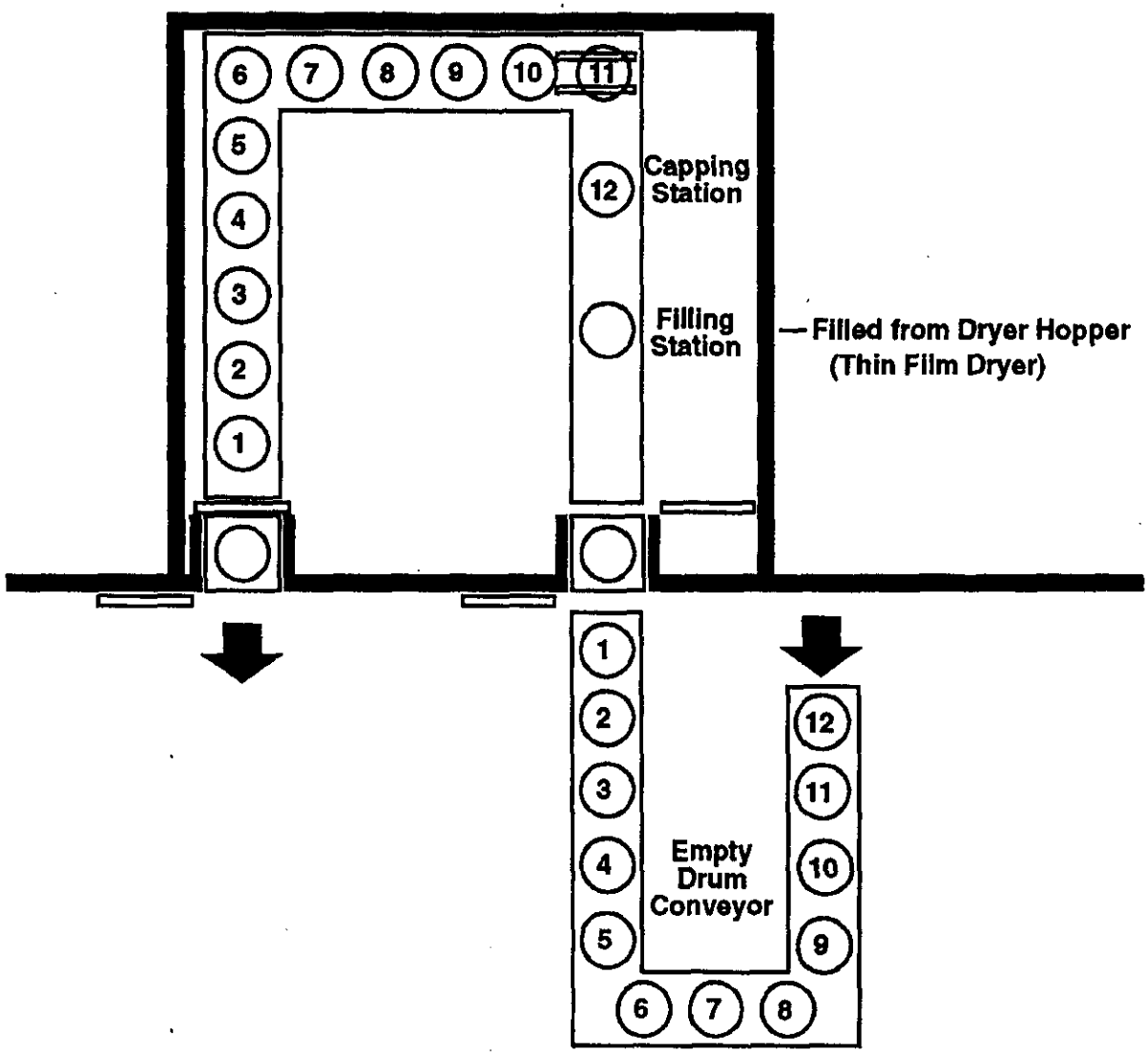


Figure 4-14. Container Handling System.

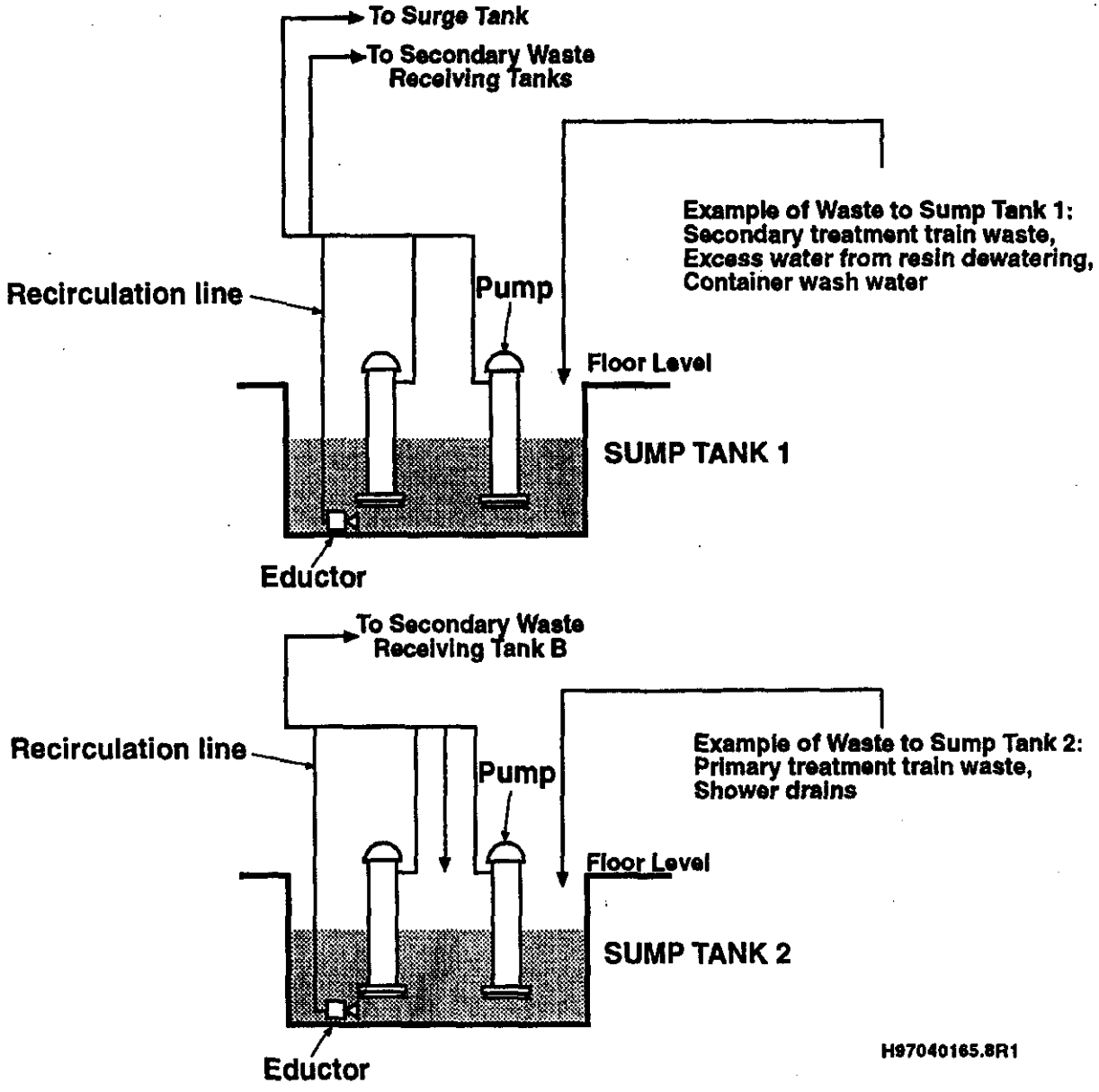


Figure 4-15. Effluent Treatment Facility Sump Tanks.

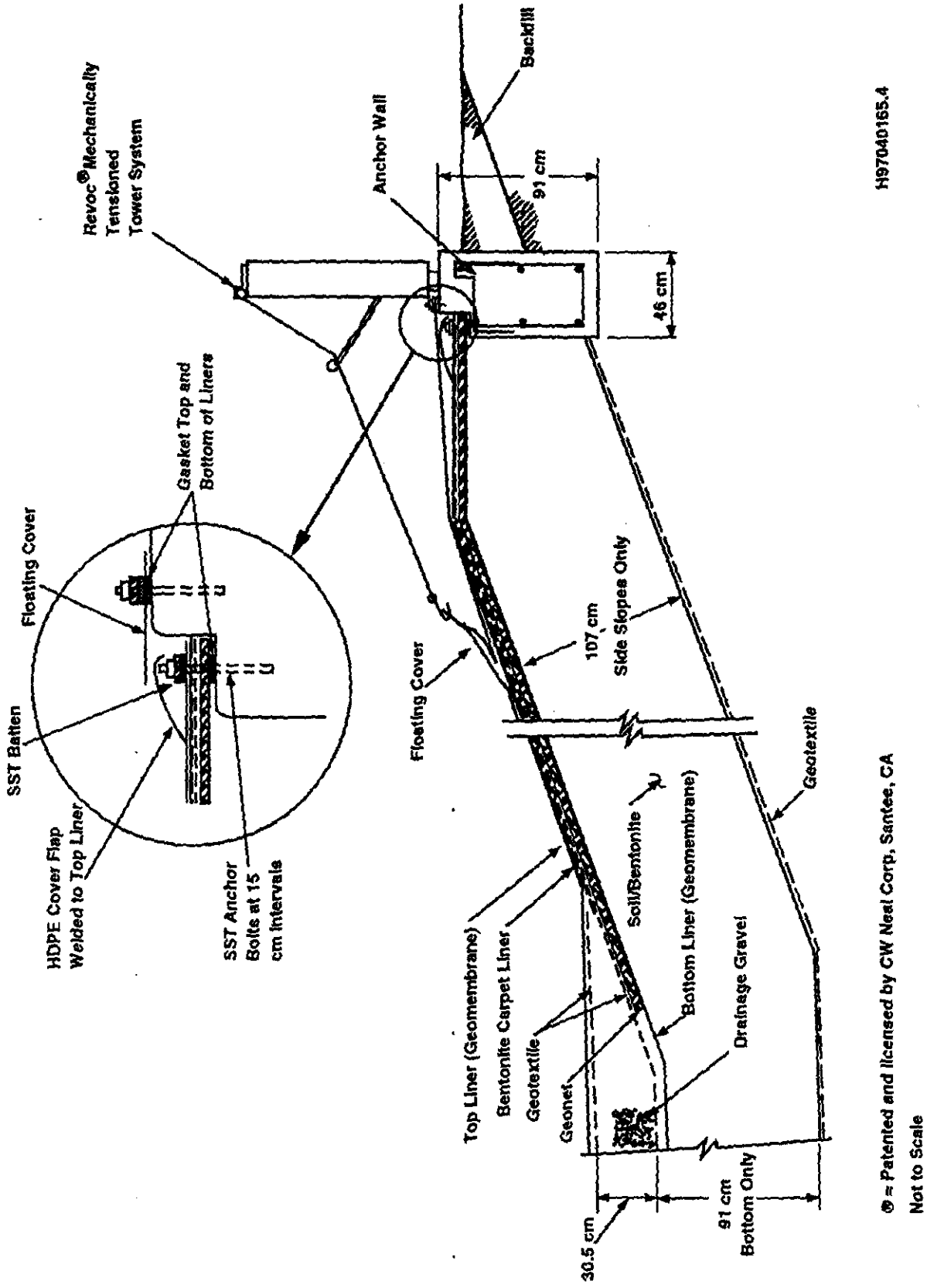


Figure 4-16. Liner Anchor Wall and Cover Tension System.

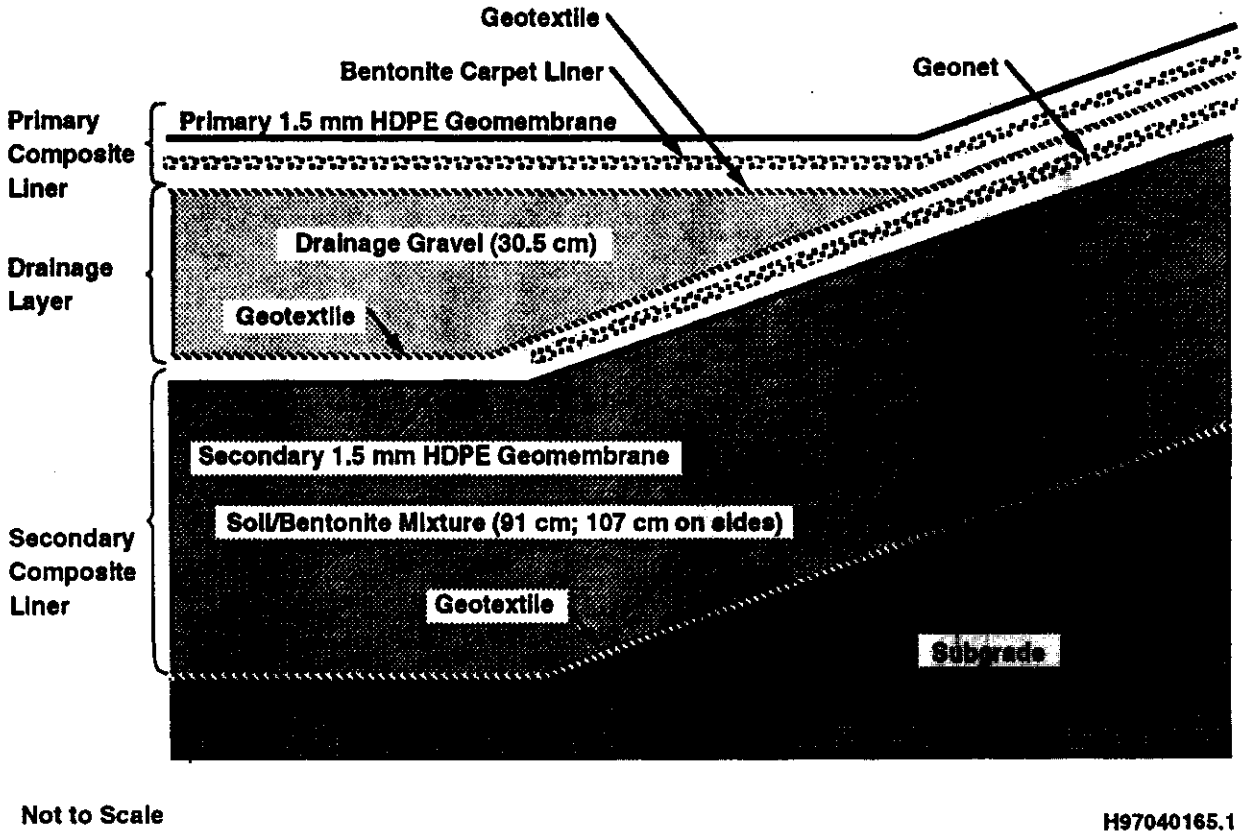


Figure 4-17. Liner System Schematic.

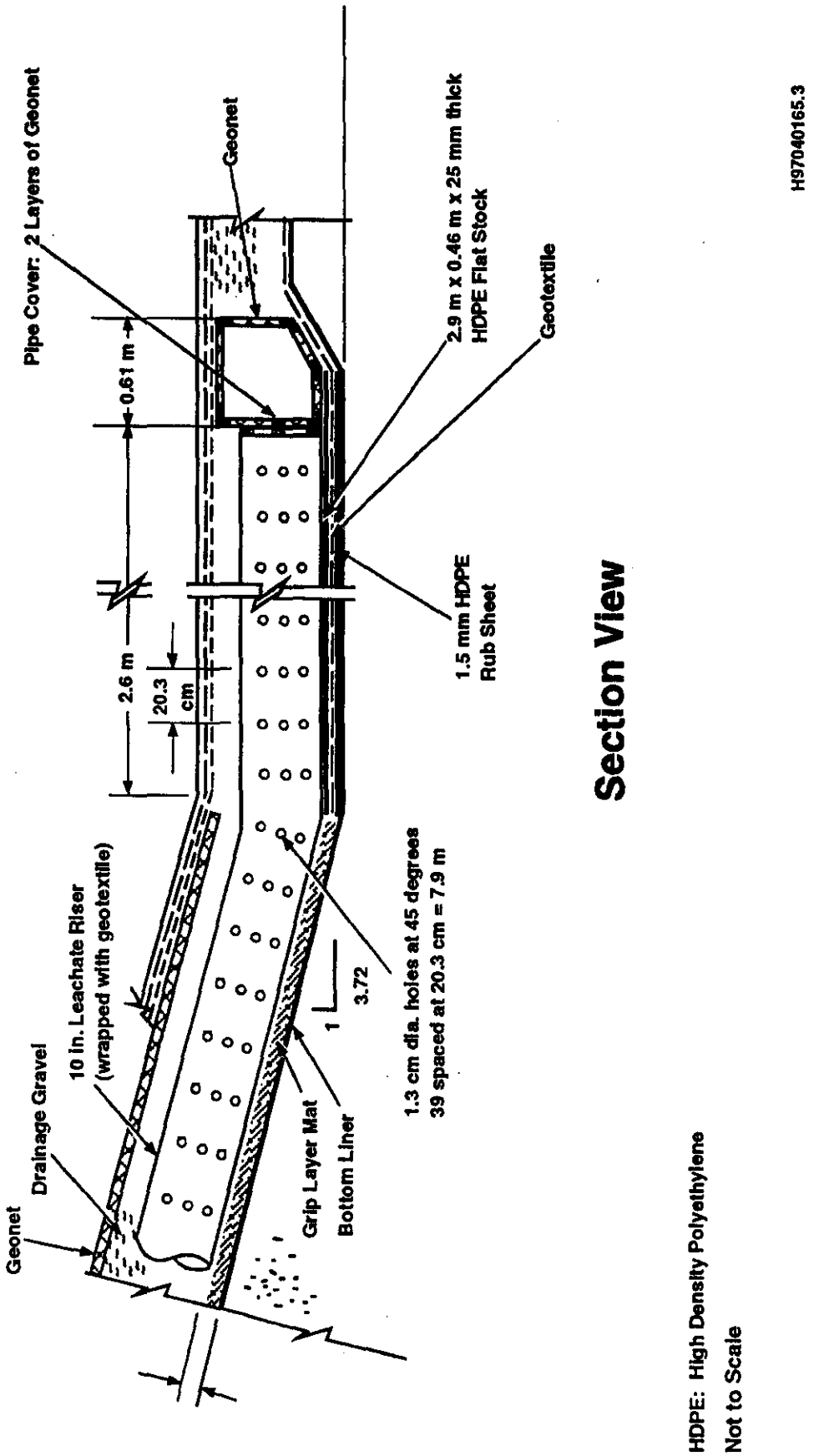


Figure 4-18. Detail of Leachate Collection Sump.

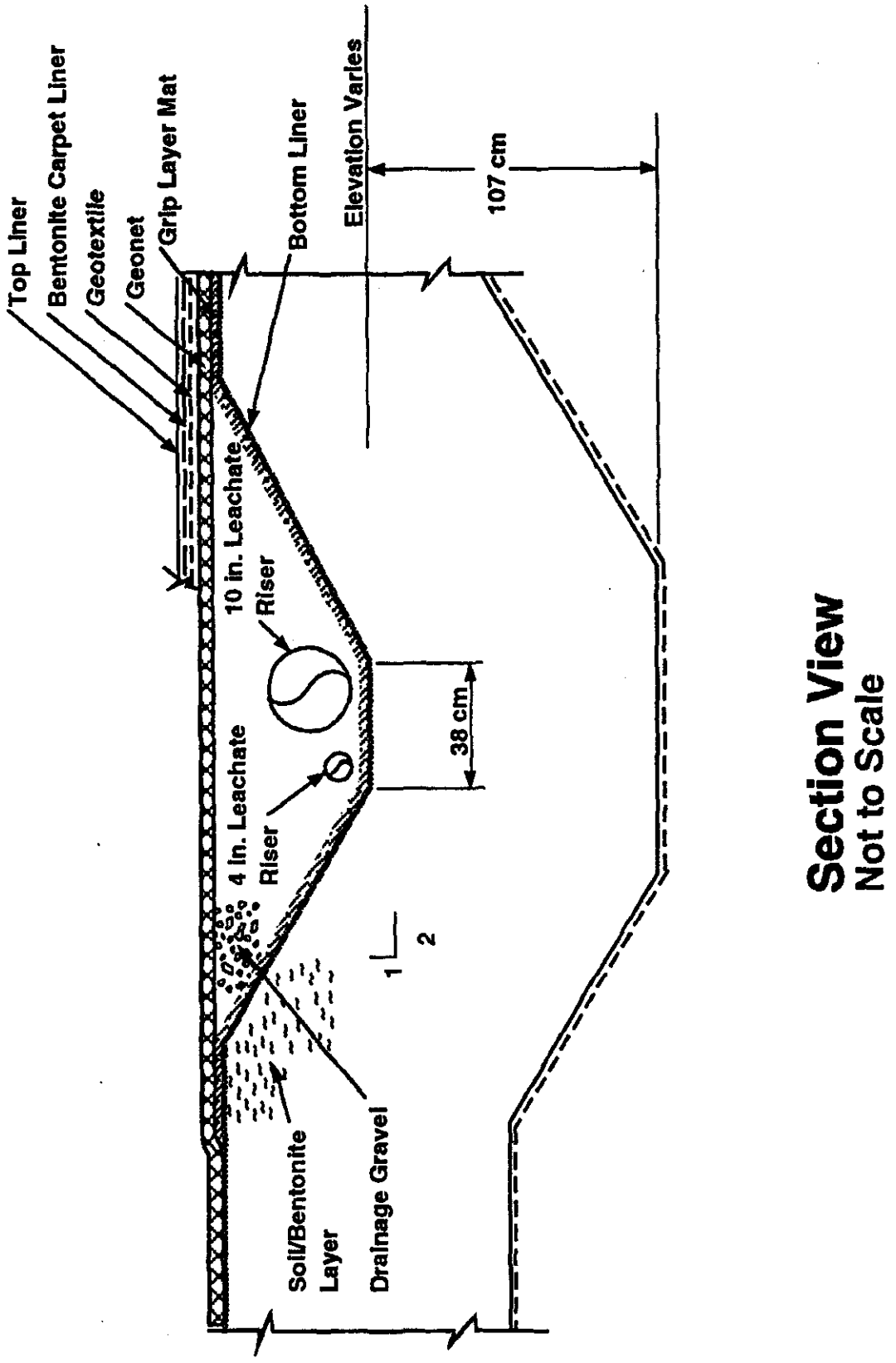


Figure 4-19. Detail of Leachate Riser Trench.

This page left intentionally blank.

Table 4-1. 200 Area Effluent Treatment Facility Tank Systems Information.

Tank Description	Material of Construction	Maximum Tank Capacity1 liters	Inner diameter meters	Height meters	Shell Thickness2 centimeters	Corrosion Protection3
Load-in tanks (2)	304 SS	37,900	3.6	4.7	0.64	Type 304 SS
Surge tank	304 SS	461,820	7.9	9.2	0.48	Type 304 SS
pH adjustment tank	304 SS	16,660	3.0	2.5	0.64	Type 304 SS
First RO feed tank	304 SS	20,440	3.0	3.2	0.64	Type 304 SS
Second RO feed tank	304 SS	7,600	Nonround tank 3.0 m x 1.5 m	1.5	0.48 w/rib stiffeners	Type 304 SS
Effluent pH adjustment tank	304 SS	14,390	2.4	3.6	0.64	Type 304 SS
Verification tanks (3)	Carbon steel with epoxy lining	2,763,340	18.3	11.4	0.79	epoxy coating
Secondary waste receiving tanks (2)	304 SS	75,700	4.3	5.7	0.64	Type 304 SS
Concentrate tanks (2)	316L SS	24,980	3.0	3.8	0.64	Type 316 SS
ETF evaporator (Vapor Body)	Alloy 625	20,800	2.4	6.8	variable	Alloy 625
Distillate flash tank	304 SS	950	Horizontal tank 0.76	Length 2.2	0.7	304 SS
Sump tank 1	304 SS	4,160	1.5 x 1.5	3.4	3/16	304 SS
Sump tank 2	304 SS	4,160	1.5 x 1.5	3.4	3/16	304 SS

Table 4-1. 200 Area Effluent Treatment Facility Tank Systems Information.
(sheet 2 of 2)

Tank description	Liner materials	Pressure controls	Foundation materials	Structural support	Seams	Connections
Load-in tanks (2)	None	vent to atmosphere	concrete slab	SS skirt bolted to concrete	welded	flanged
Surge tank	None	pressure indicator/vacuum breaker valve	reinforced concrete ring plus concrete slab	structural steel on concrete base	welded	flanged
pH adjustment tank	None	pressure indicator/vent to VOG	concrete slab	carbon steel skirt	welded	flanged
First RO feed tank	None	pressure indicator/vent to VOG	concrete slab	carbon steel skirt	welded	flanged
Second RO feed tank	None	pressure indicator/vent to VOG	concrete slab	carbon steel frame	welded	flanged
Effluent pH adjustment tank	None	pressure indicator/vent to VOG	concrete slab	carbon steel skirt	welded	flanged
Verification tanks (3)	Epoxy	pressure indicator/filtered vent to atmosphere	reinforced concrete ring plus concrete slab	structural steel on concrete base	welded	flanged
Secondary waste receiving tanks (2)	None	pressure indicator/vent to VOG	concrete slab	carbon steel skirt	welded	flanged
Concentrate tanks (2)	None	pressure indicator/vent to VOG	concrete slab	carbon steel skirt	welded	flanged
ETF evaporator (vapor body)	None	pressure indicator/vapor vent - to DFT/VOG	concrete slab	carbon steel frame	welded	flanged
Distillate flash tank	None	vent to VOG	concrete slab	carbon steel I-beam and cradle	welded	flanged
Sump tank 1	None	vent to VOG	concrete containment	reinforced concrete containment basin	welded	flanged
Sump tank 2	None	vent to VOG	concrete containment	reinforced concrete containment basin	welded	flanged

1. The maximum operating volume of the tanks is identified. For the load-in tanks and the second RO feed tank, the maximum operating volume is also the operating capacity.
2. The nominal thickness of ETF tanks is represented.
3. Type 304 SS, 304L, 316 SS and alloy 625 provide corrosion protection.
   304 SS = stainless steel type 304 or 304L.
   316L SS = stainless steel type 316L.
   DFT = distillate flash tank.
   VOG = vessel offgas system.

Table 4-2. Ancillary Equipment and Material Data. (sheet 1 of 2)

System	Ancillary equipment	Number	Material
Load-in tanks	Load-in/transfer pumps (2)	P-103A/-103B	316 SS
	Load-in filters (3)	59A-FL-001/-002/-003	304 SS
Surge tank	Surge tank pumps (3)	2025E-60A-P-1A/-1B/-1C	304 SS
Rough filter	Rough filter	2025E-60B-FL-1	304 SS
UV/OX	UV oxidation inlet cooler	2025E-60B-E-1	316 SS
	UV oxidizers (4)	2025E-60D-UV-1A/-1B/-2A/-2B	316 SS
pH adjustment	pH adjustment pumps (2)	2025E-60C-P-1A/-1B	304 SS
Peroxide decomposer	H_2O_2 decomposers (2)	2025E-60D-CO-1A/-1B	CS with epoxy coating
Fine filter	Fine filter	2025E-60B-FL-2	304 SS
Degasification	Degasification column inlet cooler	2025E-60E-E-1	316 SS
	Degasification column	2025E-60E-CO-1	FRP
	Degasification pumps (2)	2025E-60E-P-1A/-1B	316 SS
RO	Feed/booster pumps (6)	2025E-60F-P-1A/-1B/-2A/-2B/-3A/-3B	304 SS
	Reverse osmosis arrays (21)	2025E-60F-RO-01 through -21	Membranes: polyamide Outer piping: 304 SS
IX/Polishers	Polishers (3)	2025E-60G-IX-1A/-1B-1C	CS with epoxy coating
	Resins strainers (3)	2025E-60G-S-1A/-1B/-1C	304 SS
Effluent pH adjustment	Recirculation/transfer pumps (2)	2025E-60C-P-2A/-2B	304 SS/PVC
Verification tanks	Return pump	2025E-60H-P-1	304 SS
	Transfer pumps (2)	2025E-60H-P-2A/-2B	
Secondary waste receiving tanks	Secondary waste feed pumps (2)	2025E-60I-P-1A/-1B	304 SS

1

Table 4-2. Ancillary Equipment and Material Data. (sheet 2 of 2)

System	Ancillary equipment	Number	Material
ETF evaporator system	Feed/distillate heat exchanger	2025E-60I-E-02	Tubes: 316 SS Shell: 304 SS
	Heater (reboiler)	2025E-60I-E-01	Tubes: alloy 625 Shell: 304 SS
	Recirculation pump	2025E-60I-P-02	316 SS
	Concentrate transfer pump	2025E-60I-P-04	316 SS
	Entrainment separator	2025E-60I-DE-01	Top section: 316 SS Bottom section: alloy 625
	Vapor compressor (incl. silencers)	2025E-60I-C-01	304 SS
	Silencer drain pump	2025E-60I-P-06	316 SS
	Level control tank	2025E-60I-TK-5	304 SS
	Distillate flash tank pump	2025E-60I-P-03	316 SS
Concentrate tanks	Concentrate circulation pumps (2)	2025E-60J-P-1A/-1B	316 SS
Thin film dryer	Concentrate feed pump	2025E-60J-P-2	316 SS
	Dryer feed preheater	2025E-60J-E-3	316 SS
	Thin film dryer	2025E-60J-D-1	Interior surfaces: alloy 625 Rotor and blades: 316 SS
	Powder hopper	2025E-60J-H-1	316 SS
	Spray condenser	2025E-60J-DE-01	316 SS
	Distillate condenser	2025E-60J-CND-01	Tubes: 304 SS Shell: CS
	Dryer distillate pump	2025E-60J-P-3	316 SS
Resin dewatering	Dewatering pump	2025E-80E-P-1	

CS = carbon steel.
FRP = fiberglass reinforced plastic.
PVC = polyvinyl chloride.
RO = reverse osmosis.
UV = ultraviolet.
304 SS = stainless steel type 304 or 304L.
316 SS = stainless steel type 316 or 316L.

Table 4-3 . Concrete and Masonary Coatings.

Coating	Minimum wet film thickness (mil)	Percentage of film forming solids per volume (%)	Minimum dry film thickness (mil)
Concrete and masonry			
Prime: Amercoat-187*	4.5	22.0	1.0
Second: Amercoat-33	6.4	23.46	1.5
Finish: Amercoat-33	6.4	23.46	1.5
Or			
Prime: Amercoat-385	5-6	66	3-4
Topcoat: Amercoat-450HS	3-4	66	2-2.5
High traffic, container storage area			
Filler: Ameron Nu-Klad 114A**	--	100	--
Prime: Amercoat-105A	2-3	100	2-3
Topcoat: Amercoat-120	20-30	100	20-30

* Amercoat is a trademark of Ameron, Incorporation.
**Nu-Klad is a trademark of Ameron, Incorporation.

Table 4-4 . Geomembrane Material Specifications.

Property	Value
Specific gravity	0.932 to 0.950
Melt flow index	1.0 g/10 min., maximum
Thickness (thickness of flow marks shall not exceed 200% of the nominal liner thickness)	60 mil ∓10% (1.5 mm ∓ 10%)
Carbon black content	1.8 to 3%, bottom liner 2 to 3% top liner
Tensile properties (each direction)	
Tensile strength at yield	21.5 kgf/cm width, minimum
Tensile strength at break	32.2 kgf/cm width, minimum
Elongation at yield	10%, minimum
Elongation at break	500%, minimum
Tear resistance	13.6 kgf, minimum
Puncture resistance	31.3 kgf, minimum
Low temperature/brittleness	-40° C, maximum
Dimensional (%change each direction)	∓2%, maximum
Environmental stress crack	750 h, minimum
Water absorption	0.1 maximum and weight change
Hydrostatic resistance	316,000 kgf/m^2
Oxidation induction time (200 C/l atm. O_2	90 minutes

Reference: Construction Specifications (KEH 1990b). Format uses NSF 54 table for high-density polyethylene as a guid (NSF 1985). However, RCRA values for dimensional stability and environmental stress crack have been added.

%	=	percent	max	=	maximum
g	=	gram	kgf	=	kilograms force
min	=	minute	m	=	meters
h	=	hour	mm	=	millimeters

Table 4-5 . Drainage Gravel Specifications.

Property	Value
Sieve size	
25 millimeters	100 wt% passing
19 millimeters	80 – 100 wt% passing
9.5 millimeters	10 – 40 wt% passing
4.75 millimeters	0 – 4 wt% passing
Permeability	0.1 cm/sec, minimum

Reference: Sieve size is from WSDOT M41-10-88, Section 9.03.1(3)C for Grading No. 5 (WSDOT 1988). Permeability requirement is from WAC 173-303-650(2)(j) for new surface impoundments.

This page left intentionally blank,

CONTENTS

TABLES

This page intentionally left blank.

8.0 PERSONNEL TRAINING [H]

This chapter discusses personnel training requirements based on WAC 173-303 and the HF RCRA Permit (DW Portion). In accordance with WAC 173-303-806(4)(a)(xii), the *Hanford Facility Dangerous Waste Part B Permit Application* must contain two items: (1) "an outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330" and (2) "a brief description of how training will be designed to meet actual job tasks in accordance with the requirements in WAC 173-303-330(1)(d)." The HF RCRA Permit, (DW portion) Condition II.C (Personnel Training) contains training requirements applicable to Hanford Facility personnel and non-Facility personnel.

Compliance with these requirements at the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility is demonstrated by information contained both in Chapter 8.0 of DOE/RL-91-28, Attachment 33 of the HF RCRA Permit, and this chapter. This chapter supplements Chapter 8.0 of DOE/RL-91-28.

8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS

The introductory and continuing training programs are designed to prepare personnel to manage and maintain the TSD unit in a safe, effective, and environmentally sound manner. In addition to preparing personnel to manage and maintain TSD units under normal conditions, the training programs ensure that personnel are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response training is consistent with the description of actions contained in Chapter 7.0, Contingency Plan. The introductory and continuing training programs contain the following objectives:

- Teach Hanford Facility personnel to perform their duties in a way that ensures the Hanford Facility's compliance with WAC 173-303
- Teach Hanford Facility personnel dangerous waste management procedures (including implementation of the contingency plan) relevant to the job titles/positions in which they are employed, and
- Ensure Hanford Facility personnel can respond effectively to emergencies.

8.1.1 Introductory Training

Introductory training includes general Hanford Facility training and TSD unit-specific training. General Hanford Facility training is described in DOE/RL-91-28, Section 8.1, and is provided in accordance with the HF RCRA Permit (DW Portion), Condition II.C.2. TSD unit-specific training is provided to Hanford Facility personnel allowing those personnel to work unescorted, and in some cases is required for escorted access. Hanford Facility personnel cannot perform a task for which they are not properly trained, except to gain required experience while under the direct supervision of a supervisor or coworker who is properly trained. Hanford Facility personnel must be trained within 6 months after their employment at or assignment to the Hanford Facility, or to a new job title/position at the Hanford Facility, whichever is later.

General Hanford Facility training: Refer to description in DOE/RL-91-28, Section 8.1.

Contingency Plan training: Hanford Facility personnel receive training on applicable portions of the *Hanford Emergency Management Plan* [Attachment 4 of the HF RCRA Permit (DW Portion)] in general Hanford Facility training. In addition, Hanford Facility personnel receive training on content of the description of actions contained in contingency plan documentation in Chapter 7.0 and Appendix 7.A to be able to effectively respond to emergencies.

Emergency Coordinator training: Hanford Facility personnel who perform emergency coordinator duties in WAC 173-303-360 (e.g., Building Emergency Director) in the Hanford Incident Command System receive training on implementation of the contingency plan and fulfilling the position within the Hanford Incident Command System. These Hanford Facility personnel must also become thoroughly familiar with applicable contingency plan documentation, operations, activities, location, and properties of all waste handled, location of all records, and the unit/building layout.

Operations training: Dangerous waste management operations training (e.g., waste designation training, shippers training) is determined on a unit-by-unit basis and considers the type of waste management unit (e.g., container management unit) and the type of activities performed at the waste management unit (e.g., sampling). For example, training provided for management of dangerous waste in containers is different than the training provided for management of dangerous waste in a tank system. Common training required for compliance within similar waste management units can be provided in general training and supplemented at the TSD unit. Training provided for TSD unit-specific operations is identified in the training plan documentation based on: (1) whether a general training course exists, (2) the training needs to ensure waste management unit compliance with WAC 173-303, and (3) training commitments agreed to with Ecology.

8.1.2 Continuing Training

Continuing training meets the requirements for WAC 173-303-330(1)(b) and includes general Hanford Facility training and TSD unit-specific training.

General Hanford Facility training: Annual refresher training is provided for general Hanford Facility training. Refer to description in DOE/RL-91-28, Section 8.1.

Contingency plan training: Annual refresher training is provided for contingency plan training. Refer to description above in Section 8.1.1.

Emergency coordinator training: Annual refresher training is provided for emergency coordinator training. Refer to description above in Section 8.1.1.

Operations training: Refresher training occurs on many frequencies (i.e., annual, every other year, every 3 years) for operations training. When justified, some training will not contain a refresher course and will be identified as a one-time only training course. The TSD unit-specific training plan documentation will specify the frequency for each training course. Refer to description above in Section 8.1.1.

8.2 DESCRIPTION OF TRAINING DESIGN

Proper design of a training program ensures personnel who perform duties on the Hanford Facility related to WAC 173-303-330(1)(d) are trained to perform their duties in compliance with WAC 173-303. Actual job tasks, referred to as duties, are used to determine training requirements. The first step taken to ensure Hanford Facility personnel have received the proper training is to determine and document the waste management duties by job title/position. The second step compares waste management duties to general waste management unit training curriculum. If general waste management unit training curriculum does not address the waste management duties, the training curriculum is supplemented and/or on-the-job training is provided. The third step summarizes the content of a training course necessary to ensure that the training provided to each job title/position addresses associated waste management duties. The last step is to assign training curriculum to Hanford Facility personnel based on the previous evaluation. The training plan documentation contains this process.

Waste management duties include those specified in Section 8.1 as well as those contained in WAC 173-303-330(1)(d). Training elements of WAC 173-303-330(1)(d) applicable to the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility operations include the following:

Surface Impoundment (Liquid Effluent Retention Facility)

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- Key parameters for automatic waste feed cut-off systems
- Communications or alarm systems
- Response to fires or explosions
- Response to groundwater contamination incident
- *Shutdown of operations.*

Tank system (200 Area Effluent Treatment Facility)

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- Key parameters for automatic waste feed cut-off systems
- Communications or alarm systems
- Response to fires or explosions
- Shutdown of operations.

Containers (200 Area Effluent Treatment Facility)

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- Communications or alarm systems
- Response to fires or explosions

Hanford Facility personnel who perform these duties receive training pertaining to their duties. The training plan documentation described in Section 8.3 contains specific information regarding the types of training *Hanford Facility personnel receive based on the outline in Section 8.1.*

8.3 DESCRIPTION OF TRAINING PLAN

In accordance with HF RCRA Permit (DW Portion), Condition II.C.3, the unit-specific portion of the *Hanford Facility Dangerous Waste Permit Application* must contain a description of the training plan. Training plan documentation is maintained outside of the *Hanford Facility Dangerous Waste Part B Permit Application* and the HF RCRA Permit. Therefore, changes made to the training plan documentation are not subject to the HF RCRA Permit modification process. However, the training plan documentation is prepared to comply with WAC 173-303-330(2).

Documentation prepared to meet the training plan consists of hard copy and/or electronic media as provided by HF RCRA Permit (DW Portion), Condition II.C.1. The training plan documentation consists of one or more documents and/or a training database with all the components identified in the core document.

A description of how training plan documentation meets the three items in WAC 173-303-330(2) is as follows:

1. -330(2)(a): "The job title, job description, and name of the employee filling each job. The job description must include requisite skills, education, other qualifications, and duties for each position."

   Description: The specific Hanford Facility personnel job title/position is correlated to the waste management duties. Waste management duties relating to WAC 173-303 are correlated to training courses to ensure training properly is assigned.

   Only names of Hanford Facility personnel who carry out job duties relating to TSD unit waste management operations at the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility are maintained. Names are maintained within the training plan documentation. A list of Hanford Facility personnel assigned to the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility is available upon request.

Information on requisite skills, education, and other qualifications for job titles/positions are addressed by providing a reference where this information is maintained (e.g., human resources). Specific information concerning job title, requisite skills, education, and other qualifications for personnel can be provided upon request.

2. -330(2)(b): "A written description of the type and amount of both introductory and continuing training required for each position."

   Description: In addition to the outline provided in Section 8.1, training courses developed to comply with the introductory and continuing training programs are identified and described in the training plan documentation. The type and amount of training is specified in the training plan documentation as shown in Table 8-1.

3. -330(2)(c): "Records documenting that personnel have received and completed the training required by this section. The Department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received."

   Description: Training records are maintained consistent with DOE/RL-91-28, Section 8.4.

Table 8-1. 200 Area Liquid Waste Processing Facilities Training Matrix.

	Training Category*						
DOE/RL-91-28 Chapter 8 Training Category	General Hanford Facility Training	Contingency Plan Training	Emergency Coordinator Training	Operations Training			
200 Area Liquid Waste Processing Facilities DWTP implementing category	Orientation Program	Emergency Response (contingency plan)	Emergency Coordinator Training	General Waste Management	Container Management	Tank System Management	Surface Impoundment
Job title/position							
Nuclear Chemical Operators (NCOs)	X	X		X	X	X	X
Shift Technical Advisor (STAs)	X	X					
Shift Operations Manager (SOMs)	X	X	X				
Environmental Compliance Officer	X			X			
Resident Waste Service Provider	X			X	X		
Non-Resident Waste Service Provider	X			X			

* Refer to the 200 Area Liquid Waste Processing Facilities Dangerous Waste Training Plan for a complete description of coursework in each training category. The 200 Area Liquid Waste Processing Facilities Dangerous Waste Training Plan address the 242-A Evaporator, the 200 Area Effluent Treatment Facility, and the Liquid Effluent Retention Facility.

Hanford Facility RCRA Permit Modification Notification Forms
Part III, Chapter 5 and Attachment 35
242-A Evaporator

Index

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
242-A Evaporator	**Part III, Chapter 5 and Attachment 35**

Description of Modification:

Hanford Facility RCRA Permit, Condition III.5.A:

III.5.A. COMPLIANCE WITH APPROVED PERMIT APPLICATION

~~The Permittees shall comply with all requirements set forth in Attachment 35, including the Amendments specified in Condition III.5.B, if any exist. Enforceable portions of the application are listed below; all subsections, figures, and tables included in these portions are also enforceable, unless stated otherwise):~~

Part A, Form 3, Permit Application, Revision 7

Section 2.2	Topographic Map, (non-enforceable sections in Chapter 2 were modified in Class 1 Modification) quarter ending September 30, 2001~~March 31, 2000~~
Section 3.2	Waste Analysis, from Class 1 Modification for quarter ending September 30, 2001
Chapter 4.0	Process Information, from Class 1 Modification for quarter ending December 31, 1999
Chapter 6.0	Procedures to Prevent Hazards, from Class 1 Modification for quarter ending September 30, 2001
Chapter 7.0	Contingency Plan, dated May 1998, from Class 1 Modification for quarter ending September 30, 2000
Chapter 8.0	Personnel Training, from Class 1 Modification for quarter ending September 30, 2001~~0~~
Chapter 11.0	Closure and Financial Assurance, from Class 1 Modification for quarter ending June 30, 1998
Chapter 12.0	Reporting and Recordkeeping
Chapter 13.0	Other Federal and State Laws
Appendix 2A	*Topographic Map*
Appendix 3A	Waste Analysis Plan for 242-A Evaporator, from Class 1 Modification from quarter ending March 31, 1998
Appendix 4A	Engineering Drawings, from Class 1 Modification for quarter ending March 31, 2000
Appendix 4B	The 242-A Evaporator/Crystallizer Tank System Integrity Assessment Report
Appendix 7A	Building Emergency Plan for 242-A Evaporator, from Class 2 Modification dated February 2001. Enforceable portions include Sections 1.5, 3.1, 4.0, 7.1, 7.1.1, 7.1.2, 7.2, 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.5, 7.2.5.1, 7.3, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 11.0, 12.0, and 13.0.
~~Appendix 8A~~	~~200 Area Liquid Waste Processing Facilities Administrative Policies, Dangerous Waste Training Plan from Class 1 Modification for quarter ending June 30, 1998~~

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore 9/10/01	OCT 02 2001		
T. L. Moore Date	G. H. Sanders Date	F. Jamison Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
242-A Evaporator	**Part III, Chapter 5 and Attachment 35**

Description of Modification:

Chapter 2.0, Section 2.1.2.2:

2.1.2.2 Steam Service Supply

Steam needed for the 242-A Evaporator process ~~currently~~ is supplied by ~~the 200 East Area powerhouse, 284-E Building, which supplies a high-pressure steam loop serving many units in the 200 East Area~~package boilers located in the 242-BA Annex west of the 242-A Building. A 610-inch steam line supplies ~~1,55069~~ kilopascals gauge pressure steam and a 2 1/2-inch steam line provides 620 kilopascals gauge pressure steam to the 242-A ~~Evaporator~~ Building. ~~In the future, the 284-E Building will be shut down and steam will be provided to units in the 200 East Area (including the 242-A Evaporator) by several package boilers.~~ The ~~284-E Building and the~~ package boilers and 242-BA Annex are not part of the 242-A Evaporator.

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore Date	G. H. Sanders Date	F. Jamison Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
242-A Evaporator	**Part III, Chapter 5 and Attachment 35**

Description of Modification:

Chapter 8.0:

Remove Chapter 8.0 and replace with the attached Chapter 8.0.

Modification Class: [1 2 3]	*Class 1*	*Class [1]1*	*Class 2*	*Class 3*
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office;	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore Date	G. H. Sanders Date	F. Jamison Date	L.E. Ruud Date

OCT 0 2 2001

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
242-A Evaporator	**Part III, Chapter 5 and Attachment 35**

Description of Modification:

Appendix 3A, Section 6.1.1:

6.1.1 Candidate Feed Tank Sample Collection

Candidate feed tank samples are obtained by using a grab sampling method (e.g. "bottle on a string method") specified in ASTM E300, *Standard Practices for Sampling Industrial Chemicals* (ASTM 1986). The number of lateral sampling locations in candidate feed tanks is limited by the availability of tank risers providing access into the tank. Generally, only a few risers in each tank are actually available for sampling because the risers are dedicated to instrumentation or other uses. Sampling within a vertical column is generally limited only by the depth of waste in the tank. The criteria in Table 6-1-4 ~~is~~ are used when determining the specific sampling locations.

Riser selection is made by numbering the available risers that are at least 4.6 meters ~~(15 feet)~~ from each other and using a random number generator to select which risers will be used. Sample depths are determined by dividing the tank level into 1-foot increments and using a random number generator to determine a depth, which meets the criteria given in Table 6-1-4.

Modification Class: [1][2][3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore Date	G. H. Sanders Date	F. Jamison Date	L.E. Ruud Date

OCT 02 2001

[1] Class 1 *modifications requiring prior Agency approval.*

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
242-A Evaporator	**Part III, Chapter 5 and Attachment 35**

Description of Modification:

Appendix 3A, Section 6.1.2:

6.1.2 Candidate Feed Tank Sampling Quality Assurance and Quality Control

For each candidate feed tank sample, ~~four 100-milliliter bottles are drawn: one bottle for the mixing and compatibility study, two bottles for organic analysis (one each for volatile organic analysis [VOA] and semi-volatile organic analysis [semi-VOA]), and one bottle for inorganic analysis~~ a sample solution is drawn from the sampler's sensor using one or more sample bottles. All sample bottles are precleaned, amber-colored glass bottles sealed with Teflon* caps ~~or~~ septum caps and lined septums ~~except for~~ however the sample bottle for VOA, ~~which is~~ must be sealed with septum cap and lined septum.

For candidate feed tank sampling quality control, one field blank, consisting of ~~four 100-milliliter bottles, is taken during the sample event: two bottles for organic analysis (one each for VOA and semi-VOA) and two bottles for inorganic analysis~~ one or more sample bottles is taken during the sample event. Field blanks are inserted approximately 1-foot into any one of the sample risers used during the sample event. One trip blank, also consisting of ~~two 100-milliliter bottles, is also taken during each sample event: one bottle for VOA and one bottle for semi-VOA~~ one or more sample bottles is taken during each sample event. *Trip blanks are analyzed as* ~~independent samples for VOA for those constituents detected in the field blanks.~~ Field and trip blanks use the same types of sample bottles as the actual samples and are filled with reagent-grade water before shipment to the field.

Preservatives are not used with candidate feed tank samples because of concerns with high radiation exposure that would result from additional handling of sample solutions. It is not practical to refrigerate the bulky, shielded sample pigs and shipping containers. Biological activity, generally the largest problem in environmental samples, is unlikely in candidate feed tank samples because of the high salt content, pH, and radioactivity.

The chain of custody is documented on a data sheet that includes a ~~discrete~~ unique sample number, date and time sample was taken, custody seal number, and signature of the sampler. When possession of the sample is transferred to other persons, such as the shipper or laboratory, the signature of the relinquisher and receiver are recorded, along with date and time of the transfer. The receiver at the laboratory also documents on the data sheet that the sample seal number is correct and the seal is intact. The chain-of-custody data sheets are included in the operating record.

*Teflon is a trademark of E.I. DuPont de Nemours & Company

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1. (Incorporating Permit Condition II.R., Equivalent material change)

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and informational changes.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. L. Moore 9/17/01 Date	G. H. Sanders OCT 0 2 2001 Date	F. Jamison Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification
Part III, Chapter 5 and Attachment 35
242-A Evaporator

Replacement Sections

Index

CONTENTS

APPENDIX

FIGURES

This page intentionally left blank.

2.0 FACILITY DESCRIPTION AND GENERAL PROVISIONS [B AND E]

The 242-A Evaporator is an existing waste management unit located in the 200 East Area (Chapter 1.0).

The 242-A Evaporator treats mixed waste from the Double-Shell Tank System (DST System) (DOE/RL-90-39) by removing water and most volatile organics. The mixed waste is separated into a slurry stream and a process condensate stream.

A more detailed discussion of waste types and manifesting, and the identification of the processes and equipment, are provided in Chapters 3.0 and 4.0 respectively. Although the treatment, storage, and/or disposal of radioactive waste (i.e., source, special nuclear, and by-product materials as defined by the *Atomic Energy Act of 1954*) are not within the scope of *Resource Conservation and Recovery Act* (RCRA) *of 1976* or WAC 173-303, information is provided for general knowledge.

2.1 242-A EVAPORATOR DESCRIPTION [B-1]

The following sections provide general descriptions of the 242-A Evaporator process components (Figure 2-1). Detailed process information for each component is provided in Chapter 4.0.

2.1.1 Process Buildings

The principle process components of the 242-A Evaporator system are located in the 242-A and 242-AB Buildings (Figure 2-2), along with supporting service and operating areas. These buildings enclose the following areas that handle mixed waste:

- Evaporator room
- Condenser room
- Pump room
- Loadout and hot equipment storage room
- Loading room
- Ion exchange column room.

In addition, 242-A and 242-AB Buildings enclose the following areas that do not contain or handle mixed waste.

- Control room (242-AB Building)
- Aqueous makeup (AMU) room
- Heating, ventilation, and air conditioning (HVAC) room
- Miscellaneous offices, lunch room, lavatories, and change rooms.

Figures 2-3 and 2-4 provide floor plans for the first and second floors of the 242-A and 242-AB Buildings and Figure 2-5 provides building elevations.

2.1.1.1 Control Room

The new control room, located in the 242-AB Building, contains the centralized monitoring and control system (MCS). The MCS computer monitors process parameters and controls the parameters where required. Once the configuration parameters and other process control functions are set, the MCS functions independently of the operator, maintaining process parameters within specified ranges by sending output signals that operate specific pieces of equipment (e.g., control valves).

The control room also has instrumentation that monitors alarms at 241-AW, 241-AN, 241-AP, 241-A, and 242-AX Tank Farms, as well as computer terminals for the computer automated surveillance system (CASS) and the laboratory computer system (for access to sample results).

2.1.1.2 Aqueous Makeup Room

The AMU room, located on the south end of the 242-A Building, is used for receiving and mixing chemicals and transferring these into the process. The room contains the antifoam tank (E-102), a 378-liter (100-gallon) tank used to hold antifoam added to the process, the eluant tank (E-101), a 15,900-liter tank that is no longer used, and the decontamination tank (E-104), a 2,350-liter tank used to hold decontamination solutions, such as water or citric acid.

2.1.1.3 Evaporator Room

The evaporator room contains the vapor-liquid separator where evaporative separation and concentration take place, and the reboiler, which heats process solution to the required temperature. The room is set 3.0 meters belowgrade and extends approximately five stories abovegrade with work platforms located at each level.

Personnel entries to the evaporator room are made only for nonroutine maintenance and inspections. Such entries require that the evaporator vessel be drained and flushed with water or decontamination solution to reduce radiation exposure to personnel.

2.1.1.4 Condenser Room

The condenser room, like the adjacent evaporator room, is approximately five stories abovegrade, with the floor set 3.0 meters belowgrade. Condensed vapors from three condensers drain by gravity to the condensate collection tank located on the bottom floor. The condenser room also houses the vacuum condenser system, process condensate pump, condensate recycle pump, process instrumentation, and other equipment.

Also located in the condenser room is the vessel ventilation system. The vessel ventilation system is used to filter and exhaust noncondensable vapors from the 242-A Evaporator process vessels. The system consists of a deentrainment unit, prefilter, heater, high-efficiency particulate air (HEPA) filters, and an exhauster.

2.1.1.5 Pump Room

The pump room is located directly south of the evaporator room and houses the recirculation pump and slurry pump. Equipment in the pump room is designed to be maintained remotely using a bridge-type service crane. Concrete cover blocks (that can be moved by the crane) cover the pump room to provide confinement of contaminants.

A portion of the pump room floor is set 3.0 meters belowgrade to contain potential spills. Located in this section of the floor is a 1.5-meter by 1.5-meter by 1.8-meter deep sump lined with stainless steel to collect spills from various floor drains.

2.1.1.6 Loadout and Hot Equipment Storage Room

The loadout and hot equipment storage room is located adjacent to the pump room and is open to the overhead crane gallery. Failed pump room equipment (pumps, jumpers, etc.) are placed here by crane, decontaminated, and either repaired or packaged for disposal.

A shielded sampling enclosure is located within the room along a portion of the wall that is common with the pump room. Sampling lines run from the pump room to this enclosure. Valve handles outside the enclosure and a shielded viewing window allows the remote collection of feed and slurry samples.

2.1.1.7 Loading Room

The loading room is located in the southwest corner of the 242-A Building. The ceiling of the loading room is formed by a rollup, nylon-vinyl curtain-type door enclosure that can be rolled open to allow transfer of equipment between the loading room and the loadout and hot equipment storage room using the overhead crane.

2.1.1.8 Heating, Ventilation, and Air Conditioning Room

The HVAC room is located on the second floor, directly above the AMU room. The HVAC room contains the supply ventilation equipment for the 242-A Building.

2.1.1.9 Ion Exchange Column Room

The ion exchange enclosure is a small area that holds the ion exchange column for process condensate treatment. The enclosure is located on the north wall of the condenser room.

2.1.1.10 Miscellaneous Offices, Lunch Room, Lavatories, and Change Rooms

The offices, lunch room, lavatories, and change rooms are located on the first floor away from contaminated areas.

2.1.2 External Equipment and Structures

In addition to the equipment and structures housed within the 242-A and 242-AB Buildings, some external equipment and structures are required for 242-A Evaporator operation. These external units include the following:

- The 207-A retention basins
- Steam service supply
- Ventilation exhaust fans and HEPA filter housing
- Raw water service building.

2.1.2.1 The 207-A Retention Basins

The 207-A retention basins consist of six basins constructed of reinforced concrete, each having about 265,000 liters capacity. The north three basins were used to temporarily store non-contact steam condensate from the 242-A Evaporator for sampling before discharge. Subsequently, the steam condensate was routed directly to the 200 Area Treated Effluent Disposal Facility (TEDF) and the 207-A retention basins are no longer used. The three north basins are included in the 242-A Evaporator waste management unit. The three south basins previously held process condensate mixed waste for sampling and discharge. These basins have been removed from service, emptied, and will be closed under a separate closure plan.

2.1.2.2 Steam Service Supply

Steam needed for the 242-A Evaporator process is supplied by package boilers located in the 242-BA Annex west of the 242-A Building. A 10-inch steam line supplies 69 kilopascals gauge pressure steam and a 2 1/2-inch steam line provides 620 kilopascals gauge pressure steam to the 242-A Building The-package boilers and 242-BA Annex are not part of the 242-A Evaporator.

2.1.2.3 Ventilation Exhaust Fans and Filter Housing

The exhaust fans and the HEPA filter system are located north of the 242-A Evaporator. There is no dangerous or mixed waste associated with this exhaust system, which ventilates the various rooms within the building for contamination control.

2.1.2.4 Raw Water Service Building

The raw water service building (242-A-81) houses the valves and strainers for routing raw process water to the 242-A Evaporator. Columbia River water is supplied to the water service building from the 284-E Water Supply Reservoir. Water used to backflush strainers in the water service building is routed to TEDF. No dangerous or mixed waste is present in the raw water service building. The 284-E Water Supply Reservoir is not considered part of the 242-A Evaporator.

2.1.3 Other Environmental Permits

All environmental permits that are required to support operation of the 242-A Evaporator are identified in the *Annual Hanford Site Environmental Permitting Status Report* (e.g., DOE/RL-96-63).

2.1.4 Construction Schedule

Any proposed new construction for mixed waste operations will be managed as described in the Hanford Facility RCRA Permit.

2.2 TOPOGRAPHIC MAP [B-2]

A topographic map (Drawing H-13-000039) is located in Appendix 2A.

2.3 ROADWAY TRAFFIC TO THE 242-A EVAPORATOR [B-4]

General traffic information for the Hanford Facility is presented in the General Information Portion (DOE/RL-91-28). Access to the 242-A Evaporator is provided by 4th Street to the south and Canton Avenue to the east. These roads are constructed of bituminous asphalt that provides satisfactory all-weather access. Paved parking areas are provided for 242-A Evaporator personnel.

2.4 RELEASE FROM SOLID WASTE MANAGEMENT UNITS [E]

Information concerning releases from solid waste management units is discussed in the General Information Portion (DOE/RL-91-28).

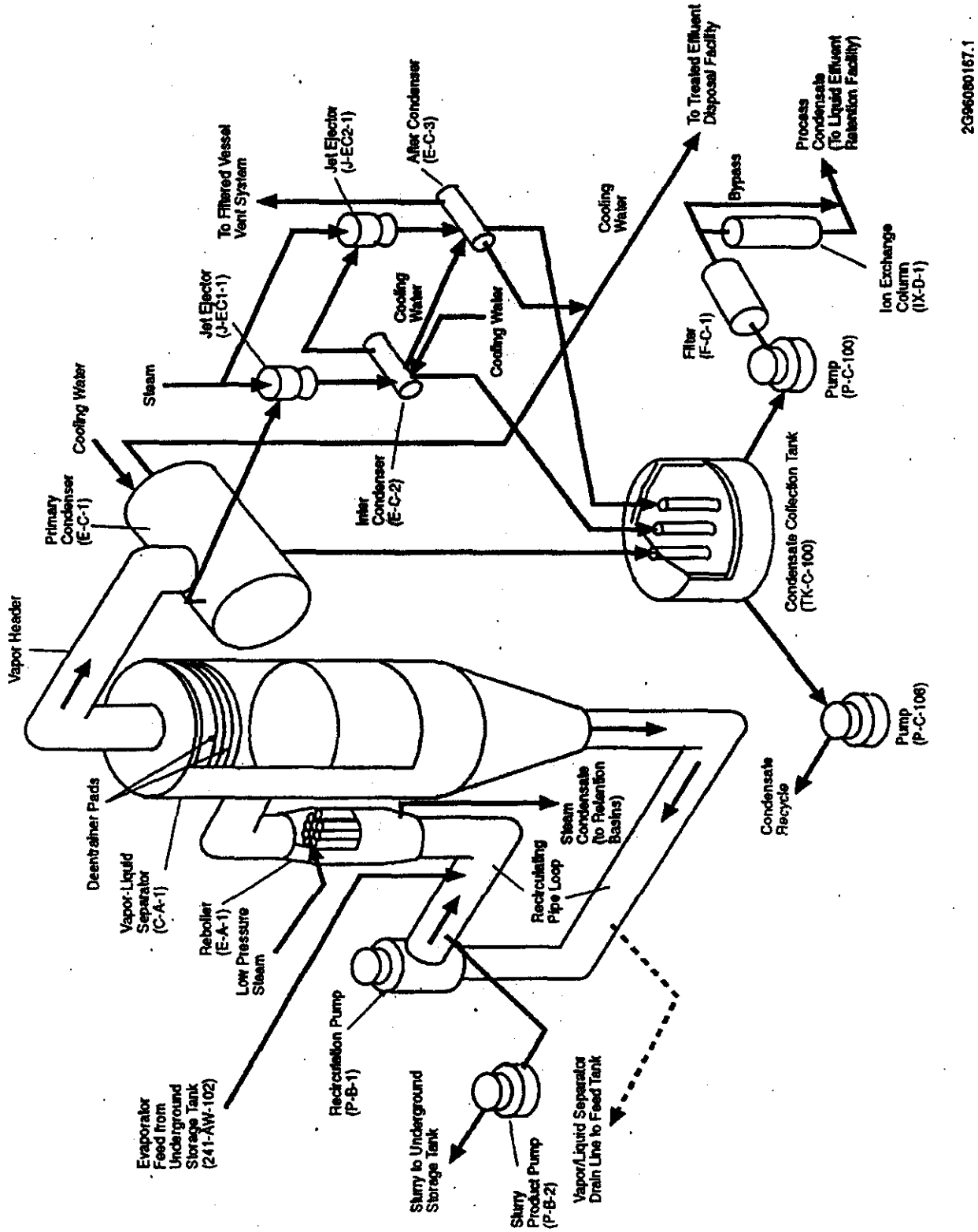


Figure 2-1. 242-A Evaporator Simplified Schematic.

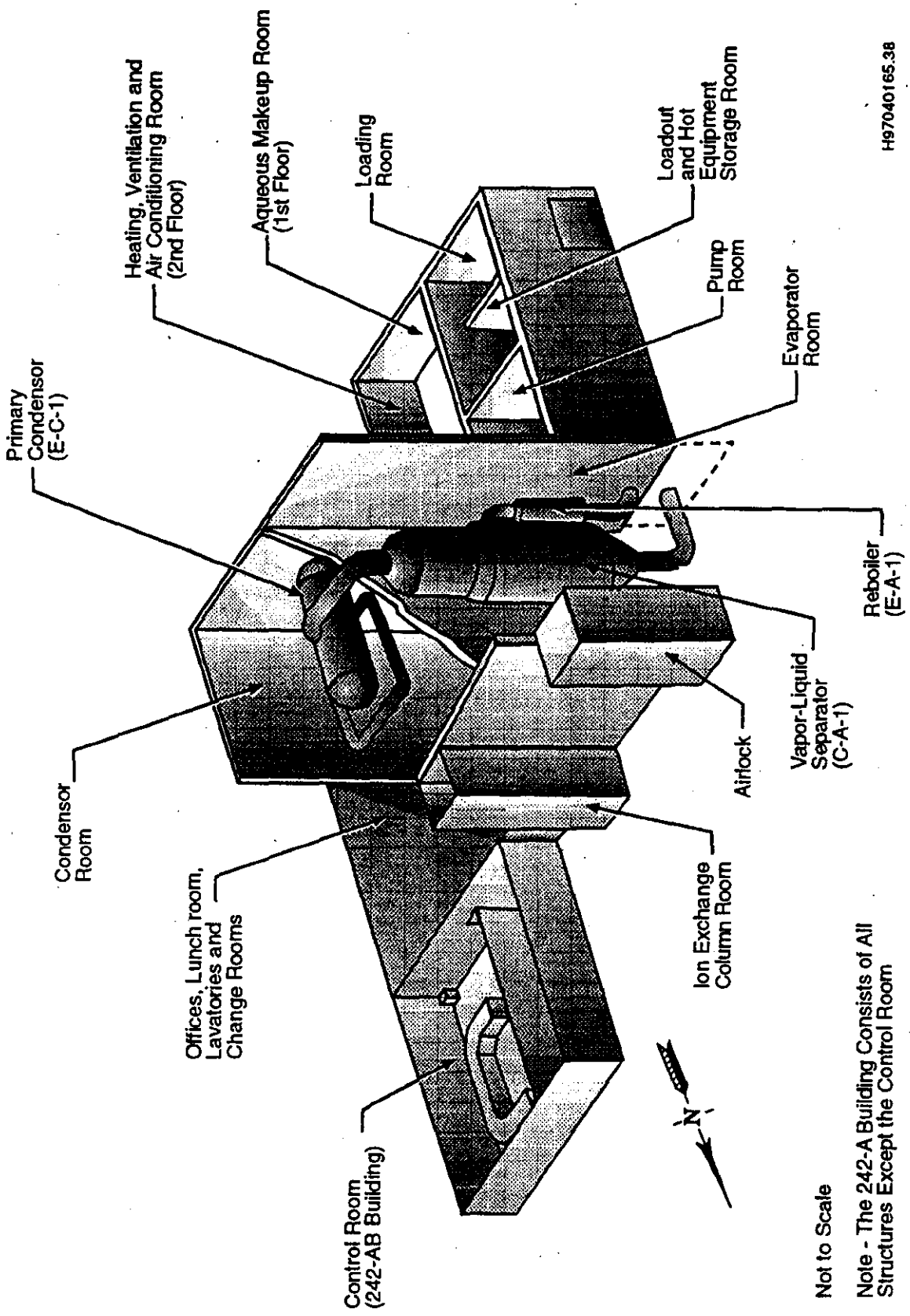


Figure 2-2. 242-A Evaporator Perspective.

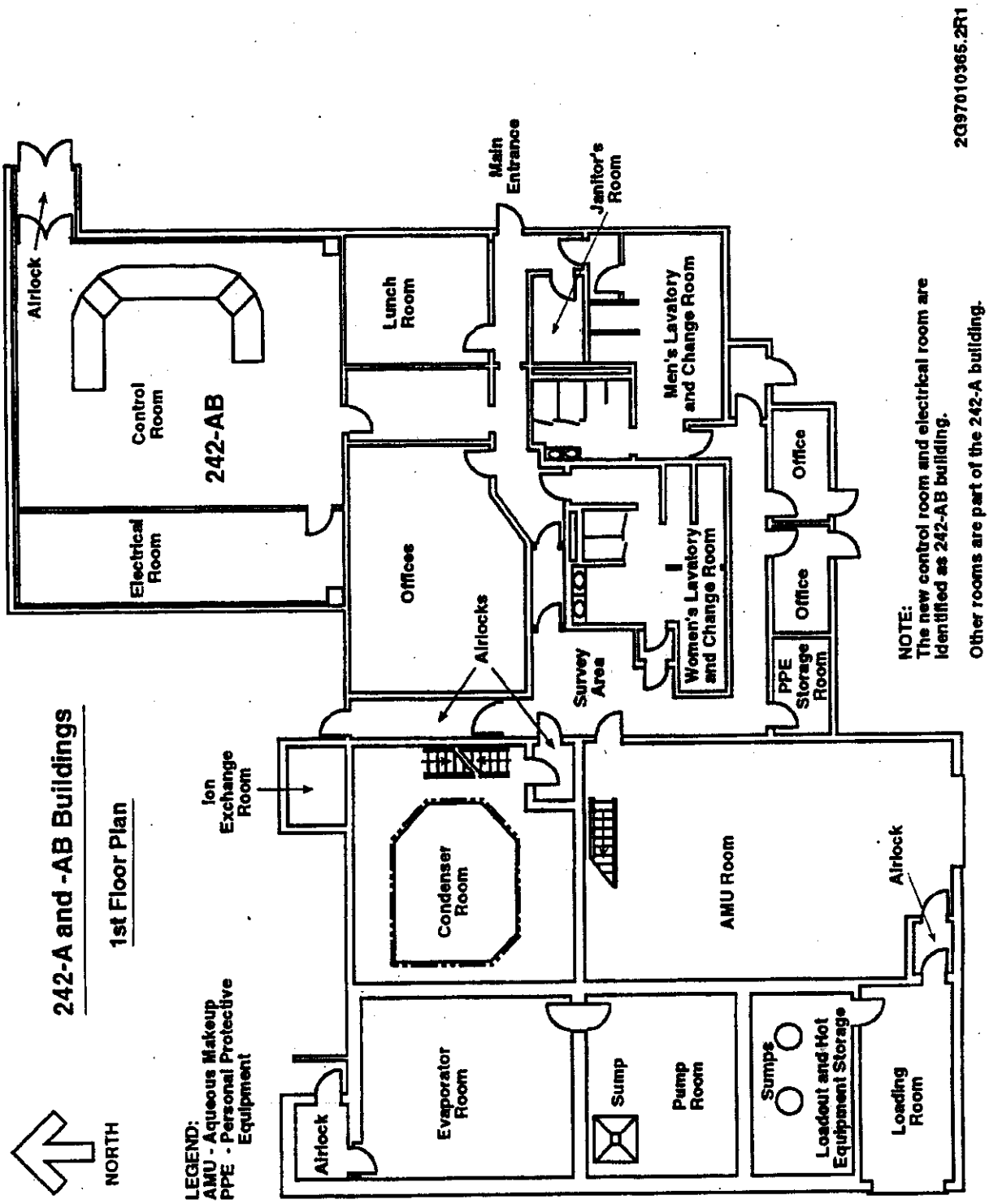


Figure 2-3. 242-A Evaporator First Floor Plan.

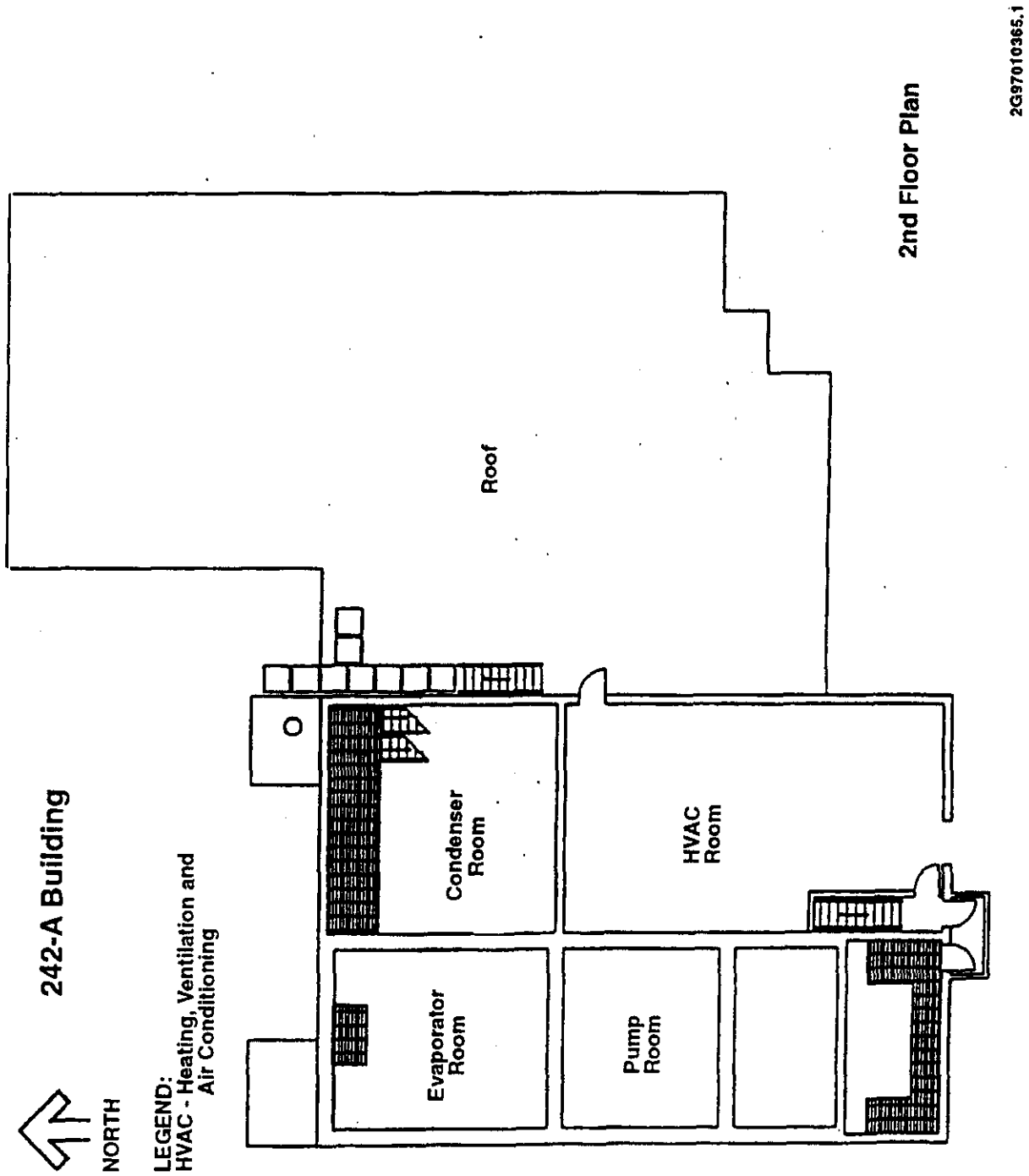


Figure 2-4. 242-A Evaporator Second Floor Plan.

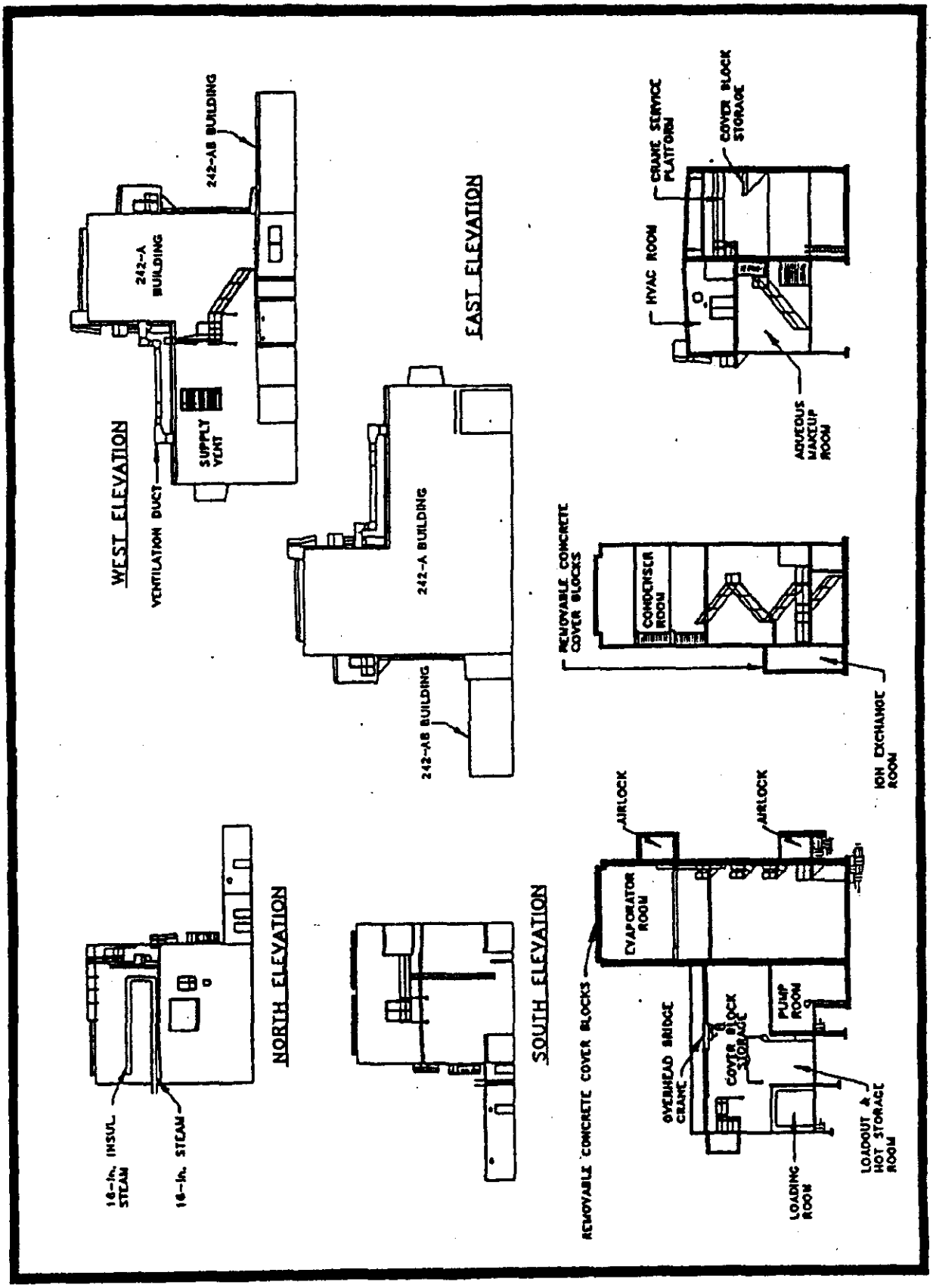


Figure 2-5. Side View of 242-A and 242-AB Buildings.

This page intentionally left blank.

CONTENTS

TABLES

This page intentionally left blank.

8.0 PERSONNEL TRAINING [H]

This chapter discusses personnel training requirements based on WAC 173-303 and the HF RCRA Permit (DW Portion). In accordance with WAC 173-303-806(4)(a)(xii), the *Hanford Facility Dangerous Waste Part B Permit Application* must contain two items: (1) "an outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330" and (2) "a brief description of how training will be designed to meet actual job tasks in accordance with the requirements in WAC 173-303-330(1)(d)." The HF RCRA Permit, (DW portion) Condition II.C (Personnel Training) contains training requirements applicable to Hanford Facility personnel and non-Facility personnel.

Compliance with these requirements at the 242-A Evaporator is demonstrated by information contained both in Chapter 8.0 of DOE/RL-91-28, Attachment 33 of the HF RCRA Permit, and this chapter. This chapter supplements Chapter 8.0 of DOE/RL-91-28.

8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS

The introductory and continuing training programs are designed to prepare personnel to manage and maintain the TSD unit in a safe, effective, and environmentally sound manner. In addition to preparing personnel to manage and maintain TSD units under normal conditions, the training programs ensure that personnel are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response training is consistent with the description of actions contained in Chapter 7.0, Contingency Plan. The introductory and continuing training programs contain the following objectives:

- Teach Hanford Facility personnel to perform their duties in a way that ensures the Hanford Facility's compliance with WAC 173-303

- Teach Hanford Facility personnel dangerous waste management procedures (including implementation of the contingency plan) relevant to the job titles/positions in which they are employed, and

- Ensure Hanford Facility personnel can respond effectively to emergencies.

8.1.1 Introductory Training

Introductory training includes general Hanford Facility training and TSD unit-specific training. General Hanford Facility training is described in DOE/RL-91-28, Section 8.1, and is provided in accordance with the HF RCRA Permit (DW Portion), Condition II.C.2. TSD unit-specific training is provided to Hanford Facility personnel allowing those personnel to work unescorted, and in some cases is required for escorted access. Hanford Facility personnel cannot perform a task for which they are not properly trained, except to gain required experience while under the direct supervision of a supervisor or coworker who is properly trained. Hanford Facility personnel must be trained within 6 months after their employment at or assignment to the Hanford Facility, or to a new job title/position at the Hanford Facility, whichever is later.

General Hanford Facility training: Refer to description in DOE/RL-91-28, Section 8.1.

Contingency Plan training: Hanford Facility personnel receive training on applicable portions of the *Hanford Emergency Management Plan* [Attachment 4 of the HF RCRA Permit (DW Portion)] in general Hanford Facility training. In addition, Hanford Facility personnel receive training on content of the description of actions contained in contingency plan documentation in Chapter 7.0 and Appendix 7.A to be able to effectively respond to emergencies.

Emergency Coordinator training: Hanford Facility personnel who perform emergency coordinator duties in WAC 173-303-360 (e.g., Building Emergency Director) in the Hanford Incident Command System receive training on implementation of the contingency plan and fulfilling the position within the Hanford Incident Command System. These Hanford Facility personnel must also become thoroughly familiar with applicable contingency plan documentation, operations, activities, location, and properties of all waste handled, location of all records, and the unit/building layout.

Operations training: Dangerous waste management operations training (e.g., waste designation training, shippers training) is determined on a unit-by-unit basis and considers the type of waste management unit (e.g., container management unit) and the type of activities performed at the waste management unit (e.g., sampling). For example, training provided for management of dangerous waste in containers is different than the training provided for management of dangerous waste in a tank system. Common training required for compliance within similar waste management units can be provided in general training and supplemented at the TSD unit. Training provided for TSD unit-specific operations is identified in the training plan documentation based on: (1) whether a general training course exists, (2) the training needs to ensure waste management unit compliance with WAC 173-303, and (3) training commitments agreed to with Ecology.

8.1.2 Continuing Training

Continuing training meets the requirements for WAC 173-303-330(1)(b) and includes general Hanford Facility training and TSD unit-specific training.

General Hanford Facility training: Annual refresher training is provided for general Hanford Facility training. Refer to description in DOE/RL-91-28, Section 8.1.

Contingency plan training: Annual refresher training is provided for contingency plan training. Refer to description above in Section 8.1.1.

Emergency coordinator training: Annual refresher training is provided for emergency coordinator training. Refer to description above in Section 8.1.1.

Operations training: Refresher training occurs on many frequencies (i.e., annual, every other year, every 3 years) for operations training. When justified, some training will not contain a refresher course and will be identified as a one-time only training course. The TSD unit-specific training plan documentation will specify the frequency for each training course. Refer to description above in Section 8.1.1.

8.2 DESCRIPTION OF TRAINING DESIGN

Proper design of a training program ensures personnel who perform duties on the Hanford Facility related to WAC 173-303-330(1)(d) are trained to perform their duties in compliance with WAC 173-303. Actual job tasks, referred to as duties, are used to determine training requirements. The first step taken to ensure Hanford Facility personnel have received the proper training is to determine and document the waste management duties by job title/position. The second step compares waste management duties to general waste management unit training curriculum. If general waste management unit training curriculum does not address the waste management duties, the training curriculum is supplemented and/or on-the-job training is provided. The third step summarizes the content of a training course necessary to ensure that the training provided to each job title/position addresses associated waste management duties. The last step is to assign training curriculum to Hanford Facility personnel based on the previous evaluation. The training plan documentation contains this process.

Waste management duties include those specified in Section 8.1 as well as those contained in WAC 173-303-330(1)(d). Training elements of WAC 173-303-330(1)(d) applicable to the 242-A Evaporator operations include the following:

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- Key parameters for automatic waste feed cut-off systems
- Communications or alarm systems
- Response to fires or explosions
- Shutdown of operations.

Hanford Facility personnel who perform these duties receive training pertaining to their duties. The training plan documentation described in Section 8.3 contains specific information regarding the types of training Hanford Facility personnel receive based on the outline in Section 8.1.

8.3 DESCRIPTION OF TRAINING PLAN

In accordance with HF RCRA Permit (DW Portion), Condition II.C.3, the unit-specific portion of the *Hanford Facility Dangerous Waste Permit Application* must contain a description of the training plan. Training plan documentation is maintained outside of the *Hanford Facility Dangerous Waste Part B Permit Application* and the HF RCRA Permit. Therefore, changes made to the training plan documentation are not subject to the HF RCRA Permit modification process. However, the training plan documentation is prepared to comply with WAC 173-303-330(2).

Documentation prepared to meet the training plan consists of hard copy and/or electronic media as provided by HF RCRA Permit (DW Portion), Condition II.C.1. The training plan documentation consists of one or more documents and/or a training database with all the components identified in the core document.

A description of how training plan documentation meets the three items in WAC 173-303-330(2) is as follows:

1. -330(2)(a): "The job title, job description, and name of the employee filling each job. The job description must include requisite skills, education, other qualifications, and duties for each position."

   Description: The specific Hanford Facility personnel job title/position is correlated to the waste management duties. Waste management duties relating to WAC 173-303 are correlated to training courses to ensure training properly is assigned.

   Only names of Hanford Facility personnel who carry out job duties relating to TSD unit waste management operations at the 242-A Evaporator are maintained. Names are maintained within the training plan documentation. A list of Hanford Facility personnel assigned to the 242-A Evaporator is available upon request.

   Information on requisite skills, education, and other qualifications for job titles/positions are addressed by providing a reference where this information is maintained (e.g., human resources). Specific information concerning job title, requisite skills, education, and other qualifications for personnel can be provided upon request.

2. -330(2)(b): "A written description of the type and amount of both introductory and continuing training required for each position."

   Description: In addition to the outline provided in Section 8.1, training courses developed to comply with the introductory and continuing training programs are identified and described in the training plan documentation. The type and amount of training is specified in the training plan documentation as shown in Table 8-1.

3. -330(2)(c): "Records documenting that personnel have received and completed the training required by this section. The Department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received."

Description: Training records are maintained consistent with DOE/RL-91-28, Section 8.4.

Table 8-1. 200 Area Liquid Waste Processing Facilities Training Matrix.

	Training Category*						
DOE/RL-91-28 Chapter 8 Training Category	General Hanford Facility Training	Contingency Plan Training	Emergency Coordinator Training	Operations Training			
200 Area Liquid Waste Processing Facilities DWTP implementing category	Orientation Program	Emergency Response (contingency plan)	Emergency Coordinator Training	General Waste Management	Container Management	Tank System Management	Surface Impoundment
Job title/position							
Nuclear Chemical Operators (NCOs)	X	X		X	X	X	X
Shift Technical Advisor (STAs)	X	X					
Shift Operations Manager (SOMs)	X	X	X				
Environmental Compliance Officer	X			X			
Resident Waste Service Provider	X			X	X		
Non-Resident Waste Service Provider	X			X			

* Refer to the 200 Area Liquid Waste Processing Facilities Dangerous Waste Training Plan for a complete description of coursework in each training category. The 200 Area Liquid Waste Processing Facilities Dangerous Waste Training Plan address the 242-A Evaporator, the 200 Area Effluent Treatment Facility, and the Liquid Effluent Retention Facility.

APPENDIX 3A

WASTE ANALYSIS PLAN FOR 242-A EVAPORATOR

1
2
3
4
5 This page intentionally left blank.

CONTENTS

FIGURES

TABLES

GLOSSARY

ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
CFR	Code of Federal Regulations
C_T	total carbon
DOE	U. S. Department of Energy
DQO	data quality objective
DQO/DEFT	data quality objective/decision error feasibility trials
DSC	differential scanning calorimeter
DST	Double-Shell Tanks
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ETF	200 Area Effluent Treatment Facility
GC	gas chromotography
HDPE	high-density polyethylene
IC_T	total inorganic carbon
IR	infared
LDR	land disposal restriction
LERF	Liquid Effluent Retention Facility
MS	mass spectrometry
N/A	not applicable
QA	quality assurance
QC	quality control
RCRA	*Resource Conservation and Recovery Act of 1976*
RPD	relative percent difference
TCLP	toxicity characteristic leaching procedure
TOC	total organic carbon
TSD	treatment, storage, and/or disposal
VOA	volatile organic analysis
WAC	Washington Administrative Code
WAP	waste analysis plan

METRIC CONVERSION CHART

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76456	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Force			**Force**		
pounds per square inch	6.895	kilopascals	kilopascals	1.4504×10^{-4}	pounds per square inch

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

1.0 INTRODUCTION

This waste analysis plan (WAP) addresses analysis necessary to manage the waste at the 242-A Evaporator according to *Resource Conservation and Recovery Act* (RCRA) requirements included in the *Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste* (Ecology and EPA 1994), *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement, Ecology et.al. 1996), Washington Administrative Code (WAC), Chapter 173-303, and Part 264 of the Code of Federal Regulations.

The WAP is included as Appendix 3A of the *242-A Evaporator Dangerous Waste Permit Application* (DOE/RL-90-42). Modifications of the WAP require modifications of the permit. Permit modifications are discussed in Section I.C of the Hanford Facility RCRA Permit and WAC 173-303-830.

1.1 PURPOSE

The purpose of the WAP is to ensure waste at the 242-A Evaporator is managed properly in accordance with WAC 173-303-300. To ensure the waste analysis is comprehensive, a data quality objectives (DQO) analysis was performed on all streams at the 242-A Evaporator. Sampling and analysis identified in the DQO analysis related to meeting RCRA requirements are included as an integral part of this WAP.

Regulatory and safety issues are addressed in the WAP by establishing boundary conditions for waste to be received and treated at the 242-A Evaporator. The boundary conditions are set by establishing limits for items such as reactivity, waste compatibility, and control of vessel vent organic emissions. Waste that exceeds the boundary conditions would not be acceptable for processing without further actions, such as blending with other waste.

1.2 SCOPE

This WAP discusses RCRA sampling and analysis of the waste in selected DST System tanks to determine the acceptability of the waste for processing at the 242-A Evaporator. Sampling and analysis of DST System waste for other reasons, such as preparation for tank-to-tank transfers, is included in the waste analysis plan for the DST System.

RCRA sampling of the process condensate transferred to the Liquid Effluent Retention Facility (LERF) can be performed at either the 242-A Evaporator or at LERF. A discussion of process condensate sampling at the 242-A Evaporator is included in this WAP, while discussion of process condensate sampling at LERF is included in the *Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility* (DOE/RL-97-03, Appendix 3A).

Samples of other 242-A Evaporator waste streams, such as steam condensate, cooling water, and 242-A-81 backflush water, are taken as required for process control but are excluded from this plan because these streams have been previously characterized and determined to be nondangerous waste streams.

1
2
3
4
5 This page intentionally left blank.

2.0 242-A EVAPORATOR PROCESS DESCRIPTION

The 242-A Evaporator, located in the 200 East Area of the Hanford Site, separates the incoming waste from the DST System into two aqueous streams as described in the following paragraph. Also associated with the 242-A Evaporator are utility waste streams such as cooling water and steam condensate, which are not dangerous waste. Description of the waste processed by the 242-A Evaporator is described in Section 3.0.

The 242-A Evaporator process uses a conventional forced-circulation, vacuum evaporation system to concentrate mixed waste solutions from the DST System tanks. The incoming stream is separated by evaporation into two liquid streams: a concentrated slurry stream and a process condensate stream. The slurry contains the majority of the radionuclides and inorganic constituents. After the slurry is concentrated to the desired amount, the slurry stream is pumped back to the DST System and stored for further treatment. Vapor from the evaporation process is condensed, producing process condensate, which is primarily water with trace amounts of organic material and a greatly reduced concentration of radionuclides. The process condensate is transferred to LERF for storage and treatment. Vacuum for the evaporator vessel is provided by two steam jet ejectors, producing a gaseous vessel vent exhaust. The 242-A Evaporator vessel vent stream is filtered and discharged through an exhaust stack. Figure 2-1 shows a simplified schematic of the 242-A Evaporator process. A more detailed description of the 242-A Evaporator process is provided in Chapter 4.0 of the *Hanford Facility Dangerous Waste Permit Application, 242-A Evaporator* (DOE/RL-90-42).

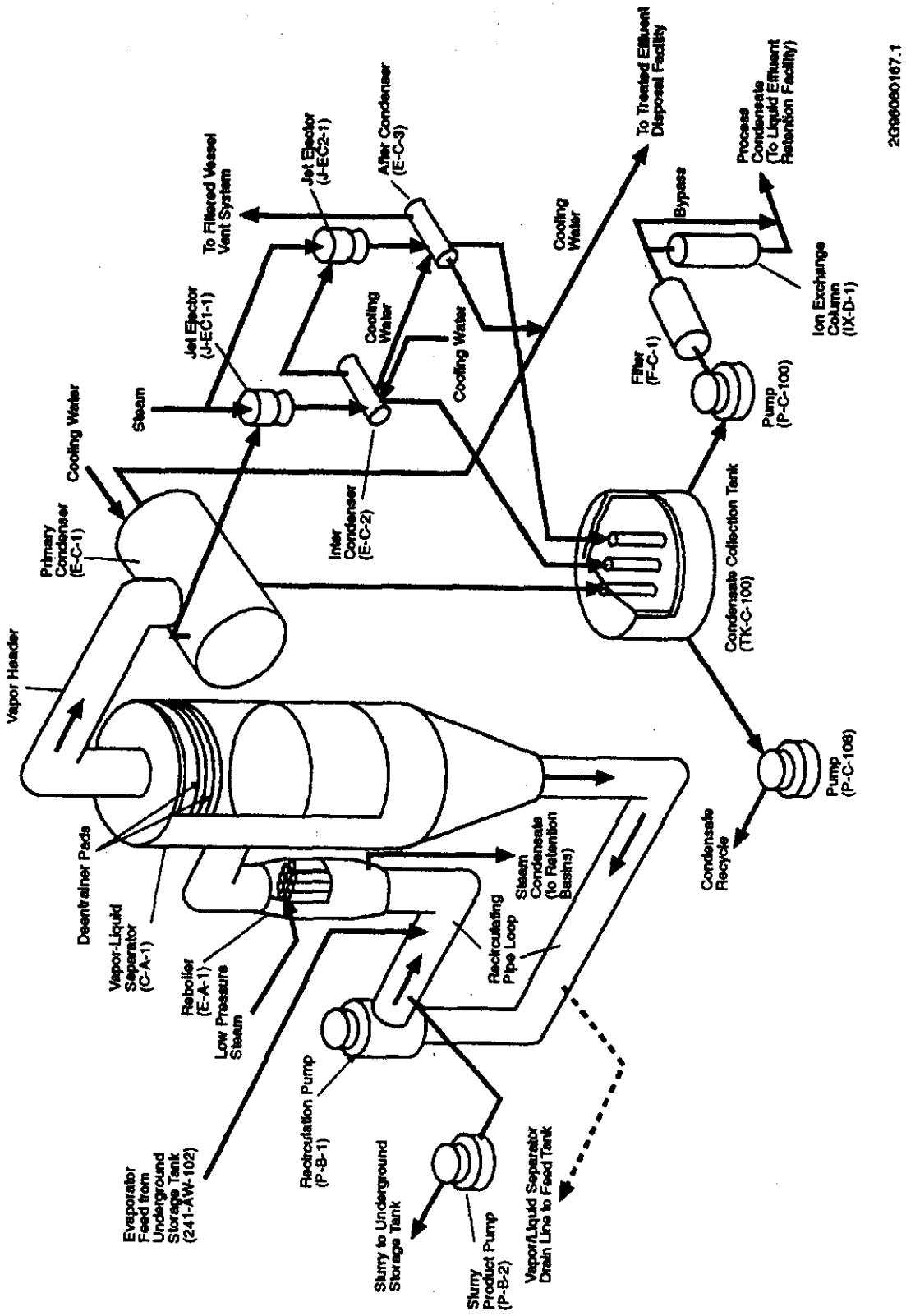


Figure 2-1. 242-A Evaporator Simplified Schematic

3.0 WASTE IDENTIFICATION

All of the waste accepted by the 242-A Evaporator comes from DST System. The waste in the DST System tanks is received from onsite generators, which characterize the waste before transfer to the DST System. Waste characterization is based on analytical data and/or process knowledge. Based on this information, the waste in certain DST System tanks are selected as 'candidates' for processing in the 242-A Evaporator. The contents of these candidate feed tanks are subjected to closer scrutiny and evaluated against 242-A Evaporator waste acceptance criteria before the final tank selection is made. To meet waste acceptance criteria, the contents of several tanks could be blended together in the feed tank (241-AW-102) prior to processing.

3.1 GENERAL CONSTITUENT DESCRIPTION

The only waste stream processed at the 242-A Evaporator is the DST System waste stream, which consists of mixed waste received from various Hanford Site activities. The mixed waste is a radioactive aqueous solution containing dissolved inorganic salts such as sodium, potassium, aluminum, hydroxides, nitrates, and nitrites. The mixed waste in some tanks has detectable levels of heavy metals such as lead, chromium, and cadmium. The radionuclide content includes fission products such as the Sr-90 and Cs-137, and actinide series elements such as uranium and plutonium. Small quantities of ammonia and organics, such as acetone, butanol, and tri-butyl phosphate, could also be present. Waste received in the DST System has been chemically adjusted to ensure the waste is compatible with materials used for construction of the waste tanks and the 242-A Evaporator. The consistency of the waste in the DST System ranges from liquid supernate to thick sludge. Waste fed to the 242-A Evaporator is supernate taken from the DST System; the sludge is not processed through the 242-A Evaporator.

The slurry is an aqueous solution containing the same components as the feed stream with increased concentrations. Most of the volatile constituents are evaporated and transferred to the process condensate. The process condensate is a dilute aqueous solution with ammonia, volatile organics, and trace quantities of radionuclides and inorganic constituents.

3.2 CLASSIFICATION OF WASTE

The waste processed at the 242-A Evaporator is classified as a mixed waste because it contains radioactive components and is a dangerous waste. The concentrated slurry produced by the evaporation process is also a mixed waste because it contains the same mixed waste constituents as the waste feed. The process condensate is classified as a mixed waste because it contains radioactive components and is a listed waste. The process condensate is a listed waste because it is derived from a listed waste.

Analysis of utility streams which do not contact mixed waste solutions, such as cooling water and steam condensate, are conducted per the requirements of the 200 Area Treated Effluent Disposal Facility, which receives these streams. These analyses are not discussed in this plan because these streams are not dangerous waste under WAC 173-303.

3.3 DANGEROUS WASTE NUMBERS

Waste transferred to the 242-A Evaporator could be assigned any of the dangerous waste numbers found in the Part A, Form 3, given in Chapter 1.0 and in the *Hanford Facility Dangerous Waste Part A Permit Application* (DOE/RL-88-21). These numbers are identical to the ones in the Part A, Form 3 for the DST System. Because of blending that occurs within the DST System, waste transferred to the

242-A Evaporator usually does not display all the characteristics found in the Part A, Form 3s, for these TSD units.

Process knowledge and historical data indicate that the slurry stream returning to the DST System contains the same dangerous waste constituents as the waste feed, so the same dangerous waste numbers are applicable to the feed and slurry.

Table 3-1 lists the dangerous waste numbers assigned to the process condensate. The process condensate is designated with the dangerous waste numbers F001 to F005 because the process condensate is derived from treatment of DST System waste assigned these numbers.

Table 3-1. Waste Designation For Process Condensate.

Waste number	Characteristic/Source	Basis for designation
F001	Spent halogenated solvents	Derived from F001 waste
F002	Spent halogenated solvents	Derived from F002 waste
F003	Spent nonhalogenated solvents	Derived from F003 waste
F004	Spent nonhalogenated solvents	Derived from F004 waste
F005	Spent nonhalogenated solvents	Derived from F005 waste
F039	Multi-source leachate from waste disposal operations	Future receipt of waste with the F039 number, derived from F001 through F005.

4.0 WASTE ACCEPTANCE PROCESS

This section describes the actions performed before every campaign to determine if the waste in the DST System tanks is acceptable for treatment at the 242-A Evaporator. This section also describes the actions for sampling the process condensate stream at the 242-A Evaporator, if necessary, to determine if the process condensate is acceptable for treatment at the 200 Area Effluent Treatment Facility (ETF).

4.1 CANDIDATE FEED WASTE ACCEPTANCE PROCESS

Candidate feed tank sampling performed for this WAP is done in the DST System before transfer of the waste to the 242-A Evaporator. Certain DST System tanks are selected as 'candidates' for waste to be processed in the 242-A Evaporator. This section describes the method for determining if the waste in a candidate feed tank is acceptable for processing.

4.1.1 Selecting Candidate Feed Tanks

For each 242-A Evaporator campaign, DST System tanks are selected as candidate feed tanks based on process knowledge of chemical properties with respect to waste acceptance criteria (Section 5.0). After a candidate tank is selected, the waste in the tank is sampled and analyzed and the data evaluated to confirm waste acceptability. Every candidate feed tank is sampled and analyzed to confirm waste acceptability.

4.1.2 Determining the Number of Candidate Feed Tank Samples

Once a candidate feed tank is selected, the number of tank samples to be taken is determined by statistical analysis using existing tank data or data from similar waste in other tanks. Figure 4-1 illustrates the decision logic used to determine the number of samples to be taken. Preliminary concentrations of critical analytes are compared to the waste acceptability limits to statistically determine the number of samples necessary to verify the composition of the waste. The statistical analysis accounts for how close the concentrations of critical analytes are to the limits and the desired confidence level. The closer the concentrations are to the limits, or the greater the desired confidence level, the more samples must be taken. For regulatory compliance, acetone is used as the critical analyte because it is often present at elevated levels. A 95% confidence level is specified for acetone. Critical analytes for process control are also assessed. Acetone analysis is usually not available from preliminary data, so process control analytes (such as nitrate and hydroxide) are often used. The statistical analysis includes the generation of power curve calculations using *Data Quality Objectives Decision Error Feasibility Trials* (EPA 1994b) software developed by the EPA. This software requires input of minimum and maximum expected values, action levels, mean sample results, standard deviations of sample results, and upper and lower confidence levels. The software outputs the minimum number of samples required. In general, three samples are taken as a minimum because taking two samples would require resampling if one sample should be lost or contaminated in the laboratory. A maximum of five samples generally is applied to minimize exposure to sampling personnel.

4.1.3 Assessing Candidate Feed Tank Analysis

When results of the sample analysis are available (and before the waste is processed), a second statistical analysis, similar to the first, is performed with the new analyte data to verify a sufficient number of samples was taken (Figure 4-2).

Candidate feed tank sampling and analysis, in conjunction with acceptance criteria in Section 5.0, are used to assess whether established limits would be exceeded. Based on the results, three possible options are implemented:

- The waste is acceptable for processing at the 242-A Evaporator without further actions.
- The waste is unacceptable for processing as a single batch, but is acceptable if blended with other waste to be processed.
- The waste is unacceptable for processing.

If the waste is suitable for evaporation, it will be transferred to the feed tank (241-AW-102) for processing.

4.2 PROCESS CONDENSATE WASTE SAMPLING PROCESS

RCRA sampling of process condensate is completed per the LERF/ETF WAP (HNF-SD-ENV-WAP-008) before treatment at the ETF. Depending on programmatic needs, this sampling can be performed at the 242-A Evaporator during a campaign or at LERF after the campaign is completed.

Before the start of a 242-A Evaporator campaign, the decision whether process condensate sampling will be performed at the 242-A Evaporator or at LERF is documented in the operating record. Planning for process condensate sampling at the 242-A Evaporator (i.e., number of samples, when samples are taken, etc.) is completed before starting the campaign.

4.2.1 Determining the Number of Process Condensate Samples

The purpose of sampling the process condensate stream at the 242-A Evaporator is to confirm that the stream is acceptable for treatment at the ETF. Before starting a 242-A Evaporator campaign where sampling will be performed at the 242-A Evaporator instead of LERF, characterization of the process condensate will be developed based on process knowledge. Process knowledge includes previous documented process condensate analysis, estimated concentrations based on documented candidate feed tank analysis, etc. RCRA sampling of the process condensate stream at the 242-A Evaporator is performed during the campaign to confirm the characterization is correct. Sampling frequency is determined using the following equation:

> Number of process condensate = N + 1 samples required (per campaign). Where N is the number of candidate feed tanks to be processed during the campaign.

For example, a campaign processing waste from only one candidate feed tank would require two samples, while a campaign processing waste from three candidate feed tanks would require four samples. Sampling is spread approximately evenly through the campaign, allowing for operational events such as unexpected shutdowns and planned maintenance outages. This sample frequency represents a confirmation rate of about one sample every 5 to 8 days of processing. This is reasonable based on the extensive database of previous process condensate analysis. A minimum of two samples are taken to allow averaging of results.

4.2.2 Assessing Process Condensate Analysis

The process condensate sample results are assessed against the requirement in the LERF/ETF WAP (HNF-SD-ENV-WAP-008). The discussion of the waste management decision process for process condensate sampling, including the reevaluation process, is also included in the LERF/ETF WAP.

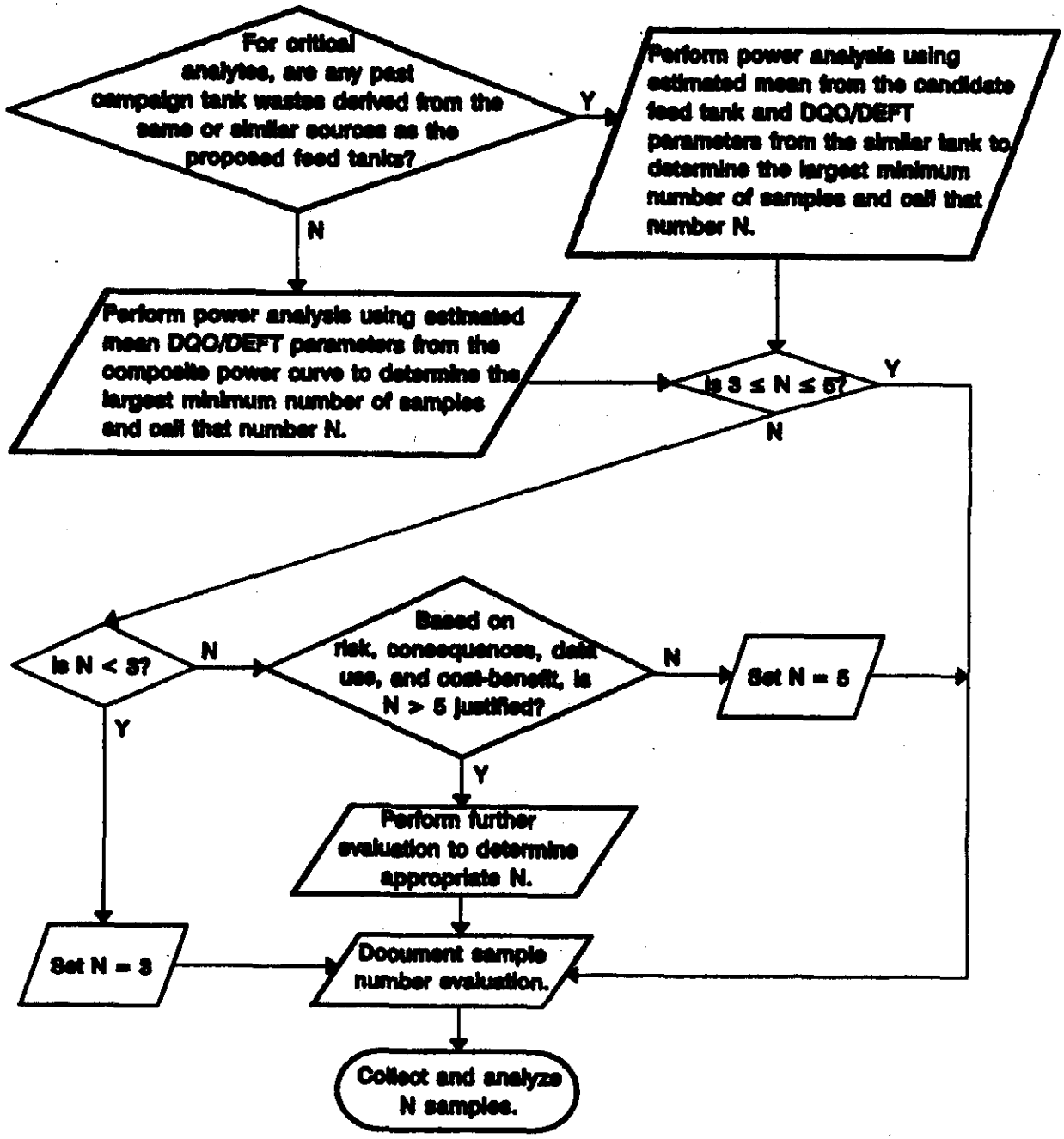


Figure 4-1. Strategy for Determining the Number of Candidate Feed Tank Samples.

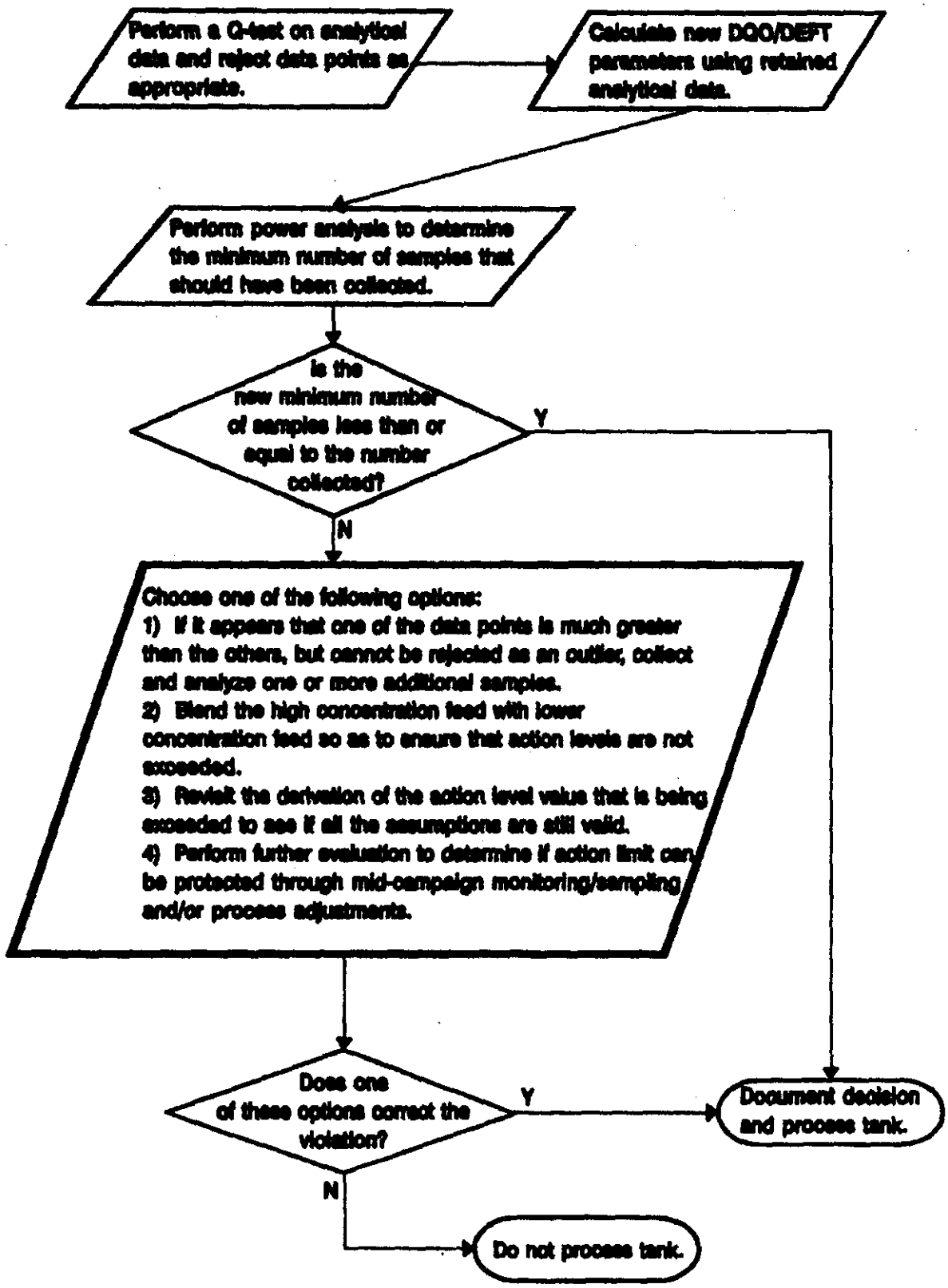


Figure 4-2. Strategy for Verifying the Number of Candidate Feed Tank Samples.

5.0 242-A EVAPORATOR ACCEPTANCE CRITERIA

Acceptance criteria for the 242-A Evaporator have been established from regulatory requirements, operating experience, previous sample analyses, and engineering calculations. Processing criteria are maximum and/or minimum values of a waste analyte that, if exceeded, alert the operator that management of the waste requires further attention. The rationale for selecting a given analyte for inclusion in this WAP, as required by WAC 173-303-300, is indicated in this section.

Additional analyses (such as specific gravity and radionuclide analysis) of the feed tanks, process condensate, and other streams are performed to ensure that the facility is operating within established parameters. This process control sampling and analysis is outside the scope of this plan because it is not used to assess compatibility of the waste with other waste and with the 242-A Evaporator tank systems.

5.1 CANDIDATE FEED TANK WASTE ACCEPTANCE CRITERIA

The following sections discuss waste acceptance criteria for candidate feed tanks to be processed in the 242-A Evaporator.

5.1.1 Exothermic Reactions

WAC 173-303-395 requires waste handling be conducted to prevent an uncontrolled reaction that could damage the tank system structural integrity or threaten human health or the environment. To evaluate the possibility of an uncontrolled reaction at the elevated temperatures in the evaporator vessel, a differential scanning calorimeter (DSC) test is performed on sample of all candidate waste to be processed. DSC measures the amount of heat absorbed or released by a sample as the temperature is increased. Waste exhibiting exotherms below 168°C, or with an absolute value of the exotherm-to-endotherm ratio greater than one, will not be processed in the 242-A Evaporator without further technical evaluation.

5.1.2 Compatibility

WAC 173-303-395 requires waste handling be conducted to prevent an uncontrolled reaction that could damage the tank system structural integrity or threaten human health or the environment. To verify there will be no adverse affects because of mixing the contents of different waste tanks in the feed tank and evaporator vessel, a compatibility evaluation is performed on waste in the candidate feed tanks. As samples from each of the planned waste sources are mixed, observations are made to note any changes in color, temperature, clarity, or any other visually determinable characteristic. This would indicate an unexpected chemical reaction that might have an impact on 242-A Evaporator operations. If such visible changes are observed when mixing samples, the waste would not be processed in the 242-A Evaporator without further technical evaluation.

5.1.3 Organic Constituents

The 242-A Evaporator performs distillation of waste containing organic concentrations greater than 10 parts per million by weight; therefore, organic air emissions are subject to WAC 173-303-690 (which incorporates 40 CFR 264, Subpart AA, by reference). Organic emissions from TSD units on the Hanford Site subject to 40 CFR 264, Subpart AA are controlled to ensure emissions to do not exceed 1.4 kilograms per hour and 2,800 kilograms per year. To ensure these requirements are met, the levels of volatile organics in the 242-A Evaporator feed must be limited to prevent excessive organic emissions during processing. Engineering calculations were used to determine the feed limits given in Table 5-1. The limits include a modifier "(R-1)/R", which adjusts the limits based on the campaign's planned boiloff

rate. R is the ratio of feed flow rate to slurry flow rate. Typically, R is equal to 2, making (R-1)/R equal to 0.5.

In addition analysis of the individual components in Table 5-1, total carbon (C_T) and total inorganic carbon (IC_T) analysis are performed as a screening tool to account for other organic species that might be present in the waste. The value of C_T minus IC_T represents the total organic concentration in the waste. If the C_T minus IC_T limit is exceeded, additional volatile organic species might be present and a more detailed evaluation will be conducted to determine organic emissions out of the vessel vent. The limit for evaluation is 174.4 milligrams per liter, based on the conservative assumption that all organic species present in the waste are as volatile as acetone. Acetone was chosen because of its relatively high volatility and low percentage of carbon.

The level of volatile organics in the feed must also be limited to ensure organic constituents that transfer to the process condensate are compatible with the LERF liner. The high density polyethylene (HDPE) liner used at the LERF is exposed to process condensate that could contain trace quantities of chemicals that could cause degradation of the liner material. Based on the liner manufacturer's compatibility data, the concentration limits in Table 5-2 are imposed on those classes of constituents that could potentially degrade the liner. To ensure that these limits are not exceeded in the process condensate, the concentration limits are applied to the candidate feed tanks as well, with the modifier "(R-1)/R". A C_T minus IC_T analysis, similar to the one described previously, is also applied to the LERF liner limits. The strictest limit for organic species in Table 5-2 is 2,000 milligrams per liter. Assuming the organic is acetone (with its low percentage of carbon), this converts to a carbon value of 1,240 milligrams per liter.

The calculations in Tables 5-1 and 5-2 require use of the 'sum of the fractions' technique. A calculation is performed where the analysis of each constituent is divided by its associated limit to produce a fraction of the limit. If the sum of these fractions is less than 1, the waste meets the requirements in the tables.

5.2 PROCESS CONDENSATE ACCEPTANCE CRITERIA

The waste acceptance criteria for process condensate sampling, including treatability, LERF liner compatibility, compatibility with other waste, etc., is given in the LERF/ETF WAP (HNF-SD-ENV-WAP-008).

Table 5-1. Candidate Feed Tank Limits for Vessel Vent Organic Discharge [a].

Feed constituent	Limit (milligrams per liter) [b, c]
Acetone	174.4 ([R-1]/R)
1-Butanol	452 ([R-1]/R)
2-Butoxyethanol	190.4 ([R-1]/R)
2-Butanone	116 ([R-1]/R)
Tri-butyl phosphate	2.03E+4 ([R-1]/R)
Total carbon and Total inorganic carbon	$(C_T\text{-}IC_T) < 174.4$ ([R-1]/R) (as acetone)

[a] Limits are based on a maximum continuous operating time equivalent to 6 months per year. If total operating time is expected to exceed 6 months per year, the limits must be re-evaluated.

$$\sum_{n=1}^{i}\left(\frac{Conc_n}{LIMIT_n}\right) \leq 1$$

[b] The limits are applied using the sum of the fractions technique: where i is the number of organic constituents detected in analysis of the waste feed tank. Total carbon and total inorganic carbon analysis are not part of the summation.

[c] R is the ratio of feed flow rate to slurry flow rate (typically R = 2).

Table 5-2. Candidate Feed Tank Limits for LERF Liner Compatibility[f].

Chemical family/parameter[a]	Current target compounds	Limit (milligrams per liter)[b,c]
Alcohol/glycol	1-Butanol	500,000 ([R-1]/R)
Alkanone[d]	Sum of acetone, 2-butanone	200,000 ([R-1]/R)
Alkenone[e]	None targeted	2,000 ([R-1]/R)
Aromatic/cyclic hydrocarbon	None targeted	2,000 ([R-1]/R)
Halogenated hydrocarbon	None targeted	2,000 ([R-1]/R)
Aliphatic hydrocarbon	None targeted	500,000 ([R-1]/R)
Ether	2-Butoxyethanol	2,000 ([R-1]/R)
Other hydrocarbons	Tri-butyl phosphate	2,000 ([R-1]/R)
Oxidizers	None targeted	1,000 ([R-1]/R)
Acids, bases, and salts	Ammonia	100,000 ([R-1]/R)
Total carbon and total onorganic carbon	Not applicable	$(C_T\text{-}IC_T) < 1{,}240$ ([R-1]/R) (as acetone)

a If a chemical fits in more than one chemical family, the more restrictive limit applies.

b The limits are applied using the sum of the fractions technique: where i is the number of constituents detected in analysis of the waste feed tank. Total carbon and total inorganic carbon analysis are not part of the summation.

$$\sum_{n=1}^{i}\left(\frac{Conc_n}{LIMIT_n}\right) \le 1$$

c R is the ratio of feed flow rate to slurry flow rate (typically R = 2).

d Ketone containing only saturated alkyl group(s)

e Ketone containing unsaturated alkyl group(s)

f This table is used to ensure process condensate generated from candidate feed tank treatment is within LERF liner compatibility limits

6.0 SAMPLE COLLECTION AND ANALYSIS

This section discusses sampling and analysis, including sampling procedures, sample collection points, sample quality assurance/quality control (QA/QC), and selection of analytes.

6.1 SAMPLE COLLECTION

This section describes collection of candidate feed tank and process condensate samples for RCRA analysis. Candidate feed tank waste is sampled and analyzed before the start of each 242-A Evaporator campaign. Process condensate samples are taken at the 242-A Evaporator only if the decision is made before the start of the campaign that sampling will be done at the 242-A Evaporator instead of LERF.

6.1.1 Candidate Feed Tank Sample Collection

Candidate feed tank samples are obtained by using a grab sampling method (e.g. "bottle on a string method") specified in ASTM E300, *Standard Practices for Sampling Industrial Chemicals* (ASTM 1986). The number of lateral sampling locations in candidate feed tanks is limited by the availability of tank risers providing access into the tank. Generally, only a few risers in each tank are actually available for sampling because the risers are dedicated to instrumentation or other uses. Sampling within a vertical column is generally limited only by the depth of waste in the tank. The criteria in Table 6-1 are used when determining the specific sampling locations.

Riser selection is made by numbering the available risers that are at least 4.6 meters from each other and using a random number generator to select which risers will be used. Sample depths are determined by dividing the tank level into 1-foot increments and using a random number generator to determine a depth, which meets the criteria given in Table 6-1.

6.1.2 Candidate Feed Tank Sampling Quality Assurance and Quality Control

For each candidate feed tank sample, a sample solution is drawn from the sample riser using one or more sample bottles. All sample bottles are precleaned, amber-colored glass bottles sealed with Teflon* caps or septum caps and lined septums; however, the sample bottle for VOA must be sealed with septum cap and lined septum.

For candidate feed tank sampling quality control, one field blank, consisting of one or more sample bottles, is taken during the sample event. Field blanks are inserted approximately 1-foot into any one of the sample risers used during the sample event. One trip blank, also consisting of one or more sample bottles, is taken during each sample event. Trip blanks are analyzed as independent samples for VOA. Field and trip blanks use the same types of sample bottles as the actual samples and are filled with reagent-grade water before shipment to the field.

Preservatives are not used with candidate feed tank samples because of concerns with high radiation exposure that would result from additional handling of sample solutions. It is not practical to refrigerate the bulky, shielded sample pigs and shipping containers. Biological activity, generally the largest problem in environmental samples, is unlikely in candidate feed tank samples because of the high salt content, pH, and radioactivity.

The chain of custody is documented on a data sheet that includes a unique sample number, date and time sample was taken, custody seal number, and signature of the sampler. When possession of the sample is

*Teflon is a trademark of E.I. DuPont de Nemours & Company

transferred to other persons, such as the shipper or laboratory, the signature of the relinquisher and receiver are recorded, along with date and time of the transfer. The receiver at the laboratory also documents on the data sheet that the sample seal number is correct and the seal is intact. The chain-of-custody data sheets are included in the operating record.

6.1.3 Process Condensate Sample Collection

Process condensate samples, when performed at 242-A Evaporator instead of LERF, are taken from the process condensate transfer line in the condenser room of the 242-A Building. Grab sampling is performed during the campaign on the transfer line downstream of the ion exchange column at the SAMP-RC3-2 sampler or other sample port. Samples of process condensate are collected in a manner consistent with SW-846 procedures (EPA 1986) as documented in sampling procedures, which are maintained and implemented by unit personnel.

6.1.4 Process Condensate Sampling Quality Assurance and Quality Control

For information on process condensate sample collection, including the number and types of sample bottles, sampling QA/QC, etc., refer to the LERF/ETF WAP (HNF-SD-ENV-WAP-008).

6.2 ANALYTE SELECTION AND RATIONALE

The DQO analysis for the 242-A Evaporator examined the data needs for sampling the candidate feed tanks and determined that the analyses in Table 6-2 should be conducted to satisfy WAC 173-303-300 requirements. Table 6-2 also contains the rationale for these parameters being selected. Section 5.0 provides additional detail on the rationale.

For information on process condensate sample analyte selection and rationale, refer to the LERF/ETF WAP (HNF-SD-ENV-WAP-008).

Table 6-1. Candidate Feed Tank Sample Point Selection.

Number of samples	Location of sample points
Two samples	One sample taken from the upper half of the waste from one riser and the other sample taken from the lower half of the waste from another riser.
Three samples	Two Samples taken from one riser (one from the top half and the other from the bottom half of the waste) and one sample from another riser
Four samples	Two samples taken from each of two separate risers. One sample is to be taken from the top half of the waste and one from the bottom half of the waste from each of the selected risers.
Five samples	Same as for four samples except one sample from either the top or bottom half of the tank will be taken from a third riser

Table 6-2. Analytes for Candidate Feed Tanks.

Parameter	Test technique	Analyte	Rationale
Exotherm	Differential scanning calorimeter	Temperature and energy	Verify the waste will not undergo an exothermic reaction (Section 5.1.1).
Compatibility test	Mixing and compatibility study	Visual physical changes	Verify the waste is chemically compatible (Section 5.1.2).
Organic compounds	Gas chromatograph/ mass spectrometer	Acetone, 1-Butanol, 1-Butoxyethanol, 1-Butanone, Tri-butyl phosphate	Used in calculations to verify that vessel vent emissions will not exceed regulatory limits and to prevent compatibility problems with the LERF liner (Section 5.1.3).
	Carbon coulometric detector	Total carbon, Total inorganic carbon	Used in calculations to verify that vessel vent emissions will not exceed regulatory limits and to prevent compatibility problems with the LERF liner (Section 5.1.3).
Ammonia	Ion selective electrode	Ammonia	To prevent compatibility problems with the LERF liner (Section 5.1.3).

7.0 ANALYTICAL METHODS AND QUALITY ASSURANCE AND QUALITY CONTROL

This section provides information on the analytical methods and QA/QC for candidate feed tank samples, including discussions concerning laboratory selection and analytical methods. For information on process condensate analytical methods and QA/QC, refer to the LERF/ETF WAP (HNF-SD-ENV-WAP-008).

7.1 LABORATORY SELECTION

Because of the highly radioactive nature of the samples, it is anticipated that candidate feed tank sample analyses will be conducted at the 222-S Laboratory Complex. Other laboratories at the Hanford Facility could be used provided they are equipped to handle such samples. Laboratory selection depends on availability, analytical needs, and the ability of the laboratory to meet permit and quality assurance requirements.

7.2 ANALYTICAL METHODS

The analytical methods that must be followed for RCRA sampling of the candidate feed tanks are included in Table 6-2. Performance-based specifications rather than procedure-based specifications are used for determining the appropriate analytical methods. This allows for necessary adjustments to the methods for Hanford Facility-specific issues, related to high radioactivity of the sample matrix, while ensuring acceptable data quality. Because of the high radioactivity, the analytical method will in some cases deviate from those in national standards such as *Test Methods For Evaluating Solid Waste*, SW-846 (EPA 1986) and *Standard Methods for the Examination of Water and Waste Water* (AWWA 1989).

7.3 LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL

Candidate feed tank analytical and sampling methods conducted as part of this plan meet the data quality requirements contained in Table 7-2. Quality control check samples (i.e., calibration samples and/or laboratory control samples) generally are performed once per sample event (e.g., once for all samples from one candidate feed tank). Matrix spike and duplicate analysis are performed once per sample event for all methods except differential scanning calorimetry (DSC). A duplicate analysis is performed for DSC analysis to determine method precision. Accuracy for DSC is evaluated by using the laboratory control standard.

The QA/QC program for sampling and analysis related to this unit must, at a minimum, comply with the applicable Hanford Site standard requirements and the regulatory requirements. All analytical data will be defensible and will be traceable to specific, related quality control samples and calibrations.

This page intentionally left blank.

Table 7-1. Analytical Methods for Candidate Feed Tank Stream Analytes.

Category	Analyte	Performance-based analytical methods	Basis for method	Equipment/Method
Organics	Acetone 2-Butanol 2-Butanone	Purge and trap and GC/MS (VOA)	SW-846 Method 8260	A diluted sample is purged with nitrogen or helium and organic vapors are trapped in an adsorbent column. The column is desorbed at 180°C into a 30-m long wide- or narrow-bore capillary column. The GC column is heated/desorbed into an MS for analysis.
	2-Butoxyethanol Tri-butyl phosphate	Solvent extraction and GC/MS (semi-VOA)	SW-846 Method 3520B and 8270A	A diluted sample is adjusted to pH <2 (pH <6 in some cases) using sulfuric acid solution. The sample is placed in a continuous liquid-liquid extractor using methylene chloride as the extractant. The extractant is placed in an evaporator and volume is reduced. The extractant is injected into a GC/MS for analysis.
Inorganic	Ammonia	Ion selective electrode	AWWA Method 4500-NH_3	The sample is preserved by the addition of hydrochloric acid solution to pH <2. For analysis, a diluted sample is made alkaline by sodium hydroxide solution. The ammonia is measured by an ammonia gas sensing electrode. A standard ammonium chloride solution is added and measured by the electrode in two stages. Based on the three readings, an ammonia concentration is calculated.
Other	Exotherm	Differential scanning calorimeter	N/A	A sample is placed in the DSC unit and heated to 500°C. The differential heat flow between the sample and a reference pan is monitored by thermocouples. A duplicate sample is run on the equipment.
	Mixing and compatibility study	Lab specific	N/A	Solution from each sample are mixed and visually checked for gas evolution, heat generation, precipitation, dissolution of solids, color change, clarity, and any other observable characteristics.

Table 7-1. Analytical Methods for Candidate Feed Tank Stream Analytes.

Category	Analyte	Performance-based analytical methods	Basis for method	Equipment/Method
	Total carbon	Combustion with IC_T/TOC coulometric detection OR Persulfate oxidation with IC_T/TOC coulometric detection	Combustion and persulfate treatment: AWWA Method 5310. Coulometry: ASTM D4129 (AWWA approval pending)	A diluted sample is injected into a furnace heated to 800°C while purged with oxygen. The furnace converts carbon to carbon dioxide, which is carried by the oxygen. The gas sample passes through adsorbent columns to remove acid vapors, sulfur oxides and nitrogen oxides. The carbon dioxide is absorbed in an organic solution and measured with a coulometric carbon analyzer. OR: A diluted sample is acidified with sulfuric acid, converting inorganic carbon to carbon dioxide. The sample purged with oxygen, stripping the carbon dioxide. Then, persulfate is added to the sample to oxidize the organic carbon. The sample is again acidified with sulfuric acid and purged with oxygen. The gas samples from both steps pass through an adsorbent column to remove acid vapors, sulfur oxides and nitrogen oxides. The carbon dioxide is absorbed in an organic solution and measured with a coulometric carbon analyzer.
	Total Inorganic Carbon	Acidification with IC_T/TOC coulometric detection	Acidification: AWWA Method 5310. Coulometry: ASTM D4129 (AWWA approval pending)	A diluted sample is acidified with sulfuric acid/sulfamic acid, converting inorganic carbon to carbon dioxide. The sample purged with oxygen, stripping the carbon dioxide. The gas sample passes through scrubbers to remove acid vapors, sulfur oxides and nitrogen oxides. The carbon dioxide is absorbed in an organic solution and measured with a coulometric carbon analyzer.

GC/MS - gas chromatography/mass spectrometry
VOA - volatile organic analysis
IC_T - total inorganic carbon
TOC - total organic carbon

Table 7-2. Quality Assurance Requirements for Candidate Feed Tank Stream Analytes.

Category	Analyte	Estimated quantitation limit (matrix specific)	Precision (RPD between duplicates), %	Accuracy (recovery of matrix spike[1]), %	Action level [2]
Organics	Acetone	28 mg/L	<25	40-110	> 87 mg/L[3]
	1-Butanol	20 mg/L	<25	30-110	> 226 mg/L[3]
	2-Butoxyethanol	30 mg/L	<25	30-110	> 95.2 mg/L[3]
	2-Butanone (methyl ethyl ketone)	18 mg/L	<25	40-110	> 58 mg/L[3]
	Tri-butyl phosphate	50 mg/L	<25	40-125	> 1.015E+4 mg/L[3]
Inorganic	Ammonia	400 μg/ml	<20	75-125	> 50,000 mg/L
Other	Exotherm	None	<20[4]	Not applicable [4]	< 168 °C or absolute value of ratio of exotherm to endotherm > 1
	Mixing and compatibility study	Not applicable	Not Applicable	Not Applicable	Visual: unusual changes in color, temperature, clarity, etc.
	Total carbon	25 μg/mL	<20	75-125	C_T-IC_T > 87 mg/L
	Total inorganic carbon	25 μg/mL	<20	75-125	C_T-IC_T > 87 mg/L

1. Reserved.
2. In deriving the action levels, the ratio of feed flow rate to slurry flow rate (R) is assumed to be 2.
3. For organic species limits, sum of the fractions rule applies (refer Tables 5-1 and 5-2). Total carbon and total inorganic carbon are not included in the summation of organics.
4. Precision for this method is evaluated by the deviation between sample (unspiked) and sample replicate. Accuracy for DSC is evaluated by using the laboratory control standard.

RPD - relative percent difference
C_T - total inorganic carbon
IC_T - total inorganic carbon
mg/L - milligram per liter
μg/L - microgram per liter

This page intentionally left blank.

8.0 REFERENCES

ASTM, 1986, *Standard Practice for Sampling Industrial Chemicals*, ASTM E300-86, American Society for Testing and Materials, West Conshohocken, Pennsylvania, updated periodically.

ASTM, 1988, *Total and Organic Carbon in Water by High Temperature Oxidation and Coulometric Detection*, ASTM D4129-88, American Society for Testing and Materials, West Conshohocken, Pennsylvania, updated periodically.

AWWA, 1989, *Standard Methods for the Examination of Water and Wastewater*, 17th edition, American Public Health Association/America Water Works Association, Washington, D.C., updated periodically.

DOE/RL, 1988, *Hanford Facility Dangerous Waste Part A Permit Application*, DOE/RL-88-21, U.S. Department of Energy Richland Field Office, Richland, Washington, updated periodically.

DOE/RL-97-03, *Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility*, Revision 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology and EPA, 1994, *Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* Permit Number WA7890008967, Washington State Department of Ecology, Olympia, Washington and U.S. Environmental Protection Agency Region 10, Seattle Washington.

Ecology, EPA, and DOE, 1996, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, Olympia, Washington, U.S. Environmental Protection Agency Region 10, Seattle, Washington, and U.S. Department of Energy Richland Operations Office, Richland, Washington.

EPA, 1986, *Test Methods For Evaluating Solid Waste Physical/Chemical Methods*, SW-846, U.S. Environmental Protection Agency, Washington, D.C., updated periodically.

EPA, 1994a, *Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Wastes, A Guidance Manual*, PB94-963603, OSWER 9938.4-03, U.S. Environmental Protection Agency, Washington D.C.

EPA, 1994b, *Data Quality Objectives Decision Error Feasibility Trials*, EPA QA/G-4D, Version 4.0, U.S. Environmental Protection Agency, Washington D.C.

This page intentionally left blank.

Hanford Facility RCRA Permit Modification Notification Forms
Part III, Chapter 6 and Attachment 36
325 Hazardous Waste Treatment Units

Index

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
325 Hazardous Waste Treatment Units	**Part III, Chapter 6 and Attachment 36**

Description of Modification:

Hanford Facility RCRA Permit, Condition III.6.A:

III.6.A. COMPLIANCE WITH APPROVED PERMIT APPLICATION

The Permittees shall comply with all requirements set forth in Attachment 36, including the Amendments specified in Condition III.6.B. Enforceable portions of the application are listed below. All subsections, figures, and tables included in these portions are also enforceable, unless stated otherwise:

Part A, Form 3, Permit Application, Revision 4A, June 2000

Chapter 2.2	Topographic Map from Class 1 Modification for quarter ending June 30, 1998
Chapter 3.0	Waste Characteristics from Class 1 Modification for quarter ending December 31, 1998
Chapter 4.0	Process Information from Class 1 Modification for quarter ending September 30, 1999
Chapter 6.0	Procedures to Prevent Hazards from Class 1 Modification for quarter ending June 30, 1999
Chapter 7.0	Contingency Plan, from Class 1 Modification for quarter ending June 30, 2000
Chapter 8.0	Personnel Training, from Class 1 Modification for quarter ending September 30, 2001
Chapter 11.0	Closure and Financial Assurance from Class 1 Modification for quarter ending March 31, 2000
Chapter 12.0	Reporting and Recordkeeping from Class 1 Modification for quarter ending December 31, 1998
Chapter 13.0	Other Relevant Laws from Class 1 Modification for quarter ending December 31, 1998
Appendix 3A	325 HWTUs Waste Analysis Plan from Class 1 Modification for quarter ending June 30, 1999
Appendix 4A	Engineering Drawings
Appendix 7A	Building Emergency Plan for the 325 HWTUs, from Class 1 Modification for quarter ending June 30, 2000
~~Appendix 8A~~	~~Training from Class 1 Modification for quarter ending December 31, 1998~~

Modification Class: [1][2][3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and Informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
A.K. Ikenberry 9-17-01	R.F. Christensen 10/2/01		
A.K. Ikenberry Date	R.F. Christensen Date	F. Jamison Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] *If the proposed modification does not match any modification listed in* WAC 173-303-830 Appendix I, *then the proposed* modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **325 Hazardous Waste Treatment Units**	Permit Part & Chapter: **Part III, Chapter 6 and Attachment 36**

Description of Modification:

Chapter 8.0

Remove Chapter 8 and replace with the attached Chapter 8.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and Informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
A.K. Ikenberry 9-17-01	R.F. Christensen 10/2/01		
A.K. Ikenberry Date	R.F. Christensen Date	F. Jamison Date	L.E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
325 Hazardous Waste Treatment Units	**Part III, Chapter 6 and Attachment 36**

Description of Modification:

Appendix 8A:

Remove Appendix 8A.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
A.K. Ikenberry	9-17-01 Date	R.F. Christensen	10/1/01 Date	F. Jamison	Date	L.E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Index

CONTENTS

TABLES

This page intentionally left blank.

8.0 PERSONNEL TRAINING [H]

This chapter discusses personnel training requirements based on WAC 173-303 and the HF RCRA Permit (DW Portion). In accordance with WAC 173-303-806(4)(a)(xii), the *Hanford Facility Dangerous Waste Part B Permit Application* must contain two items: (1) "an outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330" and (2) "a brief description of how training will be designed to meet actual job tasks in accordance with the requirements in WAC 173-303-330(1)(d)." The HF RCRA Permit, (DW portion) Condition II.C (Personnel Training) contains training requirements applicable to Hanford Facility personnel and non-Facility personnel.

Compliance with these requirements at the 325 HWTUs is demonstrated by information contained both in Chapter 8.0 of DOE/RL-91-28, Attachment 33 of the HF RCRA Permit, and this chapter. This chapter supplements Chapter 8.0 of DOE/RL-91-28.

8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS

The introductory and continuing training programs are designed to prepare personnel to manage and maintain the TSD unit in a safe, effective, and environmentally sound manner. In addition to preparing personnel to manage and maintain TSD units under normal conditions, the training programs ensure that personnel are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response training is consistent with the description of actions contained in Chapter 7.0, Contingency Plan. The introductory and continuing training programs contain the following objectives:

- Teach Hanford Facility personnel to perform their duties in a way that ensures the Hanford Facility's compliance with WAC 173-303
- Teach Hanford Facility personnel dangerous waste management procedures (including implementation of the contingency plan) relevant to the job titles/positions in which they are employed, and
- Ensure Hanford Facility personnel can respond effectively to emergencies.

8.1.1 Introductory Training

Introductory training includes general Hanford Facility training and TSD unit-specific training. General Hanford Facility training is described in DOE/RL-91-28, Section 8.1, and is provided in accordance with the HF RCRA Permit (DW Portion), Condition II.C.2. TSD unit-specific training is provided to Hanford Facility personnel allowing those personnel to work unescorted, and in some cases is required for escorted access. Hanford Facility personnel cannot perform a task for which they are not properly trained, except to gain required experience while under the direct supervision of a supervisor or coworker who is properly trained. Hanford Facility personnel must be trained within 6 months after their employment at or assignment to the Hanford Facility, or to a new job title/position at the Hanford Facility, whichever is later.

General Hanford Facility training: Refer to description in DOE/RL-91-28, Section 8.1.

Contingency Plan training: Hanford Facility personnel receive training on applicable portions of the *Hanford Emergency Management Plan* [Attachment 4 of the HF RCRA Permit (DW Portion)] in general Hanford Facility training. In addition, Hanford Facility personnel receive training on content of the description of actions contained in contingency plan documentation in Chapter 7.0 and Appendix 7.A to be able to effectively respond to emergencies.

Emergency Coordinator training: Hanford Facility personnel who perform emergency coordinator duties in WAC 173-303-360 (e.g., Building Emergency Director) in the Hanford Incident Command System receive training on implementation of the contingency plan and fulfilling the position within the Hanford Incident Command System. These Hanford Facility personnel must also become thoroughly familiar with applicable contingency plan documentation, operations, activities, location, and properties of all waste handled, location of all records, and the unit/building layout.

Operations training: Dangerous waste management operations training (e.g., waste designation training, shippers training) will be determined on a unit-by-unit basis and shall consider the type of waste management unit (e.g., container management unit) and the type of activities performed at the waste management unit (e.g., sampling). For example, training provided for management of dangerous waste in containers will be different than the training provided for management of dangerous waste in a tank system. Common training required for compliance within similar waste management units can be provided in general training and supplemented at the TSD unit. Training provided for TSD unit-specific operations will be identified in the training plan documentation based on: (1) whether a general training course exists, (2) the training needs to ensure waste management unit compliance with WAC 173-303, and (3) training commitments agreed to with Ecology.

8.1.2 Continuing Training

Continuing training meets the requirements for WAC 173-303-330(1)(b) and includes general Hanford Facility training and TSD unit-specific training.

General Hanford Facility training: Annual refresher training is provided for general Hanford Facility training. Refer to description in DOE/RL-91-28, Section 8.1.

Contingency plan training: Annual refresher training is provided for contingency plan training. Refer to description above in Section 8.1.1.

Emergency coordinator training: Annual refresher training is provided for emergency coordinator training. Refer to description above in Section 8.1.1.

Operations training: Refresher training occurs on many frequencies (i.e., annual, every other year, every 3 years) for operations training. When justified, some training will not contain a refresher course and will be identified as a one-time only training course. The TSD unit-specific training plan documentation will specify the frequency for each training course. Refer to description above in Section 8.1.1.

8.2 DESCRIPTION OF TRAINING DESIGN

Proper design of a training program ensures personnel who perform duties on the Hanford Facility related to WAC 173-303-330(1)(d) are trained to perform their duties in compliance with WAC 173-303. Actual job tasks, referred to as duties, are used to determine training requirements. The first step taken to ensure Hanford Facility personnel have received the proper training is to determine and document the waste management duties by job title/position. The second step compares waste management duties to general waste management unit training curriculum. If general waste management unit training curriculum does not address the waste management duties, the training curriculum is supplemented and/or on-the-job training is provided. The third step summarizes the content of a training course necessary to ensure that the training provided to each job title/position addresses associated waste management duties. The last step is to assign training curriculum to Hanford Facility personnel based on the previous evaluation. The training plan documentation contains this process.

Waste management duties include those specified in Section 8.1 as well as those contained in WAC 173-303-330(1)(d). Training elements of WAC 173-303-330(1)(d) applicable to the 325 HWTUs operations include the following:

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- Communications or alarm systems
- Response to fires or explosions
- Shutdown of operations.

Hanford Facility personnel who perform these duties receive training pertaining to their duties. The training plan documentation described in Section 8.3 contains specific information regarding the types of training Hanford Facility personnel receive based on the outline in Section 8.1.

8.3 DESCRIPTION OF TRAINING PLAN

In accordance with HF RCRA Permit (DW Portion), Condition II.C.3, the unit-specific portion of the *Hanford Facility Dangerous Waste Permit Application* must contain a description of the training plan. Training plan documentation is maintained outside of the *Hanford Facility Dangerous Waste Part B Permit Application* and the HF RCRA Permit. Therefore, changes made to the training plan documentation are not subject to the HF RCRA Permit modification process. However, the training plan documentation is prepared to comply with WAC 173-303-330(2).

Documentation prepared to meet the training plan consists of hard copy and/or electronic media as provided by HF RCRA Permit (DW Portion), Condition II.C.1. The training plan documentation consists of one or more documents and/or a training database with all the components identified in the core document.

A description of how training plan documentation meets the three items in WAC 173-303-330(2) is as follows:

1. -330(2)(a): "The job title, job description, and name of the employee filling each job. The job description must include requisite skills, education, other qualifications, and duties for each position."

   Description: The specific Hanford Facility personnel job title/position is correlated to the waste management duties. Waste management duties relating to WAC 173-303 are correlated to training courses to ensure training is properly assigned.

   Only names of Hanford Facility personnel who carry out job duties relating to TSD unit waste management operations at the 325 HWTUs are maintained. Names are maintained within the training plan documentation. A list of Hanford Facility personnel assigned to the 325 HWTUs is available upon request.

   Information on requisite skills, education, and other qualifications for job title/positions are addressed by providing a reference where this information is maintained (e.g., human resources). Specific information concerning job title, requisite skills, education, and other qualifications for personnel can be provided upon request.

2. -330(2)(b): "A written description of the type and amount of both introductory and continuing training required for each position."

   Description: In addition to the outline provided in Section 8.1, training courses developed to comply with the introductory and continuing training programs are identified and described in the training plan documentation. The type and amount of training is specified in the training plan documentation as shown in Table 8-1.

3. -330(2)(c): "Records documenting that personnel have received and completed the training required by this section. The Department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received."

Description: Training records are maintained consistent with DOE/RL-91-28, Section 8.4.

Table 8-1. 325 HWTUs Training Matrix

	Training Category*					
DOE/RL-91-28 Chapter 8 Training Category	General Hanford Facility Training	Contingency Plan Training	Emergency Coordinator Training	Operations Training		
325 HWTUs	Orientation Program	Building Emergency Plan	Building Emergency Director Training	Advanced Waste Management Training	Container Management	Tank System Management
Staff Position						
HWTUs Task Manager	X	X	X[1]	X	X	X[1]
HWTUs Scientist/Engineering Associate	X	X	X[1]	X	X	X[1]
Shielded Analytical Laboratories Scientist/Engineering Associates	X	X	X[1]	X	X	X[1]

[1] Required for any staff that has been assigned these duties.

* Refer to the 325 HWTUs Training Plan for a complete description of coursework in each training category.

Hanford Facility RCRA Permit Modification Notification Form

Part V, Chapter 14 and Attachment 32

303-K Storage Facility

Index

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	**Permit Part & Chapter:**
303-K Storage Facility	**Part V, Chapter 14 and Attachment 32**

Description of Modification:

Section V.14.B.f:

V.14.B.f. Due to lack of federal funding in 1998, the allowed time for closure of 303-K is hereby extended in Accordance with WAC 173-303-610(4)(b)(i) and 173-303-815(3). The Permittees shall submit a Certification of closure for 303-K no later than ~~September 30, 2001~~ November 29, 2001. In addition, the Permittees shall submit to Ecology at least two (2) reports of progress toward completion of closure (i.e., budgeting for building demolition, obtaining sufficient funding, scheduling the physical work). The first report shall be submitted no later than September 30, 1999, and the second shall be submitted no later than September 30, 2000.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and Informational changes.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
N. C. Boyter 8-14-01	D. T. Evans 8/22/01	R. Bond 8-16-01	L.E. Ruud for L.E. Ruud 8/27/01
N. C. Boyter Date	D. T. Evans Date	R. Bond Date	L.E. Ruud Date

Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Forms
for
1325-N Liquid Waste Disposal Facility
Part V, Chapter 16, Attachment 41

Index

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	**Permit Part & Chapter:**
1325-N Liquid Waste Disposal Facility	**Part V, Chapter 16, Attachment 41**

Description of Modification:
Hanford Facility RCRA Permit, V.16.A.:

V.16.A. COMPLIANCE WITH APPROVED MODIFIED CLOSURE PLAN

The Permittees shall comply with all requirements set forth in the 1325-N Closure Plan found in Attachment 41 (DOE/RL-96-39, ~~Rev. 0,~~ Appendix A), *including the Amendments specified in* Condition V.16.B. Enforceable portions of the Plan are listed below; all subsections, figures, and tables included in these portions are also enforceable, unless stated otherwise:

Part A, Form 3, Permit Application, Revision 7, February 25, 1997

Section A1.0 Introduction, from Class 1 Modifications for quarter ending June 30, 2001

Section A2.1 General Description of Unit, from Class 1 Modifications for quarter ending June 30, 2001

Section A3.0 Ground Water Monitoring, from Class 1 Modifications for quarter ending June 30, 2001

Section A4.0 Closure, from Class 1 Modifications for quarter ending June 30, 2001

Section A5.0 Post-closure Plan, from Class 1 Modifications for quarter ending June 30, 2001

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date	M. S. McCormick	Date	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A1.1:

A1.1 REGULATORY BACKGROUND

The 1301-N and 1325-N units are operated by the U.S. Department of Energy (DOE), Richland Operations Office (RL), and co-operated by Bechtel Hanford, Inc. Although the U.S. Government holds legal title to this facility, the RL, for purposes of regulation under WAC 173-303, is considered the legal owner of the facility under existing U.S. Environmental Protection Agency (EPA) interpretive regulations (51 Federal Register 7722).

The Part A, Form 3, dangerous waste permit application documentation for 1301-N originally was submitted to the Washington State Department of Ecology (Ecology) and the EPA in August 1986. Documentation for the 1325-N LWDF originally was submitted in February 1987. Seven revisions of the Part A, Form 3, dangerous waste permit application documentation for these TSD units have been submitted. The latest revision (Revision 7) of each unit Part A is attached to this appendix (Attachments A-1 and A-2). Also, a State Environmental Policy Act (SEPA) checklist, pursuant to WAC 197-11-960, will be approved prior to incorporation of this closure plan into the Permit. A draft SEPA checklist is attached to this appendix (Attachment A-3).

The Part A identifies the listed waste spent solvent, methanol (F003), as being disposed to 1301-N and 1325-N. Any media or debris that came into contact with wastewaters disposed to these units may also, by definition, be considered to be a listed dangerous waste in lieu of an approved contained-in determination. The reason this is not stated definitively is because, federally, F003 spent solvents are no longer listed if they do not exhibit the characteristic of ignitability (40 CFR 261.3[a][2][iii]), however, a similar "exclusion" does not exist in State regulation. ~~It may be determined by Ecology that soils and debris generated during remediation of these units would not be defined as listed F003 waste if they are not ignitable.~~

~~Should the F003 waste code be attached to remediation-generated soils and debris, a contained-in request would be developed for generated waste in order to alleviate the need to comply with all substantive dangerous waste management standards. Methanol is not anticipated to be detectable in soils. An approved contained-in determination would redefine media and debris generated during closure activities as nonlisted waste where methanol concentrations are below a prescribed concentration considered protective of human health and the environment. A decision on the contained-in request would be needed prior to initiation of remediation activities. In a letter from Tom Eaton, Ecology, dated February 19, 1993, a contained-in policy was presented that will be used to formulate the request. Contained-in determinations have been granted at other TSD units on the Hanford Site under this policy~~Soil samples taken from the 1325-N Trench resulted in non-detectable levels of methanol. The values reported for the nondetects range from 5.0 to 5.4 mg/kg and are well below the Model Toxics Control Act Method B cleanup of 400 mg/kg. Sampling of the 1301-N Crib was not conducted since it is considered to be analogous with the 1325-N Trench. In December 2000, Washington State Department of Ecology granted a contained-in determination for the soils located within the 1325-N and 1301-N Liquid Waste Disposal Facilities.

Modification Class: [1][2][3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/1/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A1.2:

A1.2 CLOSURE PLAN AND CORRECTIVE MEASURES STUDY INTEGRATION

Closure of the 1301-N and 1325-N units will occur under the authority of WAC 173-303. These units are also defined under the 100-NR-1 OU and are part of this TSD CMS. Integrated TSD and OU closure actions will be necessary to remediate contaminated soil and groundwater. Actions taken to remediate these TSDs will comply with the provisions of both CERCLA and RCRA. The CERCLA public involvement, including public notice and opportunity to comment, has been enhanced to concurrently satisfy the RCRA closure process. The remedy selected under CERCLA will be incorporated into the Hanford Facility RCRA Permit as the RCRA closure action after issuance of the public notice and comment process.

~~It is anticipated that t~~The CERCLA ROD ~~will be~~ was issued subsequent to the Hanford Facility RCRA Permit modification. Should the CERCLA ROD contain provisions inconsistent with the approved RCRA modifications, the Hanford Facility RCRA Permit will be again modified to reconcile these differences during the next permit modification cycle.

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/1/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A2.1.10.:

Within the Hanford Site are operational areas, including 100-N, to which access is restricted. There is a staffed checkpoint at the Wye Barricade (Figure 1-1 of this TSD CMS) through which access to the 100-N Area is allowed only to authorized personnel. Authorized personnel are those individuals with a DOE-issued security identification badge indicating the appropriate authorization. Such personnel are subject to a search of items carried into or out of controlled areas. ~~Unknowing entry to the 100-N Area is administratively prevented by postings on access roads that allow authorized access only. To preclude unknowing access into the 1301-N and 1325-N units and to minimize the possibility of entry by animals or by unauthorized individuals, the unit is surrounded by a chain link fence that has locked gate access. Also, posted at the unit are placards that read "Danger Unauthorized Personnel Keep Out."~~

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/28/01	M. S. McCormick	Date 10/1/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] *This is only an advanced notification of an intended Class* [1]1, 2, *or 3 modification, this should be followed with a formal* modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A4.1.:

The structures in 1301-N and 1325-N include concrete structures and earthen basins, ~~and~~ trenches, fencing and signage surrounding the units, and ancillary surface structures such as valve houses associated with piping. The 1301-N structures are discussed in Section 2.4.1 of the TSD CMS. Figure 2-5 shows the earthen crib structure, and Figure 2-6 shows the concrete weir box. Figures 2-8 and 2-9 illustrate the trench. Figures 2-10 through 2-13 show the trench cover support beams and cover panel configuration.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T.E. Logan	Date 9/20/04	M. S. McCormick	Date 10/1/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A4.3.1.:

A4.3.1 Past Soil Characterization Data

Data used to characterize the vadose zone soils were obtained from six boreholes drilled and sampled to support the 1301-N and 1325-N limited field investigation (LFI) (DOE-RL 1996c). Figure 2-32 of the TSD CMS shows the locations of these boreholes. Two of the boreholes are adjacent to 1301-N (199-N-107A and 199-N-108A), one is next to 1325-N (199-N-109A), and three are located northwest of 1301-N (199-N-75, 199-N-76, and 199-N-80) between that facility and the river. Samples were obtained from near the surface to a depth of up to 30.2 m (99 ft). All of these data are presented in the LFI.

In addition to the boreholes, sediment samples were collected from the 116-N-1 Crib. Data from these samples were not used in this evaluation because of insufficient QC associated with the sample collection process. Other soil samples have been collected from this vicinity, but most have only been analyzed for radionuclides.

Data from the characterization samples are summarized in Appendix A of the 1301-N and 1325-N LFI. These data indicate that chromium is the only metal of concern in vadose zone soils at 1301-N below 3.0/4.6 m (10/15 ft). Chromium exceeded background concentrations in data associated with 1301-N. Mercury is the only other metal that is included in the contaminants of concern (COCs), but no data from the boreholes at 1301-N and 1325-N are available to evaluate the presence or absence of this analyte in vadose zone soils. Therefore, it is retained as a COC in surface soils (0 to 3.0/4.6 m [10/15 ft]). However, as indicated in Appendix G of this TSD CMS, mercury will not reach groundwater in 1,000 years and therefore is not considered to be a constituent of concern for groundwater protection below 3.0/4.6 m (10/15 ft). Evaluation of nitrate concentrations in the soil is similarly limited because of a paucity of data, so that substance has been retained as a COC. Nitrate is a mobile constituent, and a nitrate plume exists in the groundwater. Therefore, nitrate is considered a COC for both surface and subsurface soils.

Data from the three boreholes located outside of these facilities indicate that no metals are above background values. One sample from the 150- to 180-cm (5- to 6-ft) interval in borehole 199-N-76 was analyzed for mercury, and its value is well below typical background concentrations. These data indicate that metals deposited in the TSDs did not migrate laterally in the vadose zone any substantial distance.

~~The organic analyte methanol is included in the COCs. It is considered a COC because of its inclusion in the Part A permit.~~Sampling during remediation did not detect the presence of methanol in the soil. The Washington State Department of Ecology granted a contained-in determination for methanol in December 2000. The LFI sampling was not analyzed for the presence of methanol, and methanol was not listed as detected in any other sampling efforts. Acetone, however, was detected in three samples collected from boreholes outside of the facilities, at concentrations up to 51 ppb. Organic analytes were not analyzed in samples collected within and adjacent to the TSD units; however, field screening using an organic vapor monitor did not detect any organic compounds. Acetone is a common laboratory contaminant, and most of the data reported by the laboratory are either at detection limit or are associated with a blank that contained detectable amounts of acetone. These circumstances cast doubt on the presence of detectable quantities of acetone in the wells outside the bounds of the TSD unit.

Additional sampling was performed in 1998 and is documented in the *Data Summary Report* (BHI 1999). Characterization of the sites were conducted through sampling in accordance with the *Sampling Analysis Plan for the 100-NR-1 Treatment, Storage, and Disposal Units During Remediation Closeout* (DOE 2000a).

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
J. E. Logan	Date	M. S. McCormick	Date	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A4.3.2:

A4.3.2 *Characterization Activities to Determine Closure Option*

~~To determine the appropriate closure option for 1301-N and 1325-N in accordance with Condition II.K. of the Permit, sampling and analysis will be required to verify whether a modified closure option has been achieved~~ A *sampling and analysis plan* (DOE 2000a) has been developed to support site closure. As presented in Section A4.3.1 and in Table 4-17 of this TSD CMS, dangerous waste constituents are retained as constituents of concern in both surface soils and subsurface soils. All alternatives (other than the No-Action Alternative) will result in the removal of dangerous waste constituents above 3.0 m (10 ft) bgs for the modified CRCIA ranger/industrial exposure scenario and 4.6 m (15 ft) bgs for the rural-residential scenario. This will result in removal of all soils that could be contaminated at levels that present a direct exposure hazard as defined in MTCA. Verification sampling to determine MTCA direct soil exposure standard compliance will therefore not be required unless some areas around the units are not excavated and removed to the 3.0m and 4.6m level. Verification sampling will be performed on contaminants that may be present below 3.0 m or 4.6 m for the purposes of determining compliance with groundwater protection standards.

~~As part of the closure activities for these units, a data quality objectives (DQO) process will be initiated to define extent and type of sampling and analysis during and after excavation.~~ The Data Quality Objectives process was used (BHI 2000) to define the extent and type of sampling and analysis required during excavation and closure. This effort will define sampling issues which may include analytes of interest, sample location, number of samples, number and frequency of field QC samples (i.e., trip blanks, equipment blanks, splits, and duplicates), sampling methodology, analytical methods, laboratory protocols, laboratory validation, data error tolerances, and data evaluation methods. This DQO effort will culminate in an Ecology-approved sampling and analysis plan.

Alternative-specific sampling and analysis activities are as follows:

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date	M. S. McCormick	Date	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A6.0:

A6.0 REFERENCES

J. B. Price, 2000, Letter, *Contained-in Determination for the 116-N-1 and 116-N-3 Soils*, to Glenn L. Goldberg, U.S. Department of Energy, December 27, 2000, Department of Ecology, Kennewick, Washington.

DOE/RL-2000-16, *Remedial Design/Remedial Action Work Plan*, Current Revision, U.S. Department of Energy, Richland, Washington.

DOE-RL, 2000, *Sampling and Analysis Plan for the 100-NR-1 Treatment, Storage, and Disposal Units During Remediation and Closeout*, DOE/RL-2000-07, Rev. 0, U.S. Department of Energy, Richland, Washington.

EPA, 2000, *Interim Remedial Action Record of Decision for the 100-NR-1 Operable Unit, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

...

Modification Class: [1][2][3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: . A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/2/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Attachment A-4:

Records Retention

This training plan includes employee training records. The employee training records are maintained electronically and are available on request~~HLAN soft reporting~~. This training plan shall be kept at the Hanford Facility and be readily retrievable. A hard copy of any site-specific training that is not recorded electronically ~~in soft reporting~~ must be kept on file and be readily retrievable.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date	M. S. McCormick	Date	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Attachment A-4:

Revision

This training plan will be revised whenever training requirements in WAC 173-303-330 or the Hanford Dangerous Waste Permit are revised, or as needed.

- ~~Training courses change names or numbers,~~
- ~~Employees change positions,~~
- ~~New employees are assigned to 1324-N and 1324-NA~~
- ~~Training requirements in WAC 173-303-330 or the Hanford Dangerous Waste Permit are revised..~~

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/3/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Attachment A-4:

Dangerous Waste Management Position Descriptions

This training plan applies only to employees who perform work at 1301-N and 1325-N or are 1301-N and 1325-N Coordinators. If employees fit into more than one position, they shall be placed in the position that requires the higher level of training. The Human Resource Division maintains required skills, education, and other qualifications for job title/positions. Specific information concerning job title/position, required skills, education and other qualifications for personnel can be provided upon request.

Job Title: Waste Handler

Duties: Perform inspections, treat wastes, perform treatability tests, take samples, package and ship waste, and respond to emergencies

~~Required Skills: Basic communication skills and ability to follow instructions~~

~~Required Education: None~~

~~Other Required Qualifications: None.~~

Job Title: General Workers

Duties: Perform inspections, respond to emergencies, provide maintenance services, operate equipment, and set up equipment

~~Required Skills: Basic communication skills and ability to follow instructions~~

~~Required Education: None~~

~~Other Required Qualifications: None.~~

Job Title: Supervisors

Duties: Supervise waste handlers and general workers, assure personnel training, perform inspections, and respond to emergencies

~~Required Skills: Management~~

~~Required Education: 4 year college degree or equivalent knowledge and experience~~

~~Other Required Qualifications: None~~

Job Title: Emergency Coordinators

Duties: Respond to emergencies per WAC 173-303-360

~~Required Skills: Management~~

~~Required Education: 4 year college degree or equivalent knowledge and experience~~

~~Other Required Qualifications: None.~~

Modification Class: [1][2][3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/1/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] *If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.*

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1325-N Liquid Waste Disposal Facility	Part V, Chapter 16, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Attachment A-4:

Communications

There are no fixed communication systems at 1301-N and 1325-N. Communication equipment may be obtained ~~the 105-N Shift Manager~~ from supervisory personnel when deemed necessary.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T.E. Logan	Date 9/20/01	M. S. McCormick	Date 10/1/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Forms
for
1301-N Liquid Waste Disposal Facility
Part V, Chapter 17, Attachment 41

Index

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	**Permit Part & Chapter:**
1301-N Liquid Waste Disposal Facility	**Part V, Chapter 17, Attachment 41**

Description of Modification:
Hanford Facility RCRA Permit, V.17.A.:

V.17.A. COMPLIANCE WITH APPROVED MODIFIED CLOSURE PLAN

The Permittees shall comply with all requirements set forth in the 1301-N Closure Plan found in Attachment 41 (DOE/RL-96-39, ~~Rev. 0,~~ Appendix A), including the Amendments specified in Condition V.17.A. Enforceable portions of the Plan are listed below; all subsections, figures, and tables included in these portions are also enforceable, unless stated otherwise:

Part A, Form 3, Permit Application, Revision 7, February 29, 1997

Section A1.0 Introduction, from Class 1 Modifications for quarter ending September 30, 2001

Section A2.1 General Description of Unit, from Class 1 Modifications for quarter ending September 30, 2001

Section A3.0 Ground Water Monitoring, from Class 1 Modifications for quarter ending September 30, 2001

Section A4.0 Closure, from Class 1 Modifications for quarter ending September 30, 2001

Section A5.0 Post-Closure Plan, from Class 1 Modifications for quarter ending September 30, 2001

Modification Class: [1][2][3]	Class 1	Class 1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/1/07	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class 1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] *If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed* modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to 1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1301-N Liquid Waste Disposal Facility	Part V, Chapter 17, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A1.1:

A1.1 REGULATORY BACKGROUND

The 1301-N and 1325-N units are operated by the U.S. Department of Energy (DOE), Richland Operations Office (RL), and co-operated by Bechtel Hanford, Inc. Although the U.S. Government holds legal title to this facility, the RL, for purposes of regulation under WAC 173-303, is considered the legal owner of the facility under existing U.S. Environmental Protection Agency (EPA) *interpretive regulations* (51 Federal Register 7722).

The Part A, Form 3, dangerous waste permit application documentation for 1301-N originally was submitted to the Washington State Department of Ecology (Ecology) and the EPA in August 1986. Documentation for the 1325-N LWDF originally was submitted in February 1987. Seven revisions of the Part A, Form 3, dangerous waste permit application documentation for these TSD units have been submitted. The latest revision (Revision 7) of each unit Part A is attached to this appendix (Attachments A-1 and A-2). Also, a State Environmental Policy Act (SEPA) checklist, pursuant to WAC 197-11-960, will be approved prior to incorporation of this closure plan into the Permit. A draft SEPA checklist is attached to this appendix (Attachment A-3).

The Part A identifies the listed waste spent solvent, methanol (F003), as being disposed to 1301-N and 1325-N. Any media or debris that came into contact with wastewaters disposed to these units may also, by definition, be considered to be a listed dangerous waste in lieu of an approved contained-in determination. The reason this is not stated definitively is because, federally, F003 spent solvents are no longer listed if they do not exhibit the characteristic of ignitability (40 CFR 261.3[a][2][iii]), however, a similar "exclusion" does not exist in State regulation. ~~It may be determined by Ecology that soils and debris generated during remediation of these units would not be defined as listed F003 waste if they are not ignitable.~~

~~Should the F003 waste code be attached to remediation-generated soils and debris, a contained-in request would be developed for generated waste in order to alleviate the need to comply with all substantive dangerous waste management standards. Methanol is not anticipated to be detectable in soils. An approved contained-in determination would redefine media and debris generated during closure activities as nonlisted waste where methanol concentrations are below a prescribed concentration considered protective of human health and the environment. A decision on the contained-in request would be needed prior to initiation of remediation activities. In a letter from Tom Eaton, Ecology, dated February 19, 1993, a contained-in policy was presented that will be used to formulate the request. Contained-in determinations have been granted at other TSD units on the Hanford Site under this policy.~~ Soil samples taken from the 1325-N Trench resulted in non-detectable levels of methanol. The values reported for the nondetects range from 5.0 to 5.4 mg/kg and are well below the Model Toxics Control Act Method B cleanup of 400 mg/kg. Sampling of the 1301-N Crib was not conducted since it is considered to be analogous with the 1325-N Trench. In December 2000, Washington State Department of Ecology granted a contained-in determination for the soils located within the 1325-N and 1301-N Liquid Waste Disposal Facilities.

Modification Class: [1 2 3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. *General Permit Provisions*
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/1/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	**Permit Part & Chapter:**
1301-N Liquid Waste Disposal Facility	**Part V, Chapter 17, Attachment 41**

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A1.2:

A1.2 CLOSURE PLAN AND CORRECTIVE MEASURES STUDY INTEGRATION

Closure of the 1301-N and 1325-N units will occur under the authority of WAC 173-303. These units are also defined under the 100-NR-1 OU and are part of this TSD CMS. Integrated TSD and OU closure actions will be necessary to remediate contaminated soil and groundwater. Actions taken to remediate these TSDs will comply with the provisions of both CERCLA and RCRA. The CERCLA public involvement, including public notice and opportunity to comment, has been enhanced to concurrently satisfy the RCRA closure process. The remedy selected under CERCLA will be incorporated into the Hanford Facility RCRA Permit as the RCRA closure action after issuance of the public notice and comment process.

~~It is anticipated that t~~The CERCLA ROD ~~will be~~ was issued subsequent to the Hanford Facility RCRA Permit modification. Should the CERCLA ROD contain provisions inconsistent with the approved RCRA modifications, the Hanford Facility RCRA Permit will be again modified to reconcile these differences during the next permit modification cycle.

Modification Class: [1][2][3]	Class 1	Class 1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date	M. S. McCormick	Date	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class 1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to 1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	**Permit Part & Chapter:**
1301-N Liquid Waste Disposal Facility	**Part V, Chapter 17, Attachment 41**

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A.2.1.10.:

Within the Hanford Site are operational areas, including 100-N, to which access is restricted. There is a staffed checkpoint at the Wye Barricade (Figure 1-1 of this TSD CMS) through which access to the 100-N Area is allowed only to authorized personnel. Authorized personnel are those individuals with a DOE-issued security identification badge indicating the appropriate authorization. Such personnel are subject to a search of items carried into or out of controlled areas. ~~Unknowing entry to the 100-N Area is administratively prevented by postings on access roads that allow authorized access only. To preclude unknowing access into the 1301-N and 1325-N units and to minimize the possibility of entry by animals or by unauthorized individuals, the unit is surrounded by a chain link fence that has locked gate access. Also, posted at the unit are placards that read "Danger Unauthorized Personnel Keep Out."~~

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T.E. Logan 9/20/01		M. S. McCormick 10/1/01		J. B. Price		L. E. Ruud	
T.E. Logan	Date	M. S. McCormick	Date	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1301-N Liquid Waste Disposal Facility	Part V, Chapter 17, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A.4.1.:

The structures in 1301-N and 1325-N include concrete structures and earthen basins,~~and~~ trenches, fencing and signage surrounding the units, and ancillary surface structures such as valve houses associated with piping. The 1301-N structures are discussed in Section 2.4.1 of the TSD CMS. Figure 2-5 shows the earthen crib structure, and Figure 2-6 shows the concrete weir box. Figures 2-8 and 2-9 illustrate the trench. Figures 2-10 through 2-13 show the trench cover support beams and cover panel configuration.

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/1/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal *modification request, and consequently implement the required Public Involvement processes when required.*

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1301-N Liquid Waste Disposal Facility	Part V, Chapter 17, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A.4.3.1:

A4.3.1 Past Soil Characterization Data

Data used to characterize the vadose zone soils were obtained from six boreholes drilled and sampled to support the 1301-N and 1325-N limited field investigation (LFI) (DOE-RL 1996c). Figure 2-32 of the TSD CMS shows the locations of these boreholes. Two of the boreholes are adjacent to 1301-N (199-N-107A and 199-N-108A), one is next to 1325-N (199-N-109A), and three are located northwest of 1301-N (199-N-75, 199-N-76, and 199-N-80) between that facility and the river. Samples were obtained from near the surface to a depth of up to 30.2 m (99 ft). All of these data are presented in the LFI.

In addition to the boreholes, sediment samples were collected from the 116-N-1 Crib. Data from these samples were not used in this evaluation because of insufficient QC associated with the sample collection process. Other soil samples have been collected from this vicinity, but most have only been analyzed for radionuclides.

Data from the characterization samples are summarized in Appendix A of the 1301-N and 1325-N LFI. These data indicate that chromium is the only metal of concern in vadose zone soils at 1301-N below 3.0/4.6 m (10/15 ft). Chromium exceeded background concentrations in data associated with 1301-N. Mercury is the only other metal that is included in the contaminants of concern (COCs), but no data from the boreholes at 1301-N and 1325-N are available to evaluate the presence or absence of this analyte in vadose zone soils. Therefore, it is retained as a COC in surface soils (0 to 3.0/4.6 m [10/15 ft]). However, as indicated in Appendix G of this TSD CMS, mercury will not reach groundwater in 1,000 years and therefore is not considered to be a constituent of concern for groundwater protection below 3.0/4.6 m (10/15 ft). Evaluation of nitrate concentrations in the soil is similarly limited because of a paucity of data, so that substance has been retained as a COC. Nitrate is a mobile constituent, and a nitrate plume exists in the groundwater. Therefore, nitrate is considered a COC for both surface and subsurface soils.

Data from the three boreholes located outside of these facilities indicate that no metals are above background values. One sample from the 150- to 180-cm (5- to 6-ft) interval in borehole 199-N-76 was analyzed for mercury, and its value is well below typical background concentrations. These data indicate that metals deposited in the TSDs did not migrate laterally in the vadose zone any substantial distance.

~~The organic analyte methanol is included in the COCs. It is considered a COC because of its inclusion in the Part A permit.~~Sampling during remediation did not detect the presence of methanol in the soil. The Washington State Department of Ecology granted a contained-in determination for methanol in December 2000. The LFI sampling was not analyzed for the presence of methanol, and methanol was not listed as detected in any other sampling efforts. Acetone, however, was detected in three samples collected from boreholes outside of the facilities, at concentrations up to 51 ppb. Organic analytes were not analyzed in samples collected within and adjacent to the TSD units; however, field screening using an organic vapor monitor did not detect any organic compounds. Acetone is a common laboratory contaminant, and most of the data reported by the laboratory are either at detection limit or are associated with a blank that contained detectable amounts of acetone. These circumstances cast doubt on the presence of detectable quantities of acetone in the wells outside the bounds of the TSD unit.

Additional sampling was performed in 1998 and is documented in the *Data Summary Report* (BHI 1999). Characterization of the sites were conducted through sampling in accordance with the *Sampling Analysis Plan for the 100-NR-1 Treatment, Storage, and Disposal Units During Remediation Closeout* (DOE 2000a).

Modification Class: [1][2][3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
9/20/01	10/1/01		
Y. E. Logan Date	M. S. McCormick Date	J. B. Price Date	L. E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	**Permit Part & Chapter:**
1301-N Liquid Waste Disposal Facility	**Part V, Chapter 17, Attachment 41**

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A4.3.2:

A4.3.2 Characterization Activities to Determine Closure Option

~~To determine the appropriate closure option for 1301-N and 1325-N in accordance with Condition II.K. of the Permit, sampling and analysis will be required to verify whether a modified closure option has been achieved~~ A *sampling and analysis plan* (DOE 2000a) has been developed to support site closure. As presented in Section A4.3.1 and in Table 4-17 of this TSD CMS, dangerous waste constituents are retained as constituents of concern in both surface soils and subsurface soils. All alternatives (other than the No-Action Alternative) will result in the removal of dangerous waste constituents above 3.0 m (10 ft) bgs for the modified CRCIA ranger/industrial exposure scenario and 4.6 m (15 ft) bgs for the rural-residential scenario. This will result in removal of all soils that could be contaminated at levels that present a direct exposure hazard as defined in MTCA. Verification sampling to determine MTCA direct soil exposure standard compliance will therefore not be required unless some areas around the units are not excavated and removed to the 3.0m and 4.6m level. Verification sampling will be performed on contaminants that may be present below 3.0 m or 4.6 m for the purposes of determining compliance with groundwater protection standards.

~~As part of the closure activities for these units, a data quality objectives (DQO) process will be initiated to define extent and type of sampling and analysis during and after excavation.~~ The Data Quality Objectives process was used (BHI 2000) to define the extent and type of sampling and analysis required during excavation and closure. This effort will define sampling issues which may include analytes of interest, sample location, number of samples, number and frequency of field QC samples (i.e., trip blanks, equipment blanks, splits, and duplicates), sampling methodology, analytical methods, laboratory protocols, laboratory validation, data error tolerances, and data evaluation methods. This DQO effort will culminate in an Ecology-approved sampling and analysis plan.

Alternative-specific sampling and analysis activities are as follows:

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/3/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	**Permit Part & Chapter:**
1301-N Liquid Waste Disposal Facility	**Part V, Chapter 17, Attachment 41**

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Section A6.0:

A6.0 REFERENCES

J. B. Price, 2000, Letter, *Contained-in Determination for the 116-N-1 and 116-N-3 Soils*, to Glenn L. Goldberg, U.S. Department of Energy, December 27, 2000, Department of Ecology, Kennewick, Washington.

DOE/RL-2000-16, *Remedial Design/Remedial Action Work Plan*, Current Revision, U.S. Department of Energy, Richland, Washington.

DOE-RL, 2000, *Sampling and Analysis Plan for the 100-NR-1 Treatment, Storage, and Disposal Units During Remediation and Closeout*, DOE/RL-2000-07, Rev. 0, U.S. Department of Energy, Richland, Washington.

EPA, 2000, *Interim Remedial Action Record of Decision for the 100-NR-1 Operable Unit, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

...

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/1/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1301-N Liquid Waste Disposal Facility	Part V, Chapter 17, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Attachment A-4:

Records Retention

This training plan includes employee training records. The employee training records are maintained electronically and are available on request~~HLAN soft reporting~~. This training plan shall be kept at the Hanford Facility and be readily retrievable. A hard copy of any site-specific training that is not recorded electronically ~~in soft reporting~~ must be kept on file and be readily retrievable.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 12/11/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	**Permit Part & Chapter:**
1301-N Liquid Waste Disposal Facility	**Part V, Chapter 17, Attachment 41**

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Attachment A-4:

Records Retention

This training plan includes employee training records. The employee training records are maintained electronically and are available on request~~HLAN soft reporting~~. This training plan shall be kept at the Hanford Facility and be readily retrievable. A hard copy of any site-specific training that is not recorded electronically ~~in soft reporting~~ must be kept on file and be readily retrievable.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/31/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] *If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed* modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, *if appropriate.*

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1301-N Liquid Waste Disposal Facility	Part V, Chapter 17, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Attachment A-4:

Revision

This training plan will be revised whenever training requirements in WAC 173-303-330 or the Hanford Dangerous Waste Permit are revised, or as needed.

- ~~Training courses change names or numbers,~~
- ~~Employees change positions,~~
- ~~New employees are assigned to 1324-N and 1324-NA~~
- ~~Training requirements in WAC 173-303-330 or the Hanford Dangerous Waste Permit are revised.~~

Modification Class: [1] [2] [3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:	Reviewed by Ecology:
T. E. Logan Date	M. S. McCormick Date	J. B. Price Date	L. E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] *If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed* modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1301-N Liquid Waste Disposal Facility	Part V, Chapter 17, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Attachment A-4:

Dangerous Waste Management Position Descriptions

This training plan applies only to employees who perform work at 1301-N and 1325-N or are 1301-N and 1325-N Coordinators. If employees fit into more than one position, they shall be placed in the position that requires the higher level of training. The Human Resource Division maintains required skills, education, and other qualifications for job title/positions. Specific information concerning job title/position, required skills, education and other qualifications for personnel can be provided upon request.

Job Title: Waste Handler

Duties: Perform inspections, treat wastes, perform treatability tests, take samples, package and ship waste, and respond to emergencies

~~Required Skills: Basic communication skills and ability to follow instructions~~

~~Required Education: None~~

~~Other Required Qualifications: None.~~

Job Title: General Workers

Duties: Perform inspections, respond to emergencies, provide maintenance services, operate equipment, and set up equipment

~~Required Skills: Basic communication skills and ability to follow instructions~~

~~Required Education: None~~

~~Other Required Qualifications: None.~~

Job Title: Supervisors

Duties: Supervise waste handlers and general workers, assure personnel training, perform inspections, and respond to emergencies

~~Required Skills: Management~~

~~Required Education: 4 year college degree or equivalent knowledge and experience~~

~~Other Required Qualifications: None~~

Job Title: Emergency Coordinators

Duties: Respond to emergencies per WAC 173-303-360

~~Required Skills: Management~~

~~Required Education: 4 year college degree or equivalent knowledge and experience~~

~~Other Required Qualifications: None.~~

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
   1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
9/20/01		10/1/01					
T. E. Logan	Date	M. S. McCormick	Date	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
1301-N Liquid Waste Disposal Facility	Part V, Chapter 17, Attachment 41

Description of Modification:

Remove and replace Appendix A with the attached Appendix A.

Appendix A, Attachment A-4-1:

Communications

There are no fixed communication systems at 1301-N and 1325-N. Communication equipment may be obtained ~~the 105-N Shift Manager~~ from supervisory personnel when deemed necessary.

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:

A. General Permit Provisions
1. Administrative and Informational changes

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
T. E. Logan	Date 9/20/01	M. S. McCormick	Date 10/3/01	J. B. Price	Date	L. E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit

1325-N Liquid Waste Disposal Facility
Part V, Chapter 16
and
1301-N Liquid Waste Disposal Facility
Part V, Chapter 17

Attachment 41

Replacement Section

Index