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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

1315 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

August 3, 1998

Mr. John Wagoner
U.S. Department of Energy
P.O. Box 550, MSIN: A7-50
Richland, WA 99352

Mr. Ron Hanson
Fluor Daniel Hanford Incorporated
P.O. Box 1000, MSIN: H5-20
Richland, WA 99352

Mr. Steve Liedle
Bechtel Hanford Company
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Richland, WA 99352

Dr. William Madia
Pacific Northwest Laboratory
P.O. Box 999, MSIN: K1-46
Richland, WA 99352

AUG 1998 RECEIVED EDMC

Dear Messrs. Wagoner, Hanson, Liedle, and Madia:

This letter transmits proposed modifications to the Hanford Facility Dangerous Waste Portion of the *Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste* (Permit). We have enclosed the supporting documentation for this modification of the Permit, which includes a Focus Sheet/Statement of Basis, a copy of the Ecology review completion letter (two applications), and signed Class 2 and Class 3 modification forms indicating that Ecology has reviewed these changes and agrees with their classification.

The public comment period for this modification begins August 10, 1998, and ends September 24, 1998. Any formal comments you have regarding the draft modifications must be received by our office during that time. If you have any questions, please contact Laura Cusack at (509) 736-3038.

Sincerely,

Michael A. Wilson

Michael Wilson, Manager
Nuclear Waste Program

MW:LC:sb

cc: Cliff Clark, USDOE
Dave Bartus, EPA
Doug Sherwood, EPA
Gary Robinson, BHI
Sue Price, FDH
Harold Tilden, PNNL

Focus

Proposed Modifications to the Dangerous-Waste Portion of the Hanford Facility-Wide RCRA Permit

Background

A facility-wide Dangerous Waste RCRA Permit (permit) was issued in August 1994 for the Hanford Site by the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency. The permit was granted under provisions of the federal Resource Conservation and Recovery Act (RCRA) and the Washington State Dangerous Waste Regulations. The permit outlines conditions for the operation and closure of dangerous and mixed waste treatment, storage and disposal (TSD) units at Hanford.

Approximately 50 TSD units at Hanford are operating under RCRA interim status. Two of the units described in this focus sheet will be incorporated into the permit, transferring them from interim status to final status. After incorporating them into the permit, general conditions apply. In addition, individual units will be subject to conditions based on their status as operating, clean-closed, or post-closure.

Statement of Basis Note

Washington State Dangerous-Waste Regulations require Ecology to prepare a "statement of basis" when a fact sheet is not prepared for the proposed permit modification(s). An extensive fact sheet was prepared for the Hanford Dangerous Waste Permit in September 1994. Modifications are being made in accordance with Washington Administrative Code (WAC) 173-303-830(3)(a). This focus sheet satisfies the purposes of both the fact sheet and the statement of basis.

The Modification Process

The Washington State Dangerous-Waste Regulations, WAC 173-303-830(3)(a) identify when Ecology may modify a permit. General condition II.D has been modified to include the most recent regulatory updates. Parts III and V have been modified as a result of new information submitted by the permittees. In addition, site-wide emergency response documentation has been revised in response to the May 1997 explosion at the Plutonium Reclamation Facility. It is anticipated there will be additional modifications of the Hanford Emergency Response Plan (DOE RL 94-02) as the improved Emergency Response System is used. The U.S. Department of Energy-Richland Operations Office (USDOE-RL), Fluor Daniel Hanford, Inc., Pacific Northwest National Laboratories, and Bechtel Hanford, Inc. were notified by Ecology of the proposed changes.

1998 Modifications to the Dangerous Waste Portion of the Hanford Facility-Wide RCRA Permit

The 1998 modifications to the permit include: incorporating two new operating units; updated emergency response-documentation for all permitted operating units; incorporating five new closure plans; modifying six existing operating permits; and modifying one existing closure plan.

Two newly permitted operating units (Part III) include:

- **The Waste Receiving and Processing Unit (WRAP)**
  WRAP will be permitted under RCRA to process previously packaged, dangerous, and mixed radioactive wastes. WRAP will also process transuranic and low-level radioactive waste under Atomic Energy Act regulations. The waste is screened, characterized, documented and, when needed, repackaged for shipment to permitted TSD facilities.

- **The Central Waste Complex (CWC)**
  CWC in the 200 West Area provides storage and treatment for dangerous, mixed, and/or radioactive waste generated on and off the Hanford Site. Buildings, storage modules - and a storage pad provide space for waste containers. Storage capacity at CWC is approximately 100,000 55-gallon drum equivalents.

New emergency-response documentation for permitted operating units:

- As part of the corrective measures to the **Plutonium Reclamation Facility** explosion on May 14, 1997 the Hanford Site's emergency-preparedness documentation has been modified. The USDOE has been granted a temporary authorization to implement these procedures, because the annual Hanford Facility RCRA permit-modification process incorporating these documents will not be completed until December 1998. USDOE began using the new Emergency Preparedness Program on July 1, 1998. Site wide emergency response documentation has also been revised to reflect improvements in the Emergency Response Organization. As a result, a common, streamlined emergency response document has been developed. The document is a combination of the previously used documents, *DOE/RL 93-75* and *DOE/RL 94-02*.

The modification of six existing operating permits:

- **616 Non-radioactive Dangerous-Waste Storage Facility (616 NRDWSF)**
  Modifications are being made to the Waste Analysis Plan, the Training Plan and the Building Emergency Plan.

- **Liquid Effluent Retention Facility (LERF) and 200-Area Effluent Treatment Facility (ETF)**
  Modifications are being made to operational practices, the Waste Analysis Plan and the Building Emergency Plan.

- **Plutonium-Uranium Extraction (PUREX Storage Tunnels)**
  Modifications are being made to the Building Emergency Plan.

- **242-A Evaporator**
  Modifications are being made to the inspection requirements and the Building Emergency Plan.

- **325 Hazardous-Waste Treatment Units (HWTU's)**
  Modifications involve only the emergency-response documentation, WAP and operational requirements.

- **305-B Storage Unit**
  Modifications involve only the emergency-response documentation.

The five new closure plans (Part V):

- **100-N Area** includes *four* TSD units that received liquid discharges to the soil column. These closure plans have been approved by Ecology after a public-review period that ended on April 30, 1998. These documents have already been through the required public comment period and are being administratively incorporated into the permit.

- **The 100-D Ponds** TSD unit is located adjacent to and north of the perimeter fence of the 100-D Area on the Hanford Site. This TSD was constructed as an unlined surface impoundment for liquid effluent and operated between 1977 and 1994. While this TSD unit primarily received non-radioactive, non-dangerous liquid effluent from the 100-D Area process sewer system, it also intermittently received characteristic dangerous waste. In August 1996, the U. S. Department of Energy voluntarily removed and appropriately disposed the contaminated sediments from 100-D Ponds, thereby establishing a "clean closed" status.

The modification of one existing clean closure plan (Part V)

- **The 303-K Storage Facility** is located in the northwest portion of the 300 Area. The 303-K Storage Facility is a small, single-story cinderblock building on a concrete pad. Various radioactive and dangerous wastes have been stored in the building and on nearby concrete, asphalt and gravel pads. Characterization for hazardous constituents has been completed according to the permit requirements. The permit update extends the date by which the permittee must submit closure certification.

How can you get involved?

A 45-day public-comment period will start **August 10, 1998** and conclude **September 24, 1998**. If requested, a public hearing will be held at Ecology's Kennewick Office, 1315 W. 4th Ave., on September 9, 1998. To request a public hearing, please call The Hanford Hotline at 800-321-2008 before August 15, 1998. All comments received during the comment period will be considered and responded to before the final decisions are made on these proposals.

Copies of the dangerous-waste portion of the Hanford Facility-Wide RCRA Permit and the proposed 1998 modifications are available for review at these **Hanford Public Information Repositories:** (For additional information, call Hanford Cleanup toll-free at 800-321-2008.)

SEATTLE
University of Washington
Suzzalo Library
Government Publications Room
(206) 543-4664

PORTLAND
Portland State University
Branford Price Millar Library
Science and Engineering Floor
(503) 725-3690

SPOKANE
Gonzaga University
Foley Center
East 502 Boone
(509) 328-4220 Ext. 3844

RICHLAND
USDOE Public Reading Room
Consolidated Information Center
Room 101 L
WSU, Tri-Cities (509) 372-7443

If you have special accommodation needs, or require this material in an alternative format, please contact Michael Turner, (509) 736-3037 (voice) or (360) 407-6206 (TDD).

All information in the repositories, plus the administrative record, including all data submitted by the applicants, may be reviewed at the **Hanford administrative record:**

Lockheed Martin Services
2440 Stevens Center Place, Suite 101
Richland, WA
Debbie Isom, (509) 376-2530
Mon.-Fri. 9a.m.-noon/1-3:30p.m.

Send written comments to:
Laura J. Cusack
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1315 W. 4th Avenue
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MODIFICATIONS TO PART III OF THE PERMIT

New Chapters:

Chapter 7 **– Waste Receiving and Processing Plant**

Chapter 8 **– Central Waste Complex**

III.7.B.a. Chapter 2

III.7.B.a.1. At the end of the paragraph, after " . . .basis" on Page 2-1, Line 24, add "provided that procedures are implemented resulting in the safe management of these boxes at WRAP. Prior to acceptance at WRAP boxes weighing more than 3,175 kilograms will be evaluated to determine if appropriate restrictions and protective measures can be implemented to ensure that safe processing can occur at WRAP. Ecology's Project Manager will be verbally notified prior to receiving such boxes."

III.7.B.a.2. On page 2-1, Line 31, insert "mixed" before " . . .low level."

III.7.B.a.3. On Page 2-1, Lines 34 and 35, insert "mixed" before " . . .transuranic."

III.7.B.a.4. On Page 2-3, Line 8, delete "stored" and replace with "managed."

III.7.B.a.5. On Page 2-3, Line 8, after " . . .throughout WRAP" insert "(e.g., shipping, receiving, stacker retriever, NDE, NDA, process gloveboxes)."

III.7.B.a.6. On Page 2-3, line 12, delete the word "most." Also delete the word "transuranic" and replace with "dangerous."

III.7.B.a.7. Footnote #3 on Page 2-3, delete " . . .and does not refer to noncompliance with WAC 173-303" and replace with "and/or waste that is not compliant with WAC 1173-303."

III.7.B.a.8. On Page 2-6, Line 48, delete "Drawing H-3-000003" and replace with "Drawing H-3-000002."

III.7.B.a.9. In Section 2.1, add the following text: "If WRAP is performing physical and chemical screening activities for another on-site TSD, only those containers which are being screened will be received at WRAP."

III.7.B.a.10. On Page 2-2, Line 46, add the following text as an additional bulleted item: "Retrieved waste shall be managed as incompatible waste until it has been characterized at WRAP."

III.7.B.b. Chapter 3

III.7.B.b.1. Delete "stored" on line 5, page 3-1, and replace with "managed."

III.7.B.b.2. Delete "storage" on line 5, page 3-1, and replace with "management."

III.7.B.b.3. WRAP is permitted for the treatment of waste that meets the WRAP acceptance criteria and for the storage of waste that will be, or has been, treated in WRAP or

CHAPTER 7
Waste Receiving and Processing Facility

This chapter sets forth the operating conditions for the Waste Receiving and Processing (WRAP) Facility.

III.7.A. COMPLIANCE WITH APPROVED PERMIT APPLICATION

The Permittees shall comply with all requirements set forth in Attachment 40, including the amendments specified in Condition III.7.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 2, May 22, 1998

Section 2.1	Description of Waste Receiving and Processing Facility
Chapter 3	Waste Analysis
Chapter 4	Process Information
Chapter 6	Procedures to Prevent Hazards
Chapter 7	Contingency Plan
Chapter 8	Personnel Training
Chapter 11	Closure and Financial Assurance
Chapter 12	Reporting and Record Keeping
Appendix 2A	Topographic Map
Appendix 3A	Waste Analysis Plan
Appendix 4A	Engineering Drawings
Appendix 7A	Building Emergency Plan
Appendix 8A	Training Plan
Attachment 41A	Waste Acceptance Process
Attachment 41B	Selecting a Laboratory and Quality Assurance/Quality Control

III.7.B. AMENDMENTS TO THE APPROVED PERMIT APPLICATION

III.7.B.c.5. After the word "sections," insert the italicized text in line 19 on page 1-2 to read as follows: "The following sections *and the flowchart in Attachment 41A* describe the process for waste acceptance . . ."

III.7.B.c.6. Delete lines 6 through 10 on page 1-3, and replace with text to read as follows: Verification: Verification activities include container receipt inspection, physical screening, and chemical screening. All waste shipments and containers are subject to receipt inspection during the waste shipment acceptance process. In addition, a percentage of waste containers and shipments are selected for physical screening. Containers are opened and inspected visually or verified by NDE, NDA, or dose rate profile. Of those containers subjected to physical screening, a percentage are required to be sampled for field or laboratory analysis. All information and data are evaluated to confirm that the waste matches the waste profile and container data/information supplied by the generator. Any . . . "

III.7.B.c.7. Delete "Waste Profile System" on line 45, page 1-3 and replace with the following: "the Performance Evaluation System (PES)."

III.7.B.c.8. Delete lines 32 through 46 on page 1-4 and replace with the following text: "conformance reports are used to complete an evaluation of the generator and to adjust the physical screening rate as indicated. At a minimum, an evaluation according to the following criteria shall be performed and the indicated scores shall be assigned based upon severity and justification:

1. Designation conformance issues
   - Regulatory violation, 7 – 10
   - Mismanagement of waste (e.g., conditions which would or did lead to placement of waste in the wrong storage location, the wrong treatment path, etc.), 4 – 6
   - No mismanagement of waste, 1 – 3
2. Characterization conformance issues
   - Safety issue, 7 – 10
   - Mismanagement of waste (see above), 4 – 6
   - No mismanagement of waste, 1 –3
3. Paperwork inconsistencies
   - LDR form, 1 – 3
   - Shipping papers or waste tracking forms, 1 – 3
   - Waste profile discrepancies, 1 – 3
   - Incomplete shipment and/or transfer information, 1 – 3
4. Screening conformance issues
   - Regulatory violation and/or safety issue, 7 – 10
   - Mismanagement of waste (see above), 4 – 6
   - No mismanagement of waste, 1 – 3
5. Receipt conformance issues
   - Regulatory violation and/or safety issue, 7 – 10
   - Mismanagement of waste, 4 – 6

was generated in WRAP. WRAP is not permitted for storage of waste that does not meet this description.

III.7.B.b.4. Delete "normally" on line 13, page 3-1.

III.7.B.b.5. Delete "manufactures" on line 15, page 3-1, and replace with "manufacturers."

III.7.B.b.6. Delete lines 19 through 21 on page 3-1 from this section.

III.7.B.b.7. Delete the following text from lines 24 and 25 on page 3-1: "and standard waste boxes. Waste also could be received in other U.S. Department of Transportation-approved containers." These containers are not permitted because they are not addressed in section 1.1.3 on page 1-5 of the WAP.

III.7.B.b.8. The Permittees shall prepare an attachment to the WAP which describes the waste tracking procedures as specified in lines 33 and 34 on page 3-1. This text shall be submitted to the Department for review and approval within thirty (30) days of issuance of this Permit. Subsequent to any revisions required by the Department, the description will be added to the text of Section 1.1.1. of the Waste Analysis Plan (WAP), also identified as Appendix 3A, as a Class 1 modification. If necessary, the Department will amend the requirements through a Class 2 or 3 Permit modification.

III.7.B.b.9. Waste transfers between Solid Waste Project TSD units (i.e., WRAP, T Plant, Central Waste Complex, and Low Level Burial Grounds) do not require the development of a new waste profile because the waste has already been accepted at one of the TSD units under the original waste profile and is being transferred for waste management purposes.

III.7.B.c. Appendix 3A

III.7.B.c.1. The enclosures in the process area for opening and sorting the waste in containers and for performing limited treatment as identified on page 1-1, lines 18 and 24 of Appendix 3A, Attachment 40, are containment enclosures commonly called gloveboxes. These are the same gloveboxes as mentioned on page 1-1, lines 36 and 37.

III.7.B.c.2. The phrase "could be" on page 1-1, line 33 is replaced with the word "is" to read as follows: "Waste . . . is examined by NDA or NDE or sent directly to the process area . . . "

III.7.B.c.3. Footnotes 1, 2, and 3 on page 1-1 are deleted.

III.7.B.c.4. The reference to Section 4.5 in the parenthetical phrase on page 1-2, line 34, is deleted and the phrase is revised to read as follows: "(Sections 2.1.3.2 and 7.4)."

- No mismanagement of waste, 1 – 3

A generator receiving a score of 10 or greater has demonstrated less than satisfactory performance and must be evaluated for corrective action by the WRAP operating organization. The physical screening rate is increased for that generator based upon the following criteria:

- A score of 10 to 15 – the physical screening frequency is increased to a minimum of 15%.
- A score of 16 to 20 – the physical screening frequency is increased to a minimum of 50%.
- A score greater than 20 – the physical screening frequency is increased to 100%.

III.7.B.c.9. Paperwork inconsistencies or improperly completed and/or incorrect information must be corrected and resolved prior to acceptance of waste for management at this TSD unit.

III.7.B.c.10. Approved waste profiles and all supporting documentation from the initial submission through all re-evaluations must be retained in the TSD unit operating record as required by Condition II.I.1. for waste managed, i.e., stored and/or treated, at this TSD unit. This documentation also must be retained in the WRAP operating record on the same schedule for those containers submitted by other TSD units for chemical screening only.

III.7.B.c.11. Within thirty (30) days of the issuance of this Permit, the Permittees are required to submit, to the Department for review and approval, text describing all constraints which apply to the acceptance of waste at this TSD unit for any purpose, including physical examination and temporary storage in any portion of the building or within the boundaries of the TSD unit. Subsequent to any revisions required by the Department, the description will be added to the text of Section.1.1.3 of the WAP as a Class 1 modification. If necessary, the Department will amend the requirements through a Class 2 or 3 Permit modification.

III.7.B.c.12. Insert the following text at line 32 on page 1-5: "1.1.1.3.4 Process for Reducing the Physical Screening Frequency. After the initial screening frequency has been established for a generator or that frequency has been adjusted due to poor performance, the physical screening frequency can be reduced in accordance with the following:

- The physical screening frequency will be stepped down in three steps based upon the ability of the generator to implement the corrective action plan and/or demonstrate an ability to appropriately manage waste. At no time shall the physical screening frequency be reduced below 5% for onsite generators or below 10% for offsite generators.

  Step 1) Reduce frequency by 66% the first month.

Step 2) Reduce frequency established in Step 1 by 50% or to the minimum allowable whichever results in a greater frequency.

Step 3) Reduce frequency to the minimum allowable.

- The reduction will be determined during the monthly evaluation process; however, the following minimum criteria must be met prior to reduction of the frequency:
  (1) Five (5) containers from the waste stream in question (defined by a single waste profile) must pass verification, and
  (2) The TSD unit must document an acceptable evaluation of the corrective action plan or that the generator's new waste management program has been implemented and is effective.

If the screening frequency was increased based upon conformance issues at the time of waste receipt, the corrective action plan must be fully implemented before the generator may return to the minimum physical screening frequency. However, waste streams from the same generator, which did not have conformance issues upon receipt at this TSD unit, may return to the minimum verification frequency if the TSD unit operating organization determines that the specific conformance issue is unlikely to affect the generator's other waste streams."

III.7.B.c.13. The following waste types are added in lines 10 through 14 on page 1-6 to the list of wastes prohibited from management at this TSD unit: (1) Bulk solids in trucks or roll-off boxes.

III.7.B.c.14. The item "Bulk liquid waste" in line 10 on page 1-6 is further defined as "Bulk liquid waste in tankers or drums."

III.7.B.c.15. Toxic Substances Control Act- (TSCA-) regulated waste may not be treated at this TSD unit until such time that a TSCA Permit is obtained for treatment.

III.7.B.c.16. Delete the text on page 1-6, line 43 through 1-7, line 13, and replace it with the following: "For waste that cannot be stored and treated in accordance with the requirements of this WAP (waste analysis plan), an alternative waste management plan (AWMP) may be submitted to the Department for review. Because the activities necessary to support such waste management may not be predictable, some flexibility in the timeframe for submitting, reviewing, and completing the AWMP may be necessary. The following schedule will be observed unless the Department and USDOE agree to an alternate schedule.

- Submit the AWMP to the Ecology Project Manager who is responsible for the TSD unit with a copy to the Hanford Facility RCRA Permit Coordinator at least 120 days before the project is expected to begin. The cover letter would summarize the nature of the request and state that "no reply within 35 working days constitutes approval."

- The Ecology Project Manager specified above review and provides comment within 35 working days after receiving the AWMP. At this time, the Department may request a longer comment period or receipt of additional information.
- Upon receipt of the comments by the Permittees, resolution of comments and issues would occur during project manager meetings or other meetings agreed to by the Permittees and the Department.
- For any additional information requested by the Department and for any resubmittal of a revised AWMP following resolution of the Department's comments, the same review timeframes are applicable.
- A final AWMP will be submitted to the Department for approval.
- If no comments are received from the Department within 35 working days after the original or final AWMP submittal, then the plan shall be approved.
- All submittals, including the Department's comments with resolution, shall be placed in the TSD unit operating record. If approval has been made by default, the Permittees shall provide a memo to the operating record so stating.
- The Department has final authority to approve or deny the AWMP."

III.7.B.c.17. Delete the text on page 2-1, lines 5 through 15.

III.7.B.c.18. Delete the phrase "or its representative" on page 2-2, line 42.

III.7.B.c.19. Delete the phrase "the information is accurate" on page 2-3, line 2, and replace with: "the waste to be shipped to WRAP is as described by the waste profile."

III.7.B.c.20. The text on page 2-3, lines 12 through 36, shall be deleted and replaced with text that is adequate to describe how containers are chosen for physical and chemical screening. Within thirty (30) days of issuance of this Permit , a description of this procedure must be submitted to the Department for review and approval; subsequent to any revisions required by the Department, the description will be added to the text of Section 2.1.2 of this WAP as a Class 1 modification. If necessary, the Department will amend the requirements through a Class 2 or 3 Permit modification.

III.7.B.c.21. Delete the text in lines 7 through 10 on page 2-4, and replace it with the following: "When the available information does not qualify as acceptable knowledge or is not sufficient to characterize a waste for management, the sampling and testing methods outlined in WAC 173-303-110 must be used by the generator to determine whether a waste designates as ignitable, corrosive, reactive, and/or toxic and whether the waste contains free liquids. If the analysis is performed to complete characterization after acceptance of the waste by the TSD unit, then this Permit governs the sampling and testing requirements."

III.7.B.c.22. Correct the WAC citations on page 2-4, lines 29 and 42 to read as follows: "173-303-380(1) (j), -(k), -(n), and –(o)."

III.7.B.c.23. Delete lines 34 through 38 on page 2-4, beginning with the following text: "During waste retrieval . . . " Replace it with: "The following waste knowledge exceptions apply to waste accepted for management at the WRAP TSD unit:

- Hazardous debris as defined in WAC 173-303-040 that is managed in accordance with 40 CFR 268.45 (the "Debris Rule") is not required to be sampled. Management of debris in this manner is not dependent on the quantification of constituents to be federal and State-only LDR regulations.
- Wastes generated on-site may be shipped to the WRAP TSD unit provided the waste has been characterized for storage and a representative sample has been taken to characterize the waste for treatment and/or disposal.
- Waste which was previously disposed and then retrieved may be transferred to the WRAP TSD unit with only the necessary information to properly manage the waste at the storage unit.
- Waste which was received prior to the implementation of this guidance and has been characterized for storage only may be transferred between WRAP and permitted storage units without re-characterization; however, the pre-shipment review and verification requirements must be met.
- On-site generators may ship waste, that cannot be sampled by the generator, to the WRAP TSD unit for completion of characterization provided that the waste is characterized for storage."

III.7.B.c.24. Delete the text on page 2-5, lines 38 through 42 (Section 2.2.1) and replace it with the following: " . . . 100 percent of each shipment (including onsite transfers) are inspected at the TSD unit for possible damage or leaks, complete labeling, intact tamper seals (if waste has been subjected to physical or chemical screening at another location), and piece count. This is to ensure that the shipment: (1) is received in good condition, (2) is the waste indicated on the manifest or shipping papers, (3) has not been opened after physical and/or chemical screening was performed, and (4) is complete. Any issue resolution, including correction of document discrepancies, re-labeling, overpacking of leaking or deteriorated drums, must occur before verification activities may continue. Documentation of issue resolutions must be maintained in the TSD unit operating record. The container receipt inspection is performed by the WRAP operating organization at WRAP. It must be completed within 24 hours of receipt of the shipment and the shipment must be moved to storage or, if discrepancies exist, into a temporary holding area within the next 24 hours. Action must be taken to overpack any leaking or damaged containers immediately upon discovery. Any paperwork discrepancies for shipments from both offsite and onsite generators must be resolved as required by WAC 173-303-370(4)."

III.7.B.c.25. The Department recognizes that the generator may hire the WRAP operating organization to treat waste, including sorting and repackaging, and thereby correct discrepancies and problems identified during the waste acceptance process. If correction of these discrepancies and problems are not accomplished within two (2) months of receipt of the waste shipment, the Permittees shall contact the

Department (specifically the Ecology Project Manager) to establish a compliance schedule for treatment of the waste shipment.

III.7.B.c.26. Delete the text on page 2-6, lines 1 through 3 (Section 2.2.2), and replace it with the following: "verification activity. Physical screening by visual inspection or NDE could be performed by the WRAP operating organization before the waste is shipped to WRAP. In this case, the visual inspection is performed by observation of the generator filling empty containers with waste or examining the container contents at the location. NDE is performed using mobile equipment which meets the performance requirements identified in the Permit. When visual inspection or NDE is performed at a location other than WRAP, at least one tamper-resistant seal is applied to each container examined and verified as acceptable, so that the container may not be reopened unless the seal is broken. These seals are the same as custody seals and are subject to the same evidentiary requirements as custody seals. The seals must be placed by the observer/verifier before the container leaves his/her sight on the day the observation occurs. The seal must be uniquely identified and controlled, e.g., signed and dated <u>or</u> uniquely numbered and tracked in a logbook. In addition, the seal must be easily differentiated from tamper-resistant seals used for other purposes. The verification must be documented in the paperwork that accompanies the waste shipment to WRAP and that paperwork must be placed in the TSD unit operating record. Also, the transfer documentation must identify whether the container required verification and the result of that verification. As long as the tamper-resistant seal remains intact, those containers of waste may be moved within the Hanford Solid Waste Complex without further physical screening, although container receipt inspections are required for all waste shipments, including transfers. The waste may still be subject to chemical screening."

III.7.B.c.27. Add the following text to Section 2.2.2: "Selection and interpretation of the appropriate physical screening method(s) are conducted by personnel who are qualified as described in the Training Plan (Appendix 8A) as amended by any Permit conditions. Each physical screening method is performed by qualified personnel."

III.7.B.c.28. Add a reference to the text on page 2-6, line 6 that reads as follows: "(See Section 3.1 for the criteria for choosing a physical screening method.)."

III.7.B.c.29. Insert the phrase "The minimum" at the beginning of the sentence in line 17 on page 2-6 and replace the phrase "generating units" in lines 17 and 18 with the word "generators" so that the sentence reads as follows: "The minimum physical screening frequency is 5 percent for onsite generators, . . . "

III.7.B.c.30. Add a reference to Section 1.1.1.3. to the sentence in line 28 of page 2-6, so the sentence reads as follows: "All failed containers and shipments are dispositioned via the PES, as described in Section 1.1.1.3. of this WAP.

III.7.B.c.31. Delete "authorized independent agent" on page 2-7, line 1.

III.7.B.c.32. Delete "or Pacific Northwest National Laboratory (PNNL) packaged waste that is transferred to PNNL operated TSD units" on page 2-7, lines 4 and 5.

III.7.B.c.33. Delete the text on page 2-7, lines 12 through 14, and replace it with the following: "frequency, and exceptions for chemical screening. Chemical screening may be performed by the WRAP operating organization before the waste is shipped to WRAP. After chemical screening is done, tamper-resistant seals are applied over the container opening on each outer container screened. The requirements described for tamper-resistant seals used for visual examination apply for chemical screening, as well. Any requirement of this Permit related to chemical screening also applies for chemical screening performed before the waste is received at WRAP."

III.7.B.c.34 Delete the text on page 2-7, line 16, and replace with the following text: "Selection and interpretation of the appropriate chemical screening method(s) are conducted by personnel who are qualified as described in the Training Plan (Appendix 8A) as amended by any permit conditions. Each chemical screening method is performed by qualified personnel."

III.7.B.c.35. Delete the text on page 2-7, lines 17 through 19, which reads: "The objective . . . documentation." and replace it with the following: "The objective of chemical screening is to obtain reasonable assurance that the waste received by the TSD unit is consistent with the description of the waste on the waste profile and to provide information that will be used to safely manage the waste at the TSD unit."

III.7.B.c.36. Delete the text in lines 19 through 21 on page 2-7, that begins with "The following tests are selected . . . " This text is replaced with the following: "All of the listed screening tests are required to be conducted on all samples collected for chemical screening, unless a technical justification is documented describing the reason for not performing the chemical screening test. The justification may be provided by a procedure, noted in the special instructions to the waste profile at the time of approval, or documented in the verification record, i.e., a logbook notation why a test is not appropriate to the sample or matrix."

III.7.B.c.37. Delete "Headspace testing" from line 27, page 2-7 and replace with "Ignitability/headspace screening for volatile compounds."

III.7.B.c.38. Delete "Polychlorinated biphenyl (PCB)" from line 32 on page 2-7.

III.7.B.c.39. Delete "Paint filter" from line 40, page 2-7 and replace with "Paint Filter Liquids Test."

III.7.B.c.40. Correct the reference in line 44 on page 2-7 to read as follows: "Section 2.2.5.2."

III.7.B.c.41. Delete ", etc." from line 19 on page 2-8.

III.7.B.c.42. Delete "special-case" in line 32, page 2-8 and replace with: "special cases."

III.7.B.c.43. Delete lines 37 through 40 on page 2-8 to the word " . . . contamination" and replace with: "Sampling is performed in accordance with WAC 173-303-110(2). A representative sample is obtained for chemical screening."

III.7.B.c.44. Delete the phrase "shipping documentation" in line 5 on page 2-9, and replace it with "waste profile."

III.7.B.c.45. Add the following paragraph describing quality assurance to Section 2.2.5: "All confirmation activities shall be governed by TSD unit-specific governing documentation and performed in a consistent manner. Confirmation records are kept in a traceable, defensible manner. All data are recorded either in uniquely identified, bound logbooks with sequentially numbered pages or on electronic media. Records must be maintained in a protective manner, e.g., protected from fire, water, access and/or tampering by unauthorized personnel. In addition, electronic records must be protected from electromagnetic damage."

III.7.B.c.46. If a false negative occurs as described in line 14, page 2-9, the corrective action described in lines 15 and 16 must include the re-evaluation of all affected video tapes/records since the previous acceptable QC check. If any results are questionable, those affected drums must be reevaluated and handled appropriately.

III.7.B.c.47. In Section 2.2.5.1. on page 2-9, quality control has not been presented for non-destructive analysis or for dose rate profile. Until such time that text describing those physical screening options is provided to the Department for review and approval, the required revisions are made, the public comment conducted, and the text becomes an enforceable condition of this WAP, all physical screening must be by visual observation and NDE only, subject to other enforceable conditions of this Permit.

III.7.B.c.48. The equipment requirements of Table 4-1, as amended by any Permit conditions, apply to sampling for chemical screening. In addition, the following sampling equipment may be used in sampling for chemical screening: (1) For liquids and slurries – dip, tank, bomb, and bailer samplers, as well as tube-type samplers (e.g., thin-walled Shelby tubes, split spoons, probes), and (2) For sludges and solids – Tube-type samplers (as above) and augers; for small containers, a spoon may be used in place of a scoop.

III.7.B.c.49. Delete lines 21 through 40 on page 2-9. The required chemical screening quality control include, but are not limited to, the following:

- Containers and equipment of the appropriate size and that are chemically compatible with the waste and all testing reagents will be used.

- A documented source of reagent water will be used.
- All chemicals and test kits shall be identified in the logbook/records by manufacturer; lot number(s) or, if no lot number is present, by date of manufacture; date of receipt; and expiration date (if none provided or not applicable, so indicate). All chemicals and test kits must be labeled so that they are traceable to the logbook/records.
- All chemical preparations, i.e., chemical mixtures or solutions, shall be documented in logbook/records by the method of preparation, e.g., weight or volume of chemical(s), identity of solute, volume or weight of solute, final concentration , as well as the name of the preparer, preparation date, expiration date. They must be labeled completely and traceable to the preparation records.
- One in 20 samples at a minimum will be sampled in duplicate and analyzed.
- One in 20 analyses at a minimum will be performed in duplicate. The duplicate sample shall not be the sampling duplicate.
- The results of quality control checks for each test kit lot or periodic testing and for daily quality control checks including equipment calibration will be recorded in a defensible manner.

III.7.B.c.50. Insert the phrase "and Quality Control" in the text in line 42 on page 2-9 and the additional text provided to read as follows:

- Equipment and Quality Control Checks

III.7.B.c.51. The following text is inserted under the bulleted heading "Equipment and Quality Control Checks in line 42 on page 2-9: "The WRAP operating organization will perform the following quality control checks on each new test kit or reagent lot to be followed by rechecks on at least a six-month interval, unless a more frequent period is specified in the test kit instructions or the quality control check method.

(a) Ignitability/Headspace Screening for Volatile Organic Compounds: Headspace screening equipment shall be calibrated using known standard in accordance with the manufacturer's instructions. In addition, the equipment will be quality control checked on each day of use by sampling the headspace of a reagent containing hexane. If it does not perform as expected, the equipment will be recalibrated.

(b) Peroxide Screening: The quality control check for the peroxide test paper is as follows: (1) Moisten the test paper with water. Add two drops of 3% hydrogen peroxide solution to the test paper. The test paper should turn blue. If it does not, replace the test paper or reject the lot. (2) Add a drop of potassium dichromate solution to approximately ½-inch of water in a test tube. Place the peroxide test paper in the solution. The test paper should not turn blue. If it changes color, replace the test paper or reject the lot. (3) Add one drop of nitric acid to the test paper. The paper should turn yellow. If it does not, replace the test paper or reject the lot.

(c) Paint Filter Liquids Test: The quality control check consists of visually inspecting each filter, prior to performing each test, to ensure

that it is in good condition and is not torn or ripped. If it is damaged, the filter shall be replaced.

(d) pH Screen: The quality control check for the pH test paper is as follows: (1) Place a drop of concentrated hydrochloric acid onto the test paper; the pH should be 0±1. (2) Place a drop of acetic acid onto the test paper; the pH should be 2 to 3±1. (3) Place a drop of reagent water onto the test paper; the pH should be 7±1. (4) Place a drop of ammonium hydroxide onto the test paper; the pH should be 11 to 12±1. (5) Place a drop of sodium hydroxide onto the test paper; the pH should be 14±1. If the pH on most of these tests is not as specified, replace or reject the pH paper. If only one or two test produce results that are different than stated, check or replace the reagents. The most important check is the reagent water, although it frequently will have a slightly acidic pH. All of the stated pH checks also may be performed using pH buffer solutions.

(e) Oxidizer Screen: The quality control check for the oxidizer test paper is as follows: Moisten the test paper with 3M hydrochloric acid. Add two drops of potassium dichromate solution to the paper. The paper should turn black. If the test is negative, replace the paper or reject the lot.

(f) Water Reactivity Screen: The quality control check consists of testing the pH of the reagent water. If the pH is not 7±1, the reagent water shall be replaced. Note that this check may be performed as part of the pH quality control check.

(g) Cyanide Screen: The ferrous ammonium citrate reagent is the most unstable reagent used in this test. The ferrous ion will oxidize to ferric upon standing for even a short period of time. If the reagent has a thick opaque color or if there are particulates floating in the solution, the reagent should be replaced. To check the ferrous ammonium citrate, perform both of the following tests: (1) Add a pinch of ferrous ammonium sulfate to ¼-inch of the ferrous ammonium citrate reagent in a test tube. Add a drop of 1,10-phenanthroline to the test tube. The solution should turn blood red. (2) Add a pinch of ferrous ammonium sulfate to ¼-inch of the ferrous ammonium citrate reagent in a test tube (this is solution 1). Add a small amount of potassium ferrocyanide to a test tube of water (this is solution 2). Add a small amount of solution 1 to solution 2 to form solution 3. Add a ¼-inch of 3 Normal (i.e., 3N or 3M) hydrochloric acid to solution 3. The solution should turn dark blue. If either test is negative, replace the reagent or reject the lot.

(h) Sulfide Screen: The quality control check for the sulfide test paper is as follows: (1) Add 1 to 2 drops of reagent water to the sulfide test paper. (2) Add two drops of 3 Normal (3N or 3M) hydrochloric acid to two sodium sulfide flakes in a disposable watch glass or weighing boat. (3) Touch the sulfide test paper to the flakes. The test paper should turn brown, black, or silvery. If the test is negative, then replace the test paper or reject the lot.

(i) HOC Screen: The quality control check is to perform the test according to the test kit instruction on a reagent containing approximately 50 ppm of a chlorinated organic compound. If the test does not indicate a positive result, replace or reject the lot. If two or more test kit lots do not indicate a positive result, replace and/or test the reagent and retest the test kit lots.

III.7.B.c.52. The phrase "shipping documentation" is used throughout Section 3.0. The Permit requires that the shipping documentation be evaluated against the "waste profile" so that only approved waste is received by the TSD unit. Therefore, ultimately each physical and chemical screening result must be in agreement with the waste profile to determine the acceptability of the result and, thereby, whether or not the container fails.

III.7.B.c.53. The result of failure (i.e., "a container fails . . .") as described in Section 3.1, Physical Screening Parameters, under the heading "Failure criteria" may be a return to the generator, a re-profiling of the waste stream, or treatment (processing or reprocessing) at the WRAP TSD unit. The result of failure for chemical screening (e.g., failing the test, constitutes failure), as described in Section 3.2, Chemical Screening Parameters, under the heading "Tolerance" may the same outcomes as for physical screening. In addition, a failure of the chemical screening may be the expected outcome of the test, dependent upon the waste profile.

III.7.B.c.54. Delete the text in lines 4 and 5 of page 3-1 and replace it with the following: "Physical and chemical screening parameters for verification must be chosen from those in Sections 3.1 and 3.2. Parameters for waste designation and to meet LDR requirements are addressed in Section 3.3."

III.7.B.c.55. Replace the phrase "could be used to perform" in line 10 on page 3-1 with the phrase "are approved for use in performing" so that the sentence reads as follows: "The following methods are approved for use in performing physical screening."

III.7.B.c.56. Replace "could be" with "are" on line20, page 3-1 so that the sentence reads as follows: "Homogenous loose solids are probed to determine the presence of material not documented . . ."

III.7.B.c.57. Replace "could be used to perform" in line 41 on page 3-2 with the phrase "are approved for use in performing" so that the sentence reads as follows: "The following methods are approved for use in performing chemical screening."

III.7.B.c.58. Delete the text in lines 38 through 40 on page 3-1 and replace it with the following text: "The container is scanned top-to-bottom and side-to-side with a non-destructive examination (NDE) system according to documented and approved procedures. At a minimum, the lifts, conveyors rotators, and manipulators for the real-time imaging systems shall be capable of handling

drums up to 85-gallons in size and up to 1000 pounds in weight and boxes up to 7000 pounds in weight. The minimum image quality, X-ray system performance, and system operator requirements shall be in accordance with the documented specifications for operating the NDE system. The X-ray components shall include the following: (1) a nine-inch (diagonal) entrance field image intensifier, or equivalent, (2) a twelve-inch, high resolution video display monitor, (3) a video printer, and (4) a high-performance, broadcast quality, S-VHS/VHS recorder/player. Quality assurance measures that indicate X-ray imaging quality shall be utilized and documented during equipment startup. For verification activities by NDE, data are observed on a video monitor and captured on video tape to provide a record. Personnel experienced in the interpretation of NDE imagery will record their observations. These observations are then compared to the inventory of container contents on the shipping documentation and also must be in agreement with the waste profile."

III.7.B.c.59. In addition to the text provided in lines 26 and 27 on page 3-3, the following condition applies: The required method for the Paint Filter Liquids Test is Method 9095 in the U.S. Environmental Protection Agency (EPA), SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (the most recently promulgated version).

III.7.B.c.60. Delete the text in lines 39 through 42 on page 3-3 and replace it with the following: "Method: Full range pH paper with a stated precision of 1.0 pH unit and a corresponding color chart is used for testing. For aqueous samples, a representative test portion of the sample is introduced onto the strip of pH paper. For solids, sludges, and non-aqueous liquids, a representative test portion is mixed with an approximately equal amount of water. The aqueous portion (extractant) of this mixture is then introduced onto the strip of pH paper. The paper is compared visually to the color chart to determine the best color match. The pH is recorded to the nearest whole pH unit."

III.7.B.c.61. Delete the text in lines 7 and 8 on page 3-4 and replace it with the following: "Method: Potassium iodide (KI) starch test paper is used for testing. KI oxidizes to iodine (I_2) in the presence of starch to yield a dark blue-black coloration on the test paper. A representative test portion of the sample is placed on a disposable watch dish or weighing boat. The KI test paper strip is acidified with 3M hydrochloric acid (HCl) and placed in contact with the test portion. A darkening of the test paper is a positive indication of the oxidizing properties of the sample."

III.7.B.c.62. Delete the text in lines 19 through 21 on page 3-4 and replace it with the following: "Method: Water reactivity of waste is determined by adding a representative test portion to an approximately equal volume of water in a disposable watch glass or weighing boat. The mixture is observed for positive indications of water reactivity such as temperature change (increase or decrease), gas evolution, gelling or polymerization."

III.7.B.c.63. Delete the text in lines 32 through 34 on page 3-4 and replace it with the following: "Method: A ferrous ammonium citrate solution is used as a colorimetric indicator of free cyanides and some complex cyanides. The reagent turns a dark Prussian blue color due to the formation of blue iron ferrocyanide in the presence of cyanide under acidic conditions. A representative test portion is placed on a disposable watch glass or weighing boat. An approximately equal amount of water is added to solid matrices. The ferrous ammonium citrate solution is added and mixed into the test portion. The mixture is then acidified with 3M hydrochloric acid (HCl). A dark blue color, if present, indicates the presence of cyanides."

III.7.B.c.64. Delete the text in lines 45 through 48 on page 3-4 and replace it with the following: "Method: Lead acetate test paper strips are used for testing. Under acidic conditions, sulfide compounds release hydrogen sulfide (H_2S) and, in the presence of this H_2S, the lead acetate paper changes to a silvery brown or black color due to the formation of lead sulfide (PbS). A representative test portion is place on a disposable watch glass or weighing boat. The test portion is acidified with 3M hydrochloric acid (HCl). A lead acetate test paper strip is dampened with water and placed near the acidified test portion. A darkening of the test paper is a positive indication of the presence of sulfides in the test portion."

III.7.B.c.65. Delete the text in lines 11 through 13 on page 3-5 and replace it with the following: "Method: A precise amount of oil (i.e., the test portion) is placed into the first of two disposable test tubes provided with the test kit. An ampule containing a colorless catalyst is broken and the contents are mixed thoroughly with the test portion. A second ampule containing metallic sodium is broken and the sodium, activated by the catalyst, strips chlorine from any chlorinated organic compounds present to form sodium chloride. An aqueous buffer solution is added to the test portion. This neutralizes the excess sodium and extracts the sodium chloride into the water. The water layer is then separated from the oil and decanted into the second test tube. An ampule containing a precise amount of reagent is broken and the contents mixed with the water. An ampule containing an indicator is then broken and the contents mixed with the water. The color of the mixture is dependant on the amount of chlorinated organic compounds in the original test portion of oil."

III.7.B.c.66. Delete the text in lines 15 and 16 on page 3-5 and replace it with the following: "Tolerance: The presence of halogenated organic compounds (HOCs) in the waste requires that either (1) the generator must supply laboratory data obtained by the SW-846 Method 8082 for the waste in the specific container, or (2) the specific container of the waste stream must sampled by the TSD unit and the waste analyzed by SW-846 Method 8082 to determine if the waste contains polychlorinated biphenyls (PCBs). If the waste does contain PCBs, the waste profile must be re-evaluated to determine if the waste is TSCA-regulated and, if the waste is not TSCA-regulated, then the quantitative analytical data must be useable to verify that the concentration of PCBs in the waste is less than 50 ppm.

The waste fails if the waste stream is TSCA-regulated or the concentration of PCBs is equal to or greater than 50 ppm. The TSD unit may fail the waste (i.e., return it to the generator) without obtaining the quantitative analytical data."

III.7.B.c.67. Delete "Sample and" from line 19 on page 3-5.

III.7.B.c.68. Delete the text in lines 21 and 22 on page 3-5 and replace it with the following: "Parameters needed to meet designation, characterization, and LDR requirements for waste stored and/or treated at WRAP are identified in Appendix A of this WAP."

III.7.B.c.69. Delete the title of Section 4.0 and replace it with the following: "Selecting Sampling Procedures." The content of this section, as amended, applies to all sampling that is done by or at the direction of the TSD unit for (1) characterization of waste after processing, (2) LDR of treated waste, or (3) additional characterization, if needed, for treatment or disposal.

III.7.B.c.70. Delete the text in lines 10 through 11 on page 4-2 beginning with "or other approved . . . " and replace it with the following: " except as amended by the Permit."

III.7.B.c.71. The following condition applies for the preservation and holding times for samples and for laboratory extracts of the samples. Waste samples are treated and preserved as necessary to protect the sample. Tables 2-36 and 4-1 in SW-846 contains recommended treatment/preservative and holding times. Not all samples require preservation and placing a holding time on a sample may not always be appropriate. Samples with a high concentration of the analyte or non-LDR samples may not require preservation, whereas aqueous samples and samples with low concentrations of the analyte or LDR samples require preservation. If the required preservation interferes with some of the analytes requested, then multiple aliquots of sample may need to be obtained for analysis. Samples taken for analysis of a persistent constituent or non-biologically degradable constituent may not require a holding time. For example, a sample for PCB analysis does not require a holding time (although the laboratory extractant is subject to a holding time). The recommended holding time and preservation for hexavalent chromium (Cr+6) listed in the Tables are required for all sample matrices unless the hexavalent chromium concentration is assumed to be represented by the total chromium in the sample. The recommended preservation and holding time for mercury (Hg) is required in all sample matrices. For the laboratory-prepared organic extracts (e.g., semi-volatile organic analysis and PCBs) the holding times listed in the Tables are required to be met for each extract.

III.7.B.c.72. Delete the title of Section 4.5 and replace it with the following: "Establishing Quality Assurance and Quality Control Procedures for Sampling."

III.7.B.c.73. The log of sampling activities described in lines 18 through 23 on page 4-2 is required to be kept in an inventoried, uniquely numbered, bound logbook with sequentially numbered pages. Any affixed information, e.g., pictures, copies of chain-of-custody documentation, shall be permanently attached to a logbook page and initialed and dated across the edge of the attached material onto the logbook page so that removal or tampering with the attachment(s) can be identified. No affixed material may be placed over any other affixed items or written entries. The requirements for defensible data recording apply, including correction of entries by single line cross-out, initial and date, and give reason for the change. A signature is required rather than initials if the correction is made by someone other than the original recorder. No entries shall be obliterated, e.g., "white out" must not be used. The identity of the person who is initialing the record must be easily determined.

III.7.B.c.74. "Appropriate personnel" in line 23 on page 4-2 is defined as the sampler or a person who is directed by the sampler.

III.7.B.c.75. Insert the following after the sentence in line 23 on page 4-2: "If sampling is conducted in a posted radiological zone, then the logbook entries may be made by a person who is outside the zone or by the sampler immediately after the sampling is completed."

III.7.B.c.76. Delete the phrase "or copies of logs are maintained by the appropriate personnel after completion of sampling activities" in line 24 on page 4-2 and replace it with the following: "are permanent records of the TSD unit and must be retained in the TSD unit operating record."

III.7.B.c.77. Delete the text in lines 26 through 28 on page 4-2 and replace it with the following: "Chain of custody and chain-of-custody documentation are maintained for samples at all times. Two chain-of-custody documentation systems are employed by WRAP: electronic for chain of custody internal to the WRAP processing area and hard copy for all other chain of custody. Electronic chain of custody is provided by the Data Management System (DMS), a computer database, for samples collected from waste undergoing processing in the WRAP gloveboxes. After a sample is collected and placed in a sample transfer container, the sample collector enters his/her unique password into the chain-of-custody screen on the DMS. When custody of the sample is transferred from one individual to another within the WRAP TSD unit, both individuals enter their passwords into the DMS at the time of custody transfer. The DMS includes, but may not be limited to, the following information: the container from which the sample originated, the unique sample number assigned, date and time of collection, sample type, sample location, method(s) of transfer to the laboratory, identity of the sample collector, identity of all subsequent internal WRAP custodians. The information on the DMS is transferred to an independent computer system on a daily basis. The independent system transfers the data to an electronic storage medium which is kept in an appropriately protected storage

vault. After preparation of the sample for transfer to a laboratory, a chain of custody form (hard copy) is generated by TSD unit personnel. The final custodian listed on the electronic chain of custody is the initial custodian on this chain of custody form. In addition, for all samples collected outside of the gloveboxes, a chain of custody form (hard copy) is filled out by the sample collector. This form includes any transfers of custody within the TSD unit. The hard copy chain-of-custody form travels with each sample to the laboratory."

III.7.B.c.78. Section 5.0 is deleted in entirety and replaced by the text of Attachment 41, B.

III.7.B.c.79. The preparative method for the toxicity characteristic is EPA, SW-846 Method 1311, Toxicity Characteristic Leaching Procedure (TCLP). To ensure that the test portion is representative of the waste, a test portion of 50 grams or more is preferred. If a test portion of 50 grams or more is used for the determination, then only a single extraction is required to be performed. However, if the test portion is less than 50 grams, each material to be tested must be extracted in duplicate or multiple replicates so that the precision of the extraction can be determined and evaluated. A relative standard deviation of 25% or lower between extractions for the analytes must be obtained for the analytical data to be useable for waste designation. All routine and quality control data associated with the TCLP and subsequent determinative methods are required to be maintained in the TSD unit operating record.

III.7.B.c.80. Instead of performing the TCLP as described above, a material may be analyzed for the total concentration of the Toxic Characteristic (TC) constituents. For this approach, solids and sludges must undergo a digestion procedure for metals or an extraction procedure for organics. Then, based on the assumption that the analytes are 100% (totally) leachable from the waste, the resulting data are evaluated against the TC criteria allowing for the 20-fold dilution that is inherent in the TCLP extraction for solids and sludges. (Note that the dilution factor does not apply for liquids.) That is, for each toxic characteristic metal and organic compound, if the analyte concentration is less than 20 times the TC limits, then the waste is not considered to possess the characteristic of toxicity for that constituent. If the totals are more than 20 times the TC limits, then a TCLP must be performed (or, if undergoing stabilization, the waste may be retreated before performing another screening).

III.7.B.c.81. Delete the text in lines 4 through 12 on page 6-1 and replace it with the following: "The frequency to re-evaluate the waste profile and supporting data and documentation is each twelve (12) months, at a minimum, or more often if the generator has informed the TSD unit of a change in the waste generation process or if the TSD unit has identified that the waste received at the TSD unit or the description on the manifest or shipping papers does not match the waste profile. If the generator has informed the TSD unit of a change in the waste generation process, the waste re-enters the waste stream approval process described in Section 2.1.1. as amended by any Permit conditions. The TSD unit will evaluate

verification data against the waste profile to identify any waste streams for which a change in waste generation process is suspect. If a waste stream is suspect, that waste stream also will re-enter the approval process described in Section 2.1.1 as amended by any Permit condition."

III.7.B.c.82. Delete the sentence in lines 10 and 11 on page 7-1, beginning with "Differences include . . . " and replace it with the following text: "Differences include, but are not limited to, the following: (1) physical and chemical screening frequencies for verification (minimum percentages of 5% for waste from on-site generators and 10% for waste from off-site generators (note that chemical screening frequency is dependent upon the physical screening frequency), (2) shipping documentation (Uniform Hazardous Waste Manifests are used for waste from off-site generators and waste tracking forms are used for waste from on-site generators), and (3) LDR documentation requirements (notification for waste from off-site generators and the information contained in the notice for waste from on-site generators)."

III.7.B.c.83. Delete "and not per Section 1.1.1.1" in line 44 on page 7-1.

III.7.B.c.84. Correct the WAC citation in line 1 on page 7-2 to read as follows: "WAC 173-303-380(1)(j), -(k), -(l), -(m), -(n), or –(o)."

III.7.B.c.85. Delete "an" in line 32 on page 7-3 and replace it with "that a federal."

III.7.B.c.86. Delete "or equivalent" in line 33 on page 7-3.

III.7.B.c.87. Delete "or any other method allowed by regulations" in line 34 on page 7-3.

III.7.B.c.88. Delete "SW-846 or any other method allowed by regulations" in line 38 on page 7-3 and replace it with "this Permit."

III.7.B.c.89. Delete "sample" in line 44 of page 7-3 and replace it with "analytical."

III.7.B.c.90. Delete "by WRAP" in line 46 on page 7-3.

III.7.B.c.91. In line 47 on page 7-3, add the following text: "A copy of the certification is placed in the WRAP operating record."

III.7.B.c.92. Delete "Where" in line 1 on page 7-4 and replace it with "When."

III.7.B.c.93. Correct the WAC citation in line 4 on page 7-4 to read as follows: "WAC 173-303-380(l)(k), -(n), -(o)."

III.7.B.d. Chapter 4

III.7.B.d.1. On Page 4-1, Line 33, delete "TSD" and replace with "LDR and disposal."

III.7.B.d.2. On Page 4-1, line 44, delete "approved" and replace with "appropriate."

III.7.B.d.3. On Page 4-2, Line 33, insert the following text: "Information for all containers received at and shipped from WRAP will be maintained on an Inventory recordkeeping/control system. The records to be maintained for these containers will include documentation of all testing, analyses, contents, and package identification number (PIN) resulting from WRAP operations. The PIN is used to track waste movement from cradle to grave on SWITS. If SWITS is substantially changed, the Permittee must notify the Department of how cradle to grave documentation will be maintained for all waste managed at WRAP."

III.7.B.d.4. On Page 4-2, Lines 45-46, delete "as previously discussed" and replace with "according to the same regulations as other containers."

III.7.B.d.5. On Page 4-3, Lines 6-9, move the text in Section 4.1.4.1 to Page 4-1, Line 36.

III.7.B.d.6. On Page 4-3, Line 9, add "The WRAP floors and curbing serve as the secondary containment for any spills that might occur inside the building."

III.7.B.d.7. The Permittee shall conduct annual inspections of all exterior roof and wall surfaces for building 2336-W during the hottest period each summer, documenting the status of building panel delamination. Inspections shall begin in 1999 and continue until the Department is satisfied that the rate of new panel delaminations has decreased and will continue to decrease such that further evaluations will not be required. All panel delaminations shall be repaired within sixty (60) days of the inspection.

The Permittee shall submit to the Department an annual report documenting the annual inspection and repair of panel delaminations at building 2336-W. The report will include the following:

- Scaled drawings (sized to one scale) indicating current panel delaminations, excluding previously repaired delaminations.
- A record of repairs made subsequent to this year's inspection.
- A listing of current panel delaminations, including location on building (i.e., specific portion of roof or wall), size, history of repair, moisture content, and location on panel (i.e., relative to edges).
- Any delaminations identified on a panel during each inspection shall be listed sequentially relative to previous panel delaminations for that panel.

This information shall be submitted to the Department within ninety (90) days of inspection. All scaled drawings will be of the same scale as documented in 1999 in order to compare changes in panel delamination rates.

III.7.B.d.8. On Page 4-4, Line 18, delete the word "only" and replace with "main."

III.7.B.d.9. On Page 4-4, Line 19, add the following text: "The estimated amount of water discharged by the fire suppression system during a 20 minute discharge is 13,578 gallons for the Shipping/Receiving Area, 8,626 gallons for the NDE/NDA Area, and 8,412 gallons for the Process Area. The Permittee shall provide equipment sized to be capable of pumping the secondary containment volume within 24 hours. For small volumes of water, 55-gallon drums will be utilized as transfer containers. If the situation threatens human health or the environment, the Permittees shall remove liquid from the secondary containment immediately, within 24 hours. If the situation does not threaten human health or the environment, then the permittee shall remove liquid from the secondary containment within 72 hours. If the identified schedules cannot be met, the Permittee shall notify the Department for approval of an alternative schedule.

III.7.B.d.10. On Page 4-4, Line 31, delete "(Chapter 7)" and insert "in Section 7.2.5 of Appendix 7A."

III.7.B.d.11. On Page 4-i, Line 16, delete "Liquids" and replace with "Waste."

III.7.B.d.12. On Page 4-4, Line 34, delete "Liquids" and replace with "Waste."

III.7.B.d.13. On Page 4-4, Line 36, delete "liquids."

III.7.B.d.14. Insert the following text as a bullet on Page 4-4, Line 38: "Normally solids are removed using a vacuum system and/or a broom. After all the material is removed the area is decontaminated using a method appropriate for the material spilled."

III.7.B.d.15. On Page 4-4, delete the text from the bullet on line 46 and replace with the following bullet: "If the waste is unknown, samples are taken and analyzed to identify dangerous constituents and for designation, treatment, and disposal purposes."

III.7.B.d.16. On Page 4-5, Line 26, insert the following text: "Records (electronic and/or paper) of all spills and releases of hazardous substances, including radiation survey results, shall be maintained as part of the WRAP operating record throughout the operating life of WRAP. These records will eventually be utilized during closure activities at WRAP as noted in Chapter 11 of this permit."

III.7.B.d.17. On Page 4-6, Line 37, after " . . .TSD unit" add ", other than WRAP,."

III.7.B.d.18. On Page 4-8, Line 1, after " . . .of mixed waste" insert the following text: "in accordance with all applicable regulations under the Atomic Energy Act and the Nuclear Waste Policy Act."

III.7.B.d.19. On Page 4-8, Line 33, delete ", and other areas within WRAP if needed."

III.7.B.d.20. On Page 4-8, Line 33, add "Treatment by macroencapsulation is permitted to occur in the Shipping and Receiving area."

III.7.B.d.21. On Page 4-8, Line 33, add "Refer to Appendix 3A for additional description of waste treatment at WRAP."

III.7.B.d.22. Permittee shall identify critical systems for safe management of dangerous waste and mixed waste at WRAP as required in Facility Condition II.L.2.b of this permit. The Permittee shall describe the location and function of each critical system identified. This information shall be submitted to the Department within thirty (30) days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

III.7.B.e. Chapter 6

III.7.B.e.1. Delete the brackets at the end of the heading on Page 6-i, Line 8, and replace with "[F-1a(1)]."

III.7.B.e.2. On Page 6-1, Line 9, after " . . .personnel" add "to radioactive, dangerous, and mixed waste."

III.7.B.e.3. On Page 6-1, Line 10, add " Procedures to prevent hazards at WRAP will comply with all applicable state, local, and federal regulatory requirements."

III.7.B.e.4. On Page 6-2, Line 3, add "WRAP operations are designed to detect abnormal conditions and to ensure regular inspections. Computerized data collection of all alarms and events, remotely controlled closed-circuit television cameras, and air monitoring data ensure that a complete record of WRAP operations is maintained. WRAP is also inspected daily for the presence of leaks or other abnormal conditions. In addition, WRAP operations, structures, and equipment are used to prevent contamination of water supplies."

III.7.B.e.5. Section 6.2.3, in addition to the items listed in the application, shall include, at a minimum, the following categories of items:

- All process line equipment
- NDE/NDA equipment
- Remote waste handling equipment
- Waste storage equipment
- Emergency equipment
- Ventilation equipment detailing all portions that serve the process area, gloveboxes, and building 2336-W. Include a description of the HEPA filtration equipment.
- Emergency equipment, including spill cleanup supplies.
- Aisle space requirements

- Safe storage of incompatible and ignitable wastes

For all items listed in section 6.2.3, including the above listed items, the Permittee shall identify the types of problems to look for during inspections, as well as the frequency of inspections for each item. The frequency of inspection for specific items on the schedule should be based on the rate of possible deterioration of equipment and/or the probability of an environmental or human health incident if the deterioration, malfunction, or operator error goes undetected between inspections. In many cases, state or federal rules specify the frequency. Be specific: "at least every thirty (30) days" or "at least every seven (7) days" rather than "weekly" or "monthly." This information shall be submitted to the Department within thirty (30) days of issuance of this permit, and upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

III.7.B.e.6. Page 6-2, Line 22, insert "Hard copies of the Log Sheets are stored at WRAP. The inspections are performed by process operations personnel (Advanced General Worker as identified in Chapter 8)." The logs will include, at a minimum, the following: date and time of inspection, printed name and the handwritten signature of the inspector, a notation of the observations made, an account of spills or discharges in accordance with WAC 173-303-145, and the date and nature of any repairs or remedial actions taken.

III.7.B.e.7. After "resultant liquid" on Page 6-3, Line 4, add "and/or contaminated material."

III.7.B.e.8. On Page 6-3, Line 3, add "The schedule for remedial action for problems revealed during inspection will depend on the potential risk to human health or the environment. Problems revealed during inspections will be responded to according to the following schedule:

<u>Problems Threatening Human Health of the Environment:</u>
Problems that pose an imminent threat to human health or the environment will be corrected immediately, but no later than 24 hours from the time of discovery.

<u>Problems Not Threatening Human Health of the Environment:</u>
Problems that do not pose an imminent threat to human health or the environment are corrected within 72 hours of discovery.

<u>Problems Requiring More Than 72 Hours to Resolve:</u>
If a longer time period is required to correct the problem, the Permittee will propose a time schedule for correcting the problem. The correction schedule is subject to approval by the Department.

III.7.B.e.9. On Page 6-6, Line 31, add "Containers will not be stored in the shipping/receiving area in a way that would interfere with loading and unloading operations."

III.7.B.e.10. On Page 6-7, Line 14, delete "provided" and replace with "provide."

III.7.B.e.11. Page 6-7, Line 39, insert "WRAP systems and structures are inherently safe during power failures."

III.7.B.e.12. After " . . .any two wastes" on Page 6-8, Line 44, insert "(see Appendix 3A for details)."

III.7.B.e.13. On Page 6-9, Lines 1-2, delete "a professional inspector familiar with the Uniform Fire Code" and replace with "the Hanford Fire Marshall."

III.7.B.e.14. After " . . .restricted waste management" on Page 6-9, Line 18, insert "gloveboxes."

III.7.B.e.15. After " . . .restricted waste management" on Page 6-9, Line 20, insert "gloveboxes."

III.7.B.e.16. After " . . .to have" on Page 6-9, Line 31, insert "filtered."

III.7.B.e.17. After " . . .waste containers" on Page 6-9, Line 31, insert "or overpack containers."

III.7.B.e.18. On Page 6-9, Line 40, delete "(Chapter 8.0)." Add new text as follows: "Relevant employees will receive the required training in order to properly manage ignitable or reactive waste at WRAP, as detailed in Chapter 8.0."

III.7.B.f. Chapter 7

III.7.B.f.1. On Page 7-I, Line 11, delete "-i" from " . . .APP 7A-i."

III.7.B.f.2. Table 7-1. Delete second footnote.

III.7.B.f.3. Table 7-1. The first paragraph of Section 4.0, and all of the following Sections, are added as applicable sections of Appendix 7A: Sections 3.1, 8.2, 8.3, 8.4, 11.0, and 12.0.

III.7.B.f.4. Those portions of DOE/RL-94-02 which are not made enforceable by inclusion in the application matrix of that document are not made enforceable by reference in this document.

III.7.B.g. Appendix 7A

III.7.B.g.1. On Page 5, delete the entire first paragraph except the first sentence.

III.7.B.g.2. On Page 5, seventh Paragraph, insert the word "non-hazardous" between "other" and "materials."

III.7.B.g.3. On Page 5, eighth Paragraph, delete the words "the various" and replace with "appropriate."

III.7.B.g.4. On Page 9, Section 6.1.3, delete "Examples of the gases placed . . ." and replace with "Routinely used gases . . ."

III.7.B.g.5. On Page 9, Section 6.1.3, delete "acetylene."

III.7.B.g.6. On Page 15, Section 7.1.2, first paragraph, after " . . .Take Cover Alarm . . ." and before " . . .is activated . . ." add "(wavering siren)."

III.7.B.g.7. In Section 7.2.1, add a section (7.2.1.1) that details procedures to safely shut down utilities at WRAP (i.e., HVAC, fire suppression, electrical circuits, and sanitary water and/or sewer). This information shall be submitted to the Department within 30 days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

III.7.B.g.8. In Section 7.2.5, delete entire fourth Bullet and add new fourth Bullet with the following, "Classify the spill as one that can be cleaned up by personnel in the immediate vicinity at the time of the incident, or as a spill that requires the notification of the BED and assistance from additional, trained personnel (i.e., HFD HazMat Team). The classification will be made using the following resources:

- SWITS information, as well as the Spill Report Checklist and other resources (ERPGs, Emergency Response Guidebook, MSDSs, etc.) will be used to determine spill constituents, including toxicity and other hazards.

- If there is not a good understanding of spill hazards, or the risks are not understood clearly, the spill shall be handled by the HazMat Team.

- Classification is not necessarily base on the quantity of the spill, but by the toxicity of the chemical present.

- The HFD can be requested to evaluate the spill to determine if immediate response by the HFD HazMat Team is warranted."

III.7.B.g.9. On Page 25, Section 7.5.3, second Paragraph, after "affected WRAP," insert "building(s)."

III.7.B.g.10. On Page 26, Section 8.2, second Bullet, delete the word "clean" and replace with "cleaned."

III.7.B.g.11. The Permittee will submit to the Department a revised Section 9.2 that indicates the specific location and capability of all portable fire extinguishers. This information shall be submitted to the Department within thirty (30) days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

III.7.B.g.12. The Permittee will submit to the Department a revised Section 9.4 that enumerates the specific Personal Protective Equipment, its location, and capabilities. This information shall be submitted to the Department within thirty (30) days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

III.7.B.g.13. The Permittee will submit to the Department a revised Section 9.5 indicating that a portable spill response cart is located in the shipping/receiving area and that one is located in the process area. Show that the spill response locker is located only in the 2336-W material preparation area room (room 152) and not in the process area. Elaborate on the capability of all equipment. This information shall be submitted to the Department within thirty (30) days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

III.7.B.g.14. On Page 31, Section 14.0, delete "1996" and replace with "(The most current version)."

III.7.B.g.15. The Permittee must review and immediately amend the emergency response documentation, if necessary, whenever: (a) Applicable regulations are revised, (b) The plan fails in an emergency, (c) The unit 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 constituents, or in a way that changes the response necessary in an emergency, and (d) The list of emergency equipment changes.

III.7.B.g.16. The Permittee must note in the WRAP operating record the time, date, and details of any incident that requires implementing the Contingency Plan. Within fifteen (15) days after the incident, the permittee must submit a written report to the Department. The report must, at a minimum, include:

(1) Name, address, and telephone number of the permitee;
(2) Name and telephone number of the Unit;
(3) Date, time, and type of incident;

(4) Name and quantity of material(s) involved;
(5) Extent of injuries;
(6) An assessment of actual or potential hazards to human health or the environment, where this is applicable;
(7) Estimated quantity and disposition of recovered material that resulted from the incident;
(8) Cause of the incident; and
(9) Description of corrective actions taken to prevent reoccurrence of the incident.

III.7.B.h. Chapter 8 (Reserved)

III.7.B.i. Appendix 8A

III.7.B.i.1. After " . . .and/or mixed waste" on Page 1, Section 2.0, add "The WRAP DWTP ensures personnel responsible for dangerous waste management are trained to perform the job duties pertinent to handling, treatment, storage, and/or disposal of dangerous waste."

III.7.B.i.2. On Page 1, Section 4.0, insert the following text; "A Facility Manager for the WRAP operating organization must ensure that personnel performing the various TSD unit and TSD unit-related activities have received appropriate on-the-job training (OJT). The OJT must be provided by an individual proficient in the specific activity or activities. That individual must sign-off that personnel who successfully complete the OJT are proficient before personnel may be assigned to perform the activity independently (i.e., without close supervision)."

III.7.B.i.3. On Page 1, Section 4.1, in the last sentence, delete "Because" and "the Facility Manager is involved in directing training."

III.7.B.i.4. On Page 2, Section 4.5, delete "WRAP and . . ." and replace with "All WRAP employees and."

III.7.B.i.5. Page 2, an additional line space should be inserted before Section 5.1.

III.7.B.i.6. On Page 4, Section 5.3.4, the categories of General Manager positions do not completely match the categories of General Manager positions listed in Attachment 2. Revise either Section 5.3.4 or Attachment 2 or both to match the General Manager descriptions and required training courses. The revised text shall be submitted to the Department within 30 days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

III.7.B.i.7. On Page 7, Section 5.5, delete the word "some" and replace with "non-facility."

III.7.B.j. Chapter 11

III.7.B.j.1. Within sixty (60) days of the issuance of the permit, the Permittee shall provide to the Department a revised closure plan. The plan shall include the following items:

- Closure methods for structures and soil.
- Criteria for the selection for the closure methods.
- Schedule of closure activities.
- Rationale for determining contaminants of concern (COC).

The permittee shall submit this information to the Department within sixty (60) days of issuance of this permit. The final closure plan for WRAP shall be included in the permit as a Class 3 modification in "Mod E" upon approval by the Department.

III.7.B.j.2. On Page 11-1, Line 7, add "The WRAP closure will address all portions of WAC 173-303-610 not specifically stated in this permit."

III.7.B.j.3. On Page 11-1, Line 25, delete the word "particle" and replace with "particulate."

III.7.B.j.4. After " . . .(Appendix 2A details the TSD Unit Boundary) . . ." on Page 11-1, Line 34, insert "as well as the removal of any soil contaminated by releases from WRAP beyond the TSD unit boundary."

III.7.B.j.5. On Page 11-1, Lines 41-42, delete "and disposed of accordingly." After " . . .will be designated," add "and disposed of."

III.7.B.j.6. After " . . .sampling program" on Page 11-2, Line 1, add ", subject to approval by the Department of Ecology,".

III.7.B.j.7. On Page 11-6, Lines 43-44, delete the sentence beginning with "In addition, . . ."

III.7.B.j.8. On Page 11-7, Line 15, revise the text to read, "Within sixty (60) days of completion of closure activities, a copy of the PE . . ."

III.7.B.j.9. On Page 11-7, Lines 18-20, delete the text beginning with "The PE is not . . ."

III.7.B.k. Chapter 12

III.7.B.k.1 On Page 12-1, Line 4, delete " . . .could be . . ." and replace with "are."

III.7.B.k.2. On Page 12-1, delete Lines 5 through 36, beginning with "Not all of . . ."

III.7.B.k.3. The Permittee shall notify the Department of the specific location on the Hanford Facility (e.g., building numbers and/or names) where the WRAP operating record will be maintained. This information shall be submitted to the Department within

thirty (30) days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification.

III.7.B.k.4. On Page 12-1, Line 37, add "The Permittee will produce and place as-built drawings in the WRAP operating record within six (6) months of issuance of this permit. In addition, the referenced as-built drawings will be revised at least every twelve (12) months to incorporate all outstanding engineering change notices (ECNs) and Non Conformance Reports (NCRs)."

III.7.B.k.5. On Page 12-1, add "All unit specific reporting requirements identified in Table 12-1 of the General Information Portion "DOE/RL-91-28" are applicable to the WRAP unit."

III.7.B.k.6. The Permittee shall identify requirements from Table 12-1 of the General Information Portion "DOE/RL-91-28" that are not applicable to WRAP and provide justification as to why they are not applicable. This information shall be submitted to the Department within thirty (30) days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

CHAPTER 8
Central Waste Complex Storage Facility

This chapter sets forth the operating conditions for the Central Waste Complex (CWC) Storage Facility.

III.8.A. COMPLIANCE WITH APPROVED PERMIT APPLICATION

The Permittees shall comply with all requirements set forth in the Central Waste Complex (CWC) Permit Application, Rev. 1, as found in Attachment 42, including the amendments specified in Condition III.8.B., if any exist. Enforceable portions are listed below (All subsections, figures, and tables included in these portions are also enforceable unless stated otherwise):

Part A Application, Revision 5, May 22, 1998

Section 2.1	Central Waste Complex Mixed Waste Storage Facility Description
Section 2.2	Topographic Maps
Section 2.4	Release from Solid Waste Management Units (SWMU)
Chapter 3.0	Waste Analysis
Chapter 4.0	Process Information
Chapter 6.0	Procedure to Prevent Hazards
Chapter 7.0	Contingency Plan
Chapter 8.0	Personnel Training
Chapter 11.0	Closure and Post Closure Requirements
Chapter 12.0	Reporting and Recordkeeping
Appendix 2A	Topographic Maps
Appendix 3A	Waste Analysis Plan
Appendix 4A	Design Drawings
Appendix 4B	Secondary Containment Calculations
Appendix 4C	Sealant Properties

Appendix 7A	Building Emergency Plan (As applicable in Chapter 7)
Appendix 8A	Training Plan
Attachment 41A	Waste Acceptance Criteria
Attachment 41B	Selecting a Laboratory and Quality Assurance/Quality Control

III.8.B. AMENDMENTS TO THE APPROVED PERMIT APPLICATION

III.8.B.a. Chapter 2

III.8.B.a.1. Section 2.4, Revise to include the following specific regulatory requirements for releases from solid waste management units; WAC-173-303-806 (4)(a)(xxiii), (xxiv), -645, -646, and 40 CFR 270.14d.

III.8.B.b. Chapter 3

III.8.B.b.1. Delete "stored" on line 5 of page 3-1, replace with "managed."

III.8.B.b.2. Delete "storage" on line 5 of page 3-1, replace with "management."

III.8.B.b.3. Delete "normally" on line 11 of page 3-1.

III.8.B.b.4. Delete lines 19 through 21 on page 3-1.

III.8.B.b.5. The Permittees shall prepare an attachment to the WAP which describes the waste tracking procedures as specified in lines 28 and 29 on page 3-1. This text shall be submitted to the Department for review and approval within 30 days of issuance of this Permit. Upon approval by the Department, the description will be added to the text of Section 1.1.1. of the Waste Analysis Plan (WAP), also identified as Appendix 3A, as a Class 1 modification. If necessary, the Department will amend the requirements through a Class 2 or 3 modification.

III.8.B.b.6. Waste transfers between Solid Waste Project TSD units (i.e., CWC, Waste Receiving and Processing, T Plant, and the Low Level Burial Grounds) do not require the development of a new waste profile because the waste has already been accepted at one of the TSD units under the original waste profile and is being transferred for waste management purposes.

III.8.B.c. Appendix 3A

III.8.B.c.1. After the word "sections," insert the italicized text in line 27, page 1-1, to read as follows: *"and the flowchart in Attachment 41A describe the process for waste acceptance and* the different types of information . . ."

III.8.B.c.2. Delete lines 14 through 18 on page 1-3, and replace with text to read as follows: Verification. Verification activities include container receipt inspection, physical screening, and chemical screening. All waste shipments and containers are subject to receipt inspection during the waste shipment acceptance process. In addition, a percentage of waste containers and shipments are selected for physical screening. Containers are opened and inspected visually or verified by NDE, NDA, or dose rate profile. Of those containers subjected to physical screening, a percentage are required to be sampled for field or laboratory analysis. All information and data are evaluated to confirm that the waste matches the waste profile and container data/information supplied by the generator. Any . . ."

III.8.B.c.3. Delete "Waste Profile System" on line 6 of page 1-3 and replace with "the Performance Evaluation System (PES)."

III.8.B.c.4. Delete lines 42 through 47 on page 1-3 and lines 1 through 7 on page 1-4 and replace with the following text: "conformance reports are used to complete an evaluation of the generator and to adjust the physical screening rate as indicated. At a minimum, an evaluation according to the following criteria shall be performed and the indicated scores shall be assigned based upon severity and justification:

6. Designation conformance issues
   - Regulatory violation, 7 – 10
   - Mismanagement of waste (e.g., conditions which would or did lead to placement of waste in the wrong storage location, the wrong treatment path, etc.), 4 – 6
   - No mismanagement of waste, 1 – 3
7. Characterization conformance issues
   - Safety issue, 7 – 10
   - Mismanagement of waste (see above), 4 – 6
   - No mismanagement of waste, 1 –3
8. Paperwork inconsistencies
   - LDR form, 1 – 3
   - Shipping papers or waste tracking forms, 1 – 3
   - Waste profile discrepancies, 1 – 3
   - Incomplete shipment and/or transfer information, 1 – 3
9. Screening conformance issues
   - Regulatory violation and/or safety issue, 7 – 10
   - Mismanagement of waste (see above), 4 – 6
   - No mismanagement of waste, 1 – 3
10. Receipt conformance issues
   - Regulatory violation and/or safety issue, 7 – 10
   - Mismanagement of waste, 4 – 6
   - No mismanagement of waste, 1 – 3

A generator receiving a score of ten (10) or greater has demonstrated less than satisfactory performance and must be evaluated for corrective action by the CWC operating organization. The physical screening rate is increased for that generator based upon the following criteria:

- A score of 10 to 15 – the physical screening frequency is increased to a minimum of 15%.
- A score of 16 to 20 – the physical screening frequency is increased to a minimum of 50%.
- A score greater than 20 – the physical screening frequency is increased to 100%.

III.8.B.c.5. Paperwork inconsistencies or improperly completed and/or incorrect information must be corrected and resolved prior to acceptance of waste for management at this TSD unit.

III.8.B.c.6. Approved waste profiles and all supporting documentation from the initial submission through all re-evaluations must be retained in the TSD unit operating record as required by Condition II.I.1. for waste managed, i.e., stored and/or treated, at this TSD unit.

III.8.B.c.7. Within 30 days of the issuance of this Permit, the Permittees are required to submit, to the Department for review and approval, text describing all constraints which apply to the acceptance of waste at this TSD unit for any purpose, including physical examination and temporary storage in any portion of the building or within the boundaries of the TSD unit. Upon approval by the Department, the description will be added to the text of Section.1.1.3 of the WAP as a Class 1 modification. If necessary, the Department will amend the requirements through a Class 2 or 3 modification.

III.8.B.c.8. Insert the following text at line 39 on page 1-4: "1.1.1.3.4 Process for Reducing the Physical Screening Frequency. After the initial screening frequency has been established for a generator or that frequency has been adjusted due to poor performance, the physical screening frequency can be reduced in accordance with the following:

- The physical screening frequency will be stepped down in three steps based upon the ability of the generator to implement the corrective action plan and/or demonstrate an ability to appropriately manage waste. At no time shall the physical screening frequency be reduced below 5% for onsite generators or below 10% for offsite generators.

  Step 1) Reduce frequency by 66% the first month.
  Step 2) Reduce frequency established in Step 1 by 50% or to the minimum allowable, whichever results in a greater frequency.
  Step 3) Reduce frequency to the minimum allowable.

- The reduction will be determined during the monthly evaluation process; however, the following minimum criteria must be met prior to reduction of the frequency:
  (1) Five (5) containers from the waste stream in question (defined by a single waste profile) must pass verification, and
  (2) The TSD unit must document an acceptable evaluation of the corrective action plan or that the generator's new waste management program has been implemented and is effective.

If the screening frequency was increased based upon conformance issues at the time of waste receipt, the corrective action plan must be fully implemented before the generator may return to the minimum physical screening frequency. However, waste streams from the same generator, which did not have conformance issues upon receipt at this TSD unit, may return to the minimum verification frequency if the TSD unit operating organization determines that the specific conformance issue is unlikely to affect the generator's other waste streams."

III.8.B.c.9. The following waste types are added in lines 19 through 23 on page 1-5 to the list of wastes prohibited from management at this TSD unit: (1) Bulk solids in trucks or roll-off boxes.

III.8.B.c.10. The item "Bulk liquid waste" in line 19 on page 1-5 is further defined as "Bulk liquid waste in tankers or drums."

III.8.B.c.11. Toxic Substances Control Act- (TSCA-) regulated waste may not be treated at this TSD unit until such time that a TSCA Permit is obtained for treatment.

III.8.B.c.12. Delete the text on page 1-6, line 1 through 35, and replace it with the following: "For waste that cannot be stored and treated in accordance with the requirements of this WAP (waste analysis plan), an alternative waste management plan (AWMP) may be submitted to the Department for review. Because the activities necessary to support such waste management may not be predictable, some flexibility in the timeframe for submitting, reviewing, and completing the AWMP may be necessary. The following schedule will be observed unless the Department and USDOE agree to an alternate schedule.

- Submit the AWMP to the Ecology Project Manager who is responsible for the TSD unit with a copy to the Hanford Facility RCRA Permit Coordinator at least 120 days before the project is expected to begin. The cover letter would summarize the nature of the request and state that "no reply within 35 working days constitutes approval."
- The Ecology Project Manager specified above reviews and provides comments within 35 working days after receiving the AWMP. At this time, the Department may request a longer comment period or receipt of additional information.

- Upon receipt of the comments by the Permittees, resolution of comments and issues would occur during project manager meetings or other meetings agreed to by the Permittees and the Department.
- For any additional information requested by the Department and for any resubmittal of a revised AWMP following resolution of the Department's comments, the same review timeframes are applicable.
- A final AWMP will be submitted to the Department for approval.
- If no comments are received from the Department within 35 working days after the original or final AWMP submittal, then the plan shall be approved.
- All submittals, including the Department's comments with resolution, shall be placed in the TSD unit operating record. If approval has been made by default, the Permittees shall provide a memo to the operating record so stating.
- The Department has final authority to approve or deny the AWMP."

III.8.B.c.13. Delete the text on page 2-1, lines 5 through 15.

III.8.B.c.14. Delete "or its representative" on page 2-2, line 42.

III.8.B.c.15. Delete "the information is accurate" on page 2-3, line 2, and replace it with: "the waste to be shipped to CWC is as described by the waste profile."

III.8.B.c.16. The text on page 2-3, lines 12 through 36, shall be deleted and replaced with text that is adequate to describe how containers are chosen for physical and chemical screening. Within 30 days of issuance of this Permit, a description of this procedure must be submitted to the Department for review and approval; subsequent to any revisions required by the Department, the description will be added to the text of Section 2.1.2 of this WAP as a Class 1 modification. If necessary, the Department will amend the requirements through a Class 2 or 3 modification.

III.8.B.c.17. Delete lines 7 through 10 on page 2-4, and replace with: "When the available information does not qualify as acceptable knowledge or is not sufficient to characterize a waste for management, the sampling and testing methods outlined in WAC 173-303-110 must be used by the generator to determine whether a waste designates as ignitable, corrosive, reactive, and/or toxic and whether the waste contains free liquids. If the analysis is performed to complete characterization after acceptance of the waste by the TSD unit, then this Permit governs the sampling and testing requirements."

III.8.B.c.18. Correct the WAC citations on page 2-4, lines 29 and 42 to read as follows: "173-303-380(1) (j), -(k), -(n), and –(o)."

III.8.B.c.19. Delete lines 34 through 38 on page 2-4, beginning with the following text: "During waste retrieval . . ." Replace it with: "The following waste knowledge exceptions apply to waste accepted for management at the CWC TSD unit:

- Hazardous debris as defined in WAC 173-303-040 that is managed in accordance with 40 CFR 268.45 (the "Debris Rule") is not required to be sampled. Management of debris in this manner is not dependent on the quantification of constituents to be federal and State-only LDR regulations.
- Wastes generated on-site may be shipped to the CWC TSD unit provided the waste has been characterized for storage and a representative sample has been taken to characterize the waste for treatment and/or disposal.
- Waste that was previously disposed and then retrieved may be transferred to the CWC TSD unit with only the necessary information to properly manage the waste at the storage unit.
- Waste received prior to the implementation of this guidance and has been characterized for storage only may be transferred between CWC and permitted storage units without re-characterization; however, the pre-shipment review and verification requirements must be met.
- On-site generators may ship waste (that cannot be sampled by the generator) to the CWC TSD unit for completion of characterization provided that the waste is characterized for storage."

III.8.B.c.20. Delete the text on page 2-5, lines 33 through 37 (Section 2.2.1) and replace it with the following: " . . . 100 percent of each shipment (including onsite transfers) are inspected at the TSD unit for possible damage or leaks, complete labeling, intact tamper seals (if waste has been subjected to physical or chemical screening at another location), and piece count. This is to ensure that the shipment: (1) is received in good condition, (2) is the waste indicated on the manifest or shipping papers, (3) has not been opened after physical and/or chemical screening was performed, and (4) is complete. Any issue resolution, including correction of document discrepancies, re-labeling, overpacking of leaking or deteriorated drums, must occur before verification activities may continue. Documentation of issue resolutions must be maintained in the TSD unit operating record. The container receipt inspection is performed by the CWC operating organization at CWC. It must be completed within 24 hours of receipt of the shipment and the shipment must be moved to storage or, if discrepancies exist, into a temporary holding area within the next 24 hours. Action must be taken to overpack any leaking or damaged containers immediately upon discovery. Any paperwork discrepancies for shipments from both offsite and onsite generators must be resolved as required by WAC 173-303-370(4)."

III.8.B.c.21. For waste in storage at CWC, the Department recognizes that the generator may hire the WRAP operating organization to treat waste, including sorting and repackaging, and thereby correct discrepancies and problems identified during the CWC waste acceptance process. If correction of these discrepancies and problems are not accomplished within two (2) months of receipt of the waste shipment to CWC, the Permittees shall contact the Department (specifically the Ecology Project Manager) to establish a compliance schedule for treatment of the waste shipment.

III.8.B.c.22. Delete the text on page 2-5, lines 44 through 46 (Section 2.2.2), and replace it with the following: "verification activity. Physical screening by visual inspection or NDE could be performed by the CWC operating organization before the waste is shipped to CWC. In this case, the visual inspection is performed by observation of the generator filling empty containers with waste or examining the contained contents at the location. NDE is performed using mobile equipment which meets the performance requirements identified in this permit. When visual inspection or NDE is performed at a location other than CWC, at least one tamper-resistant seal is applied to each container examined and verified as acceptable, so that the container may not be reopened unless the seal is broken. These seals are the same as custody seals and are subject to the same evidentiary requirements as custody seals. The seals must be placed by the observer/verifier before the container leaves his/her sight on the day the observation occurs. The seal must be uniquely identified and controlled, e.g., signed and dated <u>or</u> uniquely numbered and tracked in a logbook. In addition, the seal must be easily differentiated from tamper-resistant seals used for other purposes. The verification must be documented in the paperwork that accompanies the waste shipment to CWC and that paperwork must be placed in the TSD unit operating record. Also, the transfer documentation must identify whether the container required verification and the result of that verification. As long as the tamper-resistant seal remains intact, those containers of waste may be moved within the Hanford Solid Waste Complex without further physical screening, although container receipt inspections are required for all waste shipments, including transfers. The waste may still be subject to chemical screening."

III.8.B.c.23. Add the following text to Section 2.2.2: "Selection and interpretation of the appropriate physical screening method(s) are conducted by personnel who are qualified as described in the Training Plan (Appendix 8A) as amended by any Permit conditions. Each physical screening method is performed by qualified personnel."

III.8.B.c.24. Add a reference to the text on page 2-6, line 2, that reads as follows: "(See Section 3.1 for the criteria for choosing a physical screening method.)."

III.8.B.c.25. Insert "The minimum" at the beginning of the sentence in line 14 on page 2-6 and replace "generating units" in lines 14 and 15 with "generators," so that the sentence reads as follows: "The minimum physical screening frequency is 5 percent for onsite generators, . . . "

III.8.B.c.26. Add a reference to Section 1.1.1.3., line 25, page 2-6, so the sentence reads as follows: "All failed containers and shipments are dispositioned via the PES, as described in Section 1.1.1.3. of this WAP."

III.8.B.c.27. Delete "authorized independent agent" on page 2-6, line 45.

III.8.B.c.28. Delete "or Pacific Northwest National Laboratory (PNNL) packaged waste that is transferred to PNNL operated TSD units" on page 2-6, line 45, and page 2-7 line 1.

III.8.B.c.29. Delete the text on page 2-7, lines 8 through 10, and replace it with the following: "frequency, and exceptions for chemical screening. Chemical screening may be performed by the CWC operating organization before the waste is shipped to CWC. After chemical screening is done, tamper-resistant seals are applied over the container opening on each outer container screened. The requirements described for tamper-resistant seals used for visual examination apply for chemical screening, as well. Any requirement of this Permit related to chemical screening also applies for chemical screening performed before the waste is received at CWC."

III.8.B.c.30. Delete the text on page 2-7, line12, and replace with the following text: "Selection and interpretation of the appropriate chemical screening method(s) are conducted by personnel who are qualified as described in the Training Plan (Appendix 8A) as amended by any Permit conditions. Each chemical screening method is performed by qualified personnel."

III.8.B.c.31. Delete the text on page 2-7, lines 13 through 15, which reads "The objective . . . documentation." and replace it with the following: "The objective of chemical screening is to obtain reasonable assurance that the waste received by the TSD unit is consistent with the description of the waste on the waste profile and to provide information that will be used to safely manage the waste at the TSD unit."

III.8.B.c.32. Delete the text in lines 15 through 17 on page 2-7, that begins with: "The following tests are selected . . ." This text is replaced with the following: "All of the listed screening tests are required to be conducted on all samples collected for chemical screening, unless a technical justification is documented describing the reason for not performing the chemical screening test. The justification may be provided by a procedure, noted in the special instructions to the waste profile at the time of approval, or documented in the verification record, i.e., a logbook notation why a test is not appropriate to the sample or matrix."

III.8.B.c.33. Delete "Headspace testing" from line 23, page 2-7, and replace with "Ignitability/headspace screening for volatile compounds."

III.8.B.c.34. Delete "Polychlorinated biphenyl (PCB)" from line 28 on page 2-7.

III.8.B.c.35. Delete "Paint filter" from line 36, page 2-7, replace with "Paint Filter Liquids Test."

III.8.B.c.36. Correct the reference in line 40 on page 2-7 to read as follows: "Section 2.2.5.2."

III.8.B.c.37. Delete ", etc." from line 16 on page 2-8.

III.8.B.c.38. Delete "special-case" in line 29, page 2-8, replace it with: "special cases."

III.8.B.c.39. Delete lines 34 through 37 on page 2-8 to the word "contamination" and replace it with: "Sampling is performed in accordance with WAC 173-303-110(2). A representative sample is obtained for chemical screening."

III.8.B.c.40. Delete "shipping documentation" in line 47, page 2-8, and replace it with: "waste profile."

III.8.B.c.41. Add the following paragraph describing quality assurance to Section 2.2.5: "All confirmation activities shall be governed by TSD unit-specific governing documentation and performed in a consistent manner. Confirmation records are kept in a traceable, defensible manner. All data are recorded either in uniquely identified, bound logbooks with sequentially numbered pages or on electronic media. Records must be maintained in a protective manner, e.g., protected from fire, water, access and/or tampering by unauthorized personnel. In addition, electronic records must be protected from electromagnetic damage."

III.8.B.c.42. If a false negative occurs as described in line 8, page 2-9, the corrective action described in lines 9 and 10 must include the re-evaluation of all affected video tapes/records since the previous acceptable QC check. If any results are questionable, those affected drums must be reevaluated and handled appropriately."

III.8.B.c.43. In Section 2.2.5.1 on page 2-9, quality control has not been presented for non-destructive analysis or for dose rate profile. Until text describing those physical screening options is provided to the Department for review and approval, the required revisions are made, the public comment conducted, and the text becomes an enforceable condition of this WAP, all physical screening must be by visual observation and NDE only, subject to other enforceable conditions of this Permit.

III.8.B.c.44. The equipment requirements of Table 4-1, as amended by any Permit conditions, apply to sampling for chemical screening. In addition, the following sampling equipment may be used in sampling for chemical screening: (1) For liquids and slurries – dip, tank, bomb, and bailer samplers, as well as tube-type samplers (e.g., thin-walled Shelby tubes, split spoons, probes); and (2) For sludges and solids – Tube-type samplers (as above) and augers; for small containers, a spoon may be used in place of a scoop.

III.8.B.c.45. Delete lines 15 through 34 on page 2-9. The required chemical screening quality control include, but are not limited to, the following:

- Containers and equipment of the appropriate size and that are chemically compatible with the waste and all testing reagents will be used.
- A documented source of reagent water will be used.

- All chemicals and test kits shall be identified in the logbook/records by manufacturer; lot number(s) or, if no lot number is present, by date of manufacture; date of receipt; and expiration date (if none provided or not applicable, so indicate). All chemicals and test kits must be labeled so that they are traceable to the logbook/records.
- All chemical preparations, i.e., chemical mixtures or solutions, shall be documented in logbook/records by the method of preparation, e.g., weight or volume of chemical(s), identity of solute, volume or weight of solute, final concentration , as well as the name of the preparer, preparation date, expiration date. They must be labelled completely and traceable to the preparation records.
- One in 20 samples at a minimum will be sampled in duplicate and analyzed.
- One in 20 analyses at a minimum will be performed in duplicate. The duplicate sample shall not be the sampling duplicate.
- The results of quality control checks for each test kit lot or periodic testing and for daily quality control checks including equipment calibration will be recorded in a defensible manner.

III.8.B.c.46. Insert "and Quality Control" in the text in line 36 on page 2-9 and the additional text provided to read as follows:

- Equipment and Quality Control Checks

III.8.B.c.47. The following text is inserted under the bulleted heading: "Equipment and Quality Control Checks in line 36 on page 2-9: "The CWC operating organization will perform the following quality control checks on each new test kit or reagent lot to be followed by rechecks on at least a six-month interval, unless a more frequent period is specified in the test kit instructions or the quality control check method.

(j) Ignitability/Headspace Screening for Volatile Organic Compounds: Headspace screening equipment shall be calibrated using known standard in accordance with the manufacturer's instructions. In addition, the equipment will be quality control checked on each day of use by sampling the headspace of a reagent containing hexane. If it does not perform as expected, the equipment will be recalibrated.

(k) Peroxide Screening: The quality control check for the peroxide test paper is as follows: (1) Moisten the test paper with water. Add two drops of 3% hydrogen peroxide solution to the test paper. The test paper should turn blue. If it does not, replace the test paper or reject the lot. (2) Add a drop of potassium dichromate solution to approximately ½-inch of water in a test tube. Place the peroxide test paper in the solution. The test paper should not turn blue. If it changes color, replace the test paper or reject the lot. (3) Add one drop of nitric acid to the test paper. The paper should turn yellow. If it does not, replace the test paper or reject the lot.

(l) Paint Filter Liquids Test: The quality control check consists of visually inspecting each filter, prior to performing each test, to ensure

that it is in good condition and is not torn or ripped. If it is damaged, the filter shall be replaced.

(m) pH Screen: The quality control check for the pH test paper is as follows: (1) Place a drop of concentrated hydrochloric acid onto the test paper; the pH should be 0±1. (2) Place a drop of acetic acid onto the test paper; the pH should be 2 to 3±1. (3) Place a drop of reagent water onto the test paper; the pH should be 7±1. (4) Place a drop of ammonium hydroxide onto the test paper; the pH should be 11 to 12±1. (5) Place a drop of sodium hydroxide onto the test paper; the pH should be 14±1. If the pH on most of these tests is not as specified, replace or reject the pH paper. If only one or two test produce results that are different than stated, check or replace the reagents. The most important check is the reagent water, although it frequently will have a slightly acidic pH. All of the stated pH checks also may be performed using pH buffer solutions.

(n) Oxidizer Screen: The quality control check for the oxidizer test paper is as follows: Moisten the test paper with 3M hydrochloric acid. Add two drops of potassium dichromate solution to the paper. The paper should turn black. If the test is negative, replace the paper or reject the lot.

(o) Water Reactivity Screen: The quality control check consists of testing the pH of the reagent water. If the pH is not 7±1, the reagent water shall be replaced. Note that this check may be performed as part of the pH quality control check.

(p) Cyanide Screen: The ferrous ammonium citrate reagent is the most unstable reagent used in this test. The ferrous ion will oxidize to ferric upon standing for even a short period of time. If the reagent has a thick opaque color or if there are particulates floating in the solution, the reagent should be replaced. To check the ferrous ammonium citrate, perform both of the following tests: (1) Add a pinch of ferrous ammonium sulfact to ¼-inch of the ferrous ammonium citrate reagent in a test tube. Add a drop of 1,10-phenanthroline to the test tube. The solution should turn blood red. (2) Add a pinch of ferrous ammonium sulfate to ¼-inch of the ferrous ammonium citrate reagent in a test tube (this is solution 1). Add a small amount of potassium ferrocyanide to a test tube of water (this is solution 2). Add a small amount of solution 1 to solution 2 to form solution 3. Add a ¼-inch of 3 Normal (i.e., 3N or 3M) hydrochloric acid to solution 3. The solution should turn dark blue. If either test is negative, replace the reagent or reject the lot.

(q) Sulfide Screen: The quality control check for the sulfide test paper is as follows: (1) Add 1 to 2 drops of reagent water to the sulfide test paper. (2) Add two drops of 3 Normal (3N or 3M) hydrochloric acid to two sodium sulfide flakes in a disposable watch glass or weighing boat. (3) Touch the sulfide test paper to the flakes. The test paper should turn brown, black, or silvery. If the test is negative, then replace the test paper or reject the lot.

(r) HOC Screen: The quality control check is to perform the test according to the test kit instruction on a reagent containing approximately 50 ppm of a chlorinated organic compound. If the test does not indicate a positive result, replace or reject the lot. If two or more test kit lots do not indicate a positive result, replace and/or test the reagent and retest the test kit lots."

III.8.B.c.48. The phrase "shipping documentation" is used throughout Section 3.0. The Permit requires that the shipping documentation be evaluated against the "waste profile" so that only approved waste is received by the TSD unit. Therefore, ultimately each physical and chemical screening result must be in agreement with the waste profile to determine the acceptability of the result and, thereby, whether or not the container fails.

III.8.B.c.49. The result of failure (i.e., "a container fails . . .") as described in Section 3.1, Physical Screening Parameters, under the heading "Failure Criteria" may be a return to the generator, a re-profiling of the waste stream, or treatment (processing or reprocessing) at a permitted TSD unit. The result of failure for chemical screening (e.g., failing the test, constitutes failure), as described in Section 3.2, Chemical Screening Parameters, under the heading "Tolerance" may the same outcomes as for physical screening. In addition, a failure of the chemical screening may be the expected outcome of the test, dependent upon the waste profile.

III.8.B.c.50. Delete the text in lines 4 and 5 of page 3-1 and replace it with the following: "Physical and chemical screening parameters for verification must be chosen from those in Sections 3.1 and 3.2. Parameters for waste designation and to meet LDR requirements are addressed in Section 3.3."

III.8.B.c.51. Replace "could be used to perform" in line 10 on page 3-1 with "are approved for use in performing" so that the sentence reads as follows: "The following methods are approved for use in performing physical screening."

III.8.B.c.52. Replace "could be" with the word "are" on line20, page 3-1, so that the sentence reads as follows: "Homogenous loose solids are probed to determine the presence of material not documented . . . "

III.8.B.c.53. Replace "could be used to perform" in line 41, page 3-2, with "are approved for use in performing" so that the sentence reads as follows: "The following methods are approved for use in performing chemical screening."

III.8.B.c.54. Delete the text in lines 38 through 40 on page 3-1 and replace it with the following text: "The container is scanned top-to-bottom and side-to-side with a non-destructive examination (NDE) system according to documented and approved procedures. At a minimum, the lifts, conveyors rotators, and manipulators for the real-time imaging systems shall be capable of handling

drums up to 85-gallons in size and up to 1000 pounds in weight and boxes up to 7000 pounds in weight. The minimum image quality, X-ray system performance, and system operator requirements shall be in accordance with the documented specifications for operating the NDE system. The X-ray components shall include the following: (1) a nine-inch (diagonal) entrance field image intensifier, or equivalent, (2) a twelve-inch, high resolution video display monitor, (3) a video printer, and (4) a high-performance, broadcast quality, S-VHS/VHS recorder/player. Quality assurance measures that indicate X-ray imaging quality shall be utilized and documented during equipment startup. For verification activities by NDE, data are observed on a video monitor and captured on video tape to provide a record. Personnel experienced in the interpretation of NDE imagery will record their observations. These observations are then compared to the inventory of container contents on the shipping documentation and also must be in agreement with the waste profile.

III.8.B.c.55. In addition to the text provided in lines 26 and 27 on page 3-3, the following condition applies: The required method for the Paint Filter Liquids Test is Method 9095 in the U.S. Environmental Protection Agency (EPA), SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (the most recently promulgated version).

III.8.B.c.56. Delete the text in lines 39 through 42 on page 3-3 and replace it with the following: "Method: Full range pH paper with a stated precision of 1.0 pH unit and a corresponding color chart is used for testing. For aqueous samples, a representative test portion of the sample is introduced onto the strip of pH paper. For solids, sludges, and non-aqueous liquids, a representative test portion is mixed with an approximately equal amount of water. The aqueous portion (extractant) of this mixture is then introduced onto the strip of pH paper. The paper is compared visually to the color chart to determine the best color match. The pH is recorded to the nearest whole pH unit."

III.8.B.c.57. Delete the text in lines 7 and 8 on page 3-4 and replace it with the following: "Method: Potassium iodide (KI) starch test paper is used for testing. KI oxidizes to iodine (I_2) in the presence of starch to yield a dark blue-black coloration on the test paper. A representative test portion of the sample is placed on a disposable watch dish or weighing boat. The KI test paper strip is acidified with 3M hydrochloric acid (HCl) and placed in contact with the test portion. A darkening of the test paper is a positive indication of the oxidizing properties of the sample."

III.8.B.c.58. Delete the text in lines 19 through 21 on page 3-4 and replace it with the following: "Method: Water reactivity of waste is determined by adding a representative test portion to an approximately equal volume of water in a disposable watch glass or weighing boat. The mixture is observed for positive indications of water reactivity such as temperature change (increase or decrease), gas evolution, gelling or polymerization."

III.8.B.c.59. Delete the text in lines 32 through 34 on page 3-4 and replace it with the following: "Method: A ferrous ammonium citrate solution is used as a colorimetric indicator of free cyanides and some complex cyanides. The reagent turns a dark Prussian blue color due to the formation of blue iron ferrocyanide in the presence of cyanide under acidic conditions. A representative test portion is placed on a disposable watch glass or weighing boat. An approximately equal amount of water is added to solid matrices. The ferrous ammonium citrate solution is added and mixed into the test portion. The mixture is then acidified with 3M hydrochloric acid (HCl). A dark blue color, if present, indicates the presence of cyanides."

III.8.B.c.60. Delete the text in lines 45 through 48 on page 3-4 and replace it with the following: "Method: Lead acetate test paper strips are used for testing. Under acidic conditions, sulfide compounds release hydrogen sulfide (H_2S) and, in the presence of this H_2S, the lead acetate paper changes to a silvery brown or black color due to the formation of lead sulfide (PbS). A representative test portion is place on a disposable watch glass or weighing boat. The test portion is acidified with 3M hydrochloric acid (HCl). A lead acetate test paper strip is dampened with water and placed near the acidified test portion. A darkening of the test paper is a positive indication of the presence of sulfides in the test portion."

III.8.B.c.61. Delete the text in lines 11 through 13 on page 3-5 and replace it with the following: "Method: A precise amount of oil (i.e., the test portion) is placed into the first of two disposable test tubes provided with the test kit. An ampule containing a colorless catalyst is broken and the contents are mixed thoroughly with the test portion. A second ampule containing metallic sodium is broken and the sodium, activated by the catalyst, strips chlorine from any chlorinated organic compounds present to form sodium chloride. An aqueous buffer solution is added to the test portion. This neutralizes the excess sodium and extracts the sodium chloride into the water. The water layer is then separated from the oil and decanted into the second test tube. An ampule containing a precise amount of reagent is broken and the contents mixed with the water. An ampule containing an indicator is then broken and the contents mixed with the water. The color of the mixture is dependant on the amount of chlorinated organic compounds in the original test portion of oil.

III.8.B.c.62. Delete the text in lines 15 and 16 on page 3-5 and replace it with the following: "Tolerance: The presence of halogenated organic compounds (HOCs) in the waste requires that either (1) the generator must supply laboratory data obtained by the SW-846 Method 8082 for the waste in the specific container, or (2) the specific container of the waste stream must sampled by the TSD unit and the waste analyzed by SW-846 Method 8082 to determine if the waste contains polychlorinated biphenyls (PCBs). If the waste does contain PCBs, the waste profile must be re-evaluated to determine if the waste is TSCA-regulated and, if the waste is not TSCA-regulated, then the quantitative analytical data must be useable to verify that the concentration of PCBs in the waste is less than 50 ppm.

The waste fails if the waste stream is TSCA-regulated or the concentration of PCBs is equal to or greater than 50 ppm. The TSD unit may fail the waste (i.e., return it to the generator) without obtaining the quantitative analytical data.

III.8.B.c.63. Delete "Sample and" from line 19 on page 3-5.

III.8.B.c.64. Delete the text in lines 21 and 22 on page 3-5 and replace it with the following: "Parameters needed to meet designation, characterization, and LDR requirements for waste stored at and/or treated for CWC are identified in Appendix A of this WAP."

III.8.B.c.65. Delete the title of Section 4.0 and replace it with the following: "Selecting Sampling Procedures." The content of this section, as amended, applies to all sampling that is done by or at the direction of the TSD unit for (1) characterization of waste after processing, (2) LDR of treated waste, or (3) additional characterization, if needed, for treatment or disposal.

III.8.B.c.66. Delete the text in lines 12 through 13 on page 4-2 beginning with "or other approved . . ." and replace it with: "except as amended by the Permit."

III.8.B.c.67. The following condition applies for the preservation and holding times for samples and for laboratory extracts of the samples. Waste samples are treated and preserved as necessary to protect the sample. Tables 2-36 and 4-1 in SW-846 contains recommended treatment/preservative and holding times. Not all samples require preservation and placing a holding time on a sample may not always be appropriate. Samples with a high concentration of the analyte or non-LDR samples may not require preservation, whereas aqueous samples and samples with low concentrations of the analyte or LDR samples require preservation. If the required preservation interferes with some of the analytes requested, then multiple aliquots of sample may need to be obtained for analysis. Samples taken for analysis of a persistant constituent or non-biologically degradable constituent may not require a holding time. For example, a sample for PCB analysis does not require a holding time (although the laboratory extractant is subject to a holding time). The recommended holding time and preservation for hexavalent chromium (Cr+6) listed in the Tables are required for all sample matrices unless the hexavalent chromium concentration is assumed to be represented by the total chromium in the sample. The recommended preservation and holding time for mercury (Hg) is required in all sample matrices. For the laboratory-prepared organic extracts (e.g., semi-volatile organic analysis and PCBs) the holding times listed in the Tables are required to be met for each extract.

III.8.B.c.68. Delete the title of Section 4.5 and replace it with the following: "Establishing Quality Assurance and Quality Control Procedures for Sampling."

III.8.B.c.69. The log of sampling activities described in lines 21 through 26 on page 4-2 is required to be kept in an inventoried, uniquely numbered, bound logbook with

sequentially numbered pages. Any affixed information, e.g., pictures, copies of chain-of-custody documentation, shall be permanently attached to a logbook page and initialed and dated across the edge of the attached material onto the logbook page so that removal or tampering with the attachment(s) can be identified. No affixed material may be placed over any other affixed items or written entries. The requirements for defensible data recording apply, including correction of entries by single line cross-out, initial and date, and give reason for the change. A signature is required rather than initials if the correction is made by someone other than the original recorder. No entries shall be obliterated, e.g., "white out" must not be used. The identity of the person who is initialing the record must be easily determined.

III.8.B.c.70. "Appropriate personnel" in line 26 on page 4-2 is defined as the sampler or a person who is directed by the sampler.

III.8.B.c.71. Insert the following after the sentence in line 26 on page 4-2: "If sampling is conducted in a posted radiological zone, then the logbook entries may be made by a person who is outside the zone or by the sampler immediately after the sampling is completed."

III.8.B.c.72. Delete "or copies of logs are maintained by the appropriate personnel after completion of sampling activities" in line 27, page 4-2, and replace with: "are permanent records of the TSD unit and must be retained in the TSD unit operating record."

III.8.B.c.73. Delete the text in lines 29 through 31 on page 4-2 and replace it with the following: "Chain of custody and chain-of-custody documentation are maintained at all times for samples collected by or for CWC. The chain-of-custody documentation includes, but may not be limited to, the following information: the container from which the sample originated, the unique sample number assigned, date and time of collection, sample type, sample location, method(s) of transfer to the laboratory, identity of the sample collector, identity of all subsequent custodians. The chain of custody form is originated by the sample collector and includes all transfers of custody. The chain-of-custody form travels with each sample to the laboratory."

III.8.B.c.74. Section 5.0 is deleted in entirety and replaced by the text of Attachment 41B.

III.8.B.c.75. The preparative method for the toxicity characteristic is EPA, SW-846 Method 1311, Toxicity Characteristic Leaching Procedure (TCLP). To ensure that the test portion is representative of the waste, a test portion of 50 grams or more is preferred. If a test portion of 50 grams or more is used for the determination, then only a single extraction is required. However, if the test portion is less than 50 grams, each material to be tested must be extracted in duplicate or multiple replicates so that the precision of the extraction can be determined and evaluated. A relative standard deviation of 25% or lower between extractions for the analytes

must be obtained for the analytical data to be useable for waste designation. All routine and quality control data associated with the TCLP and subsequent determinative methods is required to be maintained in the TSD unit operating record.

III.8.B.c.76. Instead of performing the TCLP as described above, a material may be analyzed for the total concentration of the Toxic Characteristic (TC) constituents. For this approach, solids and sludges must undergo a digestion procedure for metals or an extraction procedure for organics. Then, based on the assumption that the analytes are 100% (totally) leachable from the waste, the resulting data are evaluated against the TC criteria allowing for the 20-fold dilution that is inherent in the TCLP extraction for solids and sludges (Note that the dilution factor does not apply for liquids). That is, for each toxic characteristic metal and organic compound, if the analyte concentration is less than 20 times the TC limits, then the waste is not considered to possess the characteristic of toxicity for that constituent. If the totals are more than 20 times the TC limits, then a TCLP must be performed (or, if undergoing stabilization, the waste may be retreated before performing another screening).

III.8.B.c.77. Delete the text in lines 4 through 12 on page 6-1 and replace it with the following: "The frequency to re-evaluate the waste profile and supporting data and documentation is each twelve (12) months, at a minimum, or more often if the generator has informed the TSD unit of a change in the waste generation process or if the TSD unit has identified that the waste received at the TSD unit or the description on the manifest or shipping papers does not match the waste profile. If the generator has informed the TSD unit of a change in the waste generation process, the waste re-enters the waste stream approval process described in Section 2.1.1 as amended by any Permit conditions. The TSD unit will evaluate verification data against the waste profile to identify any waste streams for which a change in waste generation process is suspect. If a waste stream is suspect, that waste stream also will re-enter the approval process described in Section 2.1.1 as amended by any Permit condition."

III.8.B.c.78. Delete the sentence in lines 10 and 11 on page 7-1, beginning with "Differences include . . . " and replace with the following: "Differences include, but are not limited to, the following: (1) physical and chemical screening frequencies for verification (minimum percentages of 5% for waste from on-site generators and 10% for waste from off-site generators (note that chemical screening frequency is dependent upon the physical screening frequency); (2) shipping documentation (Uniform Hazardous Waste Manifests are used for waste from off-site generators and waste tracking forms are used for waste from on-site generators); and (3) LDR documentation requirements (notification for waste from off-site generators and the information contained in the notice for waste from on-site generators)."

III.8.B.c.79. Delete "and not per Section 1.1.1.1" in line 47 on page 7-1.

III.8.B.c.80. Correct the WAC citation in line 4, page 7-2, to read as follows: "WAC 173-303-380(1)(j), -(k), -(l), -(m), -(n), or –(o)."

III.8.B.c.81. Delete "an" in line 22, page 7-3, and replace with "that a federal."

III.8.B.c.82. Delete "or equivalent" in line 23, page 7-3.

III.8.B.c.83. Delete "or any other method allowed by regulations" in line 24, page 7-3.

III.8.B.c.84. Delete "SW-846 or any other method allowed by regulations" in line 28, page 7-3, and replace with "this Permit."

III.8.B.c.85. Delete "sample" in line 34, page 7-3, replace with "analytical."

III.8.B.c.86. In line 37 on page 7-3, add the following text: "A copy of the certification is placed in the CWC operating record."

III.8.B.c.87. Delete "Where" in line 38, page 7-3, replace it with "When."

III.8.B.c.88. Correct the WAC citation in line 41, page 7-3, to read as follows: "WAC 173-303-380(l)(k), -(n), -(o)."

III.8.B.d. Chapter 4

III.8.B.d.1. With the exception of spill materials (that spill material which is specifically generated within the CWC facility boundary) waste treatment by CWC must be approved by the Department prior to execution. In the event that waste treatment at CWC is a consideration, the following actions must take place: (1) The permittee must revise pertinent Part B Permit chapters (e.g., the WAP, BEP) and submit them to the Department for review and approval sixty (60) days prior to when treatment is scheduled to begin, and (2) Upon approval, the revised information will be incorporated into the Permit through a Class 3 modification.

III.8.B.d.2. Permittee shall identify critical systems for safe management of dangerous waste and mixed waste at CWC as required in Facility Condition II.L.2.b of this permit. The Permittee shall describe the location and function of each critical system identified. This information shall be submitted to the Department within thirty (30) days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

III.8.B.e. Chapter 7

III.8.B.e.1. Table 7-1. Delete second footnote.

III.8.B.e.2. Table 7-1. The first paragraph of Section 4.0, and all of the following Sections, are added as applicable sections of Appendix 7A: Sections 3.1, 8.2, 8.3, 8.4, 11.0, and 12.0.

III.8.B.e.3. Those portions of DOE/RL-94-02 which are not made enforceable by inclusion in the application matrix of that document are not made enforceable by reference in this document.

III.8.B.f. Appendix 7A

III.8.B.f.1. Section 9.5 shall be revised to include catalytic recombiners.

III.8.B.f.2. The Permittee must review and immediately amend the emergency response documentation, if necessary, whenever: (a) Applicable regulations are revised, (b) The plan fails in an emergency, (c) The unit 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 constituents, or in a way that changes the response necessary in an emergency, and (d) The list of emergency equipment changes.

III.8.B.f.3. The Permittee must note in the CWC operating record the time, date, and details of any incident that requires implementing the Contingency Plan. Within fifteen (15) days after the incident, the permittee must submit a written report to the Department. The report must, at a minimum, include:

(1) Name, address, and telephone number of the permittee;
(2) Name and telephone number of the Unit;
(3) Date, time, and type of incident;
(4) Name and quantity of material(s) involved;
(5) Extent of injuries;
(6) An assessment of actual or potential hazards to human health or the environment, where this is applicable;
(7) Estimated quantity and disposition of recovered material that resulted from the incident;
(8) Cause of the incident; and
(9) Description of corrective actions taken to prevent reoccurrence of the incident.

III.8.B.g. Chapter 8 (Reserved)

III.8.B.h. Appendix 8A

III.8.B.h.1. On Page 1, Section 4.0, insert the following text; "A Facility Manager for the CWC operating organization must ensure that personnel performing the various TSD unit and TSD unit-related activities have received appropriate on-the-job training (OJT). The OJT must be provided by an individual proficient in the specific activity or activities. That individual must sign-off that personnel who

successfully complete the OJT are proficient before personnel may be assigned to perform the activity independently (i.e., without close supervision)."

III.8.B.i. Chapter 11

III.8.B.i.1. Section 11.1.2. shall be revised to include the following language: "Any sampling and analysis activities to support partial or full closure of the facility will require approval from the Department. Closure activities at minimum must meet requirements stipulated in WAC-173-303-610." The list of closure activities in revision 1 of the permit application can be used as an example of such activities, but not as a comprehensive list.

III.8.B.i.2. Section 11.1.4.5. shall be revise to include the following language: "Decontamination of the waste storage pad may require determination of the presence of chemical contamination. Appropriate closure activities will be performed to address chemical contamination if deemed necessary."

III.8.B.j. Chapter 12

III.8.B.j.1. On Page 12-1, Line 37, add "The Permittee will produce and place as-built drawings in the CWC operating record within six (6) months of issuance of this permit. In addition, the referenced as-built drawings will be revised at least every twelve (12) months to incorporate all outstanding engineering change notices (ECNs) and Non Conformance Reports (NCRs)."

III.8.B.j.2. On Page 12-1, add "All unit specific reporting requirements identified in Table 12-1 of the General Information Portion "DOE/RL-91-28" are applicable to the CWC unit."

III.8.B.j.3. The Permittee shall identify requirements from Table 12-1 of the General Information Portion "DOE/RL-91-28" that are not applicable to CWC and provide justification as to why they are not applicable. This information shall be submitted to the Department within thirty (30) days of issuance of this permit and, upon approval by the Department, incorporated as a Class 1 modification. If necessary, The Department will amend the requirements through a Class 2 or 3 modification to the Permit.

CLASS 3 PERMIT MODIFICATIONS TO PART III OF THE PERMIT

Chapter 1 **– 616 Nonradioactive Waste Storage Facility**
Chapter 2 **– 305 B Storage Facility**
Chapter 4 **– Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility**
Chapter 5 **– 242 A Evaporator**
Chapter 6 **– 325 Hazardous Waste Treatment Units**

III.1.B AMENDMENTS TO THE APPROVED PERMIT APPLICATION

III.1.B.d. Table 7.1, delete second footnote.

III.1.B.e. Table 7-1, Sections 3.1, 4.0 (first paragraph), 8.2, 8.3, 8.4, 11.0, and 12.0 are added as enforceable portions of Appendix 7A.

III.1.B.f. Portions of DOE/RL-94-02 that are not made enforceable by inclusion in the applicability matrix for that document, are not made enforceable by reference in this document.

III.1.B.g. Within thirty (30) days of issuance of this permit, the Permitees will revise and submit to the Department Section 9.5 of Appendix 7A, to more accurately identify the quantity and capacity of spill control equipment available at the unit.

III.1.B.h. Appendix 7A, add "at 616 NRDWSF" to the titles of Sections 9.2, 9.4, and 9.5.

III.1.B.i. Before any waste is received at the unit, the Permittees will revise and submit to the Department Sections 9.2, 9.4, and 9.5 of Appendix 7A, to include emergency equipment needed to identify, measure, monitor, and protect against possible toxic fume hazards described in Section 6.1.5. Upon approval by the Department, this information shall be incorporated into this Permit as a Class 1 modification. If necessary, the Department will amend to requirements through a Class 2 or 3 modification to the Permit.

III.1.B.j. Appendix 7A, Figure 1, revise title to read "616 Nonradioactive Dangerous Waste Storage Facility Evacuation Routes."

III.1.B.k. Appendix 7A, Section 8.2, In the event of a WAC 173-303 emergency, the Owner/Operator must notify the Department and appropriate local authorities, that the unit is in compliance with Sections 8.2 and 8.3 of Appendix 7A before operations are resumed in the affected areas.

III.1.B.l. The permitee must review and immediately amend the emergency response documentation, if necessary, whenever: (a) Applicable regulations or the facility permit are revised, (b) The plan fails in an emergency, (c) The unit 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 constituents, or in a way that changes the response necessary in an emergency, or (d) The list of emergency equipment changes.

III.1.B.m. The Permitee must note in the 616 NRDWSF operating record the time, date, and details of any incident that requires implementing the contingency plan. Within

fifteen (15) days after the incident, the permitee must submit a written report on the incident to the Department. The report must at a minimum include:

(1) Name, address, and telephone number of the permittee;
(2) Name and telephone number of the Unit;
(3) Date, time, and type of incident;
(4) Name and quantity of material(s) involved;
(5) Extent of injuries;
(8) An assessment of actual or potential hazards to human health or the environment, where this is applicable;
(9) Estimated quantity and disposition of recovered material that resulted from the incident;
(8) Cause of the incident; and
(9) Description of corrective actions taken to prevent reoccurrence of the incident.

III.1.B.n. The approved Waste Analysis Plan (WAP) is compliant for receipt of on-site waste and off-site waste from USDOE owned and operated units (i.e., 300 Area, 712 Building, and the Federal Building). The permittee is not to receive other off-site waste at this unit until the WAP has been revised to include waste acceptance/verification criteria for the receipt of off-site waste.

III.2.B. AMENDMENTS TO THE APPROVED PERMIT APPLICATION

III.2.B.h. **The entire document contained in Appendix 7A (DOE/RL 90-01) excluding nuclear safety information is considered applicable to RCRA requirements and Washington State Dangerous Waste Regulations, as applicable, in WAC 173-303.**

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

III.4.B.d.3. Table 7-1, Sections 3.1, 4.0 (first paragraph), 8.2, 8.3, 8.4, 11.0, and 12.0 are added as enforceable portions of Appendix 7A.

III.4.B.d.4. Portions of DOE/RL-94-02 that are not made enforceable by inclusion in the applicability matrix for that document are not made enforceable by reference in this document.

III.5.B. AMENDMENTS TO THE APPROVED PERMIT APPLICATION

III.5.B.a.14. Table 7-1, Sections 3.1, 4.0 (first paragraph), 8.2, 8.3, 8.4, 11.0, and 12.0 are added as enforceable portions of Appendix 7A.

III.5.B.a.15. Portions of DOE/RL-94-02 that are not made enforceable by inclusion in the applicability matrix for that document are not made enforceable by reference in this document.

III.6.B. AMENDMENTS TO THE APPROVED PERMIT APPLICATION

III.6.B.x. Appendix 7A, Sections 3.2, 4.0, 5.0, and 6.0 are added as enforceable sections.

III.6.B.y. Chapter 7.0, Page 7-1, add "However, the Department shall be notified of all changes to the Contingency Plan within ten (10) days of implementation.

III.6.B.z. Chapter 6, at the end of the paragraph, add "by the Department and shall follow WAC 173-303-360, where applicable.

III.6.B.aa. Portions of DOE/RL-94-02 that are not made enforceable by inclusion in the applicability matrix for that document are not made enforceable by reference in this document.

MODIFICATIONS TO PART V OF THE PERMIT

<u>New Chapters:</u>

Chapter 15 **– 100 D Ponds**
Chapter 16 **– 1325 N Liquid Waste Disposal Facility**
Chapter 17 **– 1301 N Liquid Waste Disposal Facility**
Chapter 18 **– 1324 N Percolation Pond**
Chapter 19 **– 1324 NA Surface Impoundment**

CHAPTER 15

100 D Ponds

The 100 D Ponds is an inactive TSD unit that is currently undergoing permanent closure activities. This TSD unit was operated as a liquid effluent disposal site for dangerous wastes. This Chapter sets forth the closure requirements for this TSD unit.

V.15.A. COMPLIANCE WITH APPROVED CLOSURE PLAN

The Permittees shall comply with all requirements set forth in the 100 D Ponds Closure Plan (Plan), found in Attachment 43, including the amendments specified in Condition V.15.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 4, June 30, 1994

Section 2.3	Security Information
Section 5.0	Groundwater Monitoring
Section 6.0	Closure Strategy and Performance Standards
Section 7.0	Closure Activities

V.15.B. AMENDMENTS TO THE APPROVED CLOSURE PLAN

V.15.B.a. (Reserved)

CHAPTER 16

1325-N Liquid Waste Disposal Facility

The 1325-N Liquid Waste Disposal Facility is an inactive TSD unit that is currently undergoing modified closure activities. This TSD unit was operated as a liquid waste disposal facility for dangerous wastes. This Chapter sets forth the modified closure requirements for this TSD unit.

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 44 (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
Section A2.1	General Description of Unit
Section A3.0	Groundwater Monitoring
Section A4.0	Closure
Section A5.0	Postclosure Plan

V.16.B. AMENDMENTS TO THE APPROVED CLOSURE PLAN

V.16.B.a. (Reserved)

CHAPTER 17

1301-N Liquid Waste Disposal Facility

The 1301-N Liquid Waste Disposal Facility is an inactive TSD unit that is currently undergoing modified closure activities. This TSD unit was operated as a liquid waste disposal facility for dangerous wastes. This Chapter sets forth the modified closure requirements for this TSD unit.

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 44 (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
Section A2.1	General Description of Unit
Section A3.0	Groundwater Monitoring
Section A4.0	Closure
Section A5.0	Postclosure Plan

III.17.B. AMENDMENTS TO THE APPROVED CLOSURE PLAN

III.17.B.a. (Reserved)

CHAPTER 18

1324-N Percolation Pond

The 1324-N Percolation Pond is an inactive TSD unit that is currently undergoing modified closure activities. This TSD unit was operated as a percolation unit for dangerous wastes. This Chapter sets forth the modified closure requirements for this TSD unit.

V.18.A. COMPLIANCE WITH APPROVED MODIFIED CLOSURE PLAN

The Permittees shall comply with all requirements set forth in the 1324-N Closure Plan found in Attachment 45 (DOE/RL-96-39, Rev. 0, Appendix B), including the amendments specified in Condition V.18.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 3, June 30, 1994

Section B1.0	Introduction
Section B2.1	General Description of Unit
Section B3.0	Groundwater Monitoring
Section B4.0	Closure
Section B5.0	Postclosure Plan

III.18.B. AMENDMENTS TO THE APPROVED CLOSURE PLAN

III.18.B.a. (Reserved)

CHAPTER 19

1324-NA Surface Impoundment

The 1324-NA Surface Impoundment is an inactive TSD unit that is currently undergoing modified closure activities. This TSD unit was operated as a surface impoundment unit for dangerous wastes. This Chapter sets forth the modified closure requirements for this TSD unit.

V.19.A. COMPLIANCE WITH APPROVED MODIFIED CLOSURE PLAN

The Permittees shall comply with all requirements set forth in the 1324-NA Closure Plan found in Attachment 45 (DOE/RL-96-39, Rev. 0, Appendix B), including the amendments specified in Condition V.19.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 3, June 30, 1994

Section B1.0	Introduction
Section B2.1	General Description of Unit
Section B3.0	Groundwater Monitoring
Section B4.0	Closure
Section B5.0	Postclosure Plan

III.19.B. AMENDMENTS TO THE APPROVED CLOSURE PLAN

III.19.B.a. (Reserved)

CLASS 3 PERMIT MODIFICATIONS TO PART V OF THE PERMIT

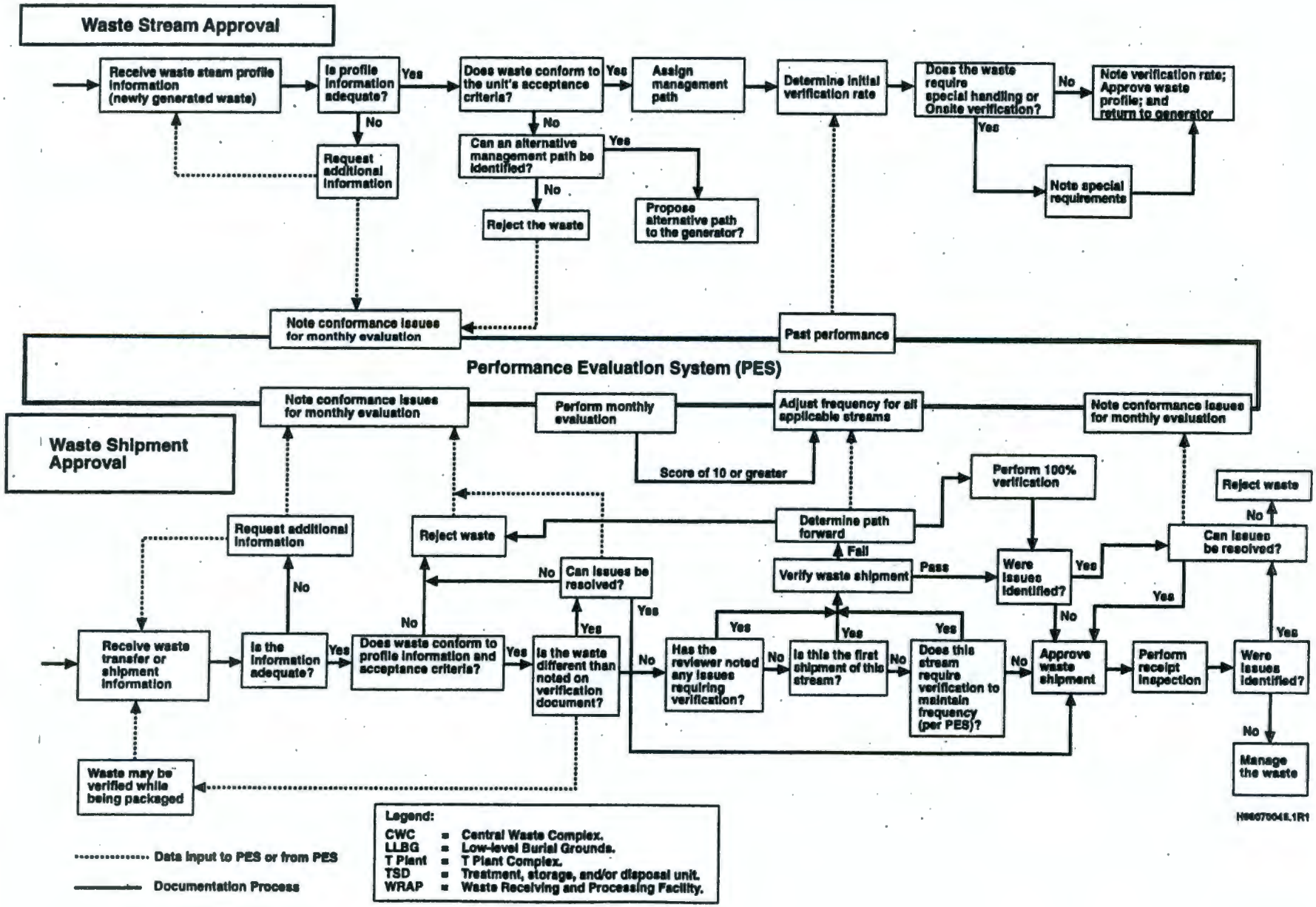
Chapter 14 – 303 K Storage Facility

V.14.B. AMENDMENTS TO THE APPROVED CLOSURE PLAN

Delete V.14.B.f. and replace with the following:

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. In addition, the Permittees shall submit to the Department at least two 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.**

Attachment 41A – Waste Acceptance Process



Attachment 41B

5.0 Selecting a Laboratory and Quality Assurance/Quality Control

The quality assurance (QA) and quality control (QC) requirements outlined in this section are applicable to laboratory activities governed by this waste analysis plan (WAP). The selection of any laboratory shall be based upon its ability to demonstrate compliance to this section. Experience and capabilities will be determined in three major areas:

(1) Comprehensive written QA/QC program that conforms to the requirements of this section

(2) Laboratory is periodically audited for effective implementation of QA/QC program by a group or agency deemed acceptable by the CWC/WRAP operating organization

(3) Participation and demonstrated proficiency in a performance-evaluation program acceptable to the CWC/WRAP operating organization.

All laboratories providing analytical support to the CWC/WRAP operating organization are required to have the following QA/QC documentation.

- Analytical data generated are controlled by the implementation of a documented laboratory QA program that meets the requirements of this section.

- Before commencement of analytical work, the laboratory staff will submit the QA plan for review by the CWC/WRAP operating organization. At a minimum, the QA plan shall address the following:

  - sample custody and management practices (see also Section 4.2 of this WAP)

  - sample preservation protocols

  - sample preparation and analytical procedure requirements

  - instrument maintenance and calibration requirements

  - internal QC measures, e.g., method blanks, spikes

  - analytical capabilities.

When it is necessary to send samples to a laboratory, contracts or work agreements are not awarded until a pre-award evaluation of the prospective laboratory has been performed. In the pre-award evaluation process, the laboratory's QA plan is submitted to the CWC/WRAP operating organization for approval. QA personnel and a technical expert may also visit the site,

or the prospective laboratories' QA/QC documents and records of surveillances/inspections, audits, non-conformances, and corrective actions.

5.1 OBJECTIVES FOR THE CWC/WRAP

The primary purpose of waste testing is to ensure that the waste is properly characterized, when process knowledge is insufficient, in compliance with RCRA requirements for general waste analysis [WAC 173-303-300(2); 40 CFR 264.13]. Waste also is tested to ensure that stored waste is safely managed, residuals from incidents (spills) that might occur are properly disposed of, and the process of accepting waste for storage is controlled. The specific objectives of the waste-sampling and analysis program at CWC/WRAP are as follows:

- Identify the presence of waste that is substantially different from waste currently stored (e.g., compatibility).
- Provide a detailed chemical and physical analysis of a representative sample of the waste before the waste is accepted at or transferred from CWC/WRAP to an offsite TSD facility to ensure proper management and disposal.
- Provide an analysis that is accurate and up-to-date to ensure that waste is properly treated.
- Ensure safe management of waste at the CWC/WRAP.
- Ensure proper disposal of residuals.
- Ensure compliance with Land Disposal Restriction (LDR) requirements.
- Identify and reject waste that does not meet CWC/WRAP acceptance requirements (e.g., incomplete information).
- Identify and reject waste that does not meet CWC/WRAP specifications (e.g., Part A, Form 3 Permit Application, restricted from management at CWC/WRAP).
- Determine if waste samples are representative of the contents of the containers at the time the samples were taken.
- Determine if waste accepted for management meets the requirements of CWC/WRAP waste acceptance criteria.
- Determine if waste accepted for management meets the information provided by the generator.

5.2 DATA QUALITY REQUIREMENTS

The overriding goal of this program is to adequately designate or certify waste, through either

acceptable knowledge or analytical testing, such that it can be appropriately managed or dispositioned. The clear objective in such a case is to either "prove the negative" or accurately designate/certify any waste for which the negative cannot be proven. The first objective is to control and characterize any errors associated with the data produced in the laboratory. Laboratory QC activities are directed at identifying any potential errors introduced during the preparative, analytical, and/or reporting phases of work. Other oversight QA activities, such as planning the field and laboratory QC program requirements, auditing ongoing and completed activities, and evaluation of certifications obtained by the laboratory, ensure that the specified procedures are followed and that the QA information needed for characterizing error, to permit adequate decision-making, is obtained.

The second objective is to illustrate that waste has been tested according to the specifications in this WAP. Activities related to this objective include, but are not limited to, the following:

- Inspections – performed by CWC/WRAP operating organization or designee, depending on the activity. The inspections primarily are visual. The purpose of these inspections is to verify that a specific guideline, specification, or procedure for the activity is completed successfully.

- Laboratory analyses – performed by onsite or offsite laboratories on samples of waste. The purpose of the laboratory analyses is to determine constituents or characteristics present, the concentration or level, and whether the results either "prove the negative" or result in designation/certification.

- Checklists – required for inspections and designed to ensure that the appropriate areas are addressed, consistently. Checklists are filled out during the course of inspection to document inspection results.

- Instrument calibration and calibration verification activities – required for ensuring data of known accuracy and precision. This activity includes maintaining records of calibration of all instruments used to perform surveying and laboratory analyses to ensure traceability to reported results.

5.2.1 Data Assessment

The acquired data need to be scientifically sound, of known quality, and thoroughly documented. Data validation is not required; however, the CWC/WRAP operating organization is responsible to ensure that data assessment or evaluation is completed. Data are assessed to determine compliance with national quality standards, which are as follows:

Precision – The overall precision shall be the agreement between the collected samples (duplicates) for the same parameters, at the same location, subjected to the same preparative and analytical techniques. Analytical precision shall be the agreement between individual test portions taken from the same sample, for the same parameters, subjected to the same preparative and analytical techniques.

Representativeness – Representativeness will address the degree to which the data accurately and precisely represent a real characterization of the waste stream, parameter variation at a sampling point, sampling conditions, and the environmental condition at the time of sampling. The issue of representativeness will be addressed for the following points:

- Based on the generating process, the waste stream, and its volume, an adequate number of sampling locations is selected.

- The representativeness of selected media has been defined accurately.

- The sampling and analytical methodologies are appropriate.

- The environmental conditions at the time of sampling are documented.

Completeness – Completeness is the amount of usable data obtained from a measurement system compared to the total amount of data requested.

Comparability – Comparability is the confidence with which one data set can be compared to another. This usually is accomplished by using consistent methodology.

5.3 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

All analytical work shall be defined and controlled by a Statement of Work, work order, or other documentation prepared in accordance with this section. Samples will be handled according to approved laboratory procedures. The accuracy, precision, and any limitations of analytical data generated in the laboratory will be determined by QC performance.

5.3.1 Analytical Methods

As needed, the CWC/WRAP operating organization will conduct analyses to determine completeness of information and whether waste meets the acceptance criteria for treatment, storage, or disposal at one of the Hanford Facility TSD units or those of a chosen offsite TSD facility. Testing and analytical methods will depend on the type of analysis sought and the reason for needing the information.

Testing shall be performed by chemists and/or appropriate analytical personnel working under a QA program. Analytical methods may be selected from those that are used routinely by the laboratories and suitable for the matrix and analyte(s) being tested. All methods employed by the laboratory for analysis of waste managed in CWC/WRAP shall be agreed upon by the CWC/WRAP operating organization before the start of work.

Laboratories performing work to support the CWC/WRAP operating organization shall have a system in place and documented, which ensures that procedures are properly prepared, reviewed, approved, issued, and controlled. Procedures shall be controlled such that only the most current version is available for use.

For parameters or methods not otherwise specified in the Permit, the following are acceptable sources of testing methods (standard methods). These are listed in order of preference.

- The most recently promulgated version of Test Method for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, U.S. Environmental Protection Agency, Office of Solid Waste.
- Other current U.S. EPA methods, as applicable to the matrix under evaluation.
- Standard Methods for the Examination of Water and Wastewater, American Public Health Association (APHA), American Water Works Association, Water Environment Federation.
- Annual Book of ASTM Standards, American Society for Testing and Materials.
- AOAC Official Methods of Analysis, AOAC (Association of Official Analytical Chemists), International.
- Other widely accepted analytical methods, proprietary methods, and non-standard methods. These may be needed in special cases, e.g., to develop operational and safety related information.

For all methods, the method must be shown to be suitable for the matrix being tested and must be demonstrated to have specificity for the parameter or analyte. Quality control parameters, including method detection limit, precision, and accuracy, must be measured and monitored in real-time to ensure that acceptable data are produced.

5.3.2 Quality Control Requirements

Quality control principles of SW-846 Method 8000B, Section 8.7 will be incorporated into laboratory procedures, including standard methods and modified methods. Additionally, modified methods will be qualified by a regulatory level detection study. This study is based on 40 CFR 136 method detection limit criteria and is run on seven (7) samples at the regulatory limit. The regulatory level detection study produces enough data for interim QC limits until the Method 8000B Section 8.7 required 20 samples are finished. At that point a modified method is then on the same QC schedule as a standard method. Although SW-846 Method 8000B Section 8.7 applies to organic analyses, this same approach to method QC will be applied to those inorganic parameters identified in Appendix A of this WAP.

The types of quality control required are as follows:

Method or Preparative Blanks – These blanks usually consist of laboratory reagent-grade water treated in the same manner as the sample (e.g., digested, extracted, distilled). They are prepared, analyzed, and reported as a standard sample would be reported. Method or preparation blanks indicate contamination from reagents or materials used. A blank is considered acceptable if (1) the concentration of any analyte of interest detected in the blank is 20 times lower then that of the samples or (2) the analyte of interest in the sample is less than 80% of the Regulatory Decision Limit.

Laboratory Control Sample – A reference material, similar in matrix to the samples, introduced into a process to monitor the performance of the system. It is used in place of a method or blank spike when the matrix warrants, and an adequate material is available.

Matrix Spike – An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs at the time of sample preparation. (Note: When the TCLP is conducted, spiking occurs after leaching at the time of digestion or extraction). Matrix spikes shall be performed on 5% of the samples (1 in 20) or one per batch of samples. The Matrix Spike gives an indication of any limitations of the preparative process employed for the matrix tested. Wherever possible and practical, the sample should be spiked at a level which is at or near the regulatory decision limit. Generally, a matrix spike and matrix spike duplicate are prepared and analyzed in an organic analysis; inorganics include a sample, duplicate, and matrix spike. Accuracy limits for Matrix Spikes are specified in SW-846 Method 8000B, Section 8.7.1. Failure to achieve these limits for any analyte of interest warrants corrective action with the following exceptions: (1) the analyte of interest in the sample is so low in relation to the spike recovery that it would not exceed the regulatory decision limit or (2) the analyte of interest in the sample exceeds the regulatory decision limit. Appropriate corrective action is specified in SW-846 Method 8000B, Section 8.7. Laboratory performance-based limits may be used in lieu of those presented in SW-846 Method 8000B Section 8.7 if negotiated with the Washington State Department of Ecology (Ecology).

Laboratory Duplicate Samples – Laboratory duplicates are obtained by removing two test portions from one field sample and analyzing each test portion as an independent sample. The analyses of laboratory duplicates monitor the precision of the preparative and analytical method for the sample matrix. Laboratory duplicates shall be performed on 5% of the samples (1 in 20) or one per batch of samples. In the case of testing for organic constituents, a matrix spike and matrix-spike duplicate are typically analyzed. Precision limits are established per SW-846 Method 8000B, Section 8.7. If the precision value exceeds the control limit, then corrective action is required with the following exceptions: (1) the sample results, regardless of precision, would not exceed the regulatory decision limit or (2) the sample results clearly exceed the regulatory decision limit, regardless of precision. Appropriate corrective action is established in SW-846 Method 8000B, Section 8.7. Laboratory performance-based limits may be used in lieu of those presented in SW-846 Method 8000B, Section 8.7 if negotiated with Ecology.

CHANGES INCLUDED FOR THE HANFORD FACILITY DANGEROUS WASTE PERMIT APPLICATION,
616 Nonradioactive Dangerous Waste Storage Facility

ATTACHMENT 8

Chapter 7.0, Contingency Plan, Revision 2A

Chapter 14.0, Part B Certification, Revision 2A

Appendix 7A, Building Emergency Plan for 616 Nonradioactive Dangerous Waste Storage Facility, HNF-IP-0263-616, Revision 4

Appendix 8A, 616 Nonradioactive Dangerous Waste Storage Facility Dangerous Waste Training Plan, HNF-1276, Revision 1

Hanford Facility RCRA Permit Modification Notification Form

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

Description of Modification:

Providing complete revision to Chapter 7, "Contingency Plan" and Appendix 7A, "Building Emergency Procedure, 305-B Building" in accordance with revised Hanford Site Emergency Plan (DOE/RL 94-02) and integration with internal documents used for the same purpose. This version of Chapter 7 will be Revision 2. The certification page (Chapter 14) is also being updated to serve as the certification for the Class 2 modification package and will be Revision 2.

Modification Class: [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: B. 6.a.

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

B. General Facility Standards
   6. Contingency Plan:
      a. Changes in emergency procedures (i.e., spill or release procedures)

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
7/27/98	7/27/98	7/28/98
G. W. McNair Date	R. F. Christensen Date	G. P. Davis 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:
616 Nonradioactive Dangerous Waste Storage Facility	**Part III, Chapter 1 and Attachment 8 [Appendix 8A]**

Description of Modification:

Remove Appendix 8A, Training Plan for the 616 NRDWSF, HNF-1276, Revision 0, and replace with Appendix 8A, Training Plan for the 616 NRDWSF, HNF-1276, Revision 1.

Justification:

The changes made to the Training Plan do not decrease the amount of training given to employees. The changes were made in an effort to maintain consistency with other training plans managed under the Solid Waste Project.
This modification is being submitted as a package with other Class 2 modifications to the 616 NRDWSF.

Modification Class: [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: B.5.a.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
General Facility Standards, Changes in the training plan: That affect the type or decrease the amount of training given to employees.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Dobbins for 5/13/98	5/19/98	6/11/98
C. G. Mattsson Date	H. E. Bilson 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:
616 Nonradioactive Dangerous Waste Storage Facility	**Part III, Chapter 1 and Attachment 8 [Chapter 7.0 and Appendix 7A]**

Description of Modification:

Remove Chapter 7.0, Revision 2 and Appendix 7A, Building Emergency Plan for the 616 NRDWSF, HNF-IP-0263-616, Revision 3, and replace with Chapter 7.0, Revision 2A and Appendix 7A, Building Emergency Plan for the 616 NRDWSF, HNF-IP-0263-616, Revision 4.

Justification:

Modifications to Chapter 7.0 and Appendix 7A reflect a new Hanford Site incident command structure and are the result of agreements reached between the DOE-RL, FDH, and Ecology.

Modification Class: [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: B.6.a.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
General Facility Standards, Contingency Plan: Changes in emergency procedures (i.e., spill or release response procedures).

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Svoboda for 5/13/98	5/14/98	6/17/98
C. O. Mattsson Date	H. E. Bilson 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 LERF- Part A and Part B Chapter 4

Description of Modification:

Increase the capacity of a LERF basin from 24.6 million liters (6.5 millions gallons) to 29.5 million liters (7.8 million gallons), and increase the total capacity of LERF from 73.8 million liters (19.5 million gallons) to 88.5 million liters (23.4 million gallons). The modified text reflects these increases, as well as other changes in response to the increase volume (see attached text from the Part A, and Chapter 4 of the Part B).

Reference:

1. Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Liquid Effluent Retention Facility, Revision 6

2. Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Chapter 4, Revision 0A

Modification Class: [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: 4.d.i. (Request downgrade to Class2)

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
Other modifications.
In the case of modifications not explicitly listed in Appendix I of this section, the permittee may submit a Class 3 modification request to the department, or he or she may request a determination by the director that the modification should be reviewed and approved as a Class 1 or Class 2 modification. If the permittee requests that the modification be classified as a Class 1 or 2 modification, he or she must provide the department with the necessary information to support the requested classification.

Temporary approval for this increase was granted on October 31, 1997 (see attached letter). This letter provides a complete discussion on the justification for this increase in volume.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Swobode for C. G. Mattsson 5/13/98 Date	H. E. Bilson 5/19/98 Date	6/2/98 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 (HWTUs)	Part III, Chapter 6 (Application Chapter 7)

Description of Modification:

Providing complete revision to Chapter 7, "Contingency Plan" and Appendix 7A, "Building Emergency Procedure, 325 Building" in accordance with revised Hanford Site Emergency Plan (DOE/RL 94-02) and integration with internal documents used for the same purpose. This version of Chapter 7 will be Revision 2. The certification page (Chapter 14) is also being updated to serve as the certification for the Class 2 modification package and will be Revision 2.

Modification Class: [1] [2]	Class 1	Class[1] 1	Class 2	Class 3
please check one of the Classes:			x	

Relevant WAC 173-303-830, Appendix I Modification: B.6.a.

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

B. General Facility Standards
   6. Contingency Plan:
      a. Changes in emergency procedures (i.e., spill or release response procedures)

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
G. W. McNair 5/19/98	R. F. Christensen 5/20/98	July 8, 98
Date	Date	Date

[1]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.

[2]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 ETF-Part B Chapter 7 and Appendix 7A

Description of Modification:

Remove Chapter 7.0, Revision 0, and Appendix 7A, Building Emergency Plan for 200 Area Effluent Treatment Facility and Liquid Effluent Retention Facility, HNF-IP-0263, Revision 3, and replace with Chapter 7.0, Revision 0A, and Appendix 7A, Building Emergency Plan for 200 Area Effluent Treatment Facility and Liquid Effluent Retention Facility, HNF-IP-0263, Revision 4.

Reference:

1. Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Chapter 7.0, Revision

2. Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Appendix 7A, Building Emergency Plan for 200 Area Effluent Treatment Facility and Liquid Effluent Retention Facility, HNF-IP-0263, Revision 4.

Modification Class: [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: B.6.a.

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

"Changes in emergency procedures (i.e., spill or release response procedures)"

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Swoboda for 5/13/98	5/19/98	6/2/98
C. G. Mattsson Date	H. E. Bilson 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 ETF- Part A and Part B Chapter 4

Description of Modification:

The Part A and Part B are modified to allow treatment as well as storage for containers which are managed in the ETF. This modification will allow for the removal and treatment of sludge that may accumulate in ETF process tanks from the treatment process. Once removed from the these tanks, the sludge is placed in containers. As necessary, the sludge is allowed to settle and the supernate is pumped back to the ETF for treatment. This sludge is removed from the tanks to prevent damage to the ETF processing equipment and to allow uninterrupted operation of the treatment process.

The Waste Analysis Plan (WAP) has been revised and the revision addresses treatment in containers. A separate modification form is submitted for a revised WAP.

Reference:

1. Hanford Facility Dangerous Waste Part A Permit Application, Form 3, 200 Area Effluent Treatment Facility, Revision 3.
2. Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Chapter 4, Revision 0A.
3. Waste Analysis Plan for Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Revision 0A.

Modification Class: [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: F.1.c

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
"Treatment processes necessary to treat wastes that are restricted from land disposal to meet some or all of the applicable treatment standards" [In this case, treatment through solidification and evaporation is provided to meet the WAC 173-303-140(4)(b)(ii) standard which prohibits land disposal of containers which hold free liquids.]

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Grobbel for C. G. Matisson 5/13/98 Date	H. E. Bilson 5/19/98 Date	6/2/98 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	Permit application: Chapter 6 Permit: Section III.5.A

Description of Modification:

1. Chapter 6.0, Table 6-4, Line 17: change the frequency of surveillance of "Diesel Generator" from "Weekly" to "Monthly".

Reason for change: The diesel generator starts immediately following loss of normal power to provide emergency power to perform a controlled shutdown of the 242-A Evaporator. Procedures originally called for a weekly no load functional check of the diesel generator. This was subsequently changed to a monthly functional check to avoid excessive wear on the diesel engine (e.g., buildup on the fuel injectors). A monthly test is considered acceptable based on the small likelihood of failure during the short 242-A Evaporator campaigns.

2. Chapter 6.0, Table 6-4, Line 19: change the frequency of surveillance of "Uninterruptible power supply" from "Monthly" to "Annually".

Reason for change: During loss of normal power, the uninterruptible power supply (UPS) provides approximately 20 minutes backup power, allowing time for the diesel generator to come to full power without disrupting the computerized Monitoring and Control System. The UPS has a low battery output voltage alarm (YSL-UPS-1) which annunciates at the 242-A Evaporator Control Room. Given this continuous alarm, and that the 242-A Evaporator only operates in short campaigns several times a year, a monthly voltage check is not necessary. Instead, the annual maintenance check, which includes a load test, is adequate to meet 242-A Evaporator needs.

3. Chapter 6.0, Table 6-2, Lines 16 and 17: change the frequencies of surveillance of "Telephones" (Line 16) and "Intercom/public address system" (Line 17) from "Monthly" to "Quarterly".

Reason for change: The telephone/public address systems are used for standard communications and warnings in the 242-A Building. The system is similar to a standard phone system and has proven very reliable. Based on this reliability, quarterly surveillances are adequate to meet facility needs.

Modification Class: [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: Item A.4.b

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

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[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:

Remove Appendix 3A, Waste Analysis Plan for Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Revision 0, from Attachment 34 and replace with Waste Analysis Plan for Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Revision 0A. See attached Justification for Waste Analysis Plan Changes.

Modification Class: [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: B.2.b.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
General Facility Standards, Changes to analytical quality assurance/control plan: Other changes.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth G. Niobe for C. G. Mattsson 5/13/98	H. E. Bilson 5/19/98	6/2/98
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:
242-A Evaporator	Part III, Chapter 5 and Attachment 35 242-A Evaporator Appendix 7A

Description of Modification:

Remove Chapter 7.0, Revision 1, and Appendix 7A, Building Emergency Plan for 242-A Evaporator, HNF-IP-0263-242-A, Revision 3, and replace with Chapter 7.0, Revision 1A, and Appendix 7A, Building Emergency Plan for 242-A Evaporator, HNF-IP-0263-242-A, Revision 4.

Reference:

1. Hanford Facility Dangerous Waste Permit Application, 242-A Evaporator, Chapter 7.0, Revision 1A

2. Hanford Facility Dangerous Waste Permit Application, 242-A Evaporator, Appendix 7A, Building Emergency Plan for 242-A Evaporator, Revision 4.

Modification Class: [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: B.6.a.

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

"Changes in emergency procedures (i.e., spill or release response procedures)"

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Swoboda for 5/15/98	5/19/98	6/2/98
C. G. Mattsson Date	H. E. Bilson 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.

WAC 173-303-830, Appendix I, Item A.4, states "Changes in the frequency of or procedures for monitoring, reporting, sampling, or maintenance activities by the permittee" are Class 2 modifications (Item A.4.b), except if they increase the frequency of monitoring, which are Class 1 modifications (Item A.4.a).

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:	
Kenneth J. Sobeda for	5/13/98		5/19/98		6/2/98
C. G. Mattsson	Date	H. E. Bilson	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:
PUREX Storage Tunnels	Part III, Chapter 3, and Attachment 28 (Chapter 7.0 and Appendix 7A)

Description of Modification:

Remove Chapter 7.0, Revision 4 and Appendix 7A , Supplemental Unit-Specific Contingency Plan for the 218-E-14 and 218-E-15 Storage Tunnels, HNF-IP-0603 (Issue Date, April 2, 1997), and replace with Chapter 7.0, Revision 4A and Appendix 7A, Supplemental Unit-Specific Contingency Plan for the 218-E-14 and 218-E-15 Storage Tunnels, HNF-IP-0603 (Effective Date, July 1, 1998).

Reason for Change:

Modifications to Chapter 7.0 and Appendix 7A of the PUREX Storage Tunnels Part B reflect a new Hanford Site incident command structure per agreements reached between DOE/RL, FDH, and Ecology.

Modification Class: [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: B.6.a.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
WAC 173-303-830, Appendix I, "General facility standards, Contingency Plan; Changes in emergency procedures (i.e., spill or release response procedures)."

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
L. J. Olguin, FDH 5/13/98 Date	J. E. Mecca, RL 5/19/98 Date	6/2/98 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 WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX

Updated August 10, 1998

PART I									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B[1]	C[2]	D[3]	E	F	G	
I.A.	Effect Of Permit								
I.A.1.a		*	*	*	*	*	*	*	
I.A.1.b		*	*	*	*	*	*	*	
I.A.2		*	*		*	*	*	*	
I.A.3	Coord. w/FFACO		*		*	*	*	*	
I.B.	Personal & Property Rights		*		*	*	*	*	
I.C.	Permit Actions								
I.C.1.	Modification, Revocation, Reissuance, or Termination		*		*	*	*	*	
I.C.2.	Filing of a Request		*		*	*	*	*	
I.C.3.	Modifications		*		*	*	*	*	
I.D.	Severability								
I.D.1.	Effect of Invalidation		*		*	*	*	*	
I.D.2.	Final Resolution		*		*	*	*	*	
I.E.	Duties & Requirements								
I.E.1.	Duty to Comply		*		*	*	*	*	
I.E.2.	Compliance Not Constituting Defense		*		*	*	*	*	
I.E.3.	Duty to Reapply		*		*	*	*	*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

1 For Category B, Part I Conditions only apply if future TSD activities are begun on the North Slope or ALE

2 For Category C, all Part I Conditions apply to activities subject to Conditions II.U. and II.v.

3 For category D, part I Conditions only apply to activities subject to Conditions II.A, II.C., II.D.4., II.G., II.I., II.L.3., II.O., II.Q., II.S., II.T., and II.X.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX

Updated August 10, 1998

PART I									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B[1]	C[2]	D[3]	E	F	G	
I.E.4.	Permit Expiration & Continuation		*		*	*	*	*	
I.E.5.	Need to Halt or Reduce Activity Not a Defense		*		*	*	*	*	
I.E.6.	Duty to Mitigate		*		*	*	*	*	
I.E.7.	Proper Operation & Maintenance		*			*	*	*	
I.E.8.	Duty to Provide Information		*		*	*	*	*	
I.E.9	Inspection & Entry		*		*	*	*	*	
I.E.10	Monitoring & Records								
I.E.10.a			*		*	*	*	*	
I.E.10.b			*		*	*	*	*	
I.E.10.c			*		*	*	*	*	
I.E.10.d			*		*	*	*	*	
I.E.10.e			*		*	*	*	*	
I.E.11.	Reporting Planned Changes		*			*	*	*	
I.E.12.	Certification of Construction or Modification		*				*		
I.E.13.	Anticipated Noncompliance		*		*	*	*	*	
I.E.14.	Transfer of Permits		*			*	*	*	
I.E.15.	Immediate Reporting								

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

[1] For Category B, Part I Conditions only apply if future TSD activities are begun on the North Slope or ALE

[2] For Category C, all Part I Conditions apply to activities subject to Conditions II.U. and II.v.

[3] For category D, part I Conditions only apply to activities subject to Conditions II.A, II.C., II.D.4., II.G., II.I., II.L.3., II.O., II.Q., II.S., II.T., and II.X.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX
Updated August 10, 1998

PART I									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B[1]	C[2]	D[3]	E	F	G	
I.E.15.a			*		*	*	*	*	
I.E.15.b			*		*	*	*	*	
I.E.15.c			*		*	*	*	*	
I.E.15.d			*		*	*	*	*	
I.E.15.e			*		*	*	*	*	
I.E.16	Written Reporting		*		*	*	*	*	
I.E.17	Manifest Discrepancy Report								
I.E.17.a			*			*	*	*	
I.E.17.b			*		*	*	*	*	
I.E.18.	Unmanifested Waste Report		*			*	*	*	
I.E.19.	Other Noncompliance		*		*	*	*	*	
I.E.20.	Other Information		*		*	*	*	*	
I.E.21.	Reports, Notifications & Submissions		*		*	*	*	*	
I.E.22.	Annual Report		*		*	*	*	*	
I.F.	Signatory Requirement		*		*	*	*	*	
I.G.	Confidential Information		*		*	*	*	*	
I.H.	Documents To Be Maintained At Facility Site		*		*	*	*	*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

1 For Category B, Part I Conditions only apply if future TSD activities are begun on the North Slope or ALE

2 For Category C, all Part I Conditions apply to activities subject to Conditions II.U. and II.v.

3 For category D, part I Conditions only apply to activities subject to Conditions II.A, II.C., II.D.4., II.G., II.I., II.L.3., II.O., II.Q., II.S., II.T., and II.X.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX
Updated August 10, 1998

PART II									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
II.A.	Facility Contingency Plan								
II.A.1.					*	*	*	*	For Category D, II.A. Conditions only apply to releases of hazardous substances which threaten human health or the environment.
II.A.2.					*	*	*	*	
II.A.3.					*	*	*	*	
II.A.4.					*	*		*	
II.A.5.					*	*	*	*	
II.B.	Preparedness & Prevention								
II.B.1.						*	*		
II.B.2.						*	*		
II.B.3.						*	*		
II.B.4.						*	*		
II.C.	Personnel Training								
II.C.1.						*	*	*	
II.C.2.					*	*	*	*	
II.C.3.						*	*	*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX

Updated August 10, 1998

PART II									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
II.C.4.					*	*	*	*	For Category D, Condition II.C.4. will not apply to unrestricted (publicly accessible) areas
II.D.	Waste Analysis								
II.D.1.						*	*	*	
II.D.2.						*	*	*	
II.D.3.						*	*	*	
II.D.4.					*				
II.E.	QA/QC								
II.E.1.						*	*	*	
II.E.2.						*	*	*	
II.E.3.						*	*	*	
II.E.4.						*	*	*	
II.E.5.						*	*	*	
II.F.	GW and Vadose Zone Monitoring					*	*	*	
II.F.1.	Purgewater Management					*	*	*	
II.F.2.	Well Remed. & Abandonment								
II.F.2.a						*	*	*	
II.F.2.b						*	*	*	
II.F.2.c						*	*	*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX

Updated August 10, 1998

PART II									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
II.F.2.d						*	*	*	
II.F.3	Well Construction					*	*	*	
II.G.	Siting Criteria				*		*		For Category D, Condition II.G. only applies if a new TSD unit is to be sited.
II.H.	Record Keeping & Rerporting								
II.H.1.	Cost Estimate for Facility Closure					*	*	*	
II.H.2.	Cost Est. for Postclosure Monitoring & Maintenance					*	*	*	
II.H.3.						*	*	*	
II.I.	Facility Operating Record								
II.I.1.		*	*		*	*	*	*	For Category D, II.I. Conditions only apply to activities subject to this Permit as defined by this matrix. For Category E, Condition applicability to be specified in Part V. Condition II.I. only applies to existing records and records prepared after the date of Permit issuance.
II.I.1.a		*	*		*	*	*	*	
II.I.1.b							*	*	
II.I.1.c					*	*	*	*	
II.I.1.d						*	*	*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX
Updated August 10, 1998

PART II									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
II.I.1.e			*		*				
II.I.1.f					*	*	*	*	
II.I.1.g						*	*	*	
II.I.1.h	Condition Reserved								
II.I.1.i						*	*	*	
II.I.1.j						*	*	*	
II.I.1.k					*	*	*	*	
II.I.1.l	Condition Reserved								
II.I.1.m						*	*	*	
II.I.1.n					*	*	*	*	
II.I.1.o	Condition Reserved								
II.I.1.p			*		*	*	*	*	
II.I.1.q			*		*	*	*	*	
II.I.1.r					*	*	*	*	
II.I.1.s					*	*	*	*	
II.I.1.t					*	*	*	*	
II.1.2.		*	*		*	*	*	*	
II.J.	Facility Closure								
II.J.1.						*	*	*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

PART II									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
II.J.2.						*	*	*	
II.J.3.						*	*	*	
II.J.4.						*	*	*	
II.K.	Soil/GW Closure Performance Standards								
II.K.1.						*	*	*	
II.K.2.						*	*	*	
II.K.3.						*	*	*	
II.K.4.						*	*	*	
II.K.5.						*	*	*	
II.K.6.						*	*	*	
II.K.7.						*	*	*	
II.L.	Design & Operation of Facility								
II.L.1.	Proper Design & Construction					*	*	*	Condition II.L.2. only applies to Category E if it is a landfill closure.
II.L.2.	Design Changes, Nonconformance, & As-Built Drawings					*	*	*	Condition II.L.2 applies to Categories E & G only if it is a landfill closure.
II.L.3.	Facility Compliance				*	*	*	*	
II.M.	Security					*	*	*	
II.N.	Receipt of Dang. Wastes Generated Off-Site								

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX
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PART II									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
II.N.1.	Receipt of Off-Site Waste						*		
II.N.2.	Waste From Sources Outside the U.S.						*		
II.N.3.	Notice to Generator						*		
II.O.	General Inspection Requirements								
II.O.1.					*				
II.O.2.					*				
II.O.3.					*				
II.P.	Manifest System								
II.P.1.						*	*	*	
II.P.2.						*	*	*	
II.Q.	On-Site Transportation								
II.Q.1.					*	*	*	*	
II.Q.2.					*	*	*	*	
II.R.	Equivalent Materials								
II.R.1.						*	*	*	
II.R.2.						*	*	*	
II.R.3.						*	*	*	
II.S.	Land Disposal Restrictions				*	*	*	*	
II.T.	Access & Information				*	*	*	*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX
Updated August 10, 1998

PART II									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
II.U.	Mapping of Underground Piping								
II.U.1.				*		*	*	*	
II.U.2.				*		*	*	*	
II.U.3.				*		*	*	*	
II.U.4.				*		*	*	*	
II.V.	Marking of Underground Piping			*		*	*	*	
II.W.	Other Permits and/or Approvals								
II.W.1.						*	*	*	
II.W.2.						*	*	*	
II.W.3.						*	*	*	
II.X.	Schedule Extensions								
II.X.1.				*	*	*	*	*	Condition II.X. only applies to Category C if activities are subject to Conditions II.U. and II.V.
II.X.2.				*	*	*	*	*	Condition II.X. only applies to Category D if activities are subject to this Permit as defined by this matrix.

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX
Updated August 10, 1998

PARTS III, IV, and V									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
III.	Unit Specific Conditions for Final Status Operations								
III.1.A.	**616 NRDWSF** Compliance with Approved Permit Application						*		
III.1.B.	Amendments to the Approved Permit Application						*		
III.2.A.	**305-B** Compliance with Approved Permit Application						*		
III.2.B.	Amendments to the Approved Permit Application						*		
III.3.A.	**PUREX Tunnels** Compliance with Approved Permit Application						*		
III.3.B.	Amendments to the Approved Permit Application						*		
III.4.A.	**LERF and 200 Area ETF** Compliance with Approved Permit Application						*		
III.4.B.	Amendments to the Approved Permit Application						*		
III.5.A.	**242-A Evaporator** Compliance with Approved Permit Application						*		
III.5.B.	Amendments to the Approved Permit Application						*		
III.6.A.	**325 HWTU** Compliance with Approved Permit Application						*		
III.6.B.	Amendments to the Approved Permit Application						*		

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX
Updated August 10, 1998

PARTS III, IV, and V									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
III.7.A.	**WRAP** Compliance with Approved Permit Application						*		
III.7.B.	Amendments to the Approved Permit Application						*		
III.8.A.	**CWC** Compliance with Approved Permit Application						*		
III.8.B.	Amendments to the Approved Permit Application						*		
IV.	Corrective Actions for Past Practice	*	*		*				
V.	Unit Specific Conditions for Units Undergoing Closure								
V.1.A.	**183-H** Basins Compliance with Approved Closure Plan					*			
V.1.B.	Amendments to the Approved Closure Plan					*			
V.2.A.	**300 ASE** Compliance with Approved Closure Plan					*			
V.2.B.	Amendments to the Approved Closure Plan					*			
V.3.A.	**2727-S** Compliance with Approved Closure Plan					*			
V.3.B.	Amendments to the Approved Closure Plan					*			
V.4.A.	**SHLWS** Compliance with Approved Closure Plan					*			
V.4.B.	Amendments to the Approved Closure Plan					*			

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX
Updated August 10, 1998

PARTS III, IV, and V									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
V.5.A.	**218 BPDS** Compliance with Approved Closure Plan					*			
V.5.B.	Amendments to the Approved Closure Plan					*			
V.6.A.	**200 APDS** Compliance with Approved Closure Plan					*			
V.6.B.	Amendments to the Approved Closure Plan					*			
V.7.A.	**2101-M Pond** Compliance with Approve Closure Plan					*			
V.7.B.	Amendments to the Approved Closure Plan					*			
V.8.A.	**B-Ponds** Compliance with Approved Closure Plan					*			
V.8.B.	Amendments to the Approved Closure Plan					*			
V.9.A.	**Hanford Patrol Academy Demo** Compliance with Approved Closure Plan					*			
V.9.B.	Amendments to the Approved Closure Plan					*			
V.10.A.	**105-DR Facility** Compliance with Approved Closure Plan					*			
V.10.B.	Amendments to the Approved Closure Plan					*			
V.11.A.	**304 Concretion Facility** Compliance with Approved Closure Plan					*			

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

PARTS III, IV, and V									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
V.11.B.	Amendments to the Approved Closure Plan					*			
V.12.A.	**4843 Alkali Metal Storage Facility** Compliance with Approved Closure Plan					*			
V.12.B.	Amendments to the Approved Closure Plan					*			
V.13.A.	**3718-F Alkali Metal Treatment and Storage Facility** Compliance with Approved Closure Plan					*			
V.13.B.	Amendments to the Approved Closure Plan					*			
V.14.A.	**303-K Storage Facility** Compliance with Approved Closure Plan					*			
V.14.B.	Amendments to the Approved Closure Plan					*			
V.15.A.	**100-D Ponds** Compliance with Approved Closure Plan					*			
V.15.B.	Amendments to the Approved Closure Plan					*			
V.16.A.	**1325-N Liquid Waste Disposal Facility** Compliance with Approved Closure Plan					*			
V.16.B.	Amendments to the Approved Closure Plan					*			
V.17.A.	**1301-N Liquid Waste Disposal Facility** Compliance with Approved Closure Plan					*			

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

HANFORD FACILITY WIDE PERMIT (REV. 5)
ATTACHMENT 3
PERMIT APPLICABILITY MATRIX
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PARTS III, IV, and V									
CONDITION		CATEGORY							QUALIFIERS
PART	TITLE	A	B	C	D	E	F	G	
V.17.B.	Amendments to the Approved Closure Plan					*			
V.18.A.	**1324-N Percolation Pond** Compliance with Approved Closure Plan					*			
V.18.B.	Amendments to the Approved Closure Plan					*			
V.19.A.	**1324-NA Surface Impoundment** Compliance with Approved Closure Plan					*			
V.19.B.	Amendments to the Approved Closure Plan					*			
VI.	Unit Specific Conditions for Units Undergoing Post Closure/Modified Closure								
VI.1.A.	**300 Area Process Trenches** Compliance with Approved Closure Plan							*	
VI.1.B.	Amendments to the Approved Closure Plan							*	

CATEGORIES ARE DEFINED AS FOLLOWS:

A. Leased Land
B. North Slope and ALE
C. Interim Status TSD Units
D. Areas Between TSDs (excluding A and B)
E. TSD Unit Closures (in Part V)
F. TSD Operating Units (in Part III)
G. TSD Units in Post Closure/Modified Closure (in Part VI)

* Condition applies to this category, as modified by applicable footnotes and qualifiers.

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
616 Nonradioactive Dangerous Waste Storage Facility	Part III, Chapter 1 and Attachment 8 [Chapter 7.0 and Appendix 7A]

Description of Modification:

Remove Chapter 7.0, Revision 2 and Appendix 7A, Building Emergency Plan for the 616 NRDWSF, HNF-IP-0263-616, Revision 3, and replace with Chapter 7.0, Revision 2A and Appendix 7A, Building Emergency Plan for the 616 NRDWSF, HNF-IP-0263-616, Revision 4.

Justification:

Modifications to Chapter 7.0 and Appendix 7A reflect a new Hanford Site incident command structure and are the result of agreements reached between the DOE-RL, FDH, and Ecology.

Modification Class: [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: B.6.a.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
General Facility Standards, Contingency Plan: Changes in emergency procedures (i.e., spill or release response procedures).

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth D. Svoboda for 5/13/98	5/19/98	
C. G. Mattsson Date	H. E. Bilson 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:
616 Nonradioactive Dangerous Waste Storage Facility	**Part III, Chapter 1 and Attachment 8 [Appendix 8A]**

Description of Modification:

Remove Appendix 8A, Training Plan for the 616 NRDWSF, HNF-1276, Revision 0, and replace with Appendix 8A, Training Plan for the 616 NRDWSF, HNF-1276, Revision 1.

Justification:

The changes made to the Training Plan do not decrease the amount of training given to employees. The changes were made in an effort to maintain consistency with other training plans managed under the Solid Waste Project.
This modification is being submitted as a package with other Class 2 modifications to the 616 NRDWSF.

Modification Class: [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: B.5.a.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
General Facility Standards, Changes in the training plan: That affect the type or decrease the amount of training given to employees.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Niobida for 5/13/98	5/19/98	
C. G. Mattsson Date	H. E. Bilson 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.

CHANGES INCLUDED FOR THE HANFORD FACILITY DANGEROUS WASTE PERMIT APPLICATION,
616 Nonradioactive Dangerous Waste Storage Facility

ATTACHMENT 8

Chapter 7.0, Contingency Plan, Revision 2A

Chapter 14.0, Part B Certification, Revision 2A

Appendix 7A, Building Emergency Plan for 616 Nonradioactive Dangerous Waste Storage Facility, HNF-IP-0263-616, Revision 4

Appendix 8A, 616 Nonradioactive Dangerous Waste Storage Facility Dangerous Waste Training Plan, HNF-1276, Revision 1

Chapter 7.0

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APPENDIX

7A BUILDING EMERGENCY PLAN FOR 616 NRDWSF ..... APP 7A-i

TABLE

7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3) T7-1

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7.0 CONTINGENCY PLAN [G]

The WAC 173-303 requirements for a contingency plan are satisfied in the following documents: Portions of the Hanford *Emergency Response Plan* [Attachment 4 of the Hanford Facility RCRA Permit (DW Portion)] and portions of the *Building Emergency Plan for 616 NRDWSF* (Appendix 7A).

The unit-specific building emergency plan also serves to satisfy a broad range of other requirements [e.g., Occupational Safety and Health Administration standards (29 CFR 1910), TSCA (40 CFR 761) and U.S. Department of Energy Orders]. Therefore, revisions made to portions of this contingency plan document that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to WAC 173-303-830 or Hanford Facility RCRA Permit (DW Portion) Condition I.C.3. Table 7-1 identifies which portions of the Building Emergency Plan are written to meet contingency plan requirements.

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Table 7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3). (sheet 1 of 2)

Requirement	Attachment 4 of the HF RCRA Permit (DW Portion).	Building Emergency Plan
-350(3)(a) - A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360.	X[1] Section 1.3.2	X[1] Section 7.1 through 7.3
-350(3)(b) - A description of the actions which shall 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.	X[1] Section 1.3.2	X[1,2] Section 7.2
-350(3)(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).	X Table 3-1	
-350(3)(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.		X[3] Section 13.0
-350(3)(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.	X Hanford Fire Department: Appendix C	X Section 9.0

Table 7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3). (sheet 2 of 2)

Requirement	Attachment 4 of the HF RCRA Permit (DW Portion).	Building Emergency Plan
-350(3)(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.	X[4] Figure 5-2	X[5] Section 1.5

[1]The *Hanford Emergency Response Plan* contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional description of actions are required if emergency planning activities are addressed. If other credible scenarios exist or if emergency procedures at the unit are different, the language contained in the Building Emergency Plan will be used during an event by a Building Emergency Director.

[2]This requirement only applies to TSD units which receive shipment of dangerous or mixed waste defined as off-site shipments in accordance with WAC 173-303.

[3]Emergency Coordinator names and home telephone numbers are maintained separate from any 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.

[4]The Hanford Facility (sitewide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

[5]An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

Chapter 14.0

CONTENTS

14.0 PART B CERTIFICATION [K] 14-1

14.0 PART B CERTIFICATION [K]
Modification D

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

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date 5/22/98

Co-operator
H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford Company

Date May 14, 1998

Note: This certifies the following: Chapter 7.0 (Contingency Plan), Revision 2A; Appendix 7A (Building Emergency Plan for the 616 Nonradioactive Dangerous Waste Storage Facility, HNF-IP-0263-616), Revision 4; Appendix 8A (Training Plan for the 616 Nonradioactive Dangerous Waste Storage Facility, HNF-1276), Revision 1.

Appendix 7A

This plan covers the 616 Nonradioactive Dangerous Waste Storage Facility (616 NRDWSF).

Approved:

Building Emergency Director — Date 5/13/98

Manager, Solid Waste Project — Date 5/13/98

Hanford Fire Department — Date 5/13/98

Emergency Preparedness — Date 5-13-98

This plan will be reviewed annually and updated as required by the Building Emergency Director and modified pursuant to Washington Administrative Code (WAC) 173-303-830 and in accordance with the Hanford Facility RCRA Permit. This document will be approved by the manager of Emergency Preparedness (or delegate) and the Hanford Fire Department.

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1.0 GENERAL INFORMATION

The 616 Nonradioactive Dangerous Waste Storage Facility (616 NRDWSF) is located on the Hanford Site, a 560-square mile U.S. Department of Energy (DOE) operational site in southeastern Washington state. The 616 NRDWSF is located in the 600 Area between the 200 East and 200 West Areas. The Hanford Site Emergency Preparedness Program is based upon the incident command system, which allows a graded approach for response to emergency events. This plan contains a description of unit-specific emergency planning and response. It is used in conjunction with DOE/RL-94-02, *Hanford Emergency Response Plan*. Response to events is performed using 616 NRDWSF-specific and/or Site level emergency procedures. The 616 NRDWSF subordinate documents implement DOE/RL-94-02.

1.1 FACILITY NAME: U.S. Department of Energy Hanford Site
616 NRDWSF.

1.2 FACILITY LOCATION: Benton County, Washington; within the 600 Area.

The building covered by this plan is the 616 NRDWSF.

1.3 OWNER: U.S. Department of Energy
Richland Operations Office
825 Jadwin Avenue
Richland, Washington 99352

FACILITY MANAGER: Waste Management Federal Services of Hanford, Inc.
P.O. Box 700
Richland, Washington 99352-0700

1.4 DESCRIPTION OF THE FACILITY AND OPERATIONS

The 616 NRDWSF is a permanent structure constructed of precast concrete double-tee wall and roof panels. The 616 NRDWSF is located approximately 200 feet north of Route 3, across from the 609-A Fire Station, between the 200 East and 200 West Areas. The storage unit boundary is considered to be 300 feet from the exterior walls, except to the south, where Route 3 serves as the boundary. The storage building consists of the following areas:

- Office and change rooms
- Storage cells:
  - Caustic
  - Oxidizer
  - Combustible
  - Acid
  - Flammable 1-A
  - Flammable 1-B.
- Packaging and sampling room

- Packaging material and handling equipment area
- Receiving area
- Loading and unloading areas.

Each area is addressed in the following sections.

1.4.1 Office and Change Rooms

The office and change rooms serve as the operations center for the 616 NRDWSF. The 616 NRDWSF Operations supervisor (616 NRDWSF supervisor) occupies the office. The office and change rooms are serviced by an independent heat pump designed to provide positive air pressure to the chemical storage cells. This system reduces the potential of exposing personnel in the office and change rooms to airborne chemical contaminants from the stored waste.

1.4.2 Storage Cells

Six storage cells are provided for the interim storage of dangerous waste at the 616 NRDWSF. Waste is stored in cells which, in the event of a release or offnormal event, are designed and constructed to minimize damage to personnel, the environment, and the storage unit.

The storage cells have sealed concrete slabs sloped to a collection trench for the accumulation of released liquids. Each collection trench is covered by a removable carbon steel grate. Containment systems for free liquid or waste designated as F020-F027 are required to have sufficient capacity to contain 10 percent of the volume of the stored waste volume or the volume of the largest container, whichever is greater (WAC 173-303-630).

Containment systems at the 616 NRDWSF include cell trenches and floor areas up to the top of containment curbs. The collection trenches in the 616 NRDWSF are capable of holding between 90.5 and 248 gallons of liquid for each cell as the width of each cell varies. The individual cell containment systems are capable of holding between 626.86 and 900.64 gallons.

A curb surrounds each cell with a sloped ramp on one end for access. The curb height varies between 1.97 and 3.93 inches as the slope of the floor varies. The curb provides additional containment in the event of a major spill that would exceed the capacity of the trench. Collected or contained liquids can be removed by using hand pumps, absorbents, or vacuum trucks.

The floors of the storage cells are sealed with an epoxy coating. The walls of the storage cells are painted to a height of 7.87 feet. The storage areas are separated from the rest of the unit by a 2-hour fire-rated concrete masonry unit firewall. Access is provided by a 1 1/2-hour fire-rated personnel door and a 1 1/2-hour fire-rated rollup door. All of the rollup doors in the firewalls are equipped for automatic closure in the event of a fire. The fire protection system for the storage cells is a wet-pipe

sprinkler system designed to meet Extra Hazard, Group II requirements, as specified in the National Fire Protection Association's *National Fire Codes* (NFPA 1989). All of the storage cells have emergency exit doors with fire alarm pull boxes and surface-mounted industrial fluorescent light fixtures with a lighting level of 20 foot candles.

The heating, ventilation, and air conditioning system in the storage cells exhausts air at a minimum rate of 4 air changes an hour. To minimize the accumulation of vapors, exhaust duct openings are located near the floor and 7.87 feet above the floor. This system meets the requirements of the *Uniform Building Code* (ICBO 1990) for hazardous occupancies. The heating, ventilation, and air conditioning unit for the storage areas is located approximately 40 feet from the heat pump used for the office and change rooms. The exhaust opening faces away from the heat pump to preclude the intake of exhaust vapors into the office and change rooms.

Activities that take place in the dangerous waste storage cells during normal operation are defined as follows.

- The containerized waste designated for storage in a particular cell is received and shipped in packagings of various sizes that are moved by hand, handtruck, or forklift.

- Waste containers are inspected for proper labeling, integrity, etc.

1.4.2.1 Caustic and Oxidizer Storage Cells. The caustic and oxidizer cells are separated from the other cells by a 2-hour fire-rated concrete masonry unit firewall with 1 1/2-hour fire-rated personnel doors and rollup doors.

1.4.2.2 Combustible and Acid Storage Cells. The combustible and acid cells are located in the middle of the storage area. The combustible and acid cells provide the same features as those provided in the caustic and oxidizer storage cells. In addition, a safety shower and an eye wash station are located in the combustible cell.

1.4.2.3 Flammable Liquid Storage Cells. Because of its hazardous and sometimes explosive characteristic, Class 1-A and Class 1-B flammable liquid waste must be stored in specific cells. The 1-A cell can store 1-B liquid waste, but the 1-B cell cannot store the 1-A liquid waste. The 1-A and 1-B cells are separated from the other storage cells by a 4-hour fire-rated concrete masonry unit firewall, two back-to-back 1 1/2-hour fire-rated rollup doors, and a 3-hour fire-rated personnel door.

Water reactive waste packaged in U.S. Department of Transportation-specified containers is stored inside portable weatherproof flammable liquid storage cabinets located in the 1-A and 1-B cells.

Unlike the other storage cells, the 1-A flammable storage cell is enclosed totally and provides a number of additional features because of the unique nature of the stored waste. These features include the following:

- Double blast-resistant entry doors
- A controlled-relief exterior wall system on one side for explosion venting
- Explosion-relief vents on the roof
- Lighting and electrical fixtures as specified in National Fire Protection Association codes (NFPA 1989) for Class I-Division I hazardous atmospheres
- An area for transferring flammable liquid waste equipped with explosion-proof electrical pumps with receptacles and grounding cables.

If contents from leaking containers of 1-A and 1-B flammable liquid waste must be transferred, the 1-A flammable storage cell meets the explosion venting requirements of the National Fire Protection Association, Table 5-7.3 (NFPA 1989).

1.4.3 Packaging and Sampling Room

The packaging and sampling room is constructed of 2-hour fire-rated concrete masonry unit interior walls and a precast double-tee exterior wall. Entry is provided by two 1 1/2-hour fire-rated doors. The floor is sealed concrete and the ceiling of precast-concrete double-tee construction is full building height. The floor is sloped to a 198.8-gallon sump for the collection of released liquid. Collected liquid can be removed with absorbents or hand pumps. A 2- to 4-inch curb surrounds the room at the base of each wall for additional containment.

A countertop is provided in the packaging and sampling room with the following items:

- Two drainless stainless-steel basins
- Hot and cold running water (both basins)
- Independent hot water heater.

The basins, provided for dangerous waste use, allow waste to be retrieved for appropriate packaging and disposal. A safety shower and an eyewash station also are provided.

Although the primary purpose of the packaging and sampling room is for waste repackaging and sampling, the room can be used as an overflow storage area for compatible waste (excluding flammable 1-A and 1-B liquid waste), empty waste containers, and nonradioactive waste samples. The packaging and sampling room also is used to store waste sampling equipment, laboratory equipment, monitoring equipment, and various other equipment required for Hanford Facility waste management activities.

1.4.4 Packaging Material and Handling Equipment Area

The packaging material and handling equipment area, in the northeast end of the storage building, is used to store waste packaging materials and waste handling equipment. Its proximity to areas where dangerous waste is handled requires the following additional features:

- Sealed concrete floor that slopes to a 198.74-gallon sump for the collection of liquid from spills or leaks
- Same fire protection system as previously described for the storage cells
- Emergency exit door.

Equipment and material stored in the packaging material and handling equipment area are as follows:

- Tools, drum dollies, forklift, and other waste handling equipment
- Absorbents and other miscellaneous spill control equipment.

1.4.5 Receiving Area

The receiving area, in the east end of the 616 NRDWSF, is a corridor used when transferring waste from the east loading area to the storage cells. Waste containers that are leaking or of questionable integrity sometimes are overpacked in this area. Compatible waste with incomplete paperwork also is staged in this area while discrepancies are resolved. Because of the types of activities that are performed in the receiving area, the area has the following additional features:

- Sealed concrete floor that slopes to a 248-gallon trench for the collection of liquid from spills or leaks
- Same fire protection system as previously described for the storage cells
- One and a half-hour fire-rated rollup doors at each end of the corridor.

1.4.6 Loading and Unloading Areas

The 616 NRDWSF has two loading and unloading areas. The primary loading and unloading area, located at the east end of the 616 NRDWSF, is provided for incoming and outgoing dangerous waste transfers. It is a 20- by 30-foot sealed concrete slab with a 13- by 20-foot approach ramp. The slab is sloped to a trench for liquid collection. The trench has a drain (with a locking removable plug) that connects to a french drain for the release of accumulated water (e.g., rainwater, snowmelt). The slab and ramp are surrounded by a curb with the exception of the ramp entry, which is at the high point of the slope.

The curb provides containment and channels liquid to the collection trench in this area. A fork truck lift and associated safety equipment (guards, handrails, etc.) are mounted on the containment pad.

The secondary loading and unloading area (a 25.6- by 20-foot slab with a 13- by 20-foot approach ramp) is located outside the combustible cell on the north side of the 616 NRDWSF. The secondary loading and unloading area is of identical construction to the primary loading and unloading area except that it does not have a fork truck lift. This secondary loading and unloading area is a redundant system and is not used under normal operating conditions.

The containment trenches are kept free of excess water when the 616 NRDWSF is in operation. In the event that a dangerous waste spill occurs on either of the loading areas, the released material will be recaptured to the greatest extent possible using pumps, absorbents, or alternate methods.

1.5 EVACUATION ROUTING

Figure 1 provides identification of the primary staging area and a general overview of the 616 NRDWSF.

1.5.1 Building Evacuation Routes

Figure 1 provides identification of emergency evacuation routes from the 616 NRDWSF.

1.5.2 Building Evacuation Routes (Building to Staging Area)

The primary staging area for the 616 NRDWSF is located 200 feet east of the main entrance. If it becomes necessary to evacuate the primary staging area, the staging area manager or the Building Emergency Director (BED) shall direct personnel to an alternate staging area or destination. Evacuation alarms are described in Section 7.1; responses to alarms are described in Section 7.2.

2.0 PURPOSE

This building emergency plan describes both the hazards and the basic responses to offnormal and/or emergency conditions at the 616 NRDWSF. "Emergency" as used in this document includes events meeting the WAC 173-303 definition of Emergency, as well as U.S. Department of Energy (DOE) Order 232.1 categories of Unusual Occurrence and Emergency. These events include spills or releases as a result of waste management, fires and explosions, transportation activities, movement of materials, packaging, and natural and security contingencies. When used in conjunction with DOE/RL-94-02, *Hanford Emergency Response Plan*, this plan meets the requirements for contingency planning as required by WAC 173-303.

3.0 BUILDING EMERGENCY ORGANIZATION

The 616 NRDWSF maintains a weekly on-call list for technical expert notification. Upon notification, the on-call person will notify the primary or alternate BED to respond to the scene in person as necessary. The on-call technical expert will maintain contact with the on-scene Incident Commander until arrival of 616 NRDWSF personnel.

Building emergency organizations are discussed in the following sections.

3.1 BUILDING EMERGENCY DIRECTOR (BED)

Emergency response will be directed by the BED until the Incident Commander arrives. The incident command structure and staff with supporting on-call personnel fulfill the responsibilities of the Emergency Coordinator as discussed in WAC 173-303-360.

During events, 616 NRDWSF personnel perform response duties under the direction of the BED. The Incident Command Post (ICP) is managed by either the senior Hanford Fire Department member present on the scene or senior Hanford Patrol member present on the scene (security events only). These individuals are designated as the Incident Commander (IC) and as such have the authority to request and obtain any resources necessary for protecting people and the environment. The BED becomes a member of the ICP and functions under the direction of the IC. In this role the BED continues to manage and direct 616 NRDWSF operations.

A listing of the primary and alternate BEDs by title, work location and work telephone numbers is contained in a separate, internally controlled document. The BED is on the premises or is available through an "on-call" list 24 hours a day. Emergency Preparedness maintains a listing of BED names, work and home telephone numbers at the Patrol Operations Center (POC) in accordance with *Hanford Facility RCRA Permit*, Dangerous Waste Portion, General Condition II.A.4.

3.2 OTHER MEMBERS

As a minimum, the BED appoints and ensures training is provided to individuals to perform as Personnel Accountability Aides and Staging Area Managers. The accountability aides facilitate the implementation of protective actions (evacuation or take cover) and facilitate the accountability of personnel after protective actions have been implemented. Staging area managers coordinate and/or conduct activities at the staging area. In addition, the BED might identify additional support personnel [maintenance, engineering, hazardous material coordinators, etc.] to be part of the building emergency organization.

The complete building emergency organization listing of positions, names, work locations and telephone numbers for 616 NRDWSF is maintained in a separate location in a format determined appropriate by 616 NRDWSF management.

4.0 IMPLEMENTATION OF THE PLAN

To meet the requirements of WAC 173-303-360, this plan will be considered to be implemented when the BED has determined that a release, a fire, or an explosion that could threaten human health or the environment (WAC 173-303-360 Emergency) has occurred at the 616 NRDWSF. The incident classification process is described in DOE/RL-94-02, Section 4.2.

Under the DOE guidance, this plan will be considered implemented whenever the BED determines that one of the incidents listed in Section 6.0 has or will occur and that the severity is or will be such that there is a potential to threaten human health or the environment. The BED will implement this plan through DOE/RL-94-02, *Hanford Emergency Response Plan*, and 616 NRDWSF and/or site-specific procedures (see Attachment A). DOE declared emergencies are assigned to three classifications, which are listed in order of increasing severity: alert emergency, site area emergency, and general emergency. The 616 NRDWSF implements these DOE emergencies through identified criteria in DOE-0223, RLEP 1.1, Appendix 1-2.D; this plan; and other documents listed in Attachment A.

The BED must assess each incident to determine the response necessary to protect the personnel, the 616 NRDWSF, and the environment. If assistance from Hanford Patrol, Fire, or ambulance units is required, the Hanford Emergency Response Number 911 (373-3800 from cellular telephones) must be used to contact the Patrol Operations Center and request the desired assistance. To request other resources or assistance from outside the 616 NRDWSF, the Patrol Operations Center business number is used (373-3800). The Emergency Duty Officer (EDO) is requested when making the initial 911 call.

5.0 FACILITY HAZARDS

Hazards at the 616 NRDWSF potentially include industrial hazards, hazardous materials, dangerous waste, and physical hazards.

5.1 INDUSTRIAL HAZARDS

Industrial hazards could include transportation incidents, accidents with moving equipment, exposure to spilled waste or chemicals, or from chemical exposure from spills. Potential material handling mishaps are associated with forklift operations. These include potential rupture of packages due to misalignment of the forklift tines.

5.2 HAZARDOUS MATERIALS

Hazardous materials might include (but might not be limited to) the following: spray adhesive, sorbent, diesel fuel, hydraulic oil, propane, road salt, industrial cleaner and degreaser, and unleaded gasoline. The use, storage, and inventory of hazardous materials is controlled. Material safety data sheets (MSDS) are maintained at 616 NRDWSF in the main hallway, near the entrance to the receiving area.

5.3 RADIOACTIVE AND/OR MIXED WASTE

Radioactive and/or mixed waste **ARE NOT** used and/or stored in the 616 NRDWSF.

5.4 CRITICALITY

N/A.

6.0 POTENTIAL EMERGENCY CONDITIONS

The credible types of and extent of emergencies caused are described in this section, unless identified as Not Applicable (N/A). The response action for each type of emergency is listed in Section 7.0.

Potential emergency conditions could fall into one of three basic categories: operations (process upsets, fires and explosions, loss of utilities, spills, and releases), natural phenomena (earthquakes), and security contingencies (bomb threat, hostage situation, etc.).

NOTE: Use Job Safety Analyses and/or MSDS as the basis for safe use of dangerous materials at the 616 NRDWSF.

6.1 FACILITY OPERATIONS EMERGENCIES

The following sections include a description of the 'worst-case' accident anticipated for each of the identified credible emergencies. This information typically is derived from the safety analysis report, hazards evaluation, or risk assessment for the unit.

6.1.1 Loss of Utilities

- Loss of Electricity. Hazards associated with a loss of electricity include potential exposure to toxic chemical vapors/particulates due to shutdown of the ventilation system. Loss of electrical supply will result in loss of operation of the following:

  - Building air supply fans
  - Building exhaust fans

- Loss of Water. Loss of fire sprinkler systems in the 616 NRDWSF negatively impacts firefighting capabilities

- Loss of Ventilation. Loss of ventilation could result in exposure to toxic chemical vapors/particulates in the event of a hazardous material spill/release.

- Loss of Steam - N/A.

- Loss of Air - N/A.

6.1.2 Major Process Disruption/Loss of Plant Control

N/A.

6.1.3 Pressure Release

Potential pressure hazards at the 616 NRDWSF could involve pressure buildup in stored containers.

6.1.4 Fire and/or Explosion

Potential fire hazards include smoke inhalation, burns, damage to equipment and/or structures, and release of hazardous materials and/or dangerous waste constituents from containers.

A fire or an explosion in the 616 NRDWSF might result in a dangerous waste release.

The combustion potential for chemicals such as peroxides or pyrophorics within containers is controlled by the management of waste packaging in accordance with approved procedures. The WAC 173-303 regulations prohibit the storage of chemically incompatible materials in common containers. Additionally, WAC 173-303 prohibits mixing containers of incompatible waste within common storage areas.

- Fires and/or Explosions Involving Hazardous Material. A fire and/or explosion in 616 NRDWSF could result in the release of hazardous and/or dangerous constituents to the air or soils.

- Toxic Fumes Hazards. Volatilization of solids during a fire might generate toxic fumes and airborne particles contaminated with hazardous and/or dangerous constituents.

- Reactive Chemical/Corrosive Material Hazards. Corrosive and reactive waste stored at 616 NRDWSF could cause chemical burns.

- Thermal Reactions/Hazards. Incompatible waste, if mixed, could cause a thermal reaction.

- Flammable Material/Liquids Hazards. Flammable liquids, if ignited, could result in the release of dangerous constituents to the air or soil.

- Asbestos Release. The 616 NRDWSF structure does not contain asbestos, but dangerous waste containing asbestos could be stored inside the drums stored within the structure. Release of friable asbestos waste could result in an inhalation hazard.

- Explosive Materials/Munitions Hazards - N/A.

6.1.5 Hazardous Material Spill

Hazardous materials are stored in the 616 NRDWSF. Spills or releases of hazardous materials could result in the following conditions:

- Spill of Hazardous Material. Hazards associated with a spill include potential exposure to dangerous constituents as well as potential environmental damage. Releases likely would be confined within the 616 NRDWSF.

- Toxic Fumes Hazards. Hazardous materials stored at the 616 NRDWSF is a potential airborne contamination hazard. Volatile materials such as concentrated caustics and solvents might generate toxic fumes.

- Fires or Explosions Involving Hazardous Material. A fire or chemical reaction in the 616 NRDWSF could result in the release of dangerous constituents to the air or soil.

- Reactive Chemical/Corrosive Material Hazards. Misrepresented shipments and/or transfers of incompatible hazardous materials stored at the 616 NRDWSF could potentially cause chemical reactions resulting in fire, explosion, and dangerous waste releases. Acidic and basic solutions are corrosive and could cause chemical burns.

- Thermal Reactions/Hazards. Thermal reactions could cause burns, chemical burns, and toxic fumes, and cause pressure hazards in sealed containers.

- Flammable Material/Liquids Hazards. Hazards associated with flammable materials and liquids include fire, explosion, and release of dangerous waste.

- Asbestos Release. The 616 NRDWSF structure does not contain asbestos, but dangerous waste containing asbestos could be stored inside containers stored within the structure. Release of friable asbestos waste could result in an inhalation hazard.

- Explosive Materials/Munitions Hazards - N/A.

6.1.6 Dangerous Waste Spill

A dangerous waste spill could result in potential personnel contamination through skin contact or inhalation. Environmental impact could include contaminated soil or air. Dangerous waste is stored in drums, boxes, etc. in the 616 NRDWSF. Information on the contents of containers stored in the 616 NRDWSF is available on the Solid Waste Information Tracking System (SWITS). Spills or releases could result in the following conditions:

- Spill of Dangerous Waste. Hazards associated with a spill include potential exposure to dangerous waste as well as potential environmental damage. Releases likely would be confined within the 616 NRDWSF.

- Toxic Fumes Hazards. Dangerous waste stored at the 616 NRDWSF is a potential airborne contamination hazard. Volatile materials such as concentrated caustics and solvents might generate toxic fumes.

- Fires or Explosions Involving Dangerous Waste. A fire or chemical reaction in the 616 NRDWSF could result in the release of dangerous waste to the air or soil.

- Reactive Chemical/Corrosive Dangerous Waste. Misrepresented shipments and/or transfers of incompatible dangerous waste managed at the 616 NRDWSF could potentially cause chemical reactions resulting in fire, explosion, and dangerous waste releases. Acidic and basic solutions are corrosive and could cause chemical burns.

- Thermal Reactions/Hazards. Thermal reactions could cause burns, chemical burns, and toxic fumes, and cause pressure hazards in sealed containers.

- Flammable Material/Liquids Hazards. Hazards associated with flammable materials and liquids include fire, explosion, and release of dangerous waste.

- Asbestos Release. The 616 NRDWSF structure does not contain asbestos, but dangerous waste containing asbestos could be stored inside containers stored within the structure. Release of friable asbestos waste could result in an inhalation hazard.

- Explosive Materials/Munitions Hazards - N/A.

6.1.7 Transportation and/or Packaging Incidents

Potential consequences of transportation and/or packaging incidents are spills or spread of chemical contamination or personnel contamination. A forklift-damaged container could result in fire or explosion. When container integrity is questionable, initial steps might be taken to prevent a release, such as overpacking.

6.1.8 Radiological Material Release N/A.

6.1.9 Criticality N/A.

6.1.10 Dangerous Waste Not Acceptable

Acceptable reasons for denying receipt of and returning to the generator a dangerous waste transfer/shipment are as follows.

- The 616 NRDWSF is not capable of managing the dangerous waste type.
- A significant discrepancy exists between the transfer/shipment and the waste listed on the manifest or tracking form.
- The waste arrives in a condition that presents an unreasonable hazard to operations or personnel.

6.2 NATURAL PHENOMENA

Natural phenomena are discussed in the following sections.

6.2.1 Seismic Event

Depending on the magnitude of the event, severe structural damage could occur resulting in serious injuries or fatalities and the release of dangerous waste. Damaged electrical circuits and wiring could result in the initiation of multiple fires.

6.2.2 Volcanic Eruption/Ashfall

Ashfall could cause shorts in electrical equipment and plug ventilation system filters.

6.2.3 High Winds/Tornados

High winds or tornados might cause structural damage to systems containing dangerous waste resulting in a release to the environment. In addition, electrical power outages also could result from high winds or tornados.

6.2.4 Flood

N/A.

6.2.5 Range Fire

The hazards associated with the range fire include those associated with a building fire plus potential site access restrictions and travel hazards such as poor visibility.

6.2.6 Aircraft Crash

An aircraft crash could result in the direct release of dangerous waste or cause a fire that could lead to the release of dangerous waste.

6.3 SECURITY CONTINGENCIES

Security contingencies are discussed in the following sections.

6.3.1 Bomb Threat

A bomb threat might be received by anyone who answers the telephone or receives mail. The major effect on the 616 NRDWSF will be evacuation of personnel. If a bomb explodes, the effects are the same as those discussed under fire and explosion.

6.3.2 Hostage Situation

A hostage situation could pose an emergency situation if there is the potential to adversely impact the 616 NRDWSF. This can be as a result of losing 616 NRDWSF control (operators removed from their stations) or when the situation results in the coercion of an employee to take some malevolent action.

6.3.3 Suspicious Object

The major effect on the 616 NRDWSF is that personnel would need to perform an emergency shutdown and evacuate the building.

7.0 INCIDENT RESPONSE

The initial response to any emergency is to immediately protect the health and safety of persons in the affected area. Identification of released material is essential to determine appropriate protective actions. Containment, treatment, and disposal assessment will be the secondary responses.

The following sections describe the process for implementing basic protective actions as well as descriptions of response actions for the events listed in Section 6.0. DOE/RL-94-02, Section 1.3, provides concept of operations for emergency response on the Hanford Site.

7.1 PROTECTIVE ACTIONS RESPONSES

Protective actions responses are discussed in the following sections.

7.1.1 Evacuation

If an evacuation is ordered or the evacuation siren sounds in the area of the 616 NRDWSF, personnel shall proceed, as follows:

616 NRDWSF STAGING AREAS	AREA	LOCATION
PRIMARY STAGING AREA	616 Building	200 feet east of main entrance
SECONDARY STAGING AREA	616 Building	Announced by the Building Emergency Director

The BED or staging area manager directs the evacuation; however, to ensure that evacuations could be conducted promptly and safely, all personnel must be familiar with the correct evacuation procedure. During an evacuation, all personnel shall report to the nearest staging area (upwind) for a head count.

If it becomes necessary to evacuate the primary staging areas, the staging area manager or the BED will instruct personnel to proceed to the alternate staging area or an alternate destination, depending on the nature of the emergency.

If an area evacuation is called for, all personnel must be familiar with the evacuation procedure outlined on the following page. The order to evacuate normally will be passed via the Crash Alarm Telephone system in the 616 NRDWSF Office.

Area evacuations are either rapid or controlled, as pointed out in the following steps. When possible, the following steps should be conducted concurrently.

AREA EVACUATION PROCEDURE
Halt any operations or work and place the building in a safe condition. Use emergency shutdown procedures for rapid evacuation.
Use whatever means are available (PA system, bullhorns, runners, etc.) to pass the evacuation information to personnel.
Evacuate personnel to the staging area; group personnel as follows: potentially contaminated protective clothing, keys immediately available for vehicles, those needing rides.
Conduct personnel accountability. Report personnel accountability results to the RL-Emergency Operations Center (373-3876, 373-1786, 376-8612, 376-4712).
Inform IC of any potentially affected personnel (i.e., injured, contaminated, exposed, etc.) once the IC arrives at the ICP.
Relay pertinent evacuation information (routes, destination etc.) to drivers.

Dispatch vehicles as soon as the vehicles are loaded.
Report status to the RL-Emergency Operations Center, request additional transportation, if required, and report if any people remain who are performing late shutdown duties.

7.1.2 Take Cover

When the Take Cover Alarm is activated, personnel must take cover in the nearest building. Normally, the 616 NRDWSF will be alerted via the Area Crash Alarm Telephone System in the 616 NRDWSF Office or by the area emergency sirens. The following actions must be taken or considered:

- Shut doors and windows and wait for further instructions
- Secure ventilation system
- Follow normal exit procedures from radiological areas
- Lock up classified documents and prepare for a possible evacuation
- Report your location to the Accountability Aid or the BED
- Accountability Aides will provide accountability status to the Staging Area Manager for 616 NRDWSF personnel during an event.

7.2 RESPONSE TO FACILITY OPERATIONS EMERGENCIES

The BED reviews site-wide procedures, the 616 NRDWSF-specific emergency response guide, specific sections of this plan, and/or plant operating procedures (POPs) and classifies the event and initiates area protective actions (facility and area sirens, notifications, etc.) and site emergency response organization activation. Attachment A provides a list of procedures and emergency response guides.

7.2.1 Loss of Utilities

- Loss of Electricity. Loss of electricity will result in loss of operation of the building ventilation system.
  - Evacuate all personnel.
  - Maintain surveillance of the 616 NRDWSF to prevent unauthorized entry.
  - Notify the building manager.
  - If instructed by management, close all cell doors inside the building, and open all exterior doors.

- Notify the Patrol Operations Center on 373-3800 if assistance is required.

- Ensure that the solid waste support team leader for Work Control and Maintenance has been contacted.

- Do not reenter the building until the electrical/ventilation systems have been reestablished.

- Before reentry, contact Industrial Hygiene to perform air quality monitoring (e.g., proper oxygen levels, no flammable atmospheres present, organic vapors are not present at toxic levels, etc.,).

- Loss of Water. Loss of water to a fire protection system is classified as an emergency condition. Personnel notify the Hanford Fire Department, and establish a fire watch.

- Loss of Ventilation. Follow the instructions for Loss of Electricity.

- Loss of Steam. N/A

- Loss of Air. N/A

7.2.1.1 Utility Disconnect Plan For 616 NRDWSF

Use these steps to place the utilities in a safe and secure condition when an emergency has been declared or when directed by the BED.

- Heating, Ventilation, and Air Conditioning

  a. Inspect all waste storage cells. If any containers are leaking or ruptured, notify management.

  b. After inspecting containers, close all cell doors inside the 616 NRDWSF.

  c. Open all exterior doors.

  d. Evacuate storage areas.

  e. If ventilation loss will be longer than 1 hour, evacuate the building (unless shutdown is part of the take cover alarm response for the 616 NRDWSF).

  f. Maintain surveillance of the building to prevent unauthorized entry.

  g. Proceed to roof or main panel marked "Heat Pump" near men's room.

  h. Locate ON/OFF switch.

i. Place switch in OFF position.

j. Do not reenter the building until the ventilation system has been reestablished and operating for at least 30 minutes.

2. Electrical

NOTE: This building should be shut down only in an extreme emergency.

a. Follow item 1, above, instructions for shutdown of the ventilation system.

b. Proceed to outside the northeast corner wall or to the hallway near the men's room.

c. Locate the main electrical distribution panel.

d. Locate the ON/OFF switch labeled "2 of 2."

e. Place switch in the OFF position.

f. Do not reenter the building until power and ventilation has been restored for at least 30 minutes.

3. Fire Sprinkler System

NOTE: This building should be shut down only in an extreme emergency and preferably by the Hanford Fire Department.

a. Proceed to the outside of the south wall of the 616 NRDWSF
b. Locate the red valve (inside of four red posts)
c. Break the seal with the attached wrench
d. Turn the valve to the SHUT position.

4. Sanitary Water/Sewer

a. Proceed to women's change room
b. Locate the main valve on the south wall
c. Turn valve until closed.

7.2.2 Major Process Disruption/Loss of Plant Control

N/A.

7.2.3 Pressure Release

On discovery of an existing or potential pressure hazard at 616 NRDWSF, ensure the following response:

- Notify personnel to leave the area of the hazard

- Inform the BED
- Evacuate affected areas
- Perform sampling or testing in accordance with recommendations from engineering/safety, and (if indicated) repackage any containers with pressure buildup.

7.2.4 Fire and/or Explosion

Fire fighting in the 616 NRDWSF is complicated by the presence of dangerous waste. It is extremely important to avoid breaching container, building, or any other containment where there is dangerous waste.

In the event of a fire, the discoverer activates a fire alarm, calls 911 (373-3800 if using a cellular phone), and evacuates. Automatic initiation of a fire alarm (through the smoke detectors and sprinkler systems) also is possible.

- On actuation of the fire alarm, personnel shut down equipment and secure waste ONLY if time permits. The alarm automatically signals the Hanford Fire Department.
- Personnel leave the area/building by the nearest safe exit and proceed to the designated staging area for accountability.
- The BED proceeds directly to MO-720 conference room and sets up the ICP. The BED will obtain all necessary information pertaining to the incident and will meet with, or send a representative to meet with, the Hanford Fire Department.

NOTE: The ICP for all Solid Waste units is located in the MO-720 conference room; the command post may be moved to another location at the discretion of the BED.

- The BED reviews site-wide procedures, the 616 NRDWSF-specific emergency response guide, specific sections of this plan, and/or POPs and classifies the event and initiates area protective actions (facility and area sirens, notifications, etc.) and site emergency response organization activation. Attachment A provides a list of procedures and emergency response guides.
- The BED informs the site organization as to the extent of the emergency (including estimates of dangerous waste quantities released to the environment).
- The BED informs the IC of any potentially affected personnel (i.e., injured, contaminated, exposed, etc.) when the IC arrives at the ICP.

- If operations are stopped in response to a fire, the BED ensures that waste containers are monitored for leaks, pressure buildup, gas generation, and ruptures.

- Hanford Fire Department firefighters extinguish the fire.

- The BED ensures that all emergency equipment is cleaned and fit for its intended use following completion of cleanup procedures.

7.2.5 Hazardous Material and Dangerous Waste Spill

Spills can result from containers, damaged packages, or personnel error. The discoverer performs the following actions for a spill and/or release:

- Notifies the 616 NRDWSF personnel (including BED) of discovery of spill or release

- Initiates notifications to the Hanford Fire Department (HazMat Team) by calling 911 (373-3800 if using a cellular phone), and provides all known information, or verifies that the BED has called 911 or determined that emergency response assistance is not required.

- Ensures that any personnel that have been exposed to a spilled chemical and/or have suffered an injury receive proper first aid, immediate medical attention, and that the PHMC health advocate is contacted by the EDO. In case of contact with a chemical, immediately flush eyes or skin with water for at least 15 minutes and promptly remove contaminated clothing and shoes. **Immediately** contact supervision and the Patrol Operations Center at 911 (373-3800 if using cellular phone) to report any injuries or exposure and obtain Hanford Fire Department medical response.

- Takes action to contain and/or to stop the spill or container leak if all of the following are true:

  - The identity of the substance(s) involved is known.

  - Appropriate protective equipment and control/cleanup supplies, e.g., absorbents, are readily available.

  - Discoverer safely can perform the action(s) without assistance, or assistance readily is available from other trained personnel.

If any of the previous conditions are not met or if there is any doubt, evacuate the area and remain outside, upwind of the spill. The discoverer will remain available for consultation with the BED, Hanford Fire Department, or other emergency response personnel and will restricts access to the area until the arrival of the BED.

The BED performs or arranges for the following:

- Establishes a command post at a safe location, and coordinates further spill mitigation activities
- Obtains all available information pertaining to the incident and determines if the incident requires implementation of the contingency plan
- Reviews site-wide procedures, the 616 NRDWSF-specific emergency response guide, specific sections of this plan, and/or POPs and classifies the event and initiates area protective actions (facility and area sirens, notifications, etc.) and site emergency response organization activation
- Informs the IC of any potentially affected personnel (i.e., injured, contaminated, exposed, etc.) when the IC arrives at the ICP
- Arranges for care of any injured persons
- Maintains access control at the incident site by keeping unauthorized personnel and vehicles away from the area. Security personnel can be used to assist in site control if control of the boundary is difficult (e.g., repeated incursions). In determining controlled access areas, considers environmental factors such as wind velocity and direction
- Arranges for proper remediation of the incident after evaluation
- Remains available for fire, patrol, and other authorities on the scene, and provides all required information
- Enlists the assistance of alternate BED(s), if response activities are projected to be long term
- Ensures the use of proper protective equipment, remedial techniques, transfer procedures [including ignition source control (e.g., nonsparking tools, grounding containers, isolation of ignition sources, use of explosion-proof electrical equipment, etc.) for flammable or reactive spills], and decontamination procedures by all involved personnel, if remediation is performed by 616 NRDWSF personnel
- Remains at the ICP to oversee activities and to provide information, if remediation is performed by the Hanford Fire Department Hazardous Materials Response Team or other response teams
- Ensures proper containerization, packaging, and labeling of recovered spill materials and overpacked containers

NOTE: All containers of spill debris, recovered product, etc., are managed in the same manner as waste containers. Overpacks in use are marked with information pertaining to their contents and noted as to the condition of the inner container.

- If operations are stopped in response to the release, ensures that systems are monitored for leaks, pressure buildup, gas generation, and ruptures

- Ensures decontamination (or restocking) and restoration of emergency equipment used in the spill remediation before resuming operations

- Provides required reports after the incident, in accordance with DOE/RL-94-02, *Hanford Emergency Response Plan*.

7.2.5.1 Receipt of Damaged or Unacceptable Shipments

In accordance with WAC 173-303-370, when a damaged shipment or transfer of dangerous waste arrives at the 616 NRDWSF and the shipment/transfer is unacceptable for receipt, the damaged shipment/transfer should not be moved.

If a damaged shipment or transfer results in a spill, the following actions are performed:

- Notify the BED, the Hanford Fire Department, and the appropriate personnel to advise of the situation. The BED responds and assists in the evaluation of, and response to, the incident. The BED informs the IC of conditions upon arrival.

- Notify the offsite generator or onsite generating unit of the damaged shipment/transfer, and request any information necessary to assist in responding to the spill.

- Proceed with remedial action, including overpacking damaged containers, cleanup of spilled material, or other necessary actions to contain the spill. Refer to Section 7.2.5 for remedial actions.

7.2.5.2 Transportation Incidents

In accordance with WAC 173-303-145, the discoverer or BED could take the following actions for leaks or spills resulting from a hazardous materials transportation incident if the actions can be performed without jeopardizing personnel safety, as appropriate:

- Determines the nature of incident
  - Personnel injuries
  - Hazardous material spill with fire
  - Hazardous material spill without fire

- Assists injured personnel

- Initiates notifications to the appropriate personnel by any means available (telephone, radio, passing motorist, etc.) to request assistance from the Hanford Fire Department (Emergency Coordinator/Incident Commander for these type of events), Hanford Patrol, and medical personnel.

- Remains in a safe location and attempts to isolate the area to prevent inadvertent personnel access.

- The BED informs the IC of any potentially affected personnel (i.e., injured, contaminated, exposed, etc.) when the IC arrives at the ICP.

7.2.6 Radiological Material Release N/A.

7.2.7 Criticality N/A.

7.2.8 Dangerous Waste Not Acceptable (and cannot be transported)

- Solid waste operations isolates the area of unacceptable waste.

- Discoverer notifies the BED. The BED responds, evaluates, and notifies appropriate personnel.

- The solid waste group assembles an investigation team.

- The investigation team determines the circumstances and the actions to be taken.

- The solid waste group proceeds with the actions determined by the investigation team.

- The solid waste group submits a written report to Ecology within 15 days of the incident.

7.3 PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS, OR RELEASES

The BED, as part of the incident command structure, takes the steps necessary to ensure that a secondary release, a fire, or an explosion does not occur. The following actions are taken:

- Isolates the area of the initial incident by shutting off power to minimize the spread of a release and/or the potential for a fire or explosion

- Inspects containment for leaks, cracks, or other damage

- Inspects for toxic vapor generation

- Removes released material and waste as soon as possible

- Contains and isolates residual waste material using dikes and absorbents
- Installs new structures, systems, or equipment to enable better management of hazardous materials or dangerous waste
- Reactivates operations in affected areas only after cleanup of residual waste materials is achieved.

7.4 RESPONSE TO NATURAL PHENOMENA

Depending on the severity of the event, the BED reviews site-wide procedures, the 616 NRDWSF-specific emergency response guide, specific sections of this plan, and/or POPs and classifies the event and initiates area protective actions (facility and area sirens, notifications, etc.) and site emergency response organization activation. Attachment A provides a list of procedures and emergency response guides.

Response to natural phenomena are discussed in the following sections.

7.4.1 Seismic Event

The primary role of the emergency response organization in a seismic event is coordinating the initial response to injuries, fires, and fire hazards; and acting to contain or control hazardous materials and dangerous waste releases.

Individuals must remain calm and stay away from windows, nearby steam lines, and any nearby hazardous material and dangerous waste locations. Once the shaking has subsided, individuals must evacuate carefully and assist those needing help. The location of any trapped individuals is reported to the BED or to 911 (373-3800 if using a cellular phone).

The BED takes whatever actions are necessary to minimize damage and personnel injuries. These actions include:

- Coordinating searches for personnel and potential hazardous conditions (fires, spills, etc.)
- Conducting accountability
- Securing utilities and 616 NRDWSF operations
- Arranging rescue efforts, and notifying 911 for assistance
- Assembling damage assessment teams
- Determining if hazardous materials and/or dangerous waste were released
- Determining current local meteorological conditions

- Warning other groups and implementing protective actions if the release poses a danger
- Providing personnel and resource assistance to other operations if required and possible

7.4.2 Volcanic Eruption/Ashfall

When notified of an impending ashfall, the BED will implement measures to minimize the impact of the ashfall, such as:

- Installing filter media over ventilation intakes
- Shutting down some or all operations and processes
- Sealing secondary use exterior doors
- Releasing all but essential personnel to go home.

If as a result of the ashfall other emergency conditions arise (e.g., fires due to electrical shorts or lightning), response is as described in other paragraphs of this section.

7.4.3 High Winds/Tornados

Upon notification of impending high winds, the BED takes steps necessary to secure all outdoor waste, hazardous material containers, and storage locations. All doors and windows are shut, and personnel are warned to use extreme caution when entering or exiting the building.

7.4.4 Flood

N/A.

7.4.5 Range Fire

Responses to range fires are handled by preventive measures (i.e., keeping hazardous material and waste accumulation areas free of combustible materials such as weeds and brush). If a range fire breaches the 616 NRDWSF boundaries, the response is as described in Section 7.2.4.

7.4.6 Aircraft Crash

The response to an aircraft crash is the same as that for responding to a fire and/or explosion.

7.5 SECURITY CONTINGENCIES

Depending on the severity of the event, the BED reviews site-wide procedures, the 616 NRDWSF-specific emergency response guide, specific sections of this plan, and/or POPs and classifies the event and initiates area protective actions (facility and area sirens, notifications, etc.) and site emergency response organization activation. Attachment A provides a list of procedures and emergency response guides.

Security contingencies are discussed in the following sections.

7.5.1 Bomb Threat

- Telephone Threat. Individuals receiving telephoned threats try to gain as much information as possible from the caller (using the bomb threat checklist). On conclusion of the call, notify the BED and Security via 911 (373-3800 if using a cellular phone).

  The BED evacuates the 616 NRDWSF and queries personnel at the staging area regarding any suspicious objects. When Security personnel arrive, follow their instructions.

- Written Threat. Receivers of written threats handle the letter as little as possible. Notify the BED and Security. Depending on the content of the letter, the 616 NRDWSF may or may not be evacuated. The letter is turned over to Security personnel, and their instructions are followed.

7.5.2 Hostage Situation/Armed Intruder

The discoverer of a hostage situation or of an armed intruder reports this to 911 (373-3800 if using a cellular phone) and to the BED if possible. The BED, after conferring with Security personnel, may covertly evacuate areas of the 616 NRDWSF not observable by the hostage taker(s)/intruder. No alarms will be sounded.

Security will determine the remaining response actions and will activate the Hostage Negotiating Team if necessary.

7.5.3 Suspicious Object

The discoverer of a suspicious object reports this to the BED and calls 911 (373-3800 if using a cellular phone), if possible, and ensures that the object is not disturbed.

The BED will evacuate the 616 NRDWSF and (based on the description provided by the discoverer) attempt to determine the identity or owner of the object. This could be done by questioning personnel at the staging area.

If the identity/ownership of the object cannot be determined, Security will assume command of the incident. The canine unit will be used to determine if the package contains explosives. If there is a positive indication of explosives or it cannot be assured that there are no explosives, then the Richland Police Department's Explosive Ordnance Disposal Team will be dispatched to properly dispose of the object.

8.0 TERMINATION OF EVENT, INCIDENT RECOVERY, RESTART OF OPERATIONS, AND POST-EMERGENCY EQUIPMENT MAINTENANCE AND DECONTAMINATION

DOE/RL-94-02, Section 8.0, describes these considerations. The extent by which these actions are employed is based upon the incident classification of each event. In addition, DOE/RL-94-02 also contains considerations for the management of incompatible wastes, which may apply.

8.1 TERMINATION OF EVENT

For events where the RL-Emergency Operations Center (RL-EOC) is activated, the RL Emergency Manager has the authority to declare event termination. This decision is based on input from the BED, IC, and other emergency response organization members. For events where the RL-EOC is not activated, the incident command structure and staff will declare event termination.

8.2 INCIDENT RECOVERY AND RESTART OF OPERATIONS

A recovery plan is developed when necessary. A recovery plan is needed following an event when further risk could be introduced to personnel, the 616 NRDWSF, or the environment through recovery action and/or to maximize the preservation of evidence. Depending on the magnitude of the event and the effort required to recover from the event, recovery planning might involve personnel from DOE-RL and other contractors. If a recovery plan is required, the plan is reviewed by appropriate personnel and approved by a Recovery Manager before restart. Restart of operations is performed in accordance with the approved plan.

If this plan was implemented for a WAC 173-303-360 Emergency (Section 4.0), Ecology must be notified before operations can resume. DOE/RL-94-02, Section 6.1, discusses different reports to outside agencies. This notification is in addition to those required reports and must include the following statements.

- There are no incompatibility issues with the waste and released materials from the incident.

- All the equipment has been cleaned, is fit for its intended use, and placed back into service. The notification may be made via telephone conference. Additional information that Ecology requests regarding these restart conditions will be included in the required 15-day report identified in WAC 173-303-360(2)(k).

For emergencies not involving activation of the RL-EOC, the BED ensures that conditions are restored to normal before operations are resumed. If the RL-EOC was activated and the emergency phase is complete, a special recovery organization could be appointed at the discretion of RL-EOC to restore conditions to normal. The makeup of this organization depends on the extent of the damage and its effects. The onsite recovery organization will be appointed by the appropriate contractor's management.

8.3 INCOMPATIBLE WASTE

After an event, the BED or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Cleanup actions are taken by 616 NRDWSF personnel or other assigned personnel. DOE/RL-94-02, Section 8.3, describes actions to be taken, which might include, but are not limited to, any of the following:

- Neutralization of corrosive spills
- Chemical treatment of reactive materials to reduce hazards
- Overpacking or transfer of contents from leaking containers
- Use of sorbents to contain and/or absorb leaking liquids for containerization and storage and/or disposal
- Decontamination of solid surfaces impacted by released material, e.g., intact containers, equipment, floors, containment systems, etc.
- Disposal of contaminated porous materials that cannot be decontaminated and any contaminated soil
- Containerizing and sampling of recovered materials for classification and determination for proper management
- Followup sampling of decontaminated surfaces to determine adequacy of cleanup techniques as appropriate.

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility is performed as necessary. Incompatible waste is not placed in the same container. Containers of waste are placed in approved storage areas appropriate for their compatibility class.

If incompatibility of waste was a factor in the incident, the BED or the onsite recovery organization ensures that the cause is corrected. Examples include modification of an incompatibility chart or increased scrutiny of waste from an offsite generator or onsite generating unit when incorrectly designated waste caused or contributed to an incident.

8.4 POST-EMERGENCY EQUIPMENT MAINTENANCE AND DECONTAMINATION

All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumables and disposed materials are restocked. Fire extinguishers are replaced.

The BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished, self-contained breathing apparatus are cleaned and refilled, protective clothing is cleaned or disposed of and restocked, etc.

Factors to consider when establishing an equipment and personnel decontamination station are as follows:

- Water supplies
- Containment/catch basins and/or systems
- Personal necessary to accomplish proper decontamination
- Protective clothing
- Decontamination supplies (buckets, brushes, soap, chemicals as needed)
- Risk to personnel
- Weather conditions [i.e., severe heat, cold (current and forecasted)]
- Toxicity of material
- Porosity of equipment to be decontaminated
- Disposal requirements of decontamination rinse
- Use of controlled zones to maintain contamination control.

9.0 EMERGENCY EQUIPMENT

Hanford Site emergency resources and equipment are described and listed in DOE/RL-94-02, Appendix C.

NOTE: While the 616 NRDWSF is in warm stand-by mode, certain portable emergency equipment may be used in other solid waste units. In the event that the 616 NRDWSF is activated, that equipment will be returned to the 616 NRDWSF before any waste is placed in the unit.

9.1 FIXED EMERGENCY EQUIPMENT AT 616 NRDWSF

FIXED EMERGENCY EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Wet-pipe overhead sprinkler system	Throughout building	Activated by heat. Designed to meet Extra Hazard, Group 2, NFPA requirements
Fire hydrant	Southeast exterior corner of the building surrounded by four yellow posts	Supply water for fighting fires
Eye wash/shower stations	Two units - one in combustible cell,and one in Packaging and Sampling Room	Immediate decontamination of personnel exposed to hazardous materials

9.2 PORTABLE EMERGENCY EQUIPMENT

PORTABLE EMERGENCY EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Fire extinguishers	Flammable Cell 1B Combustible Cell Hall near Change Rooms and Office Packaging and Material Handling Room	ABC Type
Dry Chemical	(refer to above)	ABC Type

COMMUNICATIONS EQUIPMENT/WARNING SYSTEMS

COMMUNICATIONS EQUIPMENT		
SIREN SYSTEM		
Sirens are operated manually from the 616 NRDWSF Office		
SIGNAL	MEANING	ACTIONS
ady siren	Evacuate	Evacuate as directed
ering siren	Take Cover	Seek shelter immediately
FIRE ALARM SYSTEM		
PE	LOCATION	CAPABILITY
e alarm button	Outside main entrance to the 616 NRDWSF	Alerts building occupants and the fire station
e alarm pull box	In flammable cell 1B, acid cell, combustible cell, caustic cell, oxidizer cell, packaging room, and inside the main entrance	Alert occupants and fire station
OTHER COMMUNICATIONS EQUIPMENT		
ss of ventilation dicator lights	616 NRDWSF Office	Indicate when the office and cell ventilation systems are operable
ash alarm elephone system	Position No. W-34 in the 616 NRDWSF Red phone with yellow label on the handle	Telephone system used to disseminate emergency messages; dialing a single number connects the initiator to a predetermined number of telephones
ublic address (PA) ystem	616 NRDWSF	Used for incidents that affect only a limited area near the incident
elephones adios	616 NRDWSF	Used for communication

9.4 PERSONAL PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Corrosive material gloves	Packaging and Material Handling Room	Provide protection for hands when exposed to corrosive materials
Solvent resistant gloves	Packaging and Material Handling Room	Provide protection for hands when exposed to solvents, alcohols, and water-based solutions
Abrasion resistant gloves	Packaging and Material Handling Room	Provide abrasion, cut, and puncture protection for hands when handling containers and tools
Response gloves	Packaging and Material Handling Room	Provide protection for hands when exposed to an undetermined chemical or a wide variety of toxic/ hazardous materials
Chemical resistant coveralls	Outside Men's Change Room	Provide protection when overpacking containers

9.5 SPILL CONTROL AND CONTAINMENT SUPPLIES

SPILL CONTROL EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Drum dolly	Material/equipment storage area	Specialized hand truck for moving drums
Absorbent material - cat litter, diatomaceous earth	Material/equipment storage area	Absorbing spills
Overpack drums	Material/equipment storage area	Overpack damaged containers
Chemical transfer pumps • hand pumps	Material/equipment storage area	Transfer liquids to secure containers
• electrical	Packing and sampling room	Transfer liquids to secure containers
• explosion-proof	Flammable cell 1-A	Transfer liquids to secure containers
Nonsparking tools	Material/equipment storage area	Handling flammables

9.6 INCIDENT COMMAND POST

The ICP for 616 NRDWSF is the MO-720 conference room (A-120). The ICP could be moved at the discretion of the BED.

10.0 COORDINATION AGREEMENTS

The DOE-RL has established a number of coordination agreements, or memoranda of understanding (MOU), with various agencies to ensure proper response resource availability for incidents involving the Hanford Site. A description of the agreements is contained in DOE/RL-94-02, Table 3-1.

11.0 REQUIRED REPORTS

Post-incident written reports are required for certain incidents on the Hanford Site. The reports are described in DOE/RL-94-02, Section 6.1.

12.0 PLAN LOCATION

Copies of this plan are maintained at the following locations:

- 616 Building Office
- MO-720
- Office of the BED and alternate
- RL-EOC
- Hanford Local Area Network (HLAN).

NOTE: In accordance with coordination agreements, the Hanford Fire Department provides direction during onsite event response and provides all needed information to support agencies that may be assisting the onsite responses. Therefore, only copies of plans for facilities where offsite agencies are the initial responders (e.g., 1163 Stores Building) will be provided to offsite support agencies.

13.0 BUILDING EMERGENCY ORGANIZATION

The complete building emergency organization listing of positions, names, work locations and telephone numbers for the 616 NRDWSF is maintained in a separate, internally controlled, unit document. Copies are distributed to appropriate 616 NRDWSF locations and to Emergency Preparedness. In addition, names and work and home telephone numbers of the BEDs and alternates are available from the Patrol Operations Center (373-3800) in accordance with the *Hanford Facility RCRA Permit*, Dangerous Waste Portion, General Condition II.A.4.

14.0 REFERENCES

DOE/RL-94-02, *Hanford Emergency Response Plan*, as amended.

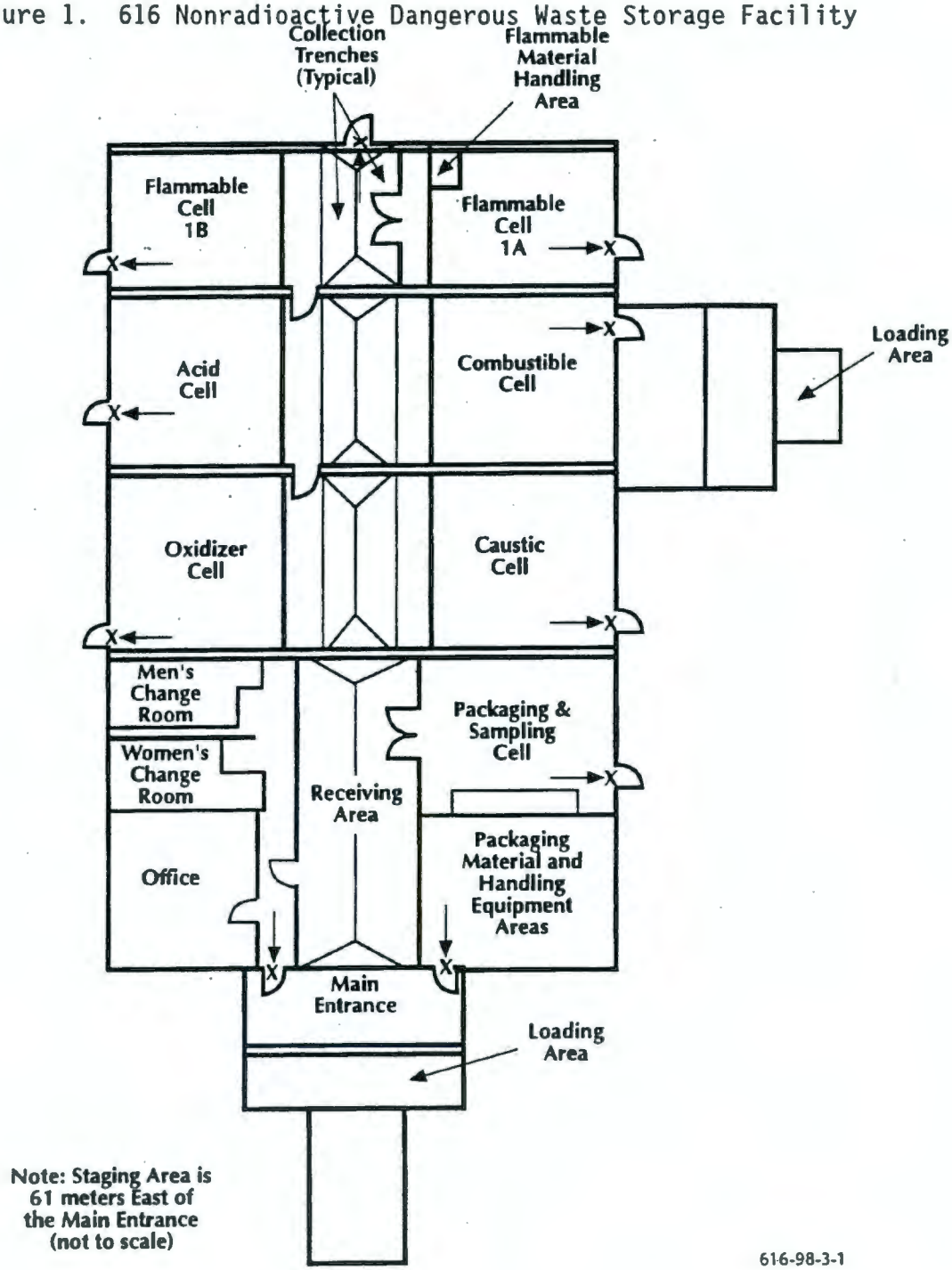
DOE Order 232.1, "Occurrence Reporting and Processing of Operations Information," U.S. Department of Energy, Washington D.C.

NIOSH, 1996, *Pocket Guide to Chemical Hazards*, National Institute of Occupational Safety and Health, U.S. Department of Health and Human Resources, Public Health Service, Centers for Disease Control, Washington, D.C., updated periodically.

WAC 173-303, "Washington State Dangerous Waste Regulations," *Washington Administrative Code*, Washington State Department of Ecology, Olympia, Washington, as amended.

Hanford Facility RCRA Permit, Dangerous Waste Portion, Washington State Department of Ecology, Olympia, Washington, as amended.

Figure 1. 616 Nonradioactive Dangerous Waste Storage Facility



ATTACHMENT A

Listing of Procedures and Guides

Site-Wide Procedures

DOE-0223, *Emergency Plan Implementing Procedures*, RLEP-3.4, "Emergency Termination, Reentry, and Recovery"

DOE-0223, *Emergency Plan Implementing Procedures*, RLEP-1.1, "Hanford Incident Command System and Event Recognition and Classification"

Facility Specific Emergency Response Guide

HNF-IP-1294, *Solid Waste Management Emergency Response Guide*

NOTE: The *Solid Waste Management Emergency Response Guide* provides more detailed response direction for all emergencies identified in Chapter 7.0 of this Building Emergency Plan.

Appendix 8A

R. W. Reddinger
R. W. Reddinger, Manager
Project Support

5-11-98
Date

R. W. Reddinger for
B. S. Darling, Training Team Leader
Project Support, Training

5-11-98
Date

R. J. Giroir
R. J. Giroir, Manager
Solid Waste Project

5/11/98
Date

Brett M Barnes
B. M. Barnes, Environmental Compliance Officer
Solid Waste Project

5/11/98
Date

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1.0 PURPOSE

This document outlines the Dangerous Waste Training Program (DWTP) for the 616 Nonradioactive Dangerous Waste Storage Facility (616 NRDWSF) organization. 616 NRDWSF is permitted as a treatment, storage, and/or disposal (TSD) unit on the Hanford Facility. The DWTP implements the requirements of Washington Administrative Code (WAC) 173-303-330 and Title 40 Code of Federal Regulations (CFR) 264.16 for the development of a written dangerous waste training plan.

2.0 SCOPE

This DWTP applies to personnel who perform work at, or in support of, the 616 NRDWSF. The DWTP requirements are based on an assessment of duties and responsibilities of personnel responsible for dangerous waste management (handling, treatment, storage, and/or disposal of dangerous waste). In addition, this training program ensures that personnel are familiar with emergency equipment and/or systems and emergency procedures to safely operate and maintain the 616 NRDWSF.

3.0 DEFINITIONS

NONE

4.0 RESPONSIBILITIES

Personnel responsibilities are described in the following sections.

4.1 Facility Manager

The Facility Manager has the overall responsibility to meet all training requirements of WAC 173-303-330 and Condition II.C of the Hanford Facility RCRA Permit (Ecology 1994). To meet the requirements in WAC 173-303-330(1)(a), the training director position is described in the *Hanford Facility Dangerous Waste Permit Application, General Information Portion* (DOE/RL-91-28, Chapter 8.0). Because the Facility Manager has overall responsibility in the assignment of training for personnel, the Facility Manager is involved in directing training at 616 NRDWSF.

4.2 Training Manager

The training manager has overall responsibility for establishing, conducting, and administering the training program for the 616 NRDWSF to ensure personnel are trained to meet their assigned jobs.

4.3 Facility Management

Managers, under the direction of the Facility Manager, are responsible for the following:

- Determining required training for all personnel assigned to the 616 NRDWSF, as required by job assignment.

- Ensuring that personnel assigned to the 616 NRDWSF receive required initial training, continuing training, and retraining as needed to be qualified to perform their assigned duties in dangerous waste management.

- Maintaining up-to-date personnel training records for assigned personnel.

4.4 Training Personnel

Training personnel are responsible for the following:

- Reviewing training requirements whenever regulations change or annually, at a minimum, for adherence to regulations and to ensure the requirements reflect the current systems, procedures, and policies applicable to each position.

- Developing and conducting training on new and existing systems or equipment.

4.5 616 Nonradioactive Dangerous Waste Storage Facility Personnel

616 NRDWSF and 616 NRDWSF support personnel are responsible for the following:

- Working with their managers to define applicable training
- Completing necessary training to gain/maintain qualifications.

5.0 TRAINING PROGRAM

The 616 NRDWSF DWTP is implemented based on training requirements related to job responsibilities.

5.1 Training Requirements

Training requirements for individual personnel are tracked in the Training Matrix (TMX).

The responsible manager reviews training requirements when personnel change positions or assume new job responsibilities, when changes are identified to this training plan (other than editorial changes), or annually, as a minimum. Updates to the training requirements are made as necessary.

Personnel must meet the training requirements within 6 months of the date of hire, within 6 months of assignment to the 616 NRDWSF, or within 6 months of assignment to a new position within the 616 NRDWSF. Personnel in-training will not make decisions that could affect facility safety. Personnel independently can perform specific jobs or tasks for which they are qualified. Personnel performing work who do not meet all training requirements must be supervised by a qualified person.

As new requirements are identified and indicated in this training plan, 616 NRDWSF personnel will comply with the new requirements within 6 months of the effective date of the requirement.

5.2 Job Titles and Descriptions

Personnel are assigned a job title and a job description. The job description includes requisite skills, work experience, education, and other qualifications, and a brief list of duties and/or responsibilities. This information is maintained by the human resources department.

5.3 Dangerous Waste Worker Position

616 NRDWSF personnel are categorized into six worker positions: (1) All Employee, (2) General Worker, (3) Advanced General Worker, (4) General Manager, (5) General Shipper, and (6) Waste Designator.

Personnel are categorized into these positions based on duties and responsibilities as determined by a job analysis or management assessment. In the event personnel duties and responsibilities fall into more than one position, personnel will complete the training requirements for each position.

The duties and responsibilities described for the positions in this section, coupled with the information described in Section 5.4, provide the necessary information to determine the training for appropriate personnel. The categories are based on duties and responsibilities of personnel associated with dangerous waste management at 616 NRDWSF and are provided in the following sections.

5.3.1 All Employee

Personnel included in this position are those who do not fall into one of the other five positions and have no duties or responsibilities directly associated with dangerous waste management. Typical job titles of personnel in this position include secretaries, clerks, and oversight personnel.

Most visitors, categorized as All Employee, generally tour, provide oversight, or are brought onsite for interviews. Other non-Hanford Facility personnel who gain access to the 616 NRDWSF to complete work in controlled areas but do not become involved in the management of dangerous waste are categorized as All Employee.

5.3.2 General Worker

Personnel with limited dangerous waste management duties, such as activities associated with the generation of dangerous waste or facility maintenance or modification, are categorized as General Workers. Typical job titles of personnel in this position include maintenance personnel, health physics technicians, and transporters.

Personnel categorized as General Workers could be assigned duties and responsibilities for the following:

- Placing waste into pre-approved containers and filling out logsheets where applicable
- Completing radiological surveys of dangerous waste
- Moving containers or loading packaged containers onto trucks

- Responding to a spill or release of known contents where duties and responsibilities are limited to containing the spill/release, returning the container to an upright position, and/or placing the known spilled material or waste into a pre-approved container.

- Applying container markings or labels based on direction from an Advanced General Worker, General Manager, or General Shipper.

5.3.3 Advanced General Worker

Personnel whose duties exceed those of a General Worker for dangerous waste management are categorized as Advanced General Workers. A typical job title of personnel in this position is Nuclear Process Operator.

Responsibilities of an Advanced General Worker for management of dangerous waste in containers can include the following:

- Determining container markings and labels
- Preparing container logsheets
- Completing waste inventories
- Sampling of waste
- Packaging and transporting waste samples
- Responding to spills and releases of waste in accordance with approved procedures
- Performing inspections and surveillances
- Receiving transfers and/or shipments of waste.

5.3.4 General Manager

Personnel identified as General Managers coordinate, direct, and oversee the work of General or Advanced General Workers in the management of dangerous waste or in the operation and control of the 616 NRDWSF. Other duties could include responsibilities during emergency events requiring implementation of the building emergency plan. Personnel at the 616 NRDWSF who could be categorized as General Managers include: the operations manager (OM), team leads (TLs), environmental compliance officer (ECO), cognizant engineers (Cog Engrs), persons in charge (PIC), hazardous material specialist (HMS), and building emergency director (BED). The TMX identifies personnel currently filling these positions.

5.3.4.1 Operations Manager

OM responsibilities include the following:

- Supervising, coordinating, and directing the activities of the TLs

- Maintaining control over the 616 NRDWSF operations in accordance with established operating procedures and policies, DOE Orders, and federal and state regulations

- Directing, controlling, and coordinating the storage and transfer of dangerous waste

- Complying with 616 NRDWSF permits
- Providing guidance to TLs during abnormal or emergency conditions.

5.3.4.2 Team Leads

TLs responsibilities include the following:

- Supervising and coordinating 616 NRDWSF operation and maintenance activities
- Maintaining control of 616 NRDWSF operations in accordance with established policies and operating procedures, DOE Orders, and federal and state regulations
- Conducting pre-job safety meetings with personnel
- Maintaining operational records
- Reviewing and revising 616 NRDWSF operations procedures
- Recognizing and responding to abnormal and/or emergency conditions
- Supervising the storage, handling, and transfer of dangerous waste
- Complying with 616 NRDWSF permits.

5.3.4.3 Environmental Compliance Officer

ECO responsibilities include the following:

- Ensuring management is aware of environmental compliance requirements and issues
- Providing support to ensure compliance with applicable environmental rules and regulations
- Serving as 616 NRDWSF liaison on environmental issues and permits
- Advising 616 NRDWSF management of emerging environmental requirements and policies, and recommending implementation strategies to ensure compliance
- Ensuring compliance with 616 NRDWSF permits.

5.3.4.4 Cognizant Engineers

Cog Engrs responsibilities include the following:

- Ensuring emergency and monitoring equipment, process equipment, procedures, designs, etc., comply with DOE Orders, federal and state regulations, national standards, and applicable engineering procedures and management standards

- Issuing and maintaining operation documentation, operating procedures, flowsheets, specifications, process test plans and procedures, operational safety requirements, etc.
- Performing evaluations of 616 NRDWSF process to ensure compliance with process control requirements and permits
- Preparing and approving engineering design documents and drawings in compliance with applicable policies, procedures, and instructions per national standards and codes
- Providing technical assistance for hazardous material and dangerous waste spill response.

5.3.4.5 Person In Charge

PIC responsibilities include providing in-field direction of tasks in progress.

5.3.4.6 Hazardous Material Specialist

HMS responsibilities include the following:

- Supervising and coordinating hazardous waste storage and transfer
- Providing approved storage containers and applicable markings
- Interfacing with other organizations to ensure proper and timely disposal of hazardous waste
- Preparing and maintaining applicable hazardous waste documentation in accordance with DOE Orders and federal and state regulations
- Ensuring nonregulated alternatives are used whenever possible
- Reviewing hazardous waste documentation and providing hazardous waste disposition instructions as required.

5.3.4.7 Building Emergency Director

BED responsibilities include the following:

- Acting as the emergency coordinator
- Assessing incidents to determine response necessary to protect the personnel, facility, and the environment
- Arranging for care of any injured personnel
- Remaining available for fire, patrol, and other authorities on the scene, and provides all required information

- Ensuring proper containerization, packaging, and labeling of recovered spill materials
- Assisting in preparing the necessary post-incident documentation.

5.3.5 General Shipper

Personnel who prepare and sign waste movement documentation for onsite transfers or offsite shipments of dangerous waste are categorized as General Shipper.

5.3.6 Waste Designator

Personnel who perform and/or complete waste designations are categorized as a Waste Designator.

5.4 Required Training

Attachment 1 is a matrix of required RCRA training courses. Training for emergency procedures, emergency equipment, and emergency systems to meet the requirements of WAC 173-330(1)(d) is included in these courses as specified in the course description. Attachment 2 provides required training for personnel by job category.

Personnel who have completed training offsite are required to provide a certificate or other suitable evidence of training course(s) that meet the requirements of WAC 173-303 and this DWTP.

5.5 Non-Hanford Facility Personnel

Non-Hanford Facility personnel who perform work at 616 NRDWSF must complete the appropriate level of training determined by line management according to the tasks they will perform.

616 NRDWSF management is responsible for ensuring that non-Hanford Facility personnel training requirements are met before granting access. Some personnel are granted access without the required training because they are either escorted or supervised by qualified personnel within 616 NRDWSF.

5.6 Conduct of Training

The training program uses a systematic approach to training. Training design, development, and implementation are based on learning objectives derived from the analysis of the specific job/task. Training is provided using classroom instruction, on-the-job training, required reading, computer-based training methods, and/or by providing drills. Training is developed and provided by personnel knowledgeable in dangerous waste management policies and/or procedures.

5.7 Documentation of Training

Classroom training is documented on course completion rosters, which are signed by personnel. Written examinations are signed by personnel at the time of taking the examination and when reviewed with the instructor who grades the examination.

Training record files on 616 NRDWSF personnel are stored in the TMX computer database, which is accessed by the facility records specialist. A report is generated from the database to inform 616 NRDWSF management when training for personnel is within 90 days of expiration. TMX report example is included in Attachment 3. Copies of completed TSD unit-specific training certifications/qualifications are available from the 616 NRDWSF training department. Additional information regarding training records can be accessed through the Human Resources Information System (HRIS). HRIS is managed by the Hanford Training Records organization.

Training records summaries for support organization personnel also are stored in the HRIS. Training records for former personnel are kept on the HRIS for 3 years from the date last worked at the 616 NRDWSF. Original signed and dated training records are maintained by the Hanford Training Records organization. These records are transferred quarterly to the Records Holding Facility in Richland, Washington. After approximately 1 year at the Records Holding Center, the original training records are archived.

5.7.1 Access of Training Records

When a training record is requested during an inspection, an electronic data storage record will be provided. If an electronic data storage record does not satisfy the inspection concerns, a hard copy training record will be provided. Training records of former personnel might not be readily available and could require a representative from the Hanford Training Records organization to access this information.

5.7.2 Determining Current Training Status

The electronic data storage training record, coupled with this DWTP, provides the training status of personnel in the field.

5.7.3 Personnel List

A list of personnel for Advanced General Workers, General Managers, General Shippers and Waste Designators is maintained on TMX, including the direct link between these positions and the individuals filling the positions. TMX is updated quarterly.

6.0 REFERENCES

DOE/RL, 1994, DOE-RL/U.S. Army Corps of Engineers to Ecology "State of Washington Department of Ecology Administrative Order No. DE94NM-063" dated April 14, 1994, items 3 and 4.

DOE/RL-91-28, *Hanford Facility Dangerous Waste Permit Application, General Information Portion*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, 1994, *Dangerous Waste Portion of the 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, modified periodically.

7.0 ATTACHMENTS

ATTACHMENT 1. RCRA TRAINING PROGRAM COURSE DESCRIPTIONS

ATTACHMENT 2. REQUIRED TRAINING FOR 616 NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY PERSONNEL

ATTACHMENT 3. EXAMPLE OF TMX DATABASE REPORT

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ATTACHMENT 1. RCRA TRAINING PROGRAM COURSE DESCRIPTIONS

The following constitute the RCRA training program courses as determined by (1) WAC 173-303, (2) the Hanford Facility RCRA Permit, and (3) correspondence between DOE-RL and Ecology on dangerous waste training.

Title	**000001 Hanford General Employee Training**
Description	Course covers DOE Orders and applicable policies pertaining to employer and personnel rights and responsibilities, general radiation training, hazard communications, dangerous waste, fire prevention, personal protective equipment, safety requirements, emergency preparedness, accident reporting, and avenues for addressing safety concerns.
Mandating document(s)	Hanford Facility RCRA Permit, General Condition II.C.2 and II.C.4.
Target audience	All personnel working on the Hanford Facility.
Frequency	Annual.

Title	02006G Waste Management Awareness
Description	Course introduces personnel to federal laws governing chemical safety in the work place. The course provides hazardous material/waste personnel with the basic fundamentals for safe use of hazardous materials and initial accumulation or storage of dangerous or mixed waste in containers. The concepts covered in this course instruct personnel on specific waste generation procedures and requirements, which include: (1) applicable waste management practices (i.e., waste stream identification, waste segregation practices, completing container logsheets, and housekeeping requirements), (2) proper responses to incidents pertaining to the waste in the accumulation containers, (3) proper responses to dealing with waste of unknown origins, and (4) proper responses to questions posed in the field concerning the above elements.
Mandating document(s)	WAC 173-303-330(1) Letter: DOE-RL/U.S. Army Corps of Engineers to Ecology "State of Washington Department of Ecology Administrative Order No. DE 94NM-063" dated April 14, 1994, items 3 and 4. Hanford Facility RCRA Permit, General Conditions II.C.1 and II.C.4.
Target audience	Hanford Facility personnel categorized as a General Worker, Advanced General Worker, and General Manager, and subcontractors categorized as General Workers. Other courses might provide equivalent training so that credit for this course is provided when the electronic data storage training record is generated.
Frequency	One-time only. (Annual refresher training is not required because training is adequately covered through 035110 and/or 03E045.)

Title	**020159 Advanced Course 2 - Hazardous Waste Shipper Certification**
Description	Course defines responsibilities and liabilities with regard to compliance to manifesting requirements and U.S. Department of Transportation regulations, including placarding, identifying proper shipping names, and loading requirements.
Mandating document(s)	WAC 173-303-330(1), -180, -190, and -370. Hanford Facility RCRA Permit, General Condition II.Q, as applicable
Target audience	General Shippers of dangerous or mixed waste on roadways anywhere on the Hanford Facility.
Frequency	Every 3 years.

Title	**02028B Building Emergency Director Training**
Description	Course provides an overview of the responsibilities of the Building Emergency Director, identifies the building emergency organizations and actions required during an event, discusses implementing the contingency plan, and discusses drill and exercise requirements.
Mandating document(s)	WAC 173-303-330(1), -340, -350, and -360.
Target audience	Hanford Facility personnel categorized as General Managers because they perform the responsibilities of a RCRA Emergency Coordinator through the title of Building Emergency Director or alternate (e.g., On-Call Manager).
Frequency	Initial (retrained annually by 037510 Building Emergency Director/Warden Requalification).

Title	**300050 Solid Waste 616 NRDWSF Facility Operations Certification**
Description	Qualifies nuclear process operators to operate the systems associated with the 616 NRDWSF including management of waste in containers.
Mandating document(s)	WAC 173-303-330, -630.
Target audience	Operations personnel categorized as Advanced General Workers.
Frequency	Every 2 years.

Title	**300590 Solid Waste Manager Certification**
Description	Course is a self-study course designed to cover management topics in order to safely operate the solid waste facilities.
Mandating document(s)	WAC 173-303-330, -630, -640, -665. Hanford Facility RCRA Permit, General Conditions.
Target audience	General Managers, because they are immediate managers of Advanced General Workers, who manage dangerous or mixed waste in containers, tank systems, and/or landfills.
Frequency	Every 2 years.

Title	**300700 Solid Waste Facility Orientation**
Description	Introduction to the Low-Level Burial Grounds, Central Waste Complex, 224-T Transuranic Waste Storage and Assay Facility, and 616 Nonradioactive Dangerous Waste Storage Facility including missions, hazards, and emergency response procedures.
Mandating document(s)	WAC 173-303-330 Hanford Facility RCRA Permit, General Condition II.C.
Target audience	All personnel assigned to, or working at, 616 NRDWSF.
Frequency	Every 2 years.

Title	**035010 Waste Designation**
Description	Course covers dangerous waste designation according to WAC 173-303. Class content includes section-by-section lecture on the regulations, with examples following each section. Personnel complete examples using a waste designation flow chart. Examples addressed include: listed waste, characteristic waste, and Washington State criteria of toxicity and persistent.
Mandating document(s)	WAC 173-303-330(1), -070, and -080 through -100.
Target audience	General Shippers and Waste Designators.
Frequency	One-time only. (Annual retraining is required only for those personnel who are required to complete 035012.)

Title	**035012 Waste Designation Qualification**
Description	Course provides qualification to be a Waste Designator.
Mandating document(s)	WAC 173-303-330(1), -070, and -080 through -100.
Target audience	Waste Designators.
Frequency	Annual.

Title	**035020 Facility Waste Sampling and Analysis**
Description	Course presents waste sampling methodologies according to U.S. Environmental Protection Agency Protocols SW-846, "Test Methods for Evaluating Solid Waste Physical/Chemical Methods". This course also covers documentation requirements in a sampling plan and/or waste analysis plan, field and laboratory quality control/assurance, the data quality objectives process, and use of actual sampling equipment as specified by WAC 173-303-110. Finally, topics on listed waste management pertaining to sample management and available onsite sampling services are covered.
Mandating document(s)	WAC 173-303-330(1), -070, -110, and -300.
Target audience	General Managers and/or General Shippers categorized because they perform responsibilities for sampling waste or effluent streams.
Frequency	One-time only.

Title	**035100 Container Waste Management - Initial**
Description	Course covers general training requirements pertaining to waste management of container in less-than-90-day accumulation areas and TSD units. The course incorporates WAC 173-303-200(1), -630, DOE Orders, and container management policy. Course includes practical exercises for hands-on experience with the packaging of dangerous or mixed waste, and preparation of packages for final destination. This course does not cover waste management aspects pertaining to other RCRA waste management units such as tank systems, surface impoundments, containment buildings, landfills, etc.
Mandating document(s)	WAC 173-303-330(1), -630, -200(1) and waste minimization.
Target audience	Advanced General Workers and General Managers categorized because they are immediate managers of or direct Advanced General Workers who manage containers of dangerous or mixed waste.
Frequency	Initial (refresher annually by 035110).

Title	**035110 Container Waste Management - Refresher**
Description	Refresher Course for Container Waste Management - Initial (035100).
Mandating document	WAC 173-303-330(1), -630, -200(1), and waste minimization.
Target audience	Advanced General Workers and General Managers categorized because they are immediate managers of or direct Advanced General Workers who manage dangerous or mixed waste in containers.
Frequency	Annual.

Title	**035120 Waste Management Administration - Initial**
Description	Course is designed for personnel preparing to become shippers of dangerous and/or mixed waste. This course covers regulatory and onsite policies, forms, reports, forecasts, and plans. Topics also covered include: waste characterization, waste certification summaries, waste specification system, and solid waste storage/disposal records. In addition, personnel learn how these forms are used to complete shipping papers.
Mandating document(s)	WAC 173-303-330(1), -630, -200, -210, -220, -380, and -390.
Target audience	General Shippers categorized because they direct Advanced General Workers in the management of containers of dangerous and mixed waste.
Frequency	Initial (refresher annually by 035130 - Waste Management Administration).

Title	**035130 Waste Management Administration - Refresher**
Description	Refresher course for Waste Management Administration - Initial (035120).
Mandating document(s)	WAC 173-303-330(1), -630, -200, -210, -220, -380, and -390.
Target audience	General Shippers categorized because they direct Advanced General Workers in the management of containers of dangerous and mixed waste.
Frequency	Annual.

Title	**037510 Building Emergency Director/Warden Requalification**
Description	Refresher for Building Emergency Director Training.
Mandating document(s)	WAC 173-303-330, -340, -350, and -360.
Target audience	General Managers categorized because they have the responsibilities of the RCRA Emergency Coordinator.
Frequency	Annual.

Title	**03E045 Building Emergency Plan for HNF-IP-0263-616**
Description	Course consists of a review of specific chemical hazards associated with operating the 616 NRDWSF, as covered by the 616 NRDWSF Building Emergency Plan. Training is completed by the supervisor, manager, or a designated individual. Information reviewed includes hazards in the work area and emergency response requirements, including communication and alarm systems and response to fires.
Mandating document(s)	WAC 173-303-330(1)(d), -340, -350, and -360.
Target audience	616 NRDWSF personnel who are General Workers, Advanced General Workers, and General Managers.
Frequency	Annual.

ATTACHMENT 2. REQUIRED TRAINING FOR 616 NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY PERSONNEL

Position	Job Title	Required Training
All Employee	All other Job Titles not specifically listed.	000001 300700
General Worker	Radiological Control Technician, Maintenance Personnel (Electrician, Instrument Technician, Insulator, Millwright, Painter, Pipefitter, Power Operator, Process Crane Operator, Rigger, Sign Painter, Truck Driver, Welder), Maintenance Manager, Radiological Control Manager.	000001 02006G 03E045 300700
Advanced General Worker	Nuclear Process Operator	000001, 02006G, 035100/035110, 03E045, 300050, 300700
General Manager	Operations Manager/Team Leader	000001, 02006G, 02028B/037510, 035100/035110, 03E045, 300590, 300700
	Environmental Manager/Team Leader	000001, 02006G, 035010, 035020, 035100/035110, 03E045, 300700
	Environmental Compliance Officer	000001, 02006G, 035010, 035020, 035100/035110, 03E045, 300700
	Environmental Engineer/Scientist Plant Engineer (Environmental)	000001, 02006G, 035010, 035020, 035100/035110, 03E045, 300700
	Hazardous Material Specialist	000001, 02006G, 035010, 035020, 035100/035110, 03E045, 300700
	Building Emergency Director	000001, 02006G, 02028B/037510, 035100/035110, 03E045, 300700

Position	Job Title	Required Training
General Shipper	Shipper	000001, 02006G, 020159, 035010, 035100/035110, 035120/035130, 03E045, 300700
Waste Designator	Waste Designator	000001, 035010, 035012, 03E045, 300700

ATTACHMENT 3. EXAMPLE OF TMX DATABASE REPORT
616 NRDWSF POSITION TRAINING REPORT

Tracking Code:
Manager:
Organization : Operations
Position: TIMS - Nuclear Process Operator (Advanced General Worker)

Matrix Last Modified on 05/16/98
30 Days Delinquent Forecast

05/20/98
15:04:38 7

Position 1
Sheet 1 of 1

	Course No.	Title	Retrain Course	Individual #1
M	000001	HGET	000001	01/26/99
M	020010	CRIT SAFETY - FISSILE	020110	09/03/99
M	02006G	WASTE MANAGEMENT AWARENESS	———	OK
M	020075	HAZ MAT GEN AWARENESS TRNG	020075	11/14/98
M	020301	CRIT SFTY JSO-FSSL	020301	09/03/99
M	031110	24 HR RCRA TSD HAZ WASTE	032020	10/16/98
M	035100	CONTAINER WASTE MGT. INITIAL	035110	07/11/98
M	03E044	BLDG EMERG PLAN - LLBG	03E044	07/17/98
M	03E045	BLDG EMERG PLAN - 616	03E045	07/17/98
M	03E046	BLDG EMERG PLAN - 224T	03E046	07/17/98
M	03E047	BLDG EMERG PLAN - CWC	03E047	07/17/98
M	300700	SOLID WASTE FAC ORIENTATION	300700	07/17/99
M	301740	SW MGMT HAZ COMM	301740	07/17/98
D	065911	MATHEMATICS	———	OK
D	065912	NPO CORE CHEMISTRY	———	OK
D	065914	NPO CORE ELECTRICAL	———	OK
D	065915	NPO CORE INSTRUMENTATION	———	OK
D	065917	NPO CORE MECHANICAL	———	OK
m	003035	LOCK & TAG: CO INITIAL	003036	****
m	020001	RAD WORKER II INITIAL	020003	01/13/99
m	020030	SCBA INITIAL TRAINING	02R030	<<11/20/97>>
m	020032	SCOTT SKA-PAK AIRLINE SYS-INIT	02R032	<<11/20/97>>
m	020035	MSA PAPR (FULL FACEPIECE) INIT	02R035	****
m	020041	RESPIRATORY PROTECTION INITIAL	02R041	<<04/16/98>>
m	020044	QUANTITATIVE MASK FIT	020044	04/14/99
m	02006L	ASBESTOS AWARENESS	02006L	02/10/99
m	020077	HAZ MAT DRIVERS TRNG - UNIT 1	020077	04/15/01
m	020130	CONFND SPC ENTRY (CSE)	———	OK
m	020140	FALL PROTECTION TRAINING	———	OK
m	020702	RAD WORKER REFRESHER TRAINING	020702	01/26/00
m	040784	BASIC CRANE & RIGGING SAFETY	040788	11/07/00
d	000080	SECURITY REFRESHER BRIEF	000080	****
d	000390	OJT TRAINING WORKSHOP	———	OK
d	000397	OJE TRAIING	———	
d	03E048	BLDG EMERG PLAN - T PLANT	03E048	
d	042720	AERIAL LIFT OPER TRNG	043920	08/13/99
d	044383	USERS SCAFFOLD SAFETY	044383	11/12/00
d	044470	FORKLIFT OPERATNL SAFETY	041890	06/10/99
d	170055	QTRC - CERT ASBESTOS WORKER	170057	
d	170500	BASIC MEDIC FIRST AID	170535	07/30/99
d	170656	HANDS-ON FIRE EXTINGSHR	170656	03/25/99
d	450700	FCLTY ORIENT - T PLANT	450700	
c	300020	CENTRL WST COMPLX OC	300020	09/30/98
c	300025	SW MIXED WST LAND DISP FAC OP	300025	10/28/98
c	300030	SOLID WST TRANSURANIC STOR/ASS	300030	10/30/98
c	300040	LOW LVL BURIAL GRND FAC	300040	09/04/99
c	300050	NON-RAD DWSF OPER CERT	300050	09/30/98

LEGEND:

Upper case (M/D/C/P)	= Course needed by all	Date	= Course retrain date
Lower case (m/d/c/p)	= Course needed by some	OK	= Course taken; no retrain required
*	= Retrain not to be maintained	****	= Course taken; retrain requirement not maintained
<< >>	= Course delinquent	Blank	= Course not needed (lower case) and not taken
/ /	= Course needed (upper case) but not taken		

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 LERF- Part A and Part B Chapter 4

Description of Modification:

Increase the capacity of a LERF basin from 24.6 million liters (6.5 millions gallons) to 29.5 million liters (7.8 million gallons), and increase the total capacity of LERF from 73.8 million liters (19.5 million gallons) to 88.5 million liters (23.4 million gallons). The modified text reflects these increases, as well as other changes in response to the increase volume (see attached text from the Part A, and Chapter 4 of the Part B).

Reference:

1. Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Liquid Effluent Retention Facility, Revision 6

2. Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Chapter 4, Revision 0A

Modification Class: [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: 4.d.i. (Request downgrade to Class2)

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
Other modifications.
In the case of modifications not explicitly listed in Appendix I of this section, the permittee may submit a Class 3 modification request to the department, or he or she may request a determination by the director that the modification should be reviewed and approved as a Class 1 or Class 2 modification. If the permittee requests that the modification be classified as a Class 1 or 2 modification, he or she must provide the department with the necessary information to support the requested classification.

Temporary approval for this increase was granted on October 31, 1997 (see attached letter). This letter provides a complete discussion on the justification for this increase in volume.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Widdle for C. G. Mattsson 5/15/98	H. E. Bilson 5/19/98	
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.

REG. FILING INFORMATION
FILE LOCATION: 2007.1
DOCUMENT TYPE/NUMBER:
SUPPLEMENTARY INFORMATION:
DOCUMENT DATED/ISSUED:
DOCUMENT SUBJECT/TITLE:

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

1315 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

October 31, 1997

Mr. James E. Rasmussen, Director
Environmental Assurance, Permits, and Policy Division
U.S. Department of Energy
Richland Operations Office
P.O. Box 550, MSIN: A5-15
Richland, WA 99352-0550

Dear Mr. Rasmussen:

Re: Temporary Increase in the Operating Capacity of Liquid Effluent Retention Facility Basins 43 and 44 (WA789000967)(TSD: S-2-8)

On September 24, 1997, the Washington State Department of Ecology (Ecology) received a request for a temporary increase in the operating capacity of the Liquid Effluent Retention Facility (LERF) Basins 43 and 44 from the U.S. Department of Energy (USDOE), Richland Operations Office. The change requested by USDOE would allow the maximum waste depth in the basin to change from 20 feet (with 4.2 feet of freeboard) to 22.2 feet (with 2 feet of freeboard). This would change the capacity of each basin from 6.5 to 7.8 million gallons. USDOE will manage the amount of waste in Basin 42 to ensure the total amount of waste in all three basins will not exceed the 19.5 million gallons specified in the LERF Part A Permit Application. The additional capacity would be used for storing contaminated groundwater pumped from the UP-1 Operable Unit before treatment at the 200 Area Effluent Treatment Facility.

USDOE provided new dike stability calculations which conclude the dikes could withstand the increased pressure of the additional waste with a safety factor of 2.5. A new overtopping analysis was also provided showing approximately 11 days of continuously running at 75 gallons per minute would be required in order to overtop the basin from the 22.2 foot level. UP-1 groundwater is received at 50 gallons per minute. Ecology has reviewed these calculations and believes USDOE has adequate administrative controls in place to prevent overtopping.

Washington Administrative Code (WAC) 173-303-830(4)(e)(iii)(B)(III) allows for temporary increase of operating capacity "To prevent disruption of ongoing waste management activities." for up to one hundred eighty days. WAC 173-303-830(4)(e)(vi) states an additional one hundred eighty days may be provided if the Permittee has requested a Class 2 or 3 change. Per WAC 173-303-830, Appendix 1 (H)(4), this modification would be classified as a Class 2 change.

Authorization for the temporary increase of storage capacity is hereby granted for one hundred eighty days. If a decision is made to proceed with a Class 2 modification, an additional one hundred eighty days are available while the modification is being processed.

If there are any questions about this letter, please contact me at (509) 736-3011.

Sincerely,

Steven J. Skurla
Project Manager
Nuclear Waste Program

SS:skr

cc: Bill Adair, FDH
Liz Bowers, USDOE
Roger Gordon, USDOE
Tony McKarens, USDOE
Doug Sherwood, EPA
Nancy Ballantyne, WMH
Joe Coenenburg, WMH
J. Wilkinson, CTUIR
Donna Powaukee, NPT
Russell Jim, YIN
Mary Lou Blazek, ODOE
Administrative Record: Liquid Effluent Retention Facility

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 ETF- Part A and Part B Chapter 4

Description of Modification:

The Part A and Part B are modified to allow treatment as well as storage for containers which are managed in the ETF. This modification will allow for the removal and treatment of sludge that may accumulate in ETF process tanks from the treatment process. Once removed from the these tanks, the sludge is placed in containers. As necessary, the sludge is allowed to settle and the supernate is pumped back to the ETF for treatment. This sludge is removed from the tanks to prevent damage to the ETF processing equipment and to allow uninterrupted operation of the treatment process.

The Waste Analysis Plan (WAP) has been revised and the revision addresses treatment in containers. A separate modification form is submitted for a revised WAP.

Reference:

1. Hanford Facility Dangerous Waste Part A Permit Application, Form 3, 200 Area Effluent Treatment Facility, Revision 3.
2. Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Chapter 4, Revision 0A.
3. Waste Analysis Plan for Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Revision 0A.

Modification Class: [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: F.1.c

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
"Treatment processes necessary to treat wastes that are restricted from land disposal to meet some or all of the applicable treatment standards" [In this case, treatment through solidification and evaporation is provided to meet the WAC 173-303-140(4)(b)(ii) standard which prohibits land disposal of containers which hold free liquids.]

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Swoboda for C. G. Matisson 5/13/98 Date	H. E. Bilson 5/14/98 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 ETF-Part B Chapter 7 and Appendix 7A

Description of Modification:

Remove Chapter 7.0, Revision 0, and Appendix 7A, Building Emergency Plan for 200 Area Effluent Treatment Facility and Liquid Effluent Retention Facility, HNF-IP-0263, Revision 3, and replace with Chapter 7.0, Revision 0A, and Appendix 7A, Building Emergency Plan for 200 Area Effluent Treatment Facility and Liquid Effluent Retention Facility, HNF-IP-0263, Revision 4.

Reference:

1. Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Chapter 7.0, Revision

2. Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Appendix 7A, Building Emergency Plan for 200 Area Effluent Treatment Facility and Liquid Effluent Retention Facility, HNF-IP-0263, Revision 4.

Modification Class: [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: B.6.a.

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

"Changes in emergency procedures (i.e., spill or release response procedures)"

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Stebbins for 5/13/98	5/15/98	
C. G. Mattsson Date	H. E. Bilson 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:

Remove Appendix 3A, Waste Analysis Plan for Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Revision 0, from Attachment 34 and replace with Waste Analysis Plan for Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Revision 0A. See attached Justification for Waste Analysis Plan Changes.

Modification Class: [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: B.2.b.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
General Facility Standards, Changes to analytical quality assurance/control plan: Other changes.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Dobbins for C. G. Mattsson 5/13/98	H. E. Bilson 5/19/98	
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.

JUSTIFICATION FOR WASTE ANALYSIS PLAN MODIFICATIONS

Several portions of the waste analysis plan (WAP) have been revised to provide for clearer and more accurate document. The specific revisions and associated justifications are discussed below. The modified WAP is attached.

General

1) Text throughout the WAP is modified to incorporate editorial and other changes required in the Unit-Specific Conditions for Final Status Operations, Part 3, Chapter 4.B of the Site-Wide Permit.

2) Minor editorial changes have been made throughout the WAP to provide clarification and to correct administrative and grammatical errors.

3) Text throughout the WAP has been modified to make the reference to 'secondary waste' clearer. The modified text indicates that 'secondary waste' is defined as waste that is generated from the treatment process, including slurry from the concentrate tank, sludge that is removed from process tanks, and the dry powder that is generated from the thin film dryer. This change was made to provide a clear distinction between secondary waste generated from the treatment process and maintenance and operations waste.

4) The text in Sections 1.0 and 6.0 was modified to indicate that sludge is removed from ETF process tanks and treated in drums. The sludge, which accumulates in the ETF process tanks, is removed to prevent damage to the ETF tanks and process equipment, and placed into drums where it is allowed to dry (i.e., treated in drums). The modifications also indicate that the sludge is sampled in the same manner and at the same frequency as the dry powder waste.

Concurrent with this modification to the WAP, other portions of the Part B Permit have been modified to address treatment and removal of sludge from the ETF process tanks. These modifications are included on a separate permit modification notification form.

5) Text in Sections 4.1.1, 4.1.2, and 6.1.2 which pertain to the order in which sample containers are filled have been modified. These sections have been modified to indicate that grab sample containers for volatile organic compounds (VOC) are typically filled before containers for other parameters. These changes were made to clarify that this approach applies to samples collected in grab sample containers.

WAP Section 1.0

The last paragraph in Section 1.1 has been modified to clarify how the treated effluent from the ETF is managed. This text was also modified to clarify the conditions of the Final Delisting (40 CFR 261, Appendix IX, Table 2). The original text could be interpreted that sampling and analysis of treated effluent is required by the delisting for every verification tank. The Final Delisting, however, only requires sampling and analysis of treated effluent from every tenth tank.

WAP Section 2.0

1) The text at the end to Section 2.2.2.1 has been modified to clarify that all the parameters identified in this portion of the text are evaluated for treatability and operational concerns (not just the parameters bulleted in the original version of this section). The original version of the text is not clear on the purpose of the other parameters, and should have indicated that all parameters discussed in Section 2.2.2.1 are evaluated for treatability and operational concerns.

2) Section 2.2.2.2 has been added and Table 2-2 was modified to make the WAP consistent with Process Description (Section 4.0 of the permit application). Currently, the process description indicates that each new waste stream is evaluated for its 'potential to corrode' as part of the aqueous waste acceptance process presented in the waste analysis plan. The new text provides additional information to complete the cross-reference. Other editorial changes were also made to accommodate this new section.

Section 3.0
No changes.

Section 4.0

1) In Section 4.1.1, first paragraph, first sentence, "PC" was changed to "an aqueous waste". The original text only indicated sampling methodology for PC (when sampled in LERF), and should have indicated that this sampling methodology applies to any aqueous waste sampled in LERF. The text in this paragraph was also modified to indicate that other materials, in addition to stainless steel may be used in sampling an aqueous waste in LERF.

2) Information in Tables 4-1(and B-1) have been modified to remove two radionuclides that were erroneously included in the list of analytes, and to add one radionuclide. Consistent with the conditions of the permit regarding radionuclides, this change is provided for information only (see Section 1.0 of the WAP).

Section 5.0

The text in Section 5.0 was modified to clarify the conditions of the Final Delisting and the State Waste Discharge Permit, No. ST 4500 (Discharge Permit), which pertain to the treated effluent.

1) Section 5.1 was modified to clarify the sampling and analysis requirements of the Final Delisting (40 CFR 261, Appendix IX, Table 2). The original text did not make it clear that the Final Delisting only requires sampling and analysis from every tenth verification tank (following approval by EPA). The last sentence in this paragraph was modified in to indicate that 'early warning values' are determined as a monthly average, as required by the Discharge Permit.

2) Section 5.2.3 was modified to clarify how samples are collected from the verification tanks, according to the requirements of the Discharge Permit and the Final Delisting.

Section 6.0

1) See General Comments 2, 3, and 4 for many of the changes to Section 6.0.

2) The text in Section 6.1.1 has been modified to indicate that the dry powder form of ETF secondary waste is usually sampled and analyzed for characterization. The original version of the WAP indicated that the ETF secondary waste is typically sampled while in slurry form. This approach was based on pre-operational design information which projected safety concerns associated radiological and chemical/industrial exposure from sampling the dry powder. Operating experience, however, indicates that in most cases sampling the dry powder does not present the radiological concern that was originally anticipated, and chemical/industrial exposures have been mitigated through use of personal protective equipment. Additionally, operating experience indicates that samples of the dry powder are more representative of the final waste form than samples of the slurry. Operating experience also indicates that sampling the dry powder is more efficient. Therefore, unless there is a safety concern due to radionuclides, the secondary waste will be sampled in the dry powder form. If there are radiological concerns, the secondary waste will be sampled in slurry form. The text was also modified in Section 6.1.3 to include information on the methods and frequency for sampling the dry powder.

3) Text in Section 6.1.1 has been re-written and Table 6-1 has been modified to indicate that influent characterization data, in conjunction with process knowledge, are used to designate the ETF secondary waste. The influent data are also used to determine the LDR status of the secondary waste. For instance, the influent data for organic compounds associated with a listed waste are compared to the known destruction efficiencies of the UV/OX and thin-film drying systems. If the resulting concentration is projected to be below LDR thresholds, the secondary waste would not be sampled or analyzed for the organic compounds. If the projected concentrations are above either LDR or designation thresholds, then the ETF secondary waste is sampled and analyzed. This approach limits redundant and unnecessary sampling and analysis of the ETF secondary waste.

4) Section 6.1.2 was modified to delete the specific reference to ASTM Method D245-75. This method was incorrectly identified. A more generic reference to ASTM and SW-846 methods (as required by WAC 173-303-110(2)) remains.

5) Text was added to Section 6.1.3 to include the frequency for sampling the secondary waste in powder form. The text was also modified to provide clarification on how samples are collected from a concentrate tank. The original text indicates that concentrate tank waste from "the first three concentrate tanks or equivalent volume" will be collected on initiation of treatment of an aqueous waste(s). Operating experience, however, indicates that treatment of some aqueous wastes will not generate three concentrate tanks or equivalent volume (i.e., 15,000 gallons of waste), which makes implementing this permit condition difficult. Instead, the revised text proposes to collect a "maximum of three samples" per batch of influent aqueous waste to clarify this issue. The last paragraph was deleted because it is no longer consistent with other changes made to Section 6.0.

Section 7.0

1) In the third paragraph of Section 7.1, the reference to "PVC" was deleted. Though the reference to PVC is an example of the type of plastic material that may be used in the ETF, it is misleading in that other types of plastics, such as Teflon, may also be used. The reference to PVC was also deleted to make the example consistent with the level of detail provided for other materials referenced in the text.

2) The conditions of the permit require that footnote "c" be deleted from Table B-1, Appendix B. Footnote "c" indicates that "[s]ample volumes and preservatives may be adjusted per laboratory directions". It is not clear why this footnote was deleted. The provisions of this footnote allow ETF personnel to collect the minimum volume of sample necessary to meet quality control objectives. This approach minimizes the amount of laboratory waste that is generated. This provision also is consistent with the quality assurance project plan for the ETF and LERF. A revised Footnote "c" makes it clearer why this provision is necessary.

CHANGES INCLUDED FOR THE HANFORD FACILITY DANGEROUS WASTE PERMIT APPLICATION, LIQUID EFFLUENT RETENTION FACILITY AND 200 AREA EFFLUENT TREATMENT FACILITY

ATTACHMENT 34

Chapter 1.0, Part A

- Hanford Facility Dangerous Waste Part A Permit Application, 200 Area Effluent Treatment Facility, Revision 3

- Hanford Facility Dangerous Waste Part A Permit Application, Liquid Effluent Retention Facility, Revision 6

Chapter 4.0, Process Information, Revision 0A

Chapter 7.0, Contingency Plan, Revision 0A

Chapter 14.0, Part B Certification, Revision 0A

Appendix 3A, Waste Analysis Plan for Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility, Revision 0A

Appendix 7A, Building Emergency Plan for 200 Area Effluent Treatment Facility and Liquid Effluent Retention Facility, HNF-IP-0263-ETF, Revision 4

CONTENTS

1.0 PART A [A] 1-1

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1.0 PART A [A]

The following is a chronology of the regulatory history of the Liquid Effluent Retention Facility (LERF) and 200 Area Effluent Treatment Facility (ETF).

LERF:

- On February 26, 1990, the original Hanford Facility Dangerous Waste Part A Permit Application (Part A), Form 3, Revision 0, was submitted to the Washington State Department of Ecology (Ecology).

- On June 26, 1991, the Part A, Form 3, Revision 1, added nonspecific source Dangerous Waste Number F005 to corresponded with the dangerous waste numbers from the Double-Shell Tank (DST) System and 242-A Evaporator.

- On May 17, 1993, the Part A, Form 3, Revision 2, added nonspecific source Dangerous Waste Numbers F001, F002, and F004 to corresponded with the dangerous waste numbers from the DST System and 242-A Evaporator.

- On November 4, 1994, the Part A, Form 3, Revision 3, added nonspecific source Dangerous Waste Number F003 to corresponded with the dangerous waste numbers from the DST System and 242-A Evaporator.

- On February 9, 1996, the Part A, Form 3, Revision 4, added treatment capability (for treatment of dilute aqueous waste streams from other Hanford Facility generators) pursuant to treatment surface impoundment exemption located in Title 40 Code of Federal Regulations Part 268.4

- On October 1, 1996, the Part A, Form 3, Revision 5, supported the transition of this treatment, storage,and/or disposal (TSD) unit to the new Project Hanford Management Contractor.

- On May 22, 1998, the Part A, Form 3, Revision 6, was submitted to increase the waste management capacity from 24,605,000 liters per basin to 29,500,000 liters per basin.

ETF:

- On June 26, 1991, the original Hanford Facility Dangerous Waste Part A, Form 3, Revision 0, was submitted to Ecology.

- On August 25, 1993, the Part A, Form 3, Revision 1, added three 2,536,000-liter verification tanks for greater-than-90 day storage and a greater-than-90 day container storage area. Also added six new dangerous waste numbers to reflect the waste that could be stored in the verification tanks and 32 new dangerous waste numbers that could be stored in the container storage area.

- On October 1, 1996, the Part A, Form 3, Revision 2, was revised to support the transition of this TSD unit to the new Project Hanford Management Contractor. Also added Dangerous Waste Number F039 (multi-source leachate). Dangerous Waste Number F039 was added to support

Low-Level Burial Grounds efforts to treat, store, and/or disposal of multi-source leachate from the mixed waste trenches and from other potential sources of leachate.

- On May 22, 1998, the Part A, Form 3, Revision 3, was submitted to add treatment of waste in containers as a new process. This process was added to address sludge which accumulates in the bottoms of the ETF process tanks. This waste is periodically removed and placed into containers. The waste is solidified by decanting the supernate from the container and the remainder of the waste is then allowed to evaporate or absorbents are added as necessary to address remaining liquids. Following treatment, this waste is either stored at the ETF or transferred to another TSD unit.

Please print or type in the unshaded areas only
(fill- in areas are spaced for elite type, i.e., 12 character/inch).

FORM

DANGEROUS WASTE PERMIT APPLICATION

1. EPA/STATE I.D. NUMBER: W A 7 8 9 0 0 0 8 9 6 7

FOR OFFICIAL USE ONLY

APPLICATION APROVED	DATE RECEIVED (mo., day, & yr.)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. if this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION (*place an "X" below and provide the appropriate date*)

☐ 1. EXISTING FACILITY (*See instructions for definition of "existing" facility. Complete item below.*)

MO.	DAY	YR.
03	22	43

*FOR EXISTING FACILITIES, PROVIDE THE DATE (*mo., day, & yr.*) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (*use the boxes to the left*)
* The date construction of the Hanford Facility commenced.

☐ 2. NEW FACILITY (*Complete item below.*)

MO.	DAY	YR.

FOR NEW FACILITIES, PROVIDE THE DATE, (*mo., day, & yr.*) OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *9place an "X" below and complete Section I above)*

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT

☒ 2. FACILITY HAS A FINAL PERMIT

III. PROCESSES – CODES AND CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the codes(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the *(Section III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.

2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
orage:		
ONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D82	*ACRES OR HECTARES*
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided: Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U

UNIT OF MEASURE	UNIT OF MEASURE CODE
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H

UNIT OF MEASURE	UNIT OF MEASURE CODE
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECATRES	Q

EXAMPLE FOR COMPLETING SECTION III *(shown in line numberS X-1 and X-2 below): A facility has two storage tanks; one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.*

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
	S04	88,500,000	L		7				
2	T02	88,500,000	V		8				
3					9				
4					10				

CONTINUE ON REVERSE

Continued from the front.

III. PROCESSES (continued)

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

Construction of the Liquid Effluent Retention Facility (LERF) began in 1990. Waste management operations began at LERF in April of 1994.

IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER – Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gra waste.

D. PROCESSES

1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER - Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.

2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.

3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2			T 0 3 D 8 0	included with above

CONTINUE ON PAGE 3

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

D. NUMBER (entered from page 1)

W	A	7	8	9	0	0	0	8	9	6	7

SCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	D001	88,497,000	K	S04	T02			Storage/Treatment-
2	through							Surface Impoundment
3	D011							
4	D018							
5	D019							
6	D022							
7	D028							
8	through							
9	D030							
10	D033							
	through							
12	D036							
13	D038							
14	through							
15	D041							
16	D043							
17	F001							
18	through							
19	F005							
20	F039							
21	WT01							
22	WT02							Included with above
23								
24								
26								

Continued from the front.

IV. DESCRIPTION OF DANGEROUS WASTE (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

V. FACILITY DRAWING Refer to attached drawing(s).

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS Refer to attached photograph(s).

All existing facilities must include photographs *(aerial or ground-level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail).*

VII. FACILITY GEOGRAPHIC LOCATION This information is provided on the attached drawings and photos.

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information," place an "X" in the box to the left and skip to Section XI below.

B. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
John D. Wagoner U.S. Department of Energy Richland Operations Office	LL Pijan for	5/22/98

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

CONTINUE ON PAGE 5

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

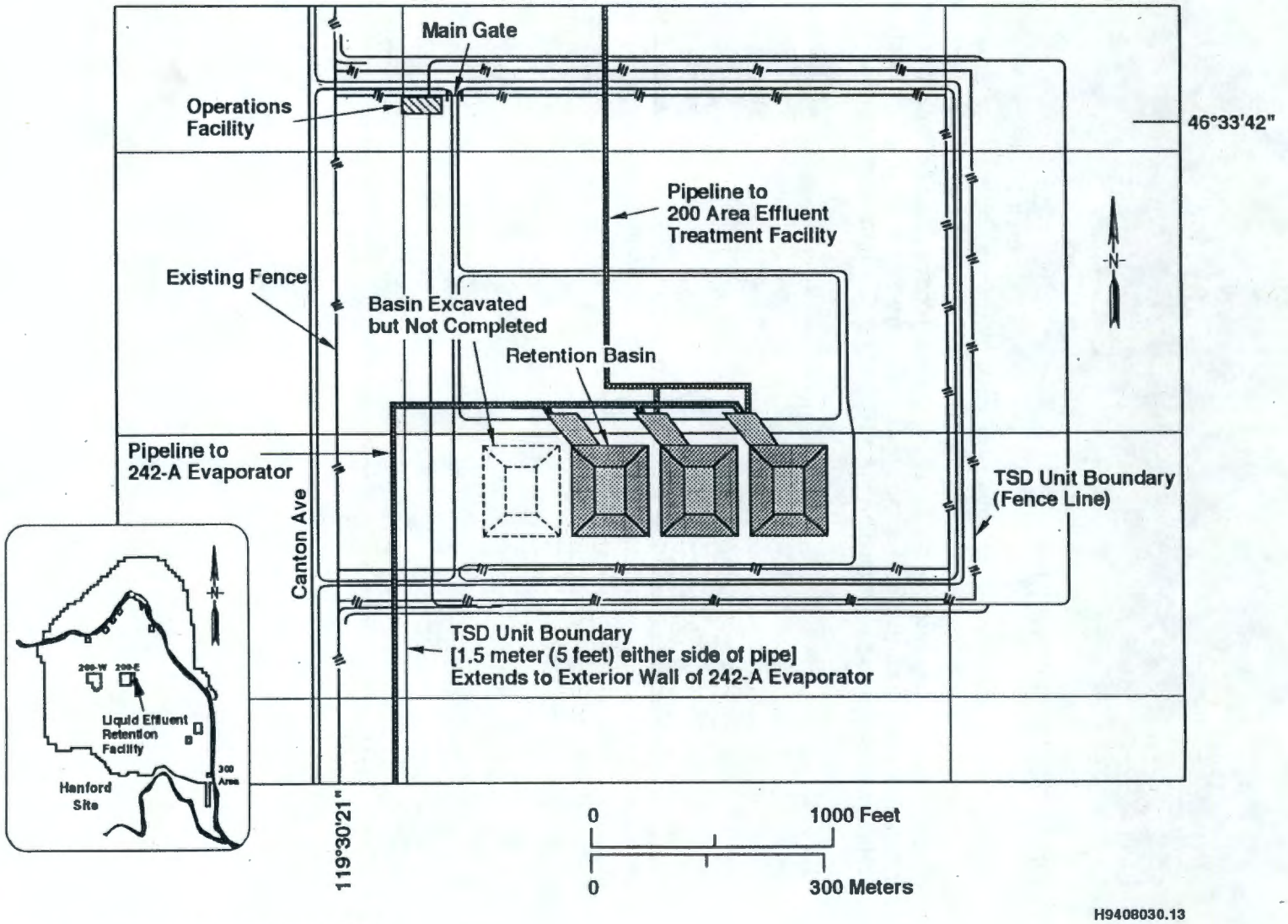
Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date 5/22/98

H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford, Inc.

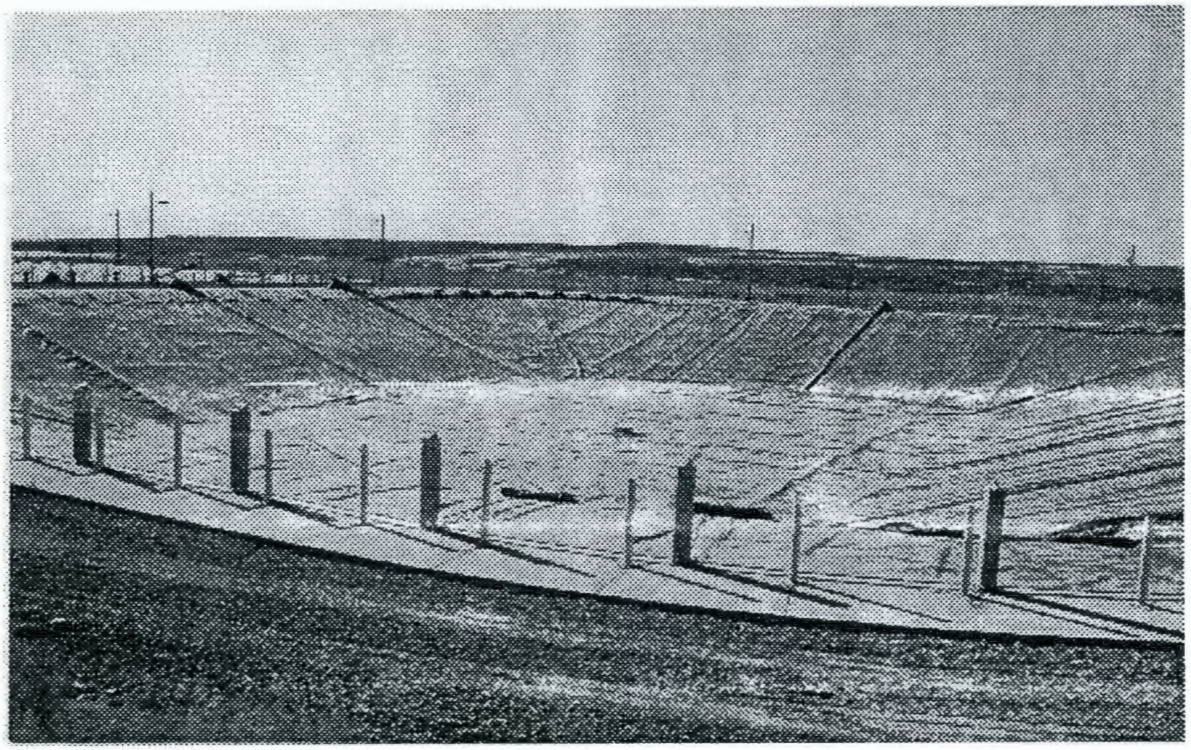
Date May 14, 1998

Liquid Effluent Retention Facility
Site Plan



Note: To convert feet to meters, multiply by 0.3048.

LIQUID EFFLUENT RETENTION FACILITY



TYPICAL BASIN

46°33'42"
119°30'21"

92081260-9CN
(PHOTO TAKEN 1992)

Please print or type in the unshaded areas only
(fill- in areas are spaced for elite type, i.e., 12 character/inch).

FORM **3**

DANGEROUS WASTE PERMIT APPLICATION

1. EPA/STATE I.D. NUMBER: W A 7 8 9 0 0 0 8 9 6 7

FOR OFFICIAL USE ONLY

APPLICATION APROVED	DATE RECEIVED *(mo., day, & yr.)*	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. if this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 1. EXISTING FACILITY (*See Instructions for definition of "existing" facility. Complete Item below.)*

MO.	DAY	YR.
03	22	43

*FOR EXISTING FACILITIES, PROVIDE THE DATE *(mo., day, & yr.)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*
* The date construction of the Hanford Facility commenced.

☐ 2. NEW FACILITY (*Complete Item below.)*

MO.	DAY	YR.

FOR NEW FACILITIES, PROVIDE THE DATE, *(mo., day, & yr.)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *9place an "X" below and complete Section I above)*

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT

☒ 2. FACILITY HAS A FINAL PERMIT

III. PROCESSES – CODES AND CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the codes(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the *(Section III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D82	*ACRES OR HECTARES*
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided: Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U

UNIT OF MEASURE	UNIT OF MEASURE CODE
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H

UNIT OF MEASURE	UNIT OF MEASURE CODE
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECATRES	Q

EXAMPLE FOR COMPLETING SECTION III *(shown in line numberS X-1 and X-2 below): A facility has two storage tanks; one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.*

LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
	T01	817,646	V		7				
–	S02	7,608,654	L		8				
3	S01	147,630	L		9				
4	T04	18,927	V		10				

CONTINUE ON REVERSE

Continued from the front.

III. PROCESSES (continued)

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (code "TO4"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

Construction of the 200 Area Effluent Treatment Facility (ETF) began in 1992. Waste management operations beg... ETF in November of 1995.

T04

Sludge that accumulates in the bottoms of ETF process tanks is removed periodically and placed into containers. The waste is solidified by decanting the supernate from the container and the remainder of the liquid is allowed to evaporate, or absorbents are added, as necessary, to address the residual liquid. The process design capacity for treatment of waste in containers is 18,927 liters per day.

IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER – Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER - Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.

2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.

3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. (enter code)				B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)			D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K	0	5	4	900	P	T 0 3	D 8 0		
X-2	D	0	0	2	400	P	T 0 3	D 8 0		
X-3	D	0	0	1	100	P	T 0 3	D 8 0		
X-4	D	0	0	2			T 0 3	D 8 0		included with above

 CONTINUE ON PAGE 3

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I. D. NUMBER *(entered from page 1)*

W	A	7	8	9	0	0	0	8	9	6	7

DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	D001	298,434,296	K	T01				Treatment-Tank
2	through							
3	D011							
4	D018							
5	D019							
6	D022							
7	D028							
8	through							
9	D030							
10	D033							
	through							
12	D036							
13	D038							
14	through							
15	D041							
16	D043							
17	F001							
18	through							
19	F005							
20	F039							
21	WT01							
22	WT02							Included with above
23	D001	30,433,326	K	S02				Storage-Tank
24	through							
	D011							
26	D018							

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I. D. NUMBER *(entered from page 1)*

W	A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	D019		K	S02				Storage-Tank (cont)
2	D022		↓	↓				↓
3	D028		↓	↓				↓
4	through		↓	↓				↓
5	D030		↓	↓				↓
6	D033		↓	↓				↓
7	through		↓	↓				↓
8	D036		↓	↓				↓
9	D038		↓	↓				↓
10	through		↓	↓				↓
11	D041		↓	↓				↓
12	D043		↓	↓				↓
13	F001		↓	↓				↓
14	through		↓	↓				↓
15	F005		↓	↓				↓
16	F039		↓	↓				↓
17	WT01		↓	↓				↓
18	WT02		↓	↓				Include with above
19	D001	1,986,735	K	S01				Storage-Container
20	through		↓	↓				↓
21	D011		↓	↓				↓
22	D018		↓	↓				↓
23	D019		↓	↓				↓
24	D022		↓	↓				↓
25								
26								

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I. D. NUMBER *(entered from page 1)*

W	A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	D028		K	S01				Storage-Container (cont)
2	through		↓	↓				↓
3	D030		↓	↓				↓
4	D033		↓	↓				↓
5	through		↓	↓				↓
6	D036		↓	↓				↓
7	D038		↓	↓				↓
8	through		↓	↓				↓
9	D041		↓	↓				↓
10	D043		↓	↓				↓
	F001		↓	↓				↓
12	through		↓	↓				↓
13	F005		↓	↓				↓
14	F039		↓	↓				↓
15	WT01		↓	↓				↓
16	WT02		↓	↓				Include with above
17	D001	81,310	K	T04				Treatment-Containers
18	through		↓	↓				↓
19	D011		↓	↓				↓
20	D018		↓	↓				↓
21	D019		↓	↓				↓
22	D022		↓	↓				↓
23	D028		↓	↓				↓
24	through		↓	↓				↓
	D030		↓	↓				↓
26								

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I. D. NUMBER *(entered from page 1)*

W	A	7	8	9	0	0	0	8	9	6	7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	D033		K	T04				Treatment-Containers (cont)
2	through							
3	D036							
4	D038							
5	through							
6	D041							
7	D043							
8	F001							
9	through							
10	F005							
11	F039							
12	WT01							
13	WT02							Included with above
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

Continued from the front.

IV. DESCRIPTION OF DANGEROUS WASTE (continued)

USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

FACILITY DRAWING Refer to attached drawing(s).

existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

PHOTOGRAPHS Refer to attached photograph(s).

All existing facilities must include photographs *(aerial or ground-level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION This information is provided on the attached drawings and photos.

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information," place an "X" in the box to the left and skip to Section XI below.

B. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
John D. Wagoner U.S. Department of Energy Richland Operations Office		5/22/98

OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

CONTINUE ON PAGE 5

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

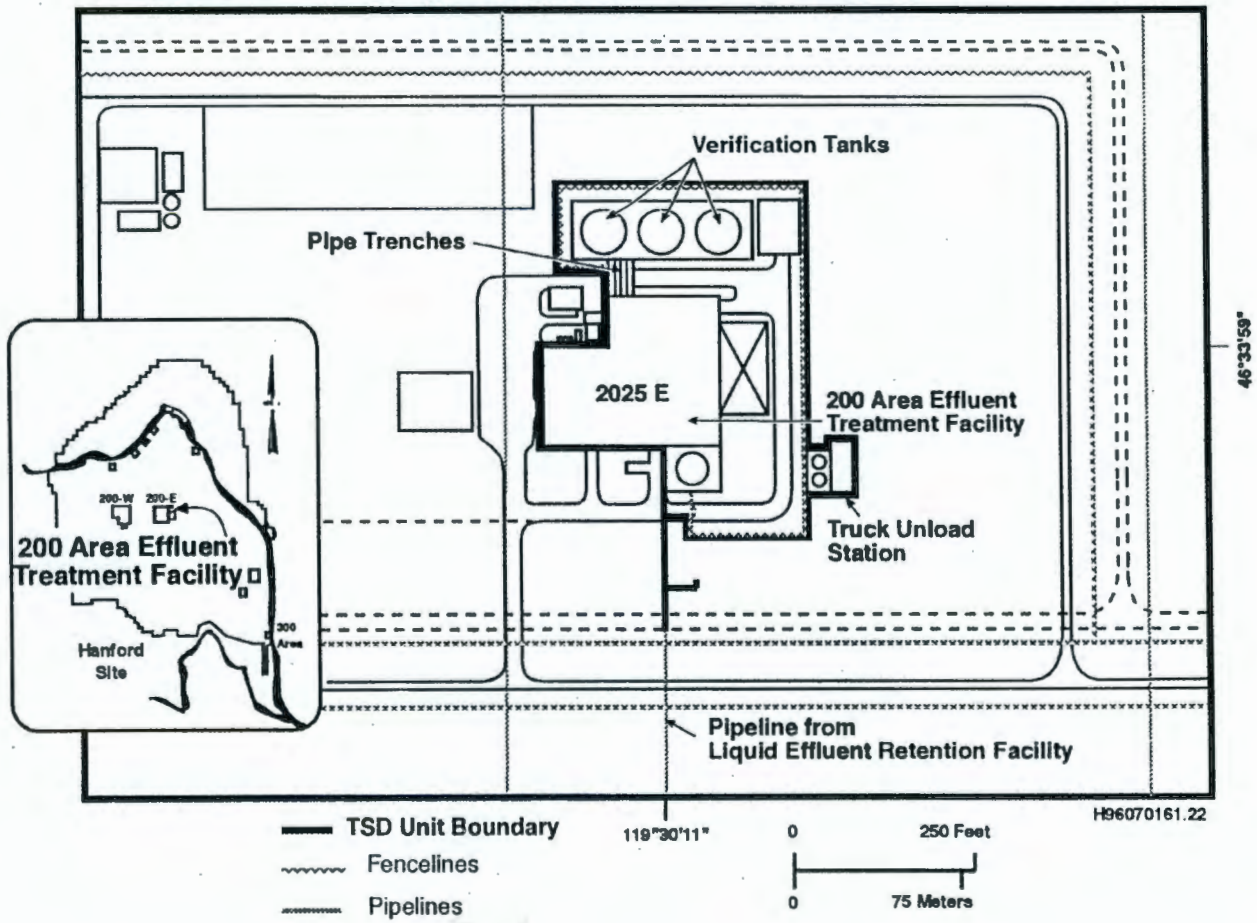
Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date 5/22/98

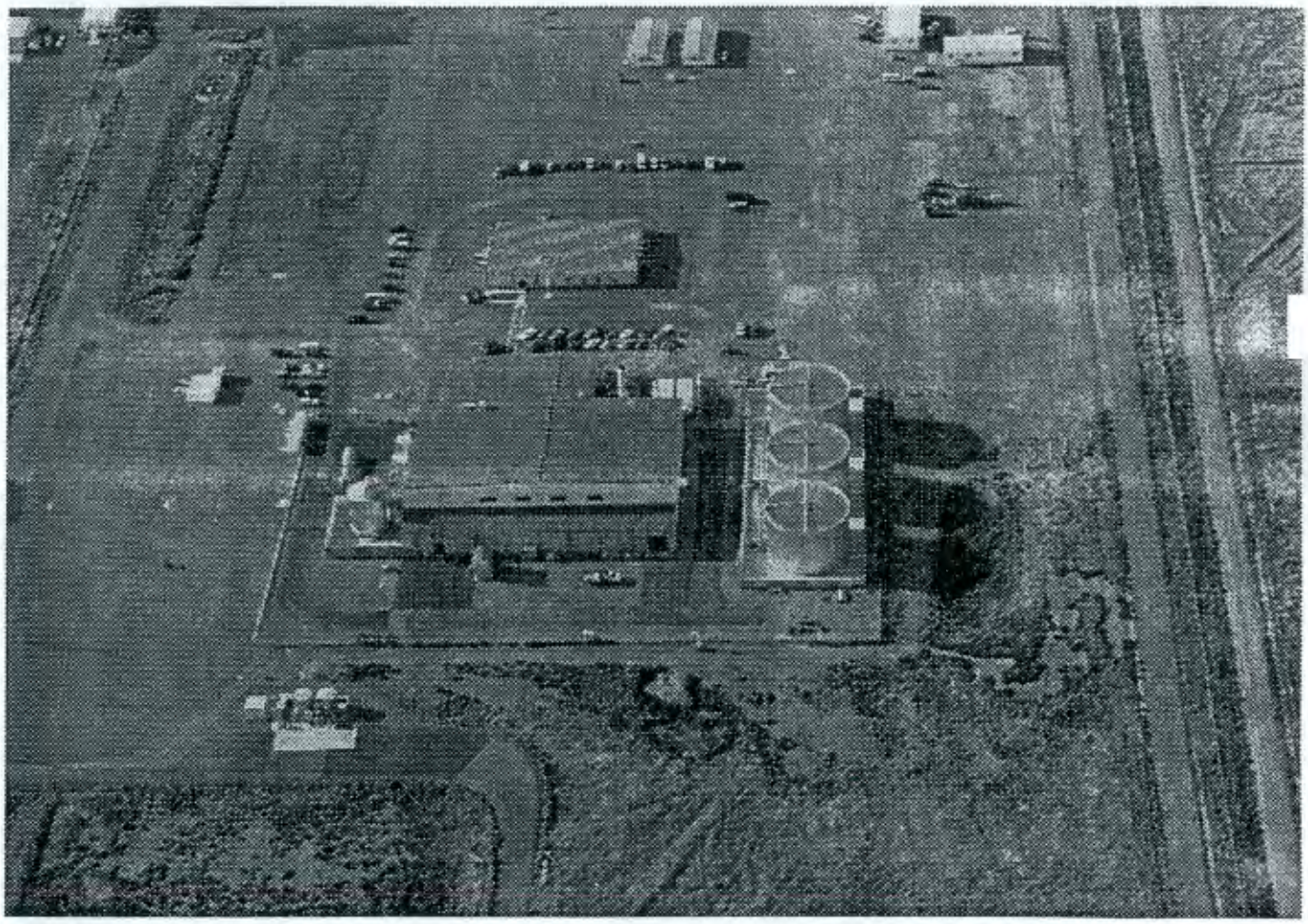
H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford, Inc.

Date May 14, 1998

200 Area Effluent Treatment Facility Site Plan



200 AREA EFFLUENT TREATMENT FACILITY



46°33'59"
119°30'11"

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(PHOTO TAKEN 1995)

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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 potentially other containers (such as drums). The Load-In Station consists of two load-in tanks, transfer pumps, level instrumentation for tanker trucks, leak detection capabilities for the containment basin and transfer line, and an underground transfer line that connects to either the ETF or LERF.

Currently, tanker trucks are used to unload aqueous waste at the Load-In Station. A 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 or directly to the 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 capabilities. 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 reagent feed 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, 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% H_2SO_4 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 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 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 (Mausshardt 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 (Mausshardt 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 and transfer pumps. 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 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. 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. Both the rough filter and fine filter are in leak-tight steel casings. A high differential pressure, which could damage the filter element, deactivates 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.

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 contain dangerous and/or mixed waste.

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

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.

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 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).

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Table 4-1. 200 Area Effluent Treatment Facility Tank Systems Information.
(sheet 1 of 2)

Tank Description	Material of Construction	Maximum Tank Capacity[1] liters	Inner diameter meters	Height meters	Shell Thickness[2] centimeters	Corrosion Protection[3]
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
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

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 Masonry 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 stability (% 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/1 atm. O_2)	90 min, minutes

Reference: Construction Specifications (KEH 1990b). Format uses NSF 54 table for high-density polyethylene as a guide (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.

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APPENDIX

7A BUILDING EMERGENCY PLAN FOR THE LIQUID EFFLUENT RETENTION FACILITY AND 200 AREA EFFLUENT TREATMENT FACILITY ..... APP 7A-i

TABLE

7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3) T7-1

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7.0 CONTINGENCY PLAN [G]

The WAC 173-303 requirements for a contingency plan are satisfied in the following documents: Portions of the *Hanford Emergency Response Plan* [Attachment 4 of the Hanford Facility RCRA Permit (DW Portion)] and portions of the *Building Emergency Plan for the Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility* (Appendix 7A).

The unit-specific building emergency plan also serves to satisfy a broad range of other requirements [e.g., Occupational Safety and Health Administration standards (29 CFR 1910), TSCA (40 CFR 761) and U.S. Department of Energy Orders]. Therefore, revisions made to portions of this contingency plan document that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to WAC 173-303-830 or Hanford Facility RCRA Permit (DW Portion) Condition I.C.3. Table 7-1 identifies which portions of the Building Emergency Plan are written to meet WAC 173-303 contingency plan requirements.

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Table 7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3). (sheet 1 of 2)

Requirement	Attachment 4 of the HF RCRA Permit (DW Portion).	Building Emergency Plan
-350(3)(a) - A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360.	X[1] Section 1.3.2	X[1] Section 7.1 through 7.3
-350(3)(b) - A description of the actions which shall 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.	X[1] Section 1.3.2	X[1,2] Section 7.2
-350(3)(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).	X Table 3-1	
-350(3)(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.		X[3] Section 13.0
-350(3)(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.	X Hanford Fire Department: Appendix C	X Section 9.0

Table 7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3). (sheet 2 of 2)

Requirement	Attachment 4 of the HF RCRA Permit (DW Portion).	Building Emergency Plan
-350(3)(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.	X[4] Figure 5-2	X[5] Section 1.5

[1]The *Hanford Emergency Response Plan* contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional description of actions are required if emergency planning activities are addressed. If other credible scenarios exist or if emergency procedures at the unit are different, the language contained in the Building Emergency Plan will be used during an event by a Building Emergency Director.

[2]This requirement only applies to TSD units which receive shipment of dangerous or mixed waste defined as off-site shipments in accordance with WAC 173-303.

[3]Emergency Coordinator names and home telephone numbers are maintained separate from any 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.

[4]The Hanford Facility (sitewide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

[5]An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

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14.0 PART B CERTIFICATION [K]
Modification D 14-3

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14.0 PART B CERTIFICATION [K]
Modification D

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

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date 5/22/98

Co-operator*
H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford Company

Date May 14, 1998

Note: This certifies the following: Chapter 1.0 (Part A), Revision 0A; Chapter 4.0 (Process Information), Revision 0A, Chapter 7.0 (Contingency Plan), Revision 0A; Appendix 3A (Waste Analysis Plan for Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility), Revision 0A; Appendix 7A (Building Emergency Plan for 200 Area Effluent Treatment Facility and Liquid Effluent Retention Facility, HNF-IP-0263-ETF), Revision 4.

* Fluor Daniel Hanford, Inc. is responsible for information presented in Chapters 1.0 through 4.0 and 6.0 through 15.0, including the associated appendices.

APPENDIX 3A

WASTE ANALYSIS PLAN FOR LIQUID EFFLUENT RETENTION FACILITY AND 200 AREA EFFLUENT TREATMENT FACILITY

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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

In accordance with the federal and state regulations set forth in 40 Code of Federal Regulations (CFR) 264.13 and in Washington State Department of Ecology (Ecology) *Dangerous Waste Regulations*, Washington Administrative Code (WAC) 173-303-300, this waste analysis plan (WAP) has been prepared for operation of the Liquid Effluent Retention Facility (LERF) and the 200 Area Effluent Treatment Facility (ETF) located in the 200 East Area on the Hanford Site, Richland, Washington.

The purpose of this WAP is to document the sampling and analytical methods, and describe the procedures which are utilized for all dangerous wastes that are managed in the specific treatment storage, and disposal (TSD) units identified in the Part A, Form 3, permit application for the LERF and the ETF (DOE/RL-97-03). This WAP also documents the requirements for generators of aqueous wastes that will be sent to the LERF or ETF for treatment. Throughout this WAP, the term generator includes any Hanford Site unit, including TSD units, whose process produces an aqueous waste.

The TSD units include a surface impoundment (LERF) which provides treatment and storage, a tank system at the ETF which provides treatment and storage, and a container management area at the ETF which provides drum storage and treatment. Additionally, this WAP discusses the sampling and analytical methods the treated effluent (treated aqueous waste) that is discharged from the ETF as a non-dangerous, delisted waste to the State-Approved Land Disposal Site (SALDS). Specifically, the WAP delineates the following:

- Influent Waste Acceptance Process - determines the acceptability of a particular aqueous waste at the LERF or ETF pursuant to applicable permit conditions, regulatory requirements, and operating capabilities prior to acceptance of the waste at the LERF or ETF for treatment or storage. See Section 2.0.

- Special Management Requirements - identifies the special management requirements for aqueous wastes managed in the LERF or ETF.
  See Section 3.0.

- Influent Aqueous Waste Sampling and Analysis - describes influent sampling and analyses used to characterize an influent aqueous waste to ensure proper management of the waste and for compliance with the special management requirements. Also includes rationale for analyses. See Section 4.0.

- Treated Effluent Sampling and Analysis - describes sampling and analyses of treated effluent (i.e., treated aqueous waste) for compliance with State Waste Discharge Permit (Ecology 1995a) and Final Delisting [40 CFR 261, Appendix IX, Table 2 (EPA, 1995)] limits. Also includes rationale for analyses. See Section 5.0.

- ETF Generated Waste Sampling and Analysis - describes the sampling analyses used to characterize the secondary waste streams generated from the treatment process and to characterize waste generated from maintenance and operations activities . Also includes rationale for analyses. See Section 6.0.

- Quality Assurance and Quality Control - ensures the accuracy and precision of sampling and analysis activities. See Section 7.0.

This WAP is designed to meet the specific requirements of the following:

- Land Disposal Restrictions Treatment Exemption for the LERF under 40 CFR 268.4, U.S. Environmental Protection Agency, December 6, 1994 (Appendix C)

- Final Delisting for the ETF, 40 CFR 261, Appendix IX, Table 2 (EPA 1995)

- Washington State Waste Discharge Permit, No. ST 4500, as amended, (Ecology 1995a)

- *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, Hanford Facility Permit WA7890008967, September 28, 1994 (Ecology 1994).

This plan also was designed to include the specific elements of a WAP, as identified in the *Dangerous Waste Permit Application Requirements* (Ecology 1996a). Groundwater monitoring is addressed in separate plans. A copy of this WAP will be available at the ETF at all times.

Throughout this WAP, reference is made to radioactive waste. Although the treatment and storage 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 the *Resource Conservation and Recovery Act* (RCRA) *of 1976*, as amended or WAC 173-303, information is provided for general knowledge where appropriate. Additionally, the conditions of the Washington State Discharge Permit, No. ST 4500 (Discharge Permit) are included in this WAP for completeness, though they also are not within the scope of RCRA or WAC 173-303. Therefore, revisions of this WAP that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to review or approval by Ecology. However, any revisions to this WAP will be incorporated into the Hanford Dangerous Waste Permit at least annually through the modification process.

1.1 LIQUID EFFLUENT RETENTION FACILITY AND EFFLUENT TREATMENT FACILITY DESCRIPTION

The LERF and ETF comprise an aqueous waste treatment system located in the 200 East Area (Figure 1-1). Both LERF and the ETF may receive aqueous waste through several inlets. 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. The Load-In Station is located just east of the ETF and currently consists of two 37,854-liter storage tanks and a pipeline that connects to either LERF or the ETF through fiberglass pipelines with secondary containment.

The LERF can receive aqueous waste through four inlets. First, aqueous waste can be transferred to LERF through a pipeline from the 200 West Area. Second, aqueous waste can be transferred through a pipeline that connects LERF with the 242-A Evaporator. Third, aqueous waste also can be transferred to LERF from a pipeline that connects LERF to the Load-In Station at the ETF. Finally, aqueous waste can be transferred into LERF through a series of sample ports located at each basin.

The LERF consists of three lined surface impoundments with a nominal capacity of 29.5 million liters each. Aqueous waste from LERF is pumped to the ETF through a double-walled fiberglass pipeline. The pipeline is equipped with leak detection located in the annulus between the inner and outer pipes. 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 waste receipt piping, 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. Detailed information on the construction and operation of the LERF is provided in Chapter 4.0 of the *Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility* (DOE/RL-97-03).

The ETF was designed to treat the contaminants anticipated in process condensate (PC) from the 242-A Evaporator and other aqueous wastes from the Hanford Site. Section 1.2 provides more information on the sources of these wastes.

The capabilities of the ETF were confirmed through pilot plant testing. A pilot plant was used to test surrogate solutions that contained constituents of concern anticipated in aqueous wastes on the Hanford Site. The pilot plant testing served as the basis for a demonstration of the treatment capabilities of the ETF in the *200 Area Effluent Treatment Facility Delisting Petition* (DOE/RL-92-72). The pilot plant test data also were used to establish that the ETF provides 'best available treatment and all known, available, and reasonable methods of treatment' (BAT/AKART), as required in the permitting of the ETF under the state water quality and wastewater discharge permit regulations (WAC 173-200 and WAC 173-216, respectively).

The ETF consists of a primary and a secondary treatment train (Figure 1-2). The primary treatment train removes or destroys dangerous and mixed waste components from the aqueous waste. In the secondary treatment train, the waste components are concentrated and dried into a powder. This waste is containerized, and transferred to a waste treatment, storage, and/or disposal (TSD) unit.

Each treatment train consists of a series of operations. The primary treatment train includes the following:

- Surge tank
- Rough filter
- Ultraviolet light oxidation (UV/OX)
- pH adjustment
- Hydrogen peroxide decomposer
- Fine filter
- Degasification
- Reverse osmosis (RO)
- Polisher [ion exchange (IX) column]
- Final pH adjustment and verification.

The secondary treatment train uses the following systems:

- Secondary waste receiving tanks
- Evaporator (mechanical vapor recompression)
- Concentrate tank
- Thin film dryer

- Container handling
- Supporting systems.

A dry powder waste is generated from the secondary treatment train, from the treatment of an aqueous waste. The secondary waste treatment system typically receives and processes by-products generated from the primary treatment train. However, in an alternate operating scenario, some aqueous wastes may be fed to the secondary treatment train before the primary treatment train. Detailed information on the treatment trains and the unit operations is provided in Chapter 4.0 of the dangerous waste permit application for the LERF and ETF (DOE/RL-97-03).

The treated effluent is contained in verification tanks where the effluent is sampled [PERMIT REQUIRED CHANGE], and held until the analytical results confirm that the effluent meets the 'delisting' criteria. Under 40 CFR 261, Appendix IX, Table 2, the treated effluent from the ETF is considered a delisted waste; that is, the treated effluent is no longer a dangerous or hazardous waste subject to the hazardous waste management requirements of RCRA. The treated effluent is discharged under the Discharge Permit as a nondangerous, delisted waste to the SALDS, located in the 600 Area, north of the 200 West Area (Figure 1-1).

1.2 SOURCES OF AQUEOUS WASTE

The ETF was intended and designed to treat a variety of radioactive and/or aqueous mixed wastes. However, during the initial phases of developing the dangerous waste permit application for the LERF and ETF, PC from the 242-A Evaporator was the only mixed waste identified for storage and treatment in the LERF and the ETF. As cleanup activities at Hanford progress, many of the aqueous wastes generated from site remediation and waste management activities will be sent to the LERF and ETF for treatment and storage.

The PC is a dangerous waste because it is derived from a listed, dangerous waste stored in the Double-Shell Tank (DST) System and because of the ammonia content. The DST waste is transferred to the 242-A Evaporator where the waste is concentrated through an evaporation process. The concentrated slurry waste is returned to the DST System, and the evaporated portion of the waste is recondensed, collected, and transferred as PC to the LERF.

Other aqueous wastes that will be treated and stored at the LERF and ETF include, but are not limited to the following Hanford wastes: 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.

Most of these aqueous wastes will be accumulated in batches in a LERF basin for interim storage and treatment through pH and flow equalization before final treatment in the ETF. However, some aqueous wastes, such as 200-UP-1 Groundwater, may flow through LERF en route to the ETF for final treatment. The constituents in these aqueous wastes are common to the Hanford Site and were considered in pilot plant testing or in vendor tests, either as a constituent or as a family of constituents.

Some of the aqueous wastes could contain tritium, a radioactive isotope of hydrogen. Because there is no economically, viable treatment technology available to remove tritium, tritium is not reduced in the treated effluent discharged to the SALDS.

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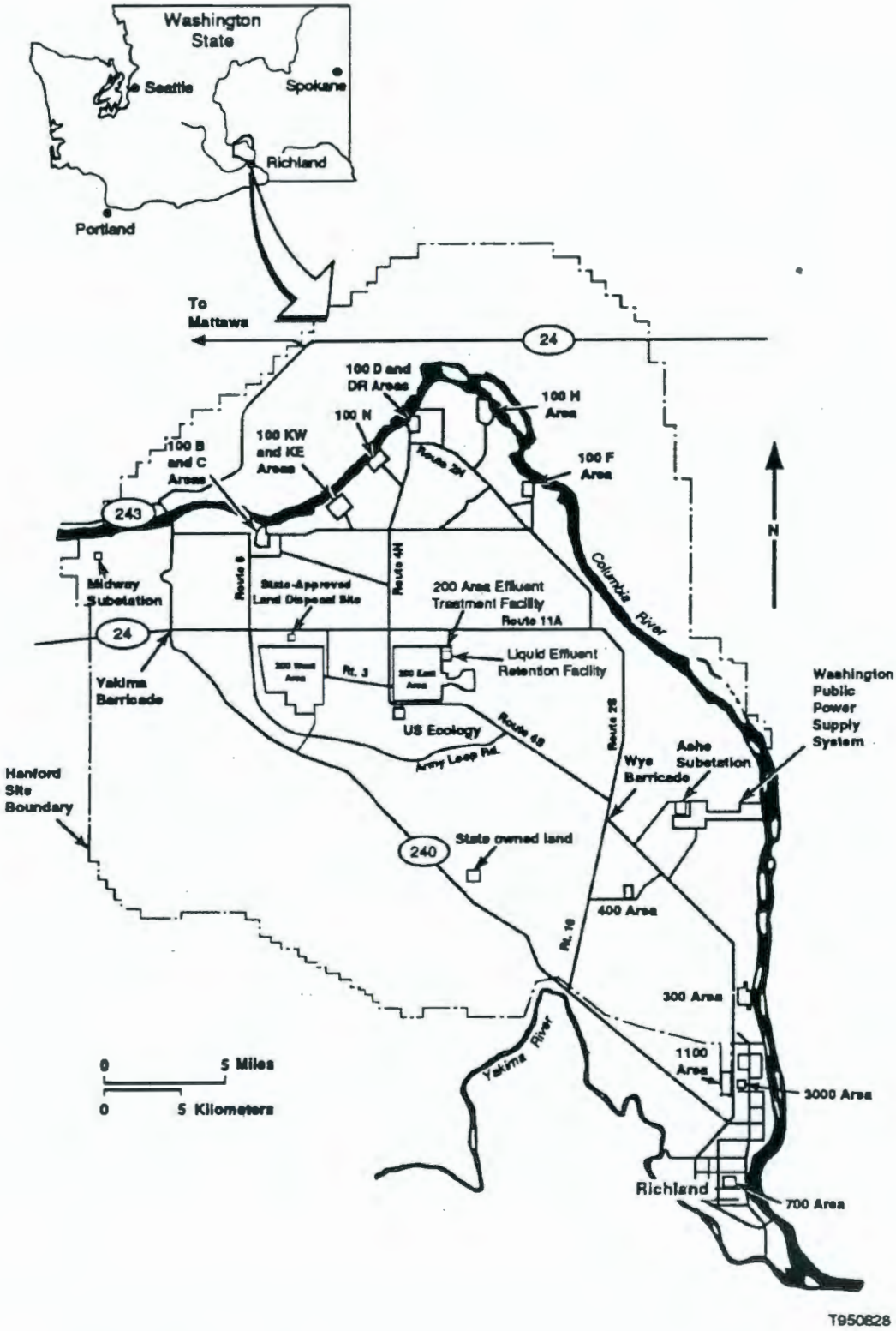

Figure 1-1. Location of the Liquid Effluent Retention Facility, the 200 Area Effluent Treatment Facility, and the State-Approved Land Disposal Site.

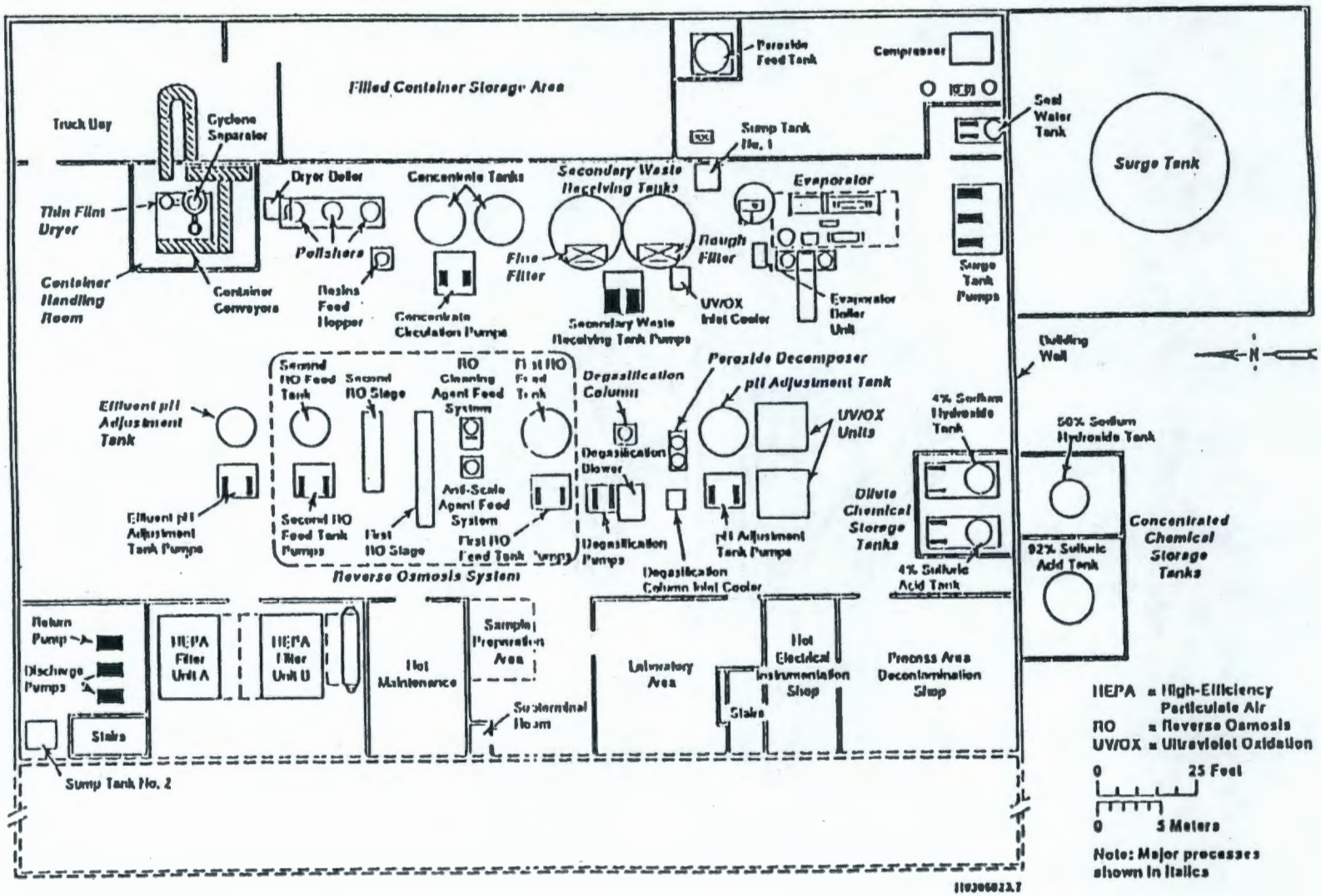

Figure 1-2. 200 Area Effluent Treatment Facility Floor Plan.

2.0 INFLUENT WASTE ACCEPTANCE PROCESS

Throughout the acceptance process, there are certain criteria that must be met for an influent waste (i.e., aqueous waste) to be accepted. These criteria are identified in the following sections and summarized in Table 2-2. It should be noted that if an aqueous waste initially does not meet these criteria, it is not necessarily rejected. In many instances, the ETF process or the LERF and ETF permits can be modified to accommodate the treatment and storage of that waste. A discussion of the re-evaluation process is provided in Section 2.3.

The first step in the waste acceptance process is for the generator to provide information on the influent waste stream. At this stage, the generator will work with LERF/ETF personnel to define what information must be provided to determine the acceptability of an aqueous waste for the treatment, storage, or disposal at the LERF and the ETF. At a minimum, the information required by WAC 173-303-300(2) will be obtained, which includes sampling and analysis of the aqueous waste stream. The LERF/ETF management will evaluate, on a case-by-case basis, whether the aqueous waste stream is acceptable for storage and treatment. The waste acceptance process contains the following steps.

Acceptance Process is performed as follows.

- Waste information--the generator of an aqueous waste works with LERF/ETF personnel to provide detailed information on the waste stream, i.e., a waste characterization.

- Waste management decision process--LERF/ETF management decision is based on a case-by-case evaluation of whether an aqueous waste stream is acceptable for treatment or storage, or whether to reject a stream. In addition, any special management practices required for an accepted stream may be specified at this time. The evaluation is divided into two categories.

  - **Regulatory acceptability**--a review to determine if there are any regulatory concerns that would prohibit the storage or treatment of an aqueous waste in the LERF or ETF; e.g., treatment would meet permit conditions that would be in compliance with applicable regulations.

  - **Operational acceptability**--an evaluation to determine if there are any operational concerns that would prohibit the storage or treatment of an aqueous waste in the LERF or ETF; e.g., determine treatability and compatibility or safety considerations.

  Specific waste acceptance criteria are defined within the individual discussions on regulatory and operational acceptability.

Re-evaluation Process is performed to ensure the characterization is accurate and current. This process also provides a mechanism for re-evaluating an aqueous waste stream that does not meet the waste acceptance criteria.

Record Information/Decision Process--provides that information used in the decision, the evaluation, and the decision are documented as part of the ETF Operating Record.

2.1 ACCEPTANCE PROCESS

When an aqueous waste stream is identified for treatment or storage in the LERF or ETF, the generator is required to characterize the waste and document the characterization on an aqueous waste profile sheet (WPS). This requirement is the first waste acceptance criterion. The LERF and the ETF personnel work with the generators to ensure that the necessary information is collected for the characterization of a waste stream (i.e., the appropriate analyses or adequate process knowledge), and that the information provided on the WPS is complete. The completed WPS is maintained at the ETF.

2.1.1 Waste Characterization

Because the constituents in the individual aqueous waste streams vary, each stream is characterized and evaluated for acceptability on a case-by-case basis. The generator is required to designate an aqueous waste which generally will be backed up by analytical data. However, a generator may use process knowledge to substantiate the waste designation, or for general characterization information. Examples of acceptable process knowledge include the following:

- Documented data or information on processes similar to that which generated the aqueous waste stream
- Information/documentation that dangerous waste constituents are from specific, well documented processes, e.g., F-listed wastes
- Information/documentation that sampling/analyzing a waste stream would pose health and safety risks to personnel
- Information/documentation that the waste does not lend itself to collecting a laboratory sample.

When a generator submits process knowledge for the characterization of a dangerous and/or mixed waste stream, the process knowledge is reviewed by LERF and ETF personnel as part of the waste acceptance process. Specifically, LERF and ETF personnel review the generator's processes to verify the integrity of the process knowledge, and determine whether the process knowledge is current and consistent with current regulations. The final decision on the adequacy of the process knowledge is determined by LERF/ETF management or their designee. The persons reviewing generator process knowledge and those making decisions on the adequacy of process knowledge are trained according to the requirements of the Dangerous Waste Training Plan [Chapter 8.0 of the dangerous waste permit application for the LERF and ETF (DOE/RL-97-03)].

The generator is also responsible for identifying those Land Disposal Restrictions (LDR) that would be applicable to the influent aqueous waste as part of the characterization, as require under 40 CFR 268.40 and WAC 173-303-140. Because the ETF is a Clean Water Act - equivalent TSD unit (40 CFR 268.37(a)), the generator is not required to identify the underlying hazardous constituents (40 CFR 286.48).

When analyzing an aqueous waste stream for characterization, a generator is required to use the target list of parameters identified in Table 4-1 (Section 4.0). The corresponding analytical methods are provided in Appendix B. The generator may use process knowledge in lieu of some analyses, as determined by LERF/ETF management or their designee, if the process knowledge is adequate (as described above). For

example, if a generator provides information that the process generating an aqueous waste does not include or involve organic chemicals, analyses for organic compounds likely would not be required. Additional analyses could be required if historical information and/or process knowledge indicate that an aqueous waste contains constituents not included in the target list of parameters.

The LERF and ETF personnel will work with the generator to determine which analyses are appropriate for the characterization. This approach ensures that the waste analyses adequately characterize the aqueous waste and defines the constituents of concern in a cost effective manner. The characterization and historical information are documented in the WPS, which is discussed in the following section.

2.1.2 Aqueous Waste Profile Sheet

The WPS documents the characterization of each new aqueous waste stream. The profile includes a detailed description of the volume, source, regulatory history, and the chemical and physical nature of the aqueous waste. For an aqueous waste to be accepted for treatment or storage in the LERF or the ETF, each new waste stream generator is required to complete and provide this form to LERF and ETF. Each generator also is required to provide the analytical data and process knowledge used to designate the aqueous waste stream, and to determine the chemical and physical nature of the waste. An example of a typical WPS is provided in Appendix A. This form could be modified to accommodate changes in regulations, operational concerns at the LERF or ETF, Hanford Facility needs, or other needs. However, the basic elements of the example form (e.g., waste source information) will be maintained in any future revision.

The LERF and the ETF management determine whether the information on the WPS is sufficient. The LERF and ETF management use this information to evaluate the acceptability of the aqueous waste for storage and treatment in the LERF and the ETF, and to determine if the aqueous waste can be handled properly.

2.2 WASTE MANAGEMENT DECISION PROCESS

All aqueous waste under consideration for acceptance must be characterized using analytical data and process knowledge. This information is used to determine the acceptability of an aqueous waste stream. The LERF and ETF Facility Manager or their designee is responsible for making the decision to accept or reject an aqueous waste stream. The management decision to accept any aqueous waste stream is based on an evaluation of regulatory acceptability and operational acceptability. Each evaluation uses acceptance criteria, which were developed to ensure that an aqueous waste is managed in a safe, environmentally sound and compliant manner. The following sections provide detail on the acceptance evaluation and the acceptance criteria.

In many instances, an aqueous waste that does not meet one of the waste acceptance criteria is not necessarily rejected. Section 2.3 discusses the process for re-evaluating an aqueous waste that does not initially meet the waste acceptance criteria. However, the final decision to reject an aqueous waste is made by LERF and ETF management. An aqueous waste stream could be rejected for one of the following reasons:

- The paperwork and/or laboratory analyses from the generator are insufficient

- Discrepancies with the regulatory and operational acceptance criteria cannot be reconciled, including:

  - An aqueous waste is not allowed under the current Discharge Permit or Final Delisting, and LERF/ETF management elect not to pursue an amendment, or the permit and Delisting cannot be amended (Section 2.2.1)

  - An aqueous waste is incompatible with LERF liner materials or with other aqueous waste in LERF and no other management method is available (2.2.2).

- Adequate storage or treatment capacity is not available.

2.2.1 Regulatory Acceptability

Each aqueous waste stream is evaluated on a case-by-case basis to determine if there is any regulatory concerns that would preclude the storage or treatment of a waste in the LERF or the ETF. Before an aqueous waste can be treated in either the LERF of the ETF, the regulatory history must be determined. Information on the regulatory history of an aqueous waste is documented in the WPS. This information is used to confirm that treating or storing the aqueous waste in the LERF or the ETF is allowed under and in compliance with WAC 173-303, dangerous waste permit application for the LERF and ETF, the Final Delisting for the ETF, and the Discharge Permit for the ETF.

2.2.1.1 Dangerous Waste Regulations/Permits. Before an aqueous waste stream is sent to the LERF or the ETF, the generator will characterize and designate the stream with the appropriate dangerous/hazardous waste numbers according to WAC 173-303-070. The Part A, Form 3, permit applications for the LERF and the ETF, and the Final Delisting for the ETF identify the specific waste numbers for dangerous/mixed waste that can be managed in the LERF and the ETF. Dangerous waste designated with waste numbers not specified in the Part A, Form 3, permit applications can not be treated or stored in the LERF or the ETF, until the Part A, Form 3, permit application is modified.

Additionally, aqueous wastes designated with listed waste numbers identified in the Final Delisting will be managed in accordance with the conditions of the delisting, or an amended delisting. Accordingly, the acceptance criteria in this evaluation are satisfied through compliance with the Part A, Form 3, permit applications and the Final Delisting.

2.2.1.2 State Waste Permit Regulations/Permit. Compliance with the Discharge Permit constitutes another waste acceptance criterion. In accordance with the conditions of the Discharge Permit, the constituents of concern in each new aqueous waste stream must be identified. The regulatory history and characterization data provided by the generator are used to identify these constituents. A constituent of concern, under the conditions of the Discharge Permit, in an aqueous waste stream is defined as any contaminant with a maximum concentration greater than one of the following:

- Any limit in the Discharge Permit (Ecology 1995a)
- Groundwater Quality Criteria (WAC 173-200)
- Final Delisting levels (EPA 1995)
- Background groundwater concentrations as measured at the ETF disposal site.

The conditions of the Discharge Permit also require a demonstration that the ETF can treat the constituents of concern to below discharge limits.

2.2.2 Operational Acceptability

Because the operating configuration or operating parameters at the LERF and ETF can be adjusted or modified, most aqueous waste streams generated on the Hanford Site can be effectively treated to below Delisting and Discharge Permit limits. Because of this flexibility, it would be impractical to define numerical acceptance or decision limits. Such limits would constrain the acceptance of appropriate aqueous waste streams for treatment at the LERF and ETF. The versatility of the LERF and ETF is better explained in the following examples:

- The typical operating configuration of the ETF is to process an aqueous waste through the UV/OX unit first, followed by the RO unit. However, high concentrations of nitrates may interfere with the performance of the UV/OX. In this case, the ETF could be configured to process the waste in the RO unit prior to the UV/OX unit.

- For a small volume aqueous waste with high concentrations of some anions and metals, the approach may 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 send to the primary treatment train.

- An aqueous waste with high concentrations of chlorides and fluorides may 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 may be to blend this aqueous waste in a LERF basin with another aqueous waste which has sufficient dissolved solids, such that the concentration of the chlorides in the secondary treatment train would not pose a corrosion concern.

- Some metal salts (e.g., barium sulfate) tend to scale the RO membranes. In this situation, descalants used in the treatment process may be increased.

- Any effluent that does not meet these limits in one pass through the ETF treatment process is recycled to the ETF for re-processing.

There are, however, some aqueous wastes whose chemical and physical properties would preclude that waste from being treated or stored at the LERF or ETF. Accordingly, an aqueous waste is evaluated to determine if it is treatable, if it would impair the efficiency or integrity of the LERF or ETF, and if it is compatible with materials in these units. This evaluation also determines if the aqueous waste is compatible with other aqueous wastes(s) managed in the LERF.

The waste acceptance criteria in this category focus on determining treatability of an aqueous waste stream, and on determining any operational concerns that would prohibit the storage or treatment of an aqueous waste stream in the LERF or the ETF. The chemical and physical properties of an aqueous waste stream are determined as part of the waste characterization, and are documented on the WPS and compared to

the design of the units to determine whether an aqueous waste stream is appropriate for storage and treatment in the LERF and the ETF.

2.2.2.1 Treatability. The process of determining treatability involves two steps. The first step is to establish the treatment efficiencies for the constituents of concern in an influent aqueous waste. The treatment efficiencies must be sufficient such that the treated effluent will meet the Discharge Permit and Delisting limits. The pilot plant testing provided destruction and removal (i.e., treatment) efficiencies for most of the anticipated constituents in aqueous waste streams at the Hanford Site, and are documented in the *200 Area Effluent Treatment Facility Delisting Petition* (DOE/RL-92-72). Information or studies from the vendors of the individual treatment units studies may also be used on a case-by-case basis to develop treatment efficiencies for the ETF or for the individual treatment units. [Chapter 4.0 of the dangerous waste permit application for the LERF and ETF (DOE/RL-97-03) provides a detailed discussion of the individual treatment units.] Treatment efficiencies also may be determined or confirmed by ETF operating data.

The second step in determining treatability is to identify those physical and chemical properties in an aqueous waste that would interfere with, or foul the ETF treatment process. This step focuses on the potential of a waste stream to interfere with the destruction efficiency of organic compounds in the UV/OX system, rejection rates of the RO membranes, or foul the filtration systems. Generally, the operating parameters or operating configuration at the LERF or ETF can be adjusted or modified to accommodate these properties. However, in those cases where a treatment process or operating configuration cannot be modified, the aqueous waste stream will be excluded from treatment or storage at the LERF or ETF.

Additionally, an aqueous waste stream is evaluated for the potential to deposit solids in a LERF basin (i.e., an aqueous waste which contains sludge). This evaluation will also consider the whether blending or mixing two or more aqueous waste streams will result in the formation of a precipitate. However, because the waste streams managed in the LERF and ETF are generally dilute, the potential for mixing waste streams an forming a precipitate is low, no specific compatibility tests are performed. If necessary, filtration at the waste source could be required before acceptance into LERF.

To determine if an aqueous waste meets the criterion of treatability, specific information is required. Treatment efficiencies will be developed from characterization data provided by the generator. Generators will also provide characterization data to identify those physical and chemical properties that would interfere with, or foul the ETF treatment process. In some instances, process knowledge may be adequate to identify a chemical or physical property that would be of concern. For example, the generator could provide process knowledge that the stream has two phases (an oily phase and an aqueous phase). In this case, if the generator could not physically separate the two phases, the aqueous waste stream would be rejected because the oily phase could compromise some of the treatment equipment. Typically, analyses for the following parameters are required to evaluate treatability and operational concerns:

- total dissolved solids
- total organic carbon
- total suspended solids
- magnesium
- potassium
- barium
- nitrate
- sulfate
- manganese
- specific conductivity
- pH.
- calcium
- sodium
- silica
- iron
- chloride
- aluminum
- phosphate

- bromide
- gross beta
- gross alpha
- gamma.

These constituents are identified in Table 2-2.

2.2.2.2 Compatibility.

Corrosion Control. Because of the materials of construction used in the ETF, corrosion is generally not a concern with new aqueous waste streams. Additionally, these waste streams are managed in a manner that minimizes corrosion. To ensure that a waste will not compromise the integrity of the ETF tanks and process equipment, each waste stream is assessed for its corrosion potential as part of the compatibility evaluation. This assessment usually focuses on chloride and fluoride concentrations; however, the chemistry of each new waste also is evaluated for other parameters that could cause corrosion.

Compatibility with Liquid Effluent Retention Facility Liner and Piping. As part of the acceptance process, the criteria of compatibility with the LERF liner materials is evaluated for each aqueous waste stream. The evaluation for liner compatibility is documented as part of the waste acceptance process. The chemical parameters or constituents considered for liner compatibility are identified in Table 2-1. The analytical methods for these parameters and constituents are provided in Appendix B.

The high-density polyethylene liners in the LERF basins potentially are vulnerable to the presence of certain constituents that might be present in some aqueous waste. Using EPA Method 9090 (EPA 1996), the liner materials were tested to evaluate compatibility between aqueous waste stored in the LERF and synthetic liner components. Based on the data from the compatibility test and vendor data on the liner materials, several constituents and parameters were identified as potentially harmful (at high concentrations) to the integrity of the liners. From these data and the application of safety factors, concentration limits in Table 2-1 were established.

Except for PC, the strategy for protecting the integrity of a LERF liner is to establish upfront that an aqueous waste is compatible before the waste is accepted into LERF. Characterization data on each new aqueous waste stream are compared to the limits outlined in Table 2-1 to ensure compatibility with the LERF liner material before acceptance into the LERF.

PC from each 242-A Evaporator campaign is sampled and analyzed, and the results compared to the limits in Table 2-1 to ensure continued compatibility with the liner. Additionally, before a waste stream is processed at the 242-A Evaporator, DST analytical data are reviewed and administrative and process controls developed and implemented to ensure that PC is compatible with the LERF liner. For flow-through aqueous wastes like the 200-UP-1 Groundwater, characterization data will be reviewed quarterly to ensure that liner compatibility is maintained.

In some instances, process knowledge may be adequate to determine that an aqueous waste is compatible with the LERF liner. In those instances where process knowledge is adequate, the waste characterization would likely not require analysis for these parameters and constituents.

Compatibility with Other Waste. Some aqueous wastes, especially small volumes, are accumulated in the LERF with other aqueous waste. Before acceptance into the LERF, the aqueous waste stream is evaluated for its compatibility with the resident aqueous waste(s). The evaluation focuses on the potential for an aqueous waste to react with another waste (40 CFR 264, Appendix V, "Examples of Potentially Incompatible

Wastes"). Though the potential for problems associated with commingling aqueous wastes is very low, this evaluation confirms the compatibility of two or more aqueous wastes from different sources. No specific analytical test for compatibility is performed.

If it is determined that an aqueous waste stream is incompatible with other aqueous waste streams, alternate management scenarios are available. For example, another LERF basin that contains a compatible aqueous waste(s) might be used, or the aqueous waste stream might be fed directly into the ETF for treatment. In any case, potentially incompatible waste streams are not mixed, and all aqueous waste is managed in a way that precludes a reaction, degradation of the liner, or interference with the ETF treatment process.

2.3 RE-EVALUATION PROCESS

In accordance with 40 CFR 264.13 and WAC 173-303-300(4)(a), an influent aqueous waste will be re-evaluated as necessary to ensure that the characterization is accurate and current. At a minimum, an aqueous waste stream will be re-evaluated in the following situations.

- The LERF and the ETF management has been notified, or has reason to believe that the process generating the waste has changed.

- The LERF and the ETF management notes a increase or decrease in the concentration of a constituent in an aqueous waste stream, beyond the range of concentrations that was described or predicted in the waste characterization.

In these situations, LERF and ETF management will review the available information. If existing analytical information is not sufficient, the generator may be asked to review and update the current waste characterization, to supply a new WPS, or re-sample and re-analyze the aqueous waste, as necessary. Other situations that might require a re-evaluation of a waste stream are discussed in the following sections.

2.3.1 Re-Evaluation for Aqueous Wastes not Meeting Waste Acceptance Criteria

An aqueous waste that does not meet one of the acceptance criteria is not necessarily rejected. Several options are available in the event that an aqueous waste is not acceptable following an initial evaluation. For example, a more extensive evaluation could be required to determine if the ETF process can be modified to treat an aqueous waste to required discharge levels. Additionally, a more extensive evaluation might be required to determine if a modification of the Discharge Permit or the Final Delisting is required and is feasible (e.g., to treat waste with new listed waste numbers).

2.3.2 Re-Evaluation for Treated Effluent not Meeting 200 Area Effluent Treatment Facility Permit Limits

If the treated effluent does not meet the Discharge Permit and Delisting limits in one pass through the ETF treatment process, the acceptability of the influent aqueous waste would be re-evaluated. This situation generally would apply to large volumes of aqueous waste (such as 200-UP-1 Groundwater) or to aqueous

waste that is sent to the LERF or the ETF in batches on some frequency (such as monthly transfers of an aqueous waste). Small volumes of aqueous waste generally would be reprocessed until permit limits are met.

2.3.3 Re-Evaluation Requirements for Flow-Through Aqueous Waste

Aqueous waste like the 200-UP-1 Groundwater is unique because of the constant-flow source, and because the waste is pumped into a LERF basin throughout the lifetime of the pump-and-treat remediation activity. Also, rather than being accumulated in the LERF in a batch mode, this aqueous waste will generally flow through the LERF to the ETF for final treatment. Though this aqueous waste has been characterized upfront for acceptability, special sampling and analysis requirements must be met during the pump-and-treat operation to ensure that it continues to meet acceptance criteria.

Accordingly, flow-through wastes like the 200-UP-1 Groundwater are, and will be sampled quarterly to update the initial characterization. This on-going characterization is monitored by the LERF and the ETF personnel. If the data from a sampling event suggest that contaminant concentrations have increased beyond that described in the initial characterization, the acceptability of the waste stream will be re-evaluated. Details on the sampling and analysis of flow-through aqueous waste, like the 200-UP-1 Groundwater, are provided in Section 4.0.

2.4 RECORD/INFORMATION AND DECISION

The information and data collected throughout the acceptance process, and the evaluation and decision on whether to accept an influent aqueous waste stream for treatment or storage in the LERF or the ETF are documented as part of the ETF Operating Record, which is maintained at the ETF. Specifically, the Operating Record contains the following components on a new influent aqueous waste stream:

- The signed WPS for each aqueous waste stream and analytical data
- Process knowledge used to characterize a dangerous/mixed waste (under WAC 173-303), and information supporting the adequacy of the process knowledge
- The evaluation on whether an aqueous waste stream meets the waste acceptance criteria, including:
  - The evaluation for regulatory acceptability including appropriate regulator approvals
  - the evaluation for liner compatibility and for compatibility with other aqueous waste.

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Table 2-1. General Limits for Liner Compatibility.

Chemical Family	Constituent(s) or Parameter(s)[a]	Limit (mg/L)[b] (sum of constituent concentrations)
Alcohol/glycol	benzyl alcohol, 1-butanol	500,000
Alkanone[c]	acetone, 2-hexanone, methyl ethyl ketone, methyl isobutyl ketone, and 2-pentanone	200,000
Alkenone[d]	none targeted	NA
Aromatic/cyclic hydrocarbon	acetophenone, benzene, chlorobenzene, cresol, 1,4-dichlorobenzene, 2,4-dinitrotoluene, di-n-octyl phthalate, naphthalene, tetrahydrofuran, toluene, xylene	2000
Halogenated hydrocarbon	carbon tetrachloride, chloroform, 1,2-dichloroethane, 1,2-dichloroethene, 1,1-dichloroethylene, methylene chloride, tetrachloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethylene, vinyl chloride	2000
Aliphatic hydrocarbon	hexachloroethane	500,000
Ether	2-butoxyethanol	2000
Other hydrocarbons	dimethylnitrosamine, tributyl phosphate	2000
Oxidizers	none targeted	NA
Acids, Bases, Salts	ammonium	100,000
pH	pH	0.5 < pH < 13.0

[a] Analytical methods for the parameters and constituents are provided in Appendix B.

[b] Analytical data for a chemical family (as indicated) are summed using the following 'sum of the fraction technique'. The individual constituent concentration, sum concentration (for families), and pH values for a waste stream are then evaluated against the compatibility limit.

$$\sum_{n=1}^{i} \left(\frac{Conc_n}{LIMIT_n}\right) \leq 1$$

where i is the number of organic constituents detected

[c] Ketone containing saturated alkyl group(s).

[d] Ketone containing unsaturated alkyl group(s).

mg/L = milligrams per liter.

Table 2-2. Waste Acceptance Criteria.

General criteria category	Criteria description
1. Characterization	A. Each generator must provide an aqueous waste profile.
	B. Each generator must designate the aqueous waste stream.
	C. Each generator must provide analytical data and/or process knowledge.
2. Regulatory acceptability	A. The LERF and ETF can store and treat influent aqueous wastes with waste numbers identified in the Part A, Form 3, permit applications for the LERF and the ETF, and the Final Delisting for the ETF.
	B. The aqueous waste must in compliance with conditions of the Discharge Permit.
3. Operational acceptability	A. Determine whether an aqueous waste stream is treatable, considering: 1. Whether the removal and destruction efficiencies on the constituents of concern will be adequate to meet Discharge Permit and Delisting levels. 2. Other treatability concerns; analyses for this evaluation may include: total dissolved solids, silica, total organic carbon, potassium, total suspended solids, sodium, specific conductivity, barium, calcium, nitrate, magnesium, chloride, manganese, phosphate, bromide, sulfate, gross alpha, gross beta, gamma, iron, aluminum
	B. Determine whether an aqueous waste stream is compatible, considering: 1. Whether an aqueous waste stream presents corrosion concerns; analysis may include chloride and fluoride 2. Whether an aqueous waste stream is compatible with LERF liner materials, compare characterization data to the liner compatibility limits (Table 2-1). 3. Whether an aqueous waste stream is compatible with other aqueous waste(s). (A 40 CFR 264 Appendix V type of comparison will be employed).

3.0 SPECIAL MANAGEMENT REQUIREMENTS

Special management requirements for aqueous wastes that are managed in the LERF or ETF are discussed in the following sections.

3.1 MONITORING THE VARIABILITY OF PROCESS CONDENSATE

The Discharge Permit (Ecology 1995a, Section S5) requires sampling of PC in the LERF basins until sufficient data are collected to adequately assess the variability of ammonia and total Kjeldahl nitrogen (TKN), strontium-90, and iodine-129. The PC will be analyzed for these parameters to assess the range of concentrations present in the PC and the results reported to Ecology. In addition, the 10 highest concentrations of tentatively identified compounds (TICs) will be reported from each PC sampling event, as required by the discharge permit. Tentatively identified compounds are non-targeted organic compounds or fragments of compounds with unique chromatographic spectra that are qualitatively identified by comparing them to standard databases of spectra. Because these compounds are identified qualitatively, their concentration only can be estimated.

Reports have been submitted to Ecology that included the results of ammonia and TKN analysis, detections of strontium-90 and iodine-129, and the 10 highest TICs. The data in these reports suggested that there is very little variability in the PC.

3.2 CONDITIONS ON PROCESS CONDENSATE FOR NEWLY IDENTIFIED WASTE NUMBERS

In January 1995, the U.S. Department of Energy, Richland Operations Office (DOE-RL) notified Ecology and the U.S. Environmental Protection Agency that small amounts of listed waste might have been introduced to the DST System, upstream of the LERF and the ETF. This listed waste previously had not been identified in the Dangerous Waste Part A, Form 3, permit applications for the DST System, LERF, or ETF. In a March 7, 1995 letter from Ecology to DOE-RL (Ecology 1995b), Ecology exercised its enforcement discretion with respect to the designation of this waste so long as several conditions are met. As long as these conditions are met, the waste numbers will not be included in the Part A, Form 3s, for the LERF or the ETF. These conditions only apply to PC. The constituents vanadium, formate, and cyanide will be analyzed in the PC to meet these conditions.

3.3 LAND DISPOSAL RESTRICTION COMPLIANCE AT LIQUID EFFLUENT RETENTION FACILITY

Because LERF provides treatment through flow and pH equalization, a surface impoundment treatment exemption from the land disposal restrictions was granted in accordance with 40 CFR 268.4 (EPA 1994 and Ecology 1996b). This treatment exemption is subject to several conditions, including a requirement that the WAP address the sampling and analysis of the treatment 'residue' [40 CFR 268.4(a)(2)(i) and WAC 173-303-300(5)(h)(i) and (ii)] to ensure it meets applicable treatment standards. Though the term 'residue' is not specifically defined, this condition further requires that sampling must be

designed to represent the "sludge and the supernatant" indicating that a residue may have a sludge (solid) and supernatant (liquid) component.

Solid residue is not anticipated to accumulate in a LERF basin for the following reasons:

- Aqueous waste streams containing sludge would not be accepted into LERF under the acceptance criteria of treatability (Section 2.2.2.1)
- No solid residue was reported from PC discharged to LERF in 1995
- The LERF basins are covered and all incoming air first passes through a breather filter
- No precipitating or flocculating chemicals are used in flow and pH equalization.

Therefore, the residue component subject to this condition is the supernatant (liquid component). As indicated above, solids are not anticipated to accumulate in a LERF basin. Additionally, an aqueous waste stream is evaluated for the potential to deposit solids in a LERF basin (i.e., an aqueous waste which contains sludge). If necessary, filtration at the waste source could be required before acceptance into LERF. The contingency for removal of solids will be addressed during closure [as indicated in the Closure Plan, Chapter 11.0 of the dangerous waste permit application for LERF and ETF (DOE/RL-97-03)].

The conditions of the treatment exemption also require that treatment residues (i.e., aqueous wastes) which do not meet the LDR treatment standards "must be removed at least annually" [40 CFR 268.4(a)(2)(ii)]. To address the conditions of this exemption, an influent aqueous waste is sampled and analyzed and the LDR status of the aqueous waste is established as part of the acceptance process. The LERF basins are then managed such that any aqueous waste(s) which exceeds an LDR standard is removed annually from a LERF basin, except for a heel of approximately 1 meter. A heel is required to stabilize the LERF liner. The volume of the heel is approximately 1.9 million liters.

4.0 INFLUENT AQUEOUS WASTE SAMPLING AND ANALYSIS

The following sections provide a summary of the sampling procedures, frequencies, and analytical parameters that will be used in the characterization of influent aqueous waste (Section 2.0) and in support of the special management requirements for aqueous waste in the LERF (Section 3.0).

4.1 SAMPLING PROCEDURES

With a few exceptions, generators are responsible for the characterization, including sampling and analysis, of an influent aqueous waste. PC is either sampled at the 242-A Evaporator or accumulated in a LERF basin following a 242-A Evaporator campaign and sampled. Flow-through aqueous wastes, such as the 200-UP-1 Groundwater, will be characterized before acceptance; however, these aqueous wastes will also be sampled at LERF quarterly. Other exceptions will be handled on a case-by-case basis and the operating record will be maintained at the unit for inspection by Ecology. The following section discusses the sampling locations, methodologies, and frequencies for these aqueous wastes. Aqueous waste generators are referred to WAC 173-303-110(2) (40 CFR 261, Appendix I) for the sampling procedures that are applicable to their waste. For samples collected at the LERF and ETF, unit-specific sampling protocol is followed. The sample containers, preservation materials, and holding times for each analysis are listed in Appendix B.

4.1.1 Batch Samples

In those cases where an aqueous waste is sampled in a LERF basin, samples are collected from four of the six available sample risers located in each basin, i.e., four separate samples. Though there are eight sample risers at each basin, one is dedicated to liquid level instrumentation and the other is dedicated as an influent port. Operating experience indicates that four samples adequately capture the variability of an aqueous waste stream. Specifically, sections of stainless steel (or other compatible material) tubing are inserted into the sample riser to an appropriate depth. Using a portable pump, the sample line is flushed with the aqueous waste and the sample collected. The grab sample containers typically are filled for volatile organic compounds (VOC) first, followed by the remainder of the containers for the other parameters.

Several sample ports are also located at the ETF, including a valve on the recirculation line at the ETF surge tank, and a sample valve on a tank discharge pump line at the ETF Load-In Station. All samples are obtained at the LERF or ETF are collected in a manner consistent with SW-846 procedures (EPA 1986).

4.1.2 Flow-Through Samples at the Liquid Effluent Retention Facility

Flow-through samples are collected from a valve located at a transfer pipeline connection to the LERF. Samples of flow-through aqueous wastes, such as 200-UP-1 Groundwater, are collected quarterly or more frequently if there is change in the source (e.g., a change in the well-head), or if it is determined that there is an increase in the concentration of contaminants beyond the range described in the initial characterization. For flow-through grab samples, VOC sample containers are typically filled first, followed by the remainder of the containers for the other parameters.

4.2 ANALYTICAL RATIONALE

As stated previously, each generator is responsible for designating and characterizing an aqueous waste stream. Accordingly, each generator samples and analyzes an influent waste stream using the target list of parameters (Table 4-1) for the waste acceptance process. At the discretion of the LERF and ETF management, a generator may provide process knowledge in lieu of some analyses as discussed in Section 2.1.1. The LERF and ETF personnel will work with the generator to determine which parameters are appropriate for the characterization.

The analytical methods for these parameters are provided in Appendix B. All methods for nonradioactive parameters are EPA methods. Additional analyses may be required if historical information and process knowledge indicate that an influent aqueous waste contains constituents not included in the target list of parameters. For example, if process knowledge indicates that an aqueous waste contains a parameter that is regulated by the Groundwater Quality Criteria (WAC 173-200), that parameter(s) would be added to the suite of analyses required for that aqueous waste stream.

The analytical data for the parameters presented in Table 4-1, including VOC, SVOC, metals, anions, general chemistry parameters, and radionuclides are used to define the physical and chemical properties of the aqueous waste to:

- Set operating conditions in the LERF and ETF (e.g., to determine operating configuration - refer to Section 2.2.2)
- Identify concentrations of some constituents which may also interfere with, or foul the ETF treatment process (e.g., fouling of the RO membranes - refer to Section 2.2.2)
- Evaluate LERF liner and piping material compatibility
- Determine treatability to evaluate if applicable constituents in the treated effluent will meet Discharge Permit and Delisting limits
- Estimate concentrations of some constituents in the waste generated in the secondary treatment train (i.e., dry powder waste).

Some analyses also are required to address special conditions (Section 3.0) or for other specific purposes as indicated below:

- Formate analysis is required for compliance with special conditions for PC (refer to Section 3.2).
- Total Kjeldahl nitrogen (TKN) analysis required under the Discharge Permit to meet special conditions for PC (until discharge permit is modified, refer to Section 3.1).
- Total dissolved solids analysis to predict volume of powder waste from the secondary treatment train.
- Radionuclide analyses are used for inventorying radionuclides as necessary to demonstrate compliance with U.S. Department of Energy Orders (including DOE Orders 5480.5 and 5480.23) and monitoring for some radionuclides required for compliance with Discharge Permit.

Table 4-1. Target Parameters for Influent Aqueous Waste Analyses.
(sheet 1 of 2)

VOLATILE ORGANIC COMPOUNDS	SEMIVOLATILE ORGANIC COMPOUNDS
Acetone	Acetophenone
Benzene	Benzyl alcohol
1-Butyl alcohol (1-Butanol)	2-Butoxyethanol
Carbon tetrachloride	Cresol (o, p, m)
Chlorobenzene	1,4-Dichlorobenzene
Chloroform	Dimethylnitrosamine (N-Nitrosodimethylamine)
1,2-Dichloroethane (total)	Di-n-octyl phthalate
1,1-Dichloroethylene	Hexachloroethane
2-Hexanone	Naphthalene
Methyl ethyl ketone (2-Butanone)	Tributyl phosphate
Methyl isobutyl ketone (Hexone, 4-Methyl-2-pentanone)	
2-Pentanone	
Tetrachloroethylene	
Tetrahydrofuran	
Toluene	
1,1,1-Trichloroethane	
1,1,2-Trichloroethane	
Trichloroethylene	
Vinyl chloride	

Table 4-1. Target Parameters for Influent Aqueous Waste Analyses.
(sheet 2 of 2)

TOTAL METALS	RADIONUCLIDES
Aluminum	Gross alpha
Antimony	Gross beta
Arsenic	Americium-241
Barium	Antimony-125
Beryllium	Carbon-14
Cadmium	Cerium/Praseodymium-144
Calcium	Cesium-134
Chromium	Cesium-137
Copper	Cobalt-60
Iron	Curium-244
Lead	Europium-154
Magnesium	Europium-155
Manganese	Gamma
Mercury	Iodine-129
Nickel	Neptunium-237
Potassium	Niobium-94
Selenium	Plutonium-238
Silicon	Plutonium-239/240
Silver	Radium-226
Sodium	Ruthenium-103
Uranium	Ruthenium-106
Vanadium	Strontium-90
Zinc	Technicium-99
	Tin-113
	Tritium
	Zinc-65
ANIONS	**GENERAL CHEMISTRY PARAMETERS**
Bromide	Ammonia
Chloride	Total Kjeldahl nitrogen
Fluoride	Cyanide
Formate[1]	pH
Nitrate	Total suspended solids
Nitrite	Total dissolved solids
Phosphate	Total organic carbon
Sulfate	Specific conductivity

[1] - Parameter only required for 242-A Evaporator process condensate (refer to Section 3.2).

5.0 TREATED EFFLUENT SAMPLING AND ANALYSIS

The treated aqueous waste, or effluent, from the ETF is collected in three 2,540,000-liter verification tanks before discharge to the SALDS. To determine whether the Discharge Permit early warning values and enforcement limits and the Delisting criteria are met, the effluent routinely is sampled at or before the verification tanks. The sampling and analyses performed are described in the following sections.

5.1 RATIONALE FOR EFFLUENT ANALYSIS PARAMETER SELECTION

The parameters measured in the treated effluent are required by the following regulatory documents:

- Delisting criteria from the Final Delisting (EPA 1995)
- Effluent limits from the State Waste Discharge Permit (Ecology 1995a)
- Early warning values from the State Waste Discharge Permit (Ecology 1995a).

The Final Delisting provides two testing regimes for the treated effluent. Under the initial verification testing regime, the first three verification tanks must be sampled and analyzed, and the data submitted to the U.S. Environmental Protection Agency (EPA). Following EPA approval, the subsequent verification testing regime is implemented, where every 10th tank is analyzed for the delisting constituents. If the concentration of any analyte is found to exceed a Discharge Permit enforcement limit or a Delisting criterion, the contents of the verification tank are reprocessed and/or re-analyzed. If the concentration of any analyte exceeds an early warning value, as a monthly average from treated effluent that is discharged, an early warning value report is prepared and submitted to Ecology.

5.2 EFFLUENT SAMPLING STRATEGY: METHODS, LOCATION, ANALYSES, AND FREQUENCY

Effluent sampling methods and locations, the analyses performed, and frequency of sampling are discussed in the following sections.

5.2.1 Effluent Sampling Method and Location

Samples of treated effluent are collected and analyzed to verify the treatment process using ETF-specific sampling protocol. These verification samples can be collected at two locations. At the first sampling location, a representative grab sample is collected from a sampling port on the verification tank recirculation line. The second sampler is located upstream of the verification tanks where flow proportional composite samples are collected for all analyses except VOC analysis. For VOCs, a zero-headspace, time proportional sampler capable of collecting a sample over a multiple-day period is used. Appendix B presents the sample containers, preservatives, and holding times for each parameter monitored in the effluent.

5.2.2 Analyses of Effluent

The parameters required by the current Discharge Permit and Delisting conditions are presented in Table 5-1. The analytical methods and PQLs associated with each parameter are provided in Appendix B. The methods and PQLs are equivalent to those used in the analysis of influent aqueous waste. With the exception of formic acid (analyzed as formate), analyses for the constituents associated with the newly listed waste numbers (Section 3.2) already are required analyses in the effluent. An analysis for formate is not required unless this constituent is identified in the influent aqueous waste.

5.2.3 Frequency of Sampling

Treated effluent is tested for all parameters listed in Table 5-1 on a frequency consistent with the conditions of the Discharge Permit and the Final Delisting. This effluent must meet the Discharge Permit and Delisting limits associated with these parameters. Under normal operating conditions, grab samples are collected from each verification tank. When a composite sample is called for, the sample is collected over the period required to fill one verification tank.

During operation of the ETF, if one or more of the constituents exceeds a Delisting criterion, the Delisting conditions require the analysis of samples from the following two verification tanks volumes before effluent can be discharged. Treated effluent that does not meet Delisting criteria and Discharge Permit is not discharged to the SALDS and is recycled for further treatment.

Table 5-1. Rationale for Parameters to Be Monitored in Treated Effluent.
(sheet 1 of 3)

Parameter	Final Delisting[1]	Discharge Permit[2]	
		Enforcement Limit	Early Warning Value
VOLATILE ORGANIC COMPOUNDS			
Acetone	X		
Benzene	X		X
1-Butyl alcohol	X		
Carbon tetrachloride	X	X	
Chlorobenzene	X		
Chloroform	X		X
1,2-Dichloroethane	X		
1,1-Dichloroethylene	X		
Methyl ethyl ketone (2-Butanone)	X		
Methyl isobutyl ketone (4-methyl-2-Pentanone)	X		
Tetrachloroethylene	X	X	
Tetrahydrofuran			X
Toluene	X		
1,1,1-Trichloroethane	X		
1,1,2-Trichloroethane	X		X
Trichloroethylene	X		
Vinyl chloride	X		
SEMIVOLATILE ORGANIC COMPOUNDS			
Acetophenone			X
Benzyl alcohol	X		
Cresol (total)	X		
1,4-Dichlorobenzene	X		

Table 5-1. Rationale for Parameters to Be Monitored in Treated Effluent.
(sheet 2 of 3)

Parameter	Final Delisting[1]	Discharge Permit[2]	
		Enforcement Limit	Early Warning Value
Dimethylnitrosamine		X	
Di-n-octyl phthalate	X		
Hexachloroethane	X		
Naphthalene	X		
Tributyl phosphate	X		
TOTAL METALS[3]			
Antimony	X		
Arsenic	X	X	
Barium	X		
Beryllium	X		X
Cadmium	X		X
Chromium	X	X	
Copper			X
Lead	X		X
Mercury	X		X
Nickel	X		
Selenium	X		
Silver	X		
Vanadium	X		
Zinc	X		
ANIONS			
Fluoride	X		
Nitrate (as N)		X	
Nitrite (as N)			X

Table 5-1. Rationale for Parameters to Be Monitored in Treated Effluent.
(sheet 3 of 3)

Parameter	Final Delisting[1]	Discharge Permit[2]	
		Enforcement Limit	Early Warning Value
Sulfate			X
OTHER ANALYSES			
Ammonia[4] (as N)	X		X
Total Kjeldahl nitrogen (as N)			X
Cyanide	X		
Tritium			M
Strontium-90			M
Gross alpha			M
Gross beta			M
Total dissolved solids			X
Total organic carbon			X
Total suspended solids			X
Specific conductivity		M	

[1] Parameters required by the current conditions of the Final Delisting, 40 CFR 261, Appendix IX, Table 2 (EPA 1995).
[2] Parameters required by the current conditions of the State Waste Discharge Permit, No. ST 4500 (Ecology 1995a).
[3] Metals reported as total concentrations.
[4] Although the Final Delisting lists "ammonium" (NH_4^+), the standard analytical methods measure ammonia (NH_3). Ammonia is assumed to be the contaminant of concern.
X Rationale for measuring this parameter in treated effluent.
M Monitor only; no limit defined.

6.0 EFFLUENT TREATMENT FACILITY GENERATED WASTE SAMPLING AND ANALYSIS

The wastes discussed in this section are managed in the container storage areas of the ETF and include the wastes generated at the ETF. This section describes the characterization of the following secondary waste streams generated within the ETF:

- Secondary waste generated from the treatment process, including the following waste forms:
  - dry powder waste
  - concentrate tanks slurry
  - sludge removed from process tanks
- Waste generated by operations and maintenance activities
- Miscellaneous waste generated within the ETF.

For each waste stream, the waste is described, a characterization methodology and rationale are provided, and sampling requirements are addressed.

6.1 SECONDARY WASTE GENERATED FROM TREATMENT PROCESSES

A dry powder waste is generated from the secondary treatment train, from the treatment of an aqueous waste. Waste is received in the secondary treatment train in waste receiving tanks where it is fed into an evaporator. Concentrate waste from the evaporator is then fed to a concentrate tank. From these tanks, the waste is fed to a thin film dryer and dried into a powder, and collected into containers. The containers are filled via a remotely controlled system. The condensed overheads from the evaporator and thin film dryer are returned to the surge tank to be fed to the primary treatment train.

Occasionally, salts from the treatment process (e.g., calcium sulfate and magnesium hydroxide) accumulate in process tanks as sludge. Because processing these salts could cause fouling in the thin film dryer, and to allow uninterrupted operation of the treatment process, the sludge is removed and placed in containers. The sludge is dewatered and the supernate is pumped back to the ETF for treatment.

The secondary treatment system typically receives and processes the following by-products generated from the primary treatment train:

- Concentrate from the first RO stage
- Backwash from the rough and fine filters
- Regeneration waste from the ion exchange system
- Spillage or overflow collected in the process sumps.

In an alternate operating scenario, some aqueous wastes may be fed to the secondary treatment train before the primary treatment train. A more complete description of these processes can be found in Chapter 4.0 of the dangerous waste permit application for LERF and ETF (DOE/RL-97-03).

6.1.1 Rationale for Selection of Parameters for Analysis

The ETF secondary waste is anticipated to consist primarily of sulfate salts, minor amounts of metals, and radionuclides. The designation of the ETF secondary waste is based on influent characterization data. These data are used to assign applicable listed waste numbers to the secondary waste and to determine if the secondary waste would designate as a characteristic waste because of toxic metals.

Concentrations of metals in the secondary waste are projected by comparing the influent metals data to the removal efficiencies of the ETF treatment process. When the influent data indicate that the secondary waste will not designate as a characteristic waste, the secondary waste, as slurry, sludge, or dry powder, is not sampled and analyzed for metals.

The influent data, in conjunction with knowledge of the ETF treatment processes, also are used to determine the LDR status of the ETF secondary waste. Knowledge of the treatment process indicates that VOCs and SVOCs (i.e., listed waste constituents) are not expected in the secondary waste because of the organic destruction capability of the UV/OX and the temperatures of the thin film dryer. Accordingly, when the influent data indicate that the secondary waste meets the LDR treatment standards, the secondary waste, as slurry, sludge, or dry powder, is not sampled and analyzed for VOCs or SVOCs.

The parameters for analysis of the ETF secondary waste are provided in Table 6-1. The specific analytical methods for these analyses are provided in Appendix B. Additionally, samples of slurry or sludge undergo a total solids analysis to convert the analytical data on other parameters to dry weight concentrations.

6.1.2 Sampling Methods

The dry powder waste and containerized sludge are sampled from containers using the principles presented in SW-846 (EPA 1986) and ASTM Methods (American Society for Testing Materials) , as referenced in WAC 173-303-110(2). The sample container requirements, sample preservation requirements, and maximum holding times for each of the parameters analyzed in either matrix are presented in Appendix B.

Concentrate tank waste samples are collected from recirculation lines, which provide mixing in the tank during pH adjustment and prevent caking. The protocol for concentrate tank sampling prescribes opening a sample port in the recirculation line to collect samples directly into sample containers. The sample port line is flushed before collecting a grab sample. The VOC sampling typically is performed first for grab samples. Each VOC sample container will be filled such that cavitation at the sample valve is minimized and the container has no head space. The remainder of the containers for the other parameters will be filled next.

6.1.3 Sampling Frequency

The ETF secondary waste is sampled at a frequency of two containers per batch. A batch is defined as any volume of aqueous waste that is being treated under consistent and constant process conditions. The secondary waste will be resampled under the following changes in process conditions:

- Change in an influent source (e.g., change in well-head)
- Change in process chemistry.

If waste from the concentrate tanks is used for characterization of a batch of influent waste, up to a maximum of three representative samples will be collected from the concentrate tanks. These samples will be analyzed for the appropriate parameters identified in Table 6-1 based on the needs identified from evaluating influent sampling and analysis data. When radiological and/or chemical exposures are of concern, analytical results from concentrate tank samples will be used to represent the powder waste generated from the treatment of that aqueous waste(s). The dry powder or concentrate tanks will be re-sampled in the following situations:

- The LERF and the ETF management has been notified, or has reason to believe that the process generating the waste has changed (for example, a change in the source such as a change in the well-head for groundwater that significantly changes the aqueous waste characterization).

- The LERF and the ETF management notes an increase or decrease in the concentration of a constituent in an aqueous waste stream, beyond the range of concentrations that was described or predicted in the waste characterization.

6.1.4 Special Requirements Pertaining to Land Disposal Restrictions

Containers of the ETF secondary waste are transferred to a storage or final disposal unit, as appropriate (e.g., the Central Waste Complex or to the Environmental Restoration Disposal Facility). The ETF personnel provide the analytical characterization data and necessary process knowledge for the waste to be tracked by the receiving staff, and for the appropriate LDR documentation.

The following information on the secondary waste is included on the LDR documentation provided to the receiving unit:

- Dangerous waste numbers (as applicable)

- Determination on whether the waste is restricted from land disposal according to the requirements of 40 CFR 268/WAC 173-303-140 (i.e., the LDR status of the waste)

- The waste tracking information associated with the transfer of waste

- Waste analysis results.

6.2 OPERATIONS AND MAINTENANCE WASTE GENERATED AT THE 200 AREA EFFLUENT TREATMENT FACILITY

Operation and maintenance of process and ancillary equipment generates additional routine waste. These waste materials are segregated to ensure proper handling and disposition, and to minimize the commingling of potentially dangerous waste with nondangerous waste. The following waste streams are anticipated to be generated during routine operation and maintenance of the ETF. This waste might or might not be dangerous waste, depending on the nature of the material and its exposure to a dangerous waste.

- Spent lubricating oils and paint waste from pumps, the dryer rotor, compressors, blowers, and general maintenance activities
- Spent filter media process filters
- Spent ion exchange resin
- HEPA filters
- UV light tubes
- RO membranes
- Equipment that cannot be returned to service
- Other miscellaneous waste that might contact a dangerous waste (e.g., plastic sheeting, glass, rags, paper, waste solvent or aerosol cans).

These waste streams are stored at the ETF before being transferred for final treatment, storage, or disposal as appropriate. This waste is characterized and designated using process knowledge (from previously determined influent aqueous waste composition information); analytical data; and material safety data sheets (MSDS) of the chemical products present in the waste or used (these data sheets are maintained at the ETF). Sampling of these waste streams is not anticipated; however, if an unidentified or unlabeled waste is discovered, that waste is sampled. This 'unknown' waste is sampled and analyzed for the parameters in Table 6-1 as appropriate, and will be designated according to Washington state regulatory requirements. The specific analytical methods for these analyses are provided in Appendix B.

6.3 OTHER WASTE GENERATED AT THE 200 AREA EFFLUENT TREATMENT FACILITY

There are two other potential sources of waste at the ETF: spills and/or overflows, and discarded chemical products. Spilled material that potentially might be dangerous waste generally is routed to the ETF sumps where the material is transferred to either the surge tank for treatment or to the secondary treatment train. A spilled material also could be containerized and transferred to another TSD unit. In most cases, process knowledge and the use of MSDSs is sufficient to designate the waste material. If the source of the spilled material is unknown and the material cannot be routed to the ETF sumps, a sample of the waste is collected and analyzed according to Table 6-1, as necessary, for appropriate characterization of the waste. Unknown wastes will be designated according to WAC 173-303. The specific analytical methods for these analyses are provided in Appendix B.

A discarded chemical product waste stream could be generated if process chemicals, cleaning agents, or maintenance products become contaminated or are otherwise rendered unusable. In all cases, these materials are appropriately containerized and designated. Sampling is performed, as appropriate, to determine the radioactivity of a waste or if required for waste designation.

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Table 6-1. 200 Area Effluent Treatment Facility Generated Waste - Sampling and Analysis.

Parameter[1]	Rationale
Total solids or percent water[2]	• Calculate dry weight concentrations
Volatile organic compounds[3]	• LDR - verify treatment standards
Semivolatile organic compounds[3]	• LDR - verify treatment standards
Metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver)	• Waste designation • LDR - verify treatment standards
Nitrate	• Address receiving TSD waste acceptance requirements
pH	• Waste designation

[1] For concentrate tank samples, the total sample (solid plus liquid) is analyzed and the analytical result is expressed on a dry weight basis. The result for toxicity characteristic metal and organic is divided by a factor of 20 and compared to the toxicity characteristic (TC) constituent limits [WAC 173-303-090(8)]. If the TC limit is met or exceeded, the waste is designated accordingly. All measured parameters are compared against the corresponding treatment standards.

[2] Total solids or percent water are not determined for unknown waste and dry powder waste samples and are analyzed in maintenance waste and sludge samples, as appropriate (i.e.., percent water might not be required for such routine maintenance waste as aerosol cans, fluorescent tubes, waste oils, batteries, etc., or sludge that has dried).

[3] VOC and/or SVOC analysis of secondary waste is required unless influent characterization data and process knowledge indicate that the constituent will not be in the final secondary waste at or above the LDR.

LDR = land disposal restrictions.

7.0 QUALITY ASSURANCE/QUALITY CONTROL

The following quality assurance/quality control (QA/QC) information for the ETF and LERF is provided as required by WAC 173-303-810(6). The sampling and analysis activities at the ETF and LERF conform to the requirements of a ETF/LERF-specific quality assurance project plan and are in accordance with the following EPA guidance documents:

- *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, as amended, U.S. Environmental Protection Agency, Washington, DC, July 1992, as referenced in WAC 173-303-110.

- *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-7-020, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio, March 1993.

7.1 SAMPLING PROGRAM

Typically generators are responsible for the sampling and analysis of an influent aqueous. However, samples of influent aqueous waste can be collected at the LERF or the Load-In Station. Samples of treated effluent are collected at the verification tanks. Secondary waste generated from the treatment process generally is sampled in the dry powder form; however, the secondary waste also could be sampled while in slurry form for characterization. Sampling of influent aqueous waste, treated effluent, and secondary waste is discussed in Sections 4.0, 5.0, and 6.0, respectively, of the WAP.

Specific information on sample holding times, preservatives, and sample containers is provided in Appendix B. The selection of the sample collection device depends on the type of sample, the sample container, the sampling location and the nature and distribution of the waste components. In general, the methodologies used for specific materials correspond to those referenced to WAC 173-303-110(2). The selection and use of the sampling device is supervised or performed by a person thoroughly familiar with the sampling requirements. Samples are collected according to ETF/LERF-specific sampling protocol.

Sampling equipment is constructed of nonreactive materials such as glass, plastic, aluminum, or stainless steel, as indicated by the nature and matrix of the waste. Care is taken in the selection of the sampling device to prevent contamination of the sample and to ensure compatibility of materials. For example, plastic bottles are not used to collect some organic wastes.

7.2 ANALYTICAL PROGRAM

The onsite laboratory employed by the ETF and LERF organization is required to have a program of quality control practices and procedures to ensure that precision and accuracy are maintained. The QA/QC program for sampling complies with the applicable Hanford Site standard requirements and the regulatory requirements. All analytical data are defensible and traceable to specific, related QC samples and calibrations. Offsite laboratories employed by the ETF and LERF must meet the same QA/QC requirements as onsite laboratories and must demonstrate quality control practices that are comparable to the onsite laboratory's program. A review of an offsite laboratory may be conducted to ensure that the quality control of

ETF and LERF data is maintained. The SW-846 analytical methods are followed (as indicated in Appendix B). However, other methods may be substituted for a parameter if the PQL can be met.

The chemical parameters and associated analytical methods identified in Appendix B are used to characterize an influent aqueous waste, effluent waste, and ETF secondary waste. The analytical data on these parameters are also used to establish that key decision limits pertinent to proper waste management are met. These key decision limits are numerical thresholds which include:

- liner compatibility limits for an influent aqueous waste as managed in LERF (may include blending a waste with other wastes to meet these limits)
- the LDR status of the ETF secondary waste
- delisting limits for treated effluent.

Where analytical data are used in key decision making, the PQL of an analytical parameter (or sum of the PQLs, as indicated by the decision) must be at or below the key decision limit.

Good laboratory practices which encompass sampling, sample handling, housekeeping and safety are maintained at all laboratories. The following section describe the specific practices which are implemented at the onsite laboratory to maintain the precision and accuracy goal of ± 20 percent for quality control samples which include method blank, quality control check, matrix spike, and duplicate samples.

The decision to re-analyze if the stated precision and accuracy goals are not met will depend on the use of the analytical results. Generally, only analytical results used in key decisions would require re-analysis if precision and accuracy goals were not met. For example, if the precision and accuracy goals are not met in a liner compatibility analysis, the sample would generally be re-analyzed if the results were close to a compatibility limit. However, if the analytical results suggested that concentrations were an order of magnitude below a liner compatibility limit, generally re-analysis would not be required. The decision to re-analyze a waste in a key decision situation will be made on a case-by-case basis.

7.2.1 Contamination Evaluation

Method blank samples are prepared with each batch of samples (at least 1 in batch of 20) and analyzed to ensure sample contamination has not occurred.

7.2.2 Quality Control Check Sample

A quality control check sample is analyzed with each batch (at least 1 in batch of 20) for each analytical parameter determined. The results show that analytical procedures are properly performed and that calibration and standardization of instrumentation are within acceptable limits per the method.

7.2.3 Matrix Spike Analyses

Matrix spike samples are employed to monitor recoveries and demonstrate accuracy. Matrix spike samples are periodically analyzed to provide information about the effect of the sample matrix on the analyte in question. Typically a ratio of one spike for each analytical batch of samples, or 1 in 20, is maintained.

7.2.4 Duplicate Analyses

A laboratory sample duplicate or a matrix spike duplicate is analyzed to assess analytical precision in the laboratory. Typically, a ratio of one duplicate sample for each analytical batch of samples, or 1 in 20, is maintained.

7.3 CONCLUSION

The aforementioned sampling and analytical quality practices help ensure that the data obtained are precise and accurate for the waste stream being sampled. The analytical results are used by ETF and LERF management to decide whether or not to accept a particular waste stream and, upon acceptance, to determine the appropriate method of treatment, storage, and disposal. Results are also important to ensure that wastes are managed properly by the ETF and LERF and that incompatible wastes are not inadvertently combined. Just as these results are important, so is the quality of these results. Thus, the quality of the analytical data, the thoroughness and care with which the sampling and analyses are performed and reported, provides an important basis for day-to-day operational decisions.

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8.0 REFERENCES

DOE/RL-92-72, *200 Area Effluent Treatment Facility Delisting Petition,* Revision 1, 1993, U.S. Department of Energy-Richland Operations Office, Richland, Washington.

DOE/RL-97-03, *Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, 1994, *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, Number WA7890008967, (Revision 3, December 1996), Washington State Department of Ecology, Olympia, Washington.

Ecology, 1995a, State Waste Discharge Permit No. ST 4500, as amended, for 200 Area Effluent Treatment Facility, Hanford Facility, Washington State Department of Ecology, Olympia, Washington, June 26, 1995.

Ecology, 1995b, "Listed Waste from Hanford Laboratories", letter from M. Wilson, Washington State Department of Ecology, to J. Rasmussen, U.S. Department of Energy, Richland Operations Office, March 7, 1995.

Ecology, 1996a, *Dangerous Waste Permit Application Permit Requirements*, #95-402, June 1996, Washington State Department of Ecology, Olympia, Washington.

Ecology, 1996b, "The Washington State Department of Ecology (Ecology) Regulatory Interpretation of the Liquid Effluent Retention Facility (LERF) Land Disposal Restriction Exemption", letter from Washington State Department of Ecology to T. Teynor, U.S. Department of Energy and A. DiLiberto, Westinghouse Hanford Company, September 9, 1996.

EPA, 1986, *Test Methods for Evaluating Solid Waste Physical/Chemical Methods, SW-846* (Third Edition, November 1986, as amended), U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

EPA, 1994, "Liquid Effluent Retention Facility (LERF) Land Disposal Restrictions Treatment Exemption - Regulatory Interpretation EPA/Ecology ID No: WA7890008967", letter from U.S. Environmental Protection Agency, Region 10 to J. Hennig, U.S. Department of Energy, December 6, 1994.

EPA, 1995, Final Delisting [Exclusion], issued to U.S. Department of Energy, 40 CFR 261, Appendix IX, Table 2 (60 FR 31115, June 13, 1995), U.S. Environmental Protection Agency, Washington, D.C.

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APPENDICES

A TYPICAL AQUEOUS WASTE PROFILE SHEET

B ANALYTICAL METHODS, SAMPLE CONTAINERS, PRESERVATIVE METHODS, AND HOLDING TIMES

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APPENDIX A

TYPICAL AQUEOUS WASTE PROFILE SHEET

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200 AREA LIQUID WASTE PROCESSING AQUEOUS PROFILE SHEET

(Please carefully read the instructions before completing this form)

I. GENERATOR INFORMATION

Generating Facility/Location: _____

Facility Manager: _____

Technical Contact/Phone: _____

Environmental Compliance Officer/Phone: _____

DOE Point of Contact: _____

II. GENERAL WASTE INFORMATION

1. Description of Process Generating Aqueous Waste: _____

_____

_____

2. Is the aqueous from a CERCLA or state mandated cleanup? Yes____ No _____

Describe Cleanup Activity: _____

3. A. Is this a dangerous or hazardous waste (40 CFR Part 261 or WAC 173-303-070)? Yes____ No ____.

B. If yes, identify ALL hazardous/dangerous listed and characteristic waste code numbers (D,F,K,P,U): _____

_____

C. State Waste Codes_____ Explain designation for State waste codes: _____

_____

III. SHIPPING/TRANSPORTATION INFORMATION

A. CONTAINMENT/PACKAGING: Bulk Liquid ___ Total Volume: _____Drum___ Number: _____Total Volume: _____

Other _____

B. SHIPPING FREQUENCY: Units _____ Per: ___ Month ___ Qtr. __Year ___

One Time ___ Other _____

C. TRANSPORTATION

1. Is this a DOT Hazardous Material? Yes____ No ____

2. Proper Shipping Name _____

3. Hazard Class: _____

4. CERCLA Reportable Quantity (RQ) and unit (as applicable): _____

5. Transportation Method (e.g., direct pipeline, tanker): _____

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261-Appendix 1 or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed.

_____ _____ _____

Signature Printed (or typed) name and title Date

EXAMPLE

APPENDIX B

ANALYTICAL METHODS, SAMPLE CONTAINERS, PRESERVATIVE METHODS, AND HOLDING TIMES

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Table B-1. Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent.
(sheet 1 of 6)

Parameter	Analytical method[a]	Method PQL[b]	Accuracy/Precision for Method[k] (percent)	Sample container[c]/ Preservative[c]/ Holding time[d]
VOLATILE ORGANIC COMPOUNDS				
Acetone	8260A	40	50-100	Sample container 2 x 40-mL amber glass with septum [l] Preservative 1:1 HCl to pH<2; 4°C [l] Holding time 14 days
Benzene		5	40-150	
1-Butyl alcohol (1-Butanol)		500	40-150	
Carbon tetrachloride		5	65-130	
Chlorobenzene		5	40-150	
Chloroform		5	50-130	
1,2-Dichloroethane		5	50-150	
1,2-Dichloroethene		5	50-150	
1,1-Dichloroethylene		5	60-130	
2-Hexanone		50	60-130	
Methylene chloride[f]		5	50-150	
Methyl ethyl ketone (2-Butanone)		100	65-130	
Methyl isobutyl ketone (Hexone, 4-Methyl-2-pentanone)		50	50-160	
2-Pentanone		10	50-160	
Tetrachloroethylene		5	65-140	
Tetrahydrofuran		100	47-150	
Toluene		5	50-160	
1,1,1-Trichloroethane		5	50-150	
1,1,2-Trichloroethane		5	50-150	
Trichloroethylene		5	70-155	
Xylene		5	50-150	
Vinyl chloride		10	40-130	

Table B-1. Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent.
(sheet 2 of 6)

Parameter	Analytical method[a]	Method PQL[b]	Accuracy/Precision for Method[k] (percent)	Sample container[c]/ Preservative[c]/ Holding time[d]
SEMIVOLATILE ORGANIC COMPOUNDS				
Acetophenone	8270B	10	70-110	Sample container 4 x 1-liter amber glass Preservative 4°C Holding time 7 days for extraction; 40 days for analysis after extraction
Benzyl alcohol		20	70-120	
2-Butoxyethanol		1000	65-105	
Cresol (o, p, m)		10	55-115	
1,4-Dichlorobenzene		10	45-95	
Dimethylnitrosamine		10	50-120	
2,4-Dinitrotoluene		10	65-100	
Di-n-octyl phthalate		10	70-130	
Hexachloroethane		10	50-110	
Naphthalene		10	60-120	
Tributyl phosphate		100	75-125	

Table B-1. Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent.
(sheet 3 of 6)

Parameter	Analytical method[a]	Method PQL[b]	Accuracy/Precision for Method[k] (percent)	Sample container[c]/ Preservative[c]/ Holding time[d]
TOTAL METALS				
Aluminum	6010A/EPA-600 200.7	450	75 - 125	Sample container 1 x 0.5-liter plastic/glass Preservative 1:1 HNO_3 to pH<2 Holding time 180 days; mercury 28 days
Antimony	EPA-600 200.8	30	75 - 125	
Arsenic	EPA-600 200.8	15	75 - 125	
Barium	6010A/EPA-600 200.7	20	75 - 125	
Beryllium	6010A/EPA-600 200.7	40	75 - 125	
Cadmium	EPA-600 200.8	5	75 - 125	
Calcium	6010A/EPA-600 200.7	100	75 - 125	
Chromium	7191/EPA-600 200.8	20	75 - 125	
Copper	6010A/EPA-600 200.7	70	75 - 125	
Iron	6010A/EPA-600 200.7	100	75 - 125	
Lead	EPA-600 200.8	10	75 - 125	
Magnesium	6010A/EPA-600 200.7	300	75 - 125	
Manganese	6010A/EPA-600 200.7	50	75 - 125	
Mercury	EPA 245.1/EPA-600 200.8	2	75 - 125	
Nickel	6010A/EPA-600 200.7	75	75 - 125	
Potassium	6010A/EPA-600 200.7	10,000	75 - 125	
Selenium	EPA-600 200.8	20	75 - 125	
Silicon	6010A/EPA-600 200.7	580	75 - 125	
Silver	6010A/EPA-600 200.7	70	75 - 125	
Sodium	6010A/EPA-600 200.7	290	75 - 125	
Uranium	EPA-600 200.8	5	75 - 125	
Vanadium	6010A/EPA-600 200.7	80	75 - 125	
Zinc	6010A/EPA-600 200.7	20	75 - 125	

Table B-1. Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent.
(sheet 4 of 6)

Parameter	Analytical method[a]	Method PQL[b]	Accuracy/Precision for Method[k] (percent)	Sample container[c]/ Preservative[c]/ Holding time[d]
GENERAL CHEMISTRY				
Bromide	EPA-600 300.0	2000	75 - 125	Sample container 1 x 1-liter glass Preservative 4°C Holding time 28 days
Chloride		1000	75 - 125	
Fluoride		500	75 - 125	
Formate[i]		1250	75 - 125	
Nitrate		100	75 - 125	
Nitrite		100	75 - 125	
Sulfate		10,000	75 - 125	
Phosphate		1500	75 - 125	
Ammonia[e]	EPA-600 350.3/350.1	40	75 - 125	Sample container 250 mL glass Preservative H_2SO_4 to pH<2; 4°C Holding time 28 days
Total Kjeldahl nitrogen	EPA-600 351.2	600	75 - 125	
Cyanide	9010A/ EPA-600 335.3	100	75 - 125	Sample container 500 mL polyethylene Preservative 6M NaOH to pH>12; 4°C Holding time 14 days
Total dissolved solids	EPA-600 160.1	RL 10,000	75 - 125	Sample container 1 L glass Preservative None Holding time 7 days for pH - as soon as practical
Total suspended solids	EPA-600 160.2	RL 4,000	75 - 125	
Specific conductivity	EPA-600 120.1 (in lab)	RL 10[g]	75 - 125	
pH[h]	EPA-600 150.1/9040	RL +/- 0.1	75 - 125	
Total organic carbon	9060A	RL 1,000	75 - 125	Sample container 250 mL glass Preservative HCl or H_2SO_4 to pH<2; 4°C Holding time 28 days

Table B-1. Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent.
(sheet 5 of 6)

Parameter	Analytical method[a]	Method PQL[b]	Accuracy/Precision for Method[k] (percent)	Sample container[e]/ Preservative[e]/ Holding time[d]
RADIONUCLIDES[j]				
Gross alpha	Laboratory specific	3 pCi/L	NA	Sample container 4 x 1-L glass Preservative HNO3 to pH < 2 Holding time 180 days
Gross beta	Laboratory specific	4 pCi/L	NA	
Gamma	Laboratory specific	NA	NA	
Americium-241	Laboratory specific	NA	NA	
Antimony-125	Laboratory specific	NA	NA	
Cerium-144	Laboratory specific	NA	NA	
Cesium-134	Laboratory specific	NA	NA	
Cesium-137	Laboratory specific	NA	NA	
Cobalt-60	Laboratory specific	NA	NA	
Curium-244	Laboratory specific	NA	NA	
Europium-154	Laboratory specific	NA	NA	
Europium-155	Laboratory specific	NA	NA	
Neptunium-237	Laboratory specific	NA	NA	
Niobium-94	Laboratory specific	NA	NA	
Plutonium-238	Laboratory specific	NA	NA	
Plutonium-239/240	Laboratory specific	NA	NA	
Radium-226	Laboratory specific	NA	NA	
Ruthenium-103	Laboratory specific	NA	NA	
Ruthenium-106	Laboratory specific	NA	NA	
Strontium-90	Laboratory specific	5 pCi/L	NA	
Tin-113	Laboratory specific	NA	NA	
Zinc-65	Laboratory specific	NA	NA	

Table B-1. Sample and Analysis Criteria for Influent Aqueous Waste and Treated Effluent.
(sheet 6 of 6)

Parameter	Analytical method[a]	Method PQL[b]	Accuracy/Precision for Method[k] (percent)	Sample container[c]/ Preservative[c]/ Holding time[d]
Carbon-14	Laboratory specific	NA	NA	Sample container 1 x 1-L glass Preservative No preservative added Holding time 180 days
Iodine-129	Laboratory specific	NA	NA	
Technicium-99	Laboratory specific	NA	NA	
Tritium	Laboratory specific	460 pCi/L	NA	

[a] SW-846 methods are presented unless otherwise noted. Other methods might be substituted if the applicable PQL can be met.
[b] PQL is determined from method detection level (MDL), where PQL = 10 x MDL (for reagent-grade water); however, PQL is affected by sample matrix. PQL units are parts per billion unless otherwise noted.
[c] Sample bottle and preservatives could be adjusted, as applicable, to minimize sample volume.
[d] Holding time = time between sampling and analysis.
[e] Although the Final Delisting lists "ammonium" (NH_4^+), the standard analytical methods measure ammonia (NH_3). Ammonia is assumed to be the contaminant of concern.
[f] Methylene chloride is not analyzed for treated effluent sampling.
[g] Conductivity reported in micromhos per centimeter
[h] pH monitored in influent aqueous waste only.
[i] Analysis for formate only required if detected in the influent aqueous waste.
[j] PQLs provided for those radionuclides which are monitored as part of the Discharge Permit.
[k] Accuracy/precision used to confirm or re-establish MDL.
[l] VOC refrigerated composite sampler with syringe requires no chemical preservative.

mL = milliliter.
RL = reporting limit.
pCi/L = picocuries per liter.
PQL = practical quantitation limit
NA = not applicable.
ND = not determined.
MDL = method detection level.

Table B-2. Sample Containers, Preservative Methods, and Holding Times for ETF Generated Waste .

Parameter	Analytical Method[a]	PQL[b]	Accuracy/Precision for Method[c] (percent)	Container[d]	Preservative[e]	Holding time[f]
Total Solids	EPA-600 160.3	10,000	75 - 125	1-liter glass	None	180 days
pH	WAC 173-303-110 (3)(a)(ii)[g]/ EPA-600 150.1/9040	±0.1				as soon as practical
Nitrate	EPA-600 300.0/9056	see Table B-1				28 days
Volatile organic compounds (combined method target compound lists)	8240 or 8260A	see Table B-1	See Table B-1	2-40 ml amber glass w/septum	None	7 days
Semivolatile organic compounds (method target compound list)	8270B	see Table B-1	See Table B-1	4-1,000 ml amber glass	None	Extract within 7 days; analyze extract within 40 days
Mercury	EPA-600 200.8, 245.1/6020	see Table B-1	75 - 125	500 ml plastic/glass	None	Mercury 28 days; 6 months all others
Selenium	EPA-600 200.8/6020	see Table B-1				
Arsenic	EPA-600 200.8/6020	see Table B-1				
Cadmium	EPA-600 200.8/6020	see Table B-1				
Total metals (method target list)	EPA-600 200.8 6020/6010A/7000 Series	see Table B-1				
Toxicity Characteristic Leaching Procedure[h]	1311	NA	NA	NA	NA	NA

[a] SW-846 methods are presented unless otherwise noted. Other methods might be substituted if the applicable PQL can be met.
[b] PQL is determined from method detection level (MDL), where PQL = 10 x MDL (may vary depending on matrix). PQL units are parts per billion unless otherwise noted.
[c] Container size and type could be changed as directed by the laboratory, or as required by the analytical method.
[d] No preservatives are added to containers because of the anticipated high concentrations of salts.
[e] Holding time equals time between sampling and analysis.
[f] For solid waste.
[g] Extraction procedure, as applicable; extract analyzed by referenced methods [WAC 173-303-110(3)(c)].

PQL = practical quantitation limit
MDL = method detection level
mL = milliliter.

This plan covers the following buildings and structures:

200 Area Effluent Treatment Facility (ETF),
Liquid Effluent Retention Facility (LERF),
200 Area Treated Effluent Disposal Facility (TEDF), and
200 Area Effluent Treatment Facility Groundwater Transfer System (GTS).

Approved:

Building Emergency Director — Date 5-14-98

Emergency Preparedness — Date 5-14-98

Hanford Fire Department — Date 5-13-98

This document will be reviewed annually and updated if necessary by the Building Emergency Director unless Hanford Facility RCRA Permit coordination requirements provides otherwise. The document will be approved by the primary Building Emergency Director, and approved by the Manager of Emergency Preparedness (or delegate) and the Hanford Fire Department.

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1.0 GENERAL INFORMATION

The 200 Area Effluent Treatment Facility (ETF) and the Liquid Effluent Retention Facility (LERF) are located in the northeast portion of the 200 East Area. The 200 Area Treated Effluent Disposal Facility (TEDF) and 200 Area ETF Groundwater Transfer System (GTS) are operated from the 2025E Building. Transfer piping systems for both TEDF and GTS are located in the 200 East and 200 West Areas. 200 East and 200 West Areas are located near the center of the Hanford Site, a 560-square-mile U.S. Department of Energy (DOE) site in southeastern Washington State. The Hanford Site Emergency Preparedness Program is based upon the incident command system which allows a graded approach for response to emergency events. This plan contains a description of facility specific emergency planning and response. It is used in conjunction with DOE/RL-94-02, *Hanford Emergency Response Plan*. Response to events is performed using facility specific and/or site-level emergency procedures.

1.1 Facility Names:

U.S. Department of Energy Hanford Site
200 Area Effluent Treatment Facility (ETF)
Liquid Effluent Retention Facility (LERF)
200 Area Treated Effluent Disposal Facility (TEDF)
200 Area ETF Groundwater Transfer System

1.2 Facility Locations: Benton County, Washington; within the 200 East and 200 West Areas.

ETF Buildings/facilities covered by this plan are:

2025E Building, Effluent Treatment Facility
2025EA Building, ETF Administration Building
MO-269, Materials Control Trailer
Load-in Station, Tanker truck load-in station

LERF Buildings/facilities covered by this plan are:

Basins 42, 43, and 44, Liquid Effluent Retention Facility
Change Trailer, Located directly between Basins 42 and 43
242AL71 Instrument Building, Located north between Basins 42 and 43
Electrical Power Substation, North side of LERF

TEDF and GTS Buildings/facilities covered by this plan are:

Transfer piping, 200 East and West areas
225W Building, Pump House 1 - 200 West Area
225E Building, Pump House 2 - 200 East Area
6653A Building, Pump House 3 - 200 East Area
6653 Building, Disposal Sampling Building

1.3 Owner: U.S. Department of Energy
Richland Operations Office
825 Jadwin Avenue
Richland, Washington 99352

FACILITY MANAGER: Waste Management Federal Services of Hanford, Inc.
P.O. Box 700
Richland, Washington 99352

ORGANIZATION: 200 Area Liquid Waste Processing Facilities (LWPF)

1.4 Description of the Facility and Operations

1.4.1 Effluent Treatment Facility

The ETF treats various aqueous wastes generated at the Hanford site prior to discharging the effluent to a State Approved Land Disposal Site (SALDS), located adjacent to the 200 West Area.

The ETF operations structure is comprised of the following:

- Process area in 2025E Building
- Administration areas in 2025E and 2025EA Buildings
- Load-in Station
- External tank storage area.

The 2025E Building is a two story structure, with a control room on the second level overlooking the process area. The process area is a high bay, single story area of the 2025E Building. The process area is a Radiological Buffer Area (RBA). The RBA is a posted area and contains various Radiological Controlled Areas (RCA). The entire 200 East Area is classified as an RCA.

The external tank storage area is inside the fenced area immediately outside of the 2025E Building. The 200 East Area security fence encloses the ETF except for the discharge line from the verification tanks to the SALDS. This fence is used to control personnel access and exclude deer and other large animals from the facility.

Figure 1 shows the evacuation routes from the 2025E Building.

Figure 2 shows the ETF/LERF site staging areas.

1.4.2 Liquid Effluent Retention Facility

The LERF consists of three identical surface impoundments constructed with primary and secondary composite liners, a leachate detection, collection, and removal system between liners, and a floating cover. The LERF basins act as an interim storage location for aqueous waste from the 242-A Evaporator, groundwater, and other site remediation projects prior to treatment at ETF.

The LERF is a basin operations structure comprised of the following:

- Excavation and dikes (basins)
- Primary and secondary composite liners
- Leachate detection, collection, and removal system
- Cover
- Piping and pumps
- MO-727 - Change trailer
- 242AL71 Instrument Building

1.4.3 200 Area Treated Effluent Disposal Facility and Groundwater Transfer System

The 200 Area TEDF transports the 200 East and West Area facility effluents to a common disposal system. TEDF consists of approximately 62,000 feet of collection and transfer system piping, three pump stations, a sample building, and two 5-acre disposal ponds located southeast of ETF. The TEDF accepts liquid effluents from numerous sources in the 200 East and 200 West Areas that meet environmental permit requirements for disposal in the disposal ponds.

The GTS transfers groundwater extracted from the 200-UP-1 Operable Unit for interim storage at LERF and subsequent treatment at ETF. The system boundary begins at the first flowmeter from the 200-UP-1 pumps in the 200 West Area and ends at the connection to the LERF basins sample riser.

Figure 3 shows the major facility structures and liquid effluent sources for the SALDS, TEDF, and GTS.

1.5 Building Evacuation Routing

Figures 1 and 2 show building evacuation routes and staging areas.

1.5.1 Effluent Treatment Facility

The 2025E Building evacuation routes are shown in Figure 1. Primary and Alternate staging areas are shown in Figure 2.

1.5.2 Liquid Effluent Retention Facility

Primary and alternate staging areas are shown in Figure 2.

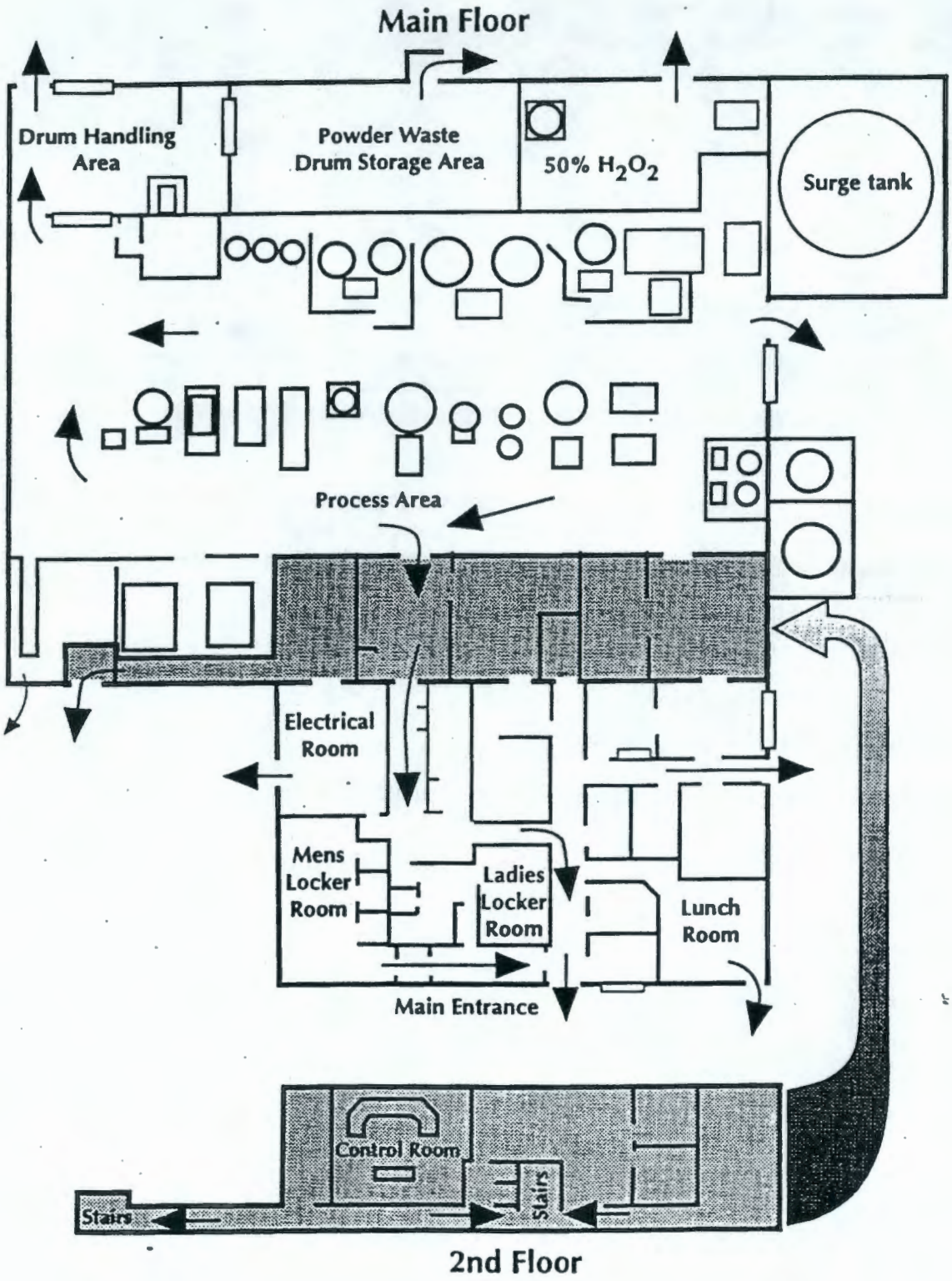
1.5.3 Treated Effluent Disposal Facility

Figure 3 shows the TEDF location.

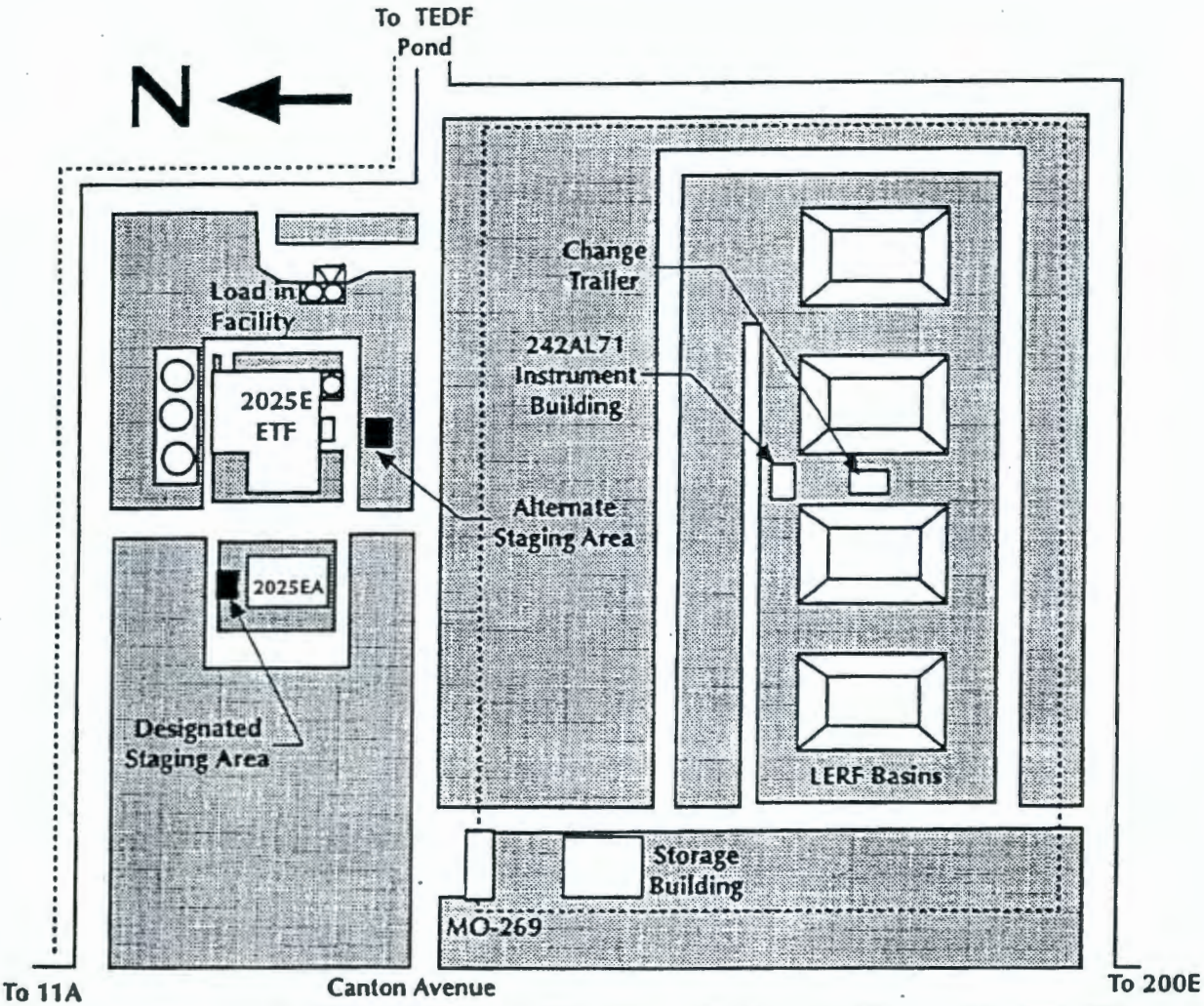
1.5.4 Groundwater Transfer System

Figure 3 shows the GTS location.

Figure 1, Evacuation Routes from 2025E



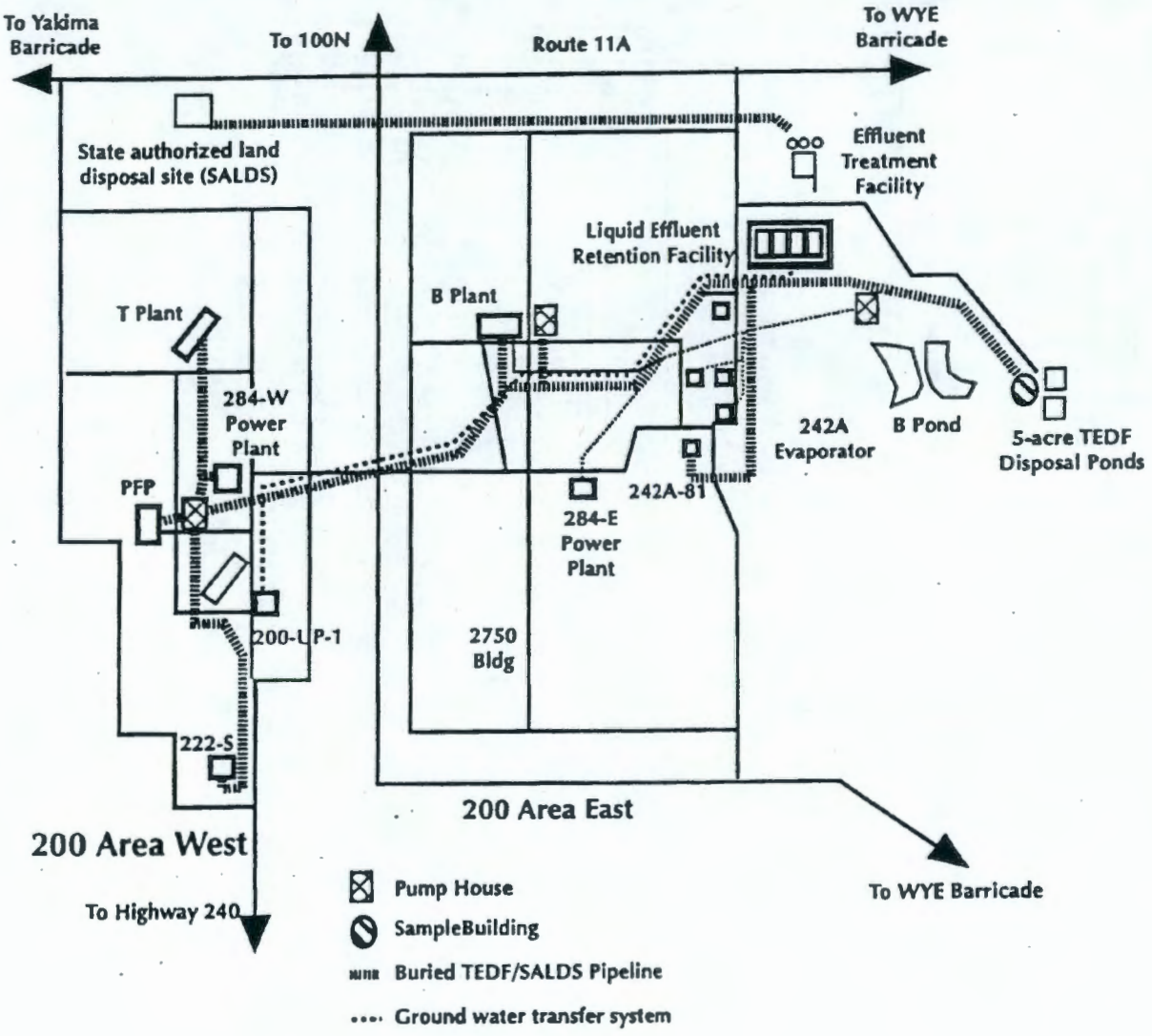
Figure, 2 ETF/LERF Site Plan



■ Staging Area

ETF or LERF site evacuation routes will be determined by the Building Emergency Director dependent on event location and wind direction

Figure, 3 200 Area LWPF SALDS, TEDF, Ground Water Transfer System



2.0 PURPOSE

This plan describes both the facility hazards and the impacts of upset and/or emergency conditions. "Emergency" as used in this document includes events meeting the Washington Administrative Code (WAC) 173-303 definition of Emergency as well as DOE-0232.1, "Occurrence Reporting and Processing of Operations Information," categories of Unusual Occurrence and Emergency. These events include spills or releases, fires and explosions, transportation activities, movement of materials, packaging, storage of hazardous materials, and natural and security contingencies. When used in conjunction with DOE/RL-94-02, *Hanford Site Emergency Response Plan*, this plan meets the requirements for contingency planning as required by WAC 173-303.

3.0 BUILDING EMERGENCY ORGANIZATION

The LWPF is staffed 24 hours each day, and is prepared to respond to emergencies through designated personnel with specific primary, on-call and alternate responsibilities. The ETF/LERF Building Emergency Director (BED) directs the emergency response until the Incident Commander arrives at the event scene. The BED is on duty 24 hours each day. The on-duty Shift Operations Manager is the designated primary BED. There is a designated alternate BED on day shift available for directing emergency response if required. Other personnel required as part of the building emergency organization are also on duty with either primary or alternate responsibilities. The following paragraphs describe this organization and the duties of designated personnel.

3.1 Building Emergency Director

Emergency response is directed by the Building Emergency Director (BED) until the Incident Commander arrives. The incident command structure and staff with supporting on-call personnel fulfill the responsibilities of the Emergency Coordinator as discussed in WAC 173-303.

During events, facility personnel perform response duties under the direction of the BED. The Incident Command Post (ICP) is managed by either the senior Hanford Fire Department member present on the scene or senior Hanford Patrol member present on the scene (security events only). These individuals are designated as the Incident Commander (IC) and as such have the authority to request and obtain any resources necessary for protecting people and the environment. The BED becomes a member of the ICP and functions under the direction of the IC. In this role the BED continues to manage and direct facility operations.

A listing of the primary and alternate BEDs by title, work location, and work telephone numbers is contained in Section 13 of this plan. The BED is on the premises or is available through an "on-call" list 24 hours a day. Emergency Preparedness maintains a listing of BED names and work and home telephone numbers at the Patrol Operations Center (POC) in accordance with *Hanford Facility RCRA Permit*, Dangerous Waste Portion, General Condition II.A.4.

3.2 Other Members

As a minimum, the BED or designee appoints and trains individuals to perform as Personnel Accountability Aides and Staging Area Managers. The accountability aides facilitate the implementation of protective actions (evacuation or take cover) and the accountability of personnel after the protective actions have been implemented. Staging Area Managers coordinate/conduct activities at the staging area. In addition, the BED may identify additional support personnel (Radiological Control, Maintenance, Engineering, Hazardous Material Coordinators, etc.) to be part of the building emergency organization. Section 13.0, BUILDING EMERGENCY ORGANIZATION, of this plan discusses the location of information regarding positions, names, and telephone numbers. Copies are distributed to appropriate facility locations and to the Hanford Site Emergency Preparedness organization.

4.0 IMPLEMENTATION OF THE PLAN

To meet the requirements of WAC 173-303, this plan will be implemented when the BED has determined that a release, fire, or explosion involving dangerous waste or dangerous waste constituents that could threaten human health or the environment (WAC 173-303-360, Emergencies) has occurred at the facility. An incident requiring evacuation of personnel or the summoning of emergency response units will not necessarily indicate that the plan will be implemented. The incident classification process is described in DOE/RL-94-02, Section 4.2.

Under DOE guidance, this plan will be implemented whenever the BED determines that one of the incidents listed in Section 6.0 of this plan has or will occur and that the severity is or will be such that there is a potential to endanger human health or the environment (DOE Unusual Occurrence or Emergency).

DOE Declared Emergencies are assigned one of three classifications which, in the order of increasing severity, are: 1) Alert Emergency, 2) Site Area Emergency, and 3) General Emergency. The ETF/LERF implements responses to these DOE emergencies through this plan and criteria identified in DOE-0223, RLEP 1.1, Appendix 1-2.K, and other documents listed in Attachment A of this plan.

The BED assesses each incident to determine the response necessary to protect personnel, the facility, and the environment. If emergency assistance from Hanford Patrol, Hanford Fire Department, or ambulance units is required, the Hanford Emergency Response Number (911) is used to contact the POC and request the desired assistance. To request other resources or assistance from outside the facility, the POC business number is used (373-3800).

5.0 FACILITY HAZARDS

Facility hazards and potential targets are identified and evaluated in the hazards assessment required by DOE Orders for the ETF/LERF. The hazards assessment is not used in the Hanford Facility contingency planning program. The objective of this section of the emergency plan is to document all known hazards that pose significant risks to human health or to the environment and identify quantitative values for those significant risks.

Certain information in this plan pertains only to DOE Order considerations (e.g., discussions pertaining to hazards from hazardous materials and radioactive-only materials). Terms such as Emergency Response Protective Guidelines (ERPG), Alert Emergencies, Site Area Emergencies, and General Emergencies pertain only to DOE Order planning considerations. These hazards and terms are not part of the Hanford Facility contingency planning program. The only portion of this section that is part of the Hanford Facility contingency planning program are the chemical constituent hazards discussed in Section 5.3.

5.1 ETF Hazards

5.1.1 Hazardous Materials

Material Safety Data Sheets (MSDSs) are located in building 2025EA, rooms 101 and 104, and in the ETF Control Room.

Materials at the ETF defined in DOE Order guidance as potentially hazardous include chemicals added as part of the treatment process, chemicals added to prevent corrosion, and anti-foaming agents added to the evaporator. There are no explosives in the system, although some chemicals can react or decompose violently. Hazardous chemicals in the process liquid are discussed in Section 5.1.3.

Hazardous process chemicals identified in the hazards assessment are given in Table 1, including the associated DOE Order ERPG values. DOE Order emergency planning ensures that appropriate protective actions are taken for the full range of events from a release of hazardous material that has the potential to exceed limits.

Table 1. ETF HAZARDOUS PROCESS CHEMICALS

Hazardous Chemical	ERPG Values		
	1	2	3
50% hydrogen peroxide	NA	25 ppm	50 ppm
92% sulfuric acid	2 mg/m^3	10 mg/m^3	30 mg/m^3
50% sodium hydroxide	2 mg/m^3	40 mg/m^3	100 mg/m^3

ppm-parts per million; mg-milligram; m^3-cubic meter

5.1.2 Industrial Hazards

The industrial hazards associated with the facility include electrical equipment, rotating equipment, confined spaces, compressed gas cylinders, and propane tanks. The industrial hazards associated with the facility do not pose a threat to the human health or the environment. Industrial hazards are addressed in the building health and safety plan and maintenance programs.

5.1.3 Radioactive/Dangerous/Mixed Waste

5.1.3.1 Solid Form

There are three types of solid mixed wastes at ETF:

- Secondary waste powder - A dry powder with a low radioactivity level that may contain ammonium, sodium, sulfates, silicon, nitrates, calcium, magnesium, and trace metals. The ETF Process Run Plan will document the characterization of the waste streams. The process drum capacity is 55 gallons. Locations include the thin film dryer room, drum handling area, and the process drum storage area. Maximum radiological source terms and hazardous materials for the secondary waste powder are below the levels requiring evaluation for emergency preparedness concerns.

- Indirect Waste - Materials that are used in the treatment process. These materials include spent resin beads, spent reverse osmosis membranes, spent high efficiency particulate air (HEPA) cartridges, carbon filter medium, and spent filter elements. Storage locations could include all staged maintenance areas or satellite accumulation areas.

- Dry active waste - Small quantities of waste from routine operations and maintenance activities (i.e., rags, sampling media, etc.). Locations include the process area, external tank area, staged maintenance areas, and satellite accumulation areas.

5.1.3.2 Liquid Form

The aqueous waste treated at ETF may contain trace amounts of radioactive materials and/or dangerous chemical constituents. The radioactive/dangerous/ mixed waste is evaluated in the hazards assessment as required by DOE Orders. Maximum radiological source term and dangerous waste materials are evaluated in the ETF Process Run Plan. The amount present must be below the levels requiring reevaluation for emergency preparedness concerns prior to treatment.

The influent aqueous waste to the ETF is treated in the primary treatment train to remove contaminants to allow discharge to the ground in accordance with the Washington State Waste Discharge Permit. These contaminants are concentrated in the secondary treatment train and are addressed in Section 5.1.3.1.

Emergency planning activities include implementing instructions that evaluate conditions and consequences associated with abnormal radiation levels, as well as release of waste water. For the purposes of field measurements, the site boundary is defined as 100 meters from the facility buildings.

5.1.3.3 Gaseous Form

Airborne effluent streams are produced through the following:

- Radiological control area Heating Ventilation Air Conditioning (HVAC) system - exhaust from radiologically controlled areas.
- Vessel offgas system - Vapors and gases from the various tanks and treatment systems.

The vessel offgas HEPA filters remove particulate and condensate from the air stream before discharge to the radiologically controlled area HVAC system. The combined air stream passes through another HEPA filter and is monitored for radiation. Analysis shows that potential radioactive release levels are less than the values requiring event classification.

5.1.4 Criticality

A criticality is not a credible hazard at ETF. Emergency planning is not required.

5.2 LERF Hazards

5.2.1 Hazardous Materials

No hazardous material is stored at LERF. Small quantities of hazardous material could be used in maintenance and sampling activities. Any release of these materials would not be classed as a WAC 173-303 or DOE emergency. No emergency planning response is required.

5.2.2 Industrial Hazards

The industrial hazards associated with LERF include electrical equipment, rotating equipment, confined spaces, compressed gas cylinders, and propane tanks. The industrial hazards associated with the facility do not pose a threat to the health and safety of the general public or environment. Industrial hazards are addressed in the building health and safety plan and maintenance programs.

5.2.3 Radioactive/Dangerous/Mixed waste

5.2.3.1 Solid Form

Small quantities of low radioactivity mixed waste from routine operations and maintenance activities (i.e., rags, sampling media, etc.). Locations include sampling areas, staged maintenance areas, and satellite accumulation areas. Any release of these materials would not be classed as a WAC 173-303 or DOE emergency. No emergency planning response is required.

5.2.3.2 Liquid Form

The aqueous waste stored in the LERF basins may contain trace amounts of radioactivity with dangerous chemical constituents and is evaluated in the hazards assessment as required by DOE Orders. Maximum radiological source terms for LERF are below the levels requiring evaluation for emergency preparedness concerns. The chemical constituent of concern, based on worst case scenarios for process condensate from the 242-A Evaporator, is ammonia. DOE Order ERPG values are shown in Table 2.

Table 2 LERF WASTE CHEMICAL CONSTITUENTS OF CONCERN

Constituent	ERPG Values		
	1	2	3
Process liquid - Ammonia	25 ppm	200 ppm	1000 ppm

5.2.3.3 Gaseous Form

Airborne effluent streams produced from the wastewater in the basins is vented through the basin vent system. Analysis shows that potential for gaseous release levels are less than the values requiring event classification. However, release modes for the basin liquid are discussed in Section 5.2.3.2.

5.2.4 Criticality

A criticality is not a credible hazard at LERF. Emergency planning is not required.

5.3 TEDF and Ground Water Transfer System Hazards

The hazards associated with the TEDF and the GTS are industrial hazards only. Industrial hazards to facility personnel are addressed in the building health and safety plan and maintenance programs.

5.3.1 Hazardous Materials

Only small amounts of sample preservative chemicals are stored at the TEDF. There are no hazardous materials associated with the TEDF or GTS that would pose a threat to human health or the environment. However, maintenance and sampling activities might require the use of small quantities of hazardous materials. Hazards associated with maintenance and sampling activities are addressed in the health and safety plan and maintenance programs.

5.3.2 Industrial Hazards

The industrial hazards associated with the TEDF include electrical equipment, rotating equipment, confined spaces, compressed gas cylinders, and propane tanks. A propane storage tank for the pump house #1 Standby Power Generator is the only hazard above common industrial hazards. Response to an event involving the propane tank would be as a result of

fire or explosion. The industrial hazards associated with the TEDF or GTS do not pose a threat to human health or the environment.

5.3.3 Radioactive/Dangerous/Mixed Waste

The level of radioactive/dangerous materials in the influent to TEDF allows for disposal as a nondangerous waste. The total inventory of the GTS is based on the volume of the transfer line and the concentration of contaminants in the 200-UP-1 groundwater. The radioactive/dangerous material inventories associated with the aqueous waste in the TEDF or GTS are sufficiently low that there is no threat to human health or the environment.

5.3.4 Criticality

A criticality accident is not credible at the TEDF or GTS.

6.0 POTENTIAL EMERGENCY CONDITIONS

The objective of this section is to identify WAC 173-303 and DOE Order potential emergency conditions and to identify the appropriate DOE Order emergency classification level. Protective action responses based on these classifications are discussed in Section 7.0. Technical justification for the values and limits identified in this section are provided in the hazards assessment required by DOE Orders for the ETF/LERF. The hazards assessment is not used in the Hanford Facility contingency planning program.

Potential emergency conditions fall into three basic categories: operational (process upsets, fires and explosions, loss of utilities, spills, and releases), natural phenomena (earthquakes and storms), and security contingencies (bomb threats, hostage situations). For operational emergencies, event frequency coupled with accident severity provide the criteria for emergency plan response.

Potential radioactive/dangerous/mixed waste release modes include fires, explosions, spills, or environmental releases. These events are evaluated based on the potential impact to operations and subsequent release of waste or hazardous materials. Potential consequences to human health or the environment are the ultimate criteria for event classification and protective response actions. Additionally, prolonged small releases are evaluated for their potential to impact human health or the environment.

6.1 Operational Emergencies

Operational emergencies for each facility are discussed in the following section.

6.1.1 ETF Operational Emergencies

6.1.1.1 Loss of Utilities

Loss of utilities would interrupt the treatment processes but would not be classed as a WAC 173-303 or DOE Order defined emergency.

6.1.1.2 Major Process Disruption/Loss of Plant Control

Process disruption/loss of plant control would interrupt the treatment processes but would not be classed as a WAC 173-303 or DOE Order defined emergency.

6.1.1.3 Pressure Release

The ETF has low pressure compressed air and steam systems. Loss of the compressed air or steam system(s) could result in loss of plant control or a process disruption. Process disruption/loss of plant control would interrupt the treatment processes but would not be classed as a WAC 173-303 or DOE Order defined emergency.

Compressed gas cylinders are used at the ETF. Failure of compressed gas bottles could cause flying debris hazards and are addressed as part of fire and/or explosion, Section 6.1.1.4

A process system pressure release is categorized as a condensate spray release. This is addressed as a radioactive/dangerous/mixed waste spill, Section 6.1.1.6.

6.1.1.4 Fire and/or Explosion

A fire/explosion could generate highly toxic and/or corrosive fumes. Flying debris might result from explosions and compressed gas cylinder failure. Process system disruption, loss of plant control, and breach of process system boundaries could result from the flying debris. Fire involving sulfuric acid might be classified as a Site Area Emergency.

6.1.1.5 Hazardous Material Spill

Hazards associated with process chemical spills include potential exposure to corrosive, oxidizing, or toxic materials, as well as potential environmental damage by the release of these materials to the air, water, or soil column. The hazards assessment required by DOE Orders identifies sulfuric acid and hydrogen peroxide spills as events that could pose significant risk or consequences to warrant emergency planning. Emergency classification criteria are provided in Table 3.

Table 3. HAZARDOUS MATERIAL EMERGENCY CLASSIFICATION

Event	Emergency Action Level	Emergency Classification
Sulfuric acid spill	Entire contents of tank or tanker truck spill is released **AND** fire involving the contents of the tank or tanker truck **AND** field measurements at facility boundary (100 meters) indicate sulfuric acid concentrations of 2 milligrams per cubic meter or greater.	Site Area Emergency
Hydrogen peroxide spill	A spill of greater than or equal to 6800 liters (1800 gallons) **AND** field measurements at facility boundary indicate hydrogen peroxide concentrations of 25 parts per million or greater.	Site Area Emergency

6.1.1.6 Dangerous/Mixed Waste Spill

The ETF inventories include large quantities of process liquid, secondary powder waste, indirect waste, and dry active waste. The hazards assessment has evaluated that there are no events that could pose significant risk or consequences to warrant emergency planning. ETF has the potential for minor exposures to radioactive material, corrosive, oxidizing or toxic materials, as well as localized environmental damage by their release to air, water, or soil column. Therefore, response for dangerous/mixed waste releases are included in the scope of emergency planning.

6.1.1.7 Transportation and/or Packaging Incidents

A transportation and/or packaging incident involving chemicals, dangerous/mixed waste, or samples could result in exposure to hazardous materials (corrosive, oxidizer, toxic) and/or low levels of radioactivity, as well as potential environmental damage by their release to the air, water, or soil column.

6.1.1.8 Radiological Material Release/Abnormal Radiation level

The ETF inventories include large quantities of process liquid, secondary powder waste, indirect waste, and dry active waste. Radioactive materials will accumulate in various treatment systems and in secondary waste powder. ETF has the potential for concentrating radioactive materials, therefore, response for abnormal radiation levels and radioactive material release are included in the scope of emergency planning. Criteria used to classify radiological emergencies is identified in Section 5.0.

6.1.1.9 Criticality

A criticality is not a credible accident at the ETF. Emergency planning is not required. The hazards assessment concluded that criticality is not credible at the ETF.

6.1.2 LERF Operational Emergencies

6.1.2.1 Loss of Utilities

Loss of utilities would interrupt the pumping and automatic sampling processes but would not be classed as a WAC 173-303 or DOE Order defined emergency.

6.1.2.2 Major Process Disruption/Loss of Plant Control

Major process disruption/loss of plant control would interrupt the pumping and automatic sampling processes but would not be classed as a WAC 173-303 or DOE Order defined emergency.

6.1.2.3 Pressure Release

The are no high pressure systems at LERF. A piping system breach is addressed as a radioactive/dangerous/mixed waste spill (Section 6.1.2.6).

6.1.2.4 Fire and/or Explosion

A fire/explosion could generate highly toxic and/or corrosive fumes.

6.1.2.5 Hazardous Material Spill

Process liquid releases are addressed in Section 6.1.2.6. Small quantities of hazardous material could be used in maintenance and sampling activities. A spill of these materials would not be classed as a WAC 173-303 or DOE Order emergency. No emergency planning response is required.

6.1.2.6 Dangerous/Mixed Waste Spill

The LERF inventories include large quantities of process liquid. The hazards assessment has determined events listed in Table 4 could pose significant risks or consequences and warrant emergency planning. LERF has the potential for exposures to radioactive material, corrosive, oxidizing or toxic materials, as well as environmental damage by their release to air, water, or soil column. Therefore response for dangerous/mixed waste release are included in the scope of emergency planning.

Table 4 Dangerous/Mixed Waste Emergency Classification

Event	Emergency Action Level	Emergency Classification
Loss of basin cover	Significant portion of basin (>50%) is uncovered **AND** ammonia concentration in liquid > 7200 ppm **AND** field measurements at facility boundary (100 meters) indicate ammonia concentrations >25 ppm.	Alert Emergency
Process liquid spray	Breach in LERF piping occurs outside containment barriers, spilling >37.8 liters (10 gallons) **AND** Ammonia concentration in liquid greater than 6800 ppm **AND** Field measurements at facility boundary (100 meters) indicate ammonia concentrations >25 ppm.	Alert Emergency
Process liquid spill	Spill of LERF liquid occurs outside containment barriers of >37.8 liters (10 gallons) **AND** Ammonia concentration in liquid > 2500 ppm **AND** Field measurements at facility boundary (100 meters) indicate ammonia concentrations >25 ppm.	Alert Emergency
Process liquid spill	Spill of LERF liquid occurs outside containment barriers of >280 liters (74 gallons) **AND** Ammonia concentration in liquid > 2500 ppm **AND** Field measurements at facility boundary (100 meters) indicate ammonia concentrations >200 ppm.	Site Emergency

6.1.2.7 Transportation and/or Packaging Incidents

A transportation and/or packaging incident involving hazardous chemicals, radioactive/dangerous/mixed waste, or samples could result in exposure to hazardous materials (corrosive, oxidizer, toxic) and/or low levels of radioactivity, as well as potential environmental damage by their release to the air, water, or soil column.

6.1.2.8 Radiological Material Release/Abnormal Radiation level

Refer to Section 6.1.2.6.

6.1.2.9 Criticality

A criticality is not a credible accident at LERF. Emergency planning is not required.

6.1.3 TEDF and GTS Operational Emergencies

6.1.3.1 Loss of Utilities

Loss of utilities would interrupt the pumping and automatic sampling processes but would not be classed as a WAC 173-303 or DOE Order defined emergency. No emergency planning response is required.

6.1.3.2 Major Process Disruption/Loss of Plant Control

Process disruption/loss of plant control could cause an inadvertent discharge of treated effluent or nontreated groundwater to a nonpermitted area. Discharge to an unauthorized area would not be classed as a WAC 173-303 or DOE Order defined emergency. No emergency planning response is required.

6.1.3.3 Pressure Release

There are no high pressure systems at the TEDF or GTS. A piping system breach is addressed in section 6.1.3.6.

6.1.3.4 Fire and/or Explosion

A fire/explosion could generate highly toxic and/or corrosive fumes.

6.1.3.5 Hazardous Material Spill

No hazardous material is stored in the TEDF pump houses. Small quantities of hazardous material could be used in maintenance and sampling activities. This would not be classed as a WAC 173-303 or DOE Order emergency. No emergency planning response is required.

6.1.3.6 Dangerous/Mixed Waste Spill

Influent to TEDF is a nondangerous waste. TEDF and groundwater releases would not be classed as a WAC 173-303 or DOE Order emergency. No emergency planning response is required for this event. LWPF surveillance serves as leak detection.

6.1.3.7 Transportation and/or Packaging Incidents

There are no transportation and/or packaging activities at TEDF or GTS.

6.1.3.8 Radiological Material Release/Abnormal Radiation level

TEDF process liquid meets discharge limits. A groundwater release would not be classed as a WAC 173-303 or DOE Order emergency. No emergency planning response is required for this event.

6.1.3.9 Criticality

A criticality is not a credible accident at TEDF or the GTS. Emergency planning is not required.

6.2 Natural Phenomena

6.2.1 Seismic Event

Depending on the magnitude of the seismic event, severe structural damage could occur at ETF/LERF, resulting in serious injuries or fatalities and the release of hazardous or radioactive materials to the environment. Damaged electrical circuits and wiring could result in the initiation of fires.

Any seismic event that is felt by personnel, with some minor facility damage, and disturbance of tall objects at ETF/LERF locations that house hazardous chemicals and/or radioactive materials requires classification as an Alert Emergency. An emergency classification upgrade could occur based on facility conditions and/or actual hazardous material or radioactive/dangerous/mixed waste releases determined by personnel assessing quake damage.

6.2.2 Ashfall/Snow Fall Roof Overloading

Ash or snow accumulations can cause actual roof or other structural damage to buildings containing hazardous material or radioactive/dangerous/mixed waste. There should be ample warning of an approaching large ashfall to allow the facilities to be placed in a stable condition.

6.2.3 High Winds/Tornados

An Alert Emergency classification is suggested when sustained wind speeds in excess of 40 meters per second (90 miles per hour) are observed and cause degradation of the facility safety boundary. An emergency classification upgrade could occur based on actual facility damage or release of hazardous materials, radioactive/dangerous/mixed waste.

6.2.4 Flood

A flood is not a credible accident at ETF/LERF because the facility is not within the Columbia River flood plain. Emergency planning is not required.

6.2.5 Range Fire

An Alert Emergency is suggested in the event that a range fire threatens any ETF/LERF building containing hazardous material or radioactive/dangerous/mixed waste.

6.2.6 Aircraft Crash

A Site Area Emergency classification is suggested if an aircraft crash occurs into or near ETF/LERF. An emergency classification upgrade could occur based on actual facility damage or release of hazardous material or radioactive/dangerous/mixed waste.

6.3 Security Contingencies

6.3.1 Bomb Threat/Suspicious Object

An Alert Emergency classification is required if there is a credible bomb threat or a confirmed explosive device located in ETF/LERF housing hazardous chemicals and/or radioactive material. If the device explodes, classification of the event will be performed as stated in Section 6.1.1.4, 6.1.2.4, or 6.1.3.4.

6.3.2 Hostage Situation/Armed Intruder

A hostage situation or armed intruder(s) at ETF/LERF requires an Alert Emergency classification. An emergency classification upgrade could occur based on actual facility damage or release of hazardous material or radioactive/dangerous/mixed waste.

6.3.3 Suspicious Object

The major effect on the facility due to recognizing a suspicious object is that the facility should be placed in a safe configuration, if time permits, and the facility evacuated.

7.0 INCIDENT RESPONSE

The initial response to any emergency is to immediately protect the health and safety of persons in the immediate area. Identification of released material is essential to determine appropriate protective actions. Containment, treatment, and disposal assessment are secondary responses.

The following sections describe the process for implementing basic protective actions as well as descriptions of response actions for the events listed in Section 6.0. DOE/RL-94-02, Section 1.3, provides concept of operations for emergency response on the Hanford Site

Incident responses are coordinated from the ETF control room or a designated alternate location.

7.1 Protective Actions Responses

7.1.1 Evacuation

The objective of a facility evacuation order is to limit personnel exposure to hazardous materials or radioactive/dangerous/mixed waste by increasing the distance between personnel and the hazard. The scope of the evacuation includes evacuation of the facility because of an event at the facility as well as evacuation of the facility in response to a site evacuation order. Evacuation will be directed by the BED when conditions warrant and will apply to all personnel not actively involved in the event response or emergency plan-related activities.

The BED will initiate the evacuation by directing an announcement be made to evacuate along with the evacuation location over a public address system, facility radios, and, as conditions warrant, by activating the 200 Area site evacuation/take cover alarms by calling the POC using 911 (preferred) or 373-3800. Personnel proceed to a predetermined staging area (shown in Figure 2), or other safe upwind location, as determined by the BED. The BED will determine the operating configuration of the facility and identify any additional protective actions to limit personnel exposure to the hazard.

Emergency organization personnel or assigned operations personnel will conduct a sweep of occupied buildings to ensure that all non-essential personnel and visitors have evacuated. For an immediate evacuation, accountability will be performed at the staging area. The BED will assign personnel as accountability aides and staging managers with the responsibility to ensure that evacuation actions are taken at all occupied buildings at the ETF or LERF complexes. All implementing actions executed by the aides/managers are directed by the emergency response procedures identified in Attachment A. When evacuation actions are complete, the aides/managers will provide a status report to the BED. The BED will provide status to the Incident Commander.

7.1.2 Take Cover

The objective of the take cover order is to limit personnel exposure to hazardous materials, or radioactive/dangerous/mixed waste when evacuation is inappropriate or not practical. Evacuation might not be practical or appropriate because of extreme weather conditions or the material release might limit the ability to safely evacuate personnel.

The BED will initiate the take cover by directing an announcement be made over the public address system, facility radios, and, as conditions warrant, by activating the 200 Area site take cover alarms by calling the POC using 911 (preferred) or 373-3800. Actions to complete a facility take-cover will be directed by the emergency response procedure in Attachment A. Protective actions associated with operations include configuring, or shutting down, the ventilation systems. Determination of additional take cover response is based on plant operating configuration, weather conditions, amount and duration of release, and other conditions, as applicable to the event and associated hazard. As a minimum, personnel exposure to the hazard will be minimized. The BED will assign personnel as accountability aides with responsibility to ensure that take-cover actions are taken at all occupied buildings at the ETF complex. All implementing actions executed by the aides/managers are directed by the emergency response procedure in attachment A. When take cover actions are complete the aides/manager will provide the BED with a status report.

7.2 Response to Operational Emergencies

Operations activities to isolate, contain, and mitigate an event can be performed in parallel with classification and protective action implementation. The response procedures are structured to allow parallel activity with clearly established priorities. The division of actions and workload between various personnel is such that coordinated team response will result in the successful implementation of both emergency operating actions and emergency planning requirements. Specific event mitigation strategy for each type of accident is provided in the following sections.

7.2.1 Loss of Utilities

The hazards assessment has determined that this occurrence does not pose significant risk to human health or the environment. This event is not classified as a WAC 173-303 or DOE Order defined emergency. No emergency planning is required.

7.2.2 Major Process Disruption/Loss of Plant Control

The hazards assessment has determined that this occurrence does not pose significant risk to human health or the environment. This event is not classified as a WAC 173-303 or DOE Order defined emergency. No emergency planning is required.

7.2.3 Pressure Release

The hazards assessment has determined that a pressure release does not pose significant risk to human health or the environment. This event is not classified as a WAC 173-303 or DOE Order defined emergency. No emergency planning is required. Hazardous material release and radioactive/dangerous/mixed waste releases are addressed in Section 7.2.5.

7.2.4 Fire and/or Explosion

On becoming aware of a fire and/or explosion, the discoverer notifies personnel (if any) in the immediate area and directs them to a safe location. The discoverer then activates the nearest fire alarm pull station, contacts 911 to request fire fighting assistance, and contacts the ETF control room to report the fire. As soon as non-essential personnel are notified of a fire (verbally or by fire alarm activation), they immediately exit the facility to a safe upwind location, account for their personnel, and follow the instructions of responding personnel. If personnel are reported as missing, and might be within the facility, the Hanford Fire Department conducts a search.

The BED is notified and initiates activation of the event command post and resources.

Operations personnel initiate a plant shutdown with the method (controlled or emergency) depending on the location and severity of the fire and the location and type of hazards in the affected area. A controlled shutdown is performed unless it is unsafe to remain in the control room. An emergency shutdown is performed if the control room must be evacuated. The Shift Operations Manager interfaces with the Hanford Fire Department and provides the following:

a. Location and health of personnel, including missing personnel and possible locations for fire fighters to search.

b. Location and severity of fire.

c. Known hazardous (radiological and nonradiological) conditions.

d. Facility operating status.

e. Utility systems status.

f. Support by radiological control personnel (i.e., monitoring, surveys, sampling, decontamination).

g. Facility layout, and facility known hazardous conditions, (i.e., electrical, thermal, flammable materials, pressurized cylinders, toxic gas, pressure systems, batteries, radiation areas, etc.).

h. Support for fire fighter activities as required.

Once the fire is extinguished, the Shift Operations Manager/BED ensures administrative restrictions are implemented to protect the facility, the workers, and the environment. The Shift Operations Manager/BED makes notifications as required and assists with recovery actions.

An incident requiring evacuation of personnel or the summoning of emergency response units does not necessarily indicate that the contingency plan has been implemented.

A fire or explosion involving 92% sulfuric acid will be classified as a Site Emergency. Actions described in Section 7.2.5.2 will be performed for this event.

7.2.5 Hazardous Material, Radioactive/Dangerous/Mixed Waste Spills or Releases

The ETF and LERF have engineering controls to contain or minimize spills. These controls include, containment berms, dedicated spill control sumps, remote gauges and level indicators as well as spray shields on chemical pipe flanges. LWPF procedures provide alarm response and maintenance actions for leak detection equipment, surveillance of possible leak locations, and response actions for detected spills.

Spills can result from many sources including process leaks, container spills or leaks, damaged packages or shipments, or personnel error. Spills of mixed waste are complicated by the need to deal with the extra hazard induced by the presence of radioactive materials.

If a spill or release is discovered, the discoverer performs the following actions:

1. Notifies the ETF control room and evacuates to a safe area

2. Remains available for consultation with the BED, Hanford Fire Department, or other emergency response personnel.

The control room operator performs the following actions:

1. Uses the public address system to notify the facility occupants of the event
2. Notifies the BED/HFD and relays information received from the event scene
3. Places the facility in a safe condition
4. Remains available to support further notification and response activities

The BED performs or arranges for personnel to perform the following actions:

1. Coordinates response activity and establishes a command post at a safe location
2. Obtains all available information pertaining to the incident and determines if the spill or release warrants implementation of the contingency plan in accordance with Sections 4.0, 6.1.5, and 6.1.9
3. Determines need for assistance from outside agencies and arranges for their mobilization and response
4. Initiates the appropriate announcements, if building or area evacuations are necessary
5. Arranges for care of any injured persons
6. Requests activation of the affected area emergency sirens/crash alarm system if a threat to surrounding facilities
7. Provides for event notification
8. Maintains access control at the incident site by keeping unauthorized personnel and vehicles away from the area. Security personnel can be used to assist in site control if control of the boundary is difficult. In determining controlled access areas, considers environmental factors such as wind speed and direction
9. Arranges for proper remediation of the incident after evaluation
10. Remains available for HFD, Hanford Patrol, and other authorities on the scene and provide all required information
11. Enlists the assistance of alternate BED(s), if around-the-clock work is anticipated
12. Refers media inquiries to the Media Relations/Communications offices of the contractors or DOE-RL.
13. Ensures the use of proper protective equipment, remedial techniques (including ignition source control for flammable spills), and decontamination procedures by all involved personnel, if remediation is performed by ETF personnel

14. Remains at the command post to oversee activities and to provide information, if remediation is performed by the HFD Hazardous Materials Response Team or other response teams

15. Ensures proper containerization, packaging, and labeling of recovered spill materials and overpack containers

16. Ensures decontamination (or restocking) and restoration of emergency equipment used in the spill remediation before resuming operations

17. Provides required reports after the incident.

7.2.5.1 Damaged, Unacceptable Hazardous Material, Dangerous and/or Mixed Waste Shipments

When a damaged shipment of hazardous material or dangerous waste arrives at the ETF and the shipment is unacceptable for receipt, actions will be taken to rectify the problem. If required, actions described in Section 7.2.5 are taken.

7.2.6 Radiological Material Release

At a minimum, actions described in Section 7.2.5 are taken. Abnormal radiation actions also may be implemented if conditions are warranted.

7.2.7 Criticality

The hazards assessment has determined that a criticality is not credible for ETF or LERF. No emergency planning is required.

7.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The BED, in coordination with emergency response organizations, takes the steps necessary to ensure that a secondary release, fire, or explosion does not occur. The area of the initial incident is isolated by shutting off power, closing off ventilation systems, etc. The affected area containment is inspected for leaks, cracks, or other damage and for toxic vapor generation. Released material and waste remaining inside of containment structures are removed as soon as possible, and residual waste material is contained and isolated using dikes and adsorbents. Areas where residual released materials remain are covered or otherwise stabilized to prevent migration or spread from wind or precipitation run-off.

New structures, systems, or equipment are installed as required to enable better management of hazardous materials or dangerous waste. Adjacent operations in affected areas are reactivated only after cleanup of residual waste materials is achieved.

7.4 Response to Natural Phenomena

If other emergency conditions arise as a result of a natural phenomena event, response is appropriate for the condition created. For example: A fire due to lightning initiates the fire

response actions and a spill of hazardous material due to an earthquake initiates spill response actions.

7.4.1 Seismic Event

The Hanford Site emergency response organization's primary role in a seismic event is coordinating the initial response to injuries, fires, and fire hazards, and acting to contain or control radioactive and/or hazardous material releases.

Individuals should remain calm and stay away from windows, steam lines, and hazardous material storage locations. Once the shaking has subsided, individuals evacuate carefully and assist personnel needing help. The locations of any trapped individuals are reported to the BED or are reported to 911 or 373-3800.

The BED takes whatever actions are necessary to minimize damage and personnel injuries, including:

- Coordinating searches for personnel and potential hazardous conditions (fires, spills, etc.),
- Conducting accountability,
- Securing utilities and facility operations,
- Arranging for rescue efforts, and notifying 911 or 373-3800 for assistance,
- Determining if hazardous materials were released,
- Determining current local meteorological conditions,
- Warning other facilities and implementing protective actions if release of hazardous materials poses a danger,
- Providing personnel and resource assistance to other facilities.

7.4.2 Volcanic Eruption/Ashfall

When notified of an impending ashfall, the BED implements measures to minimize the impact of the ashfall, including the following:

- Installing filter media over building ventilation intakes,
- Installing filter media or protective coverings on outdoor equipment that could be adversely affected by the ash (diesel generators, equipment rooms etc.),
- Shutting down some or all operations and processes,
- Sealing secondary use exterior doors,

7.4.3 High Winds/Tornados

On notification of impending high winds, the BED takes steps necessary to secure all outside doors and windows, and secure all outdoor waste and hazardous material handling activities. All doors and windows are shut, and personnel are warned to use extreme caution when entering or exiting the building. After the event, facility inspections are performed in accordance with the post-natural phenomena hazards inspection plan and procedure.

7.4.4 Flood

The hazard assessment determined that flooding at the LERF/ETF is not credible. No emergency planning response is required.

7.4.5 Range Fire

Responses to range fires are handled by preventive measures (i.e., keeping hazardous material and waste accumulation areas free of combustible materials such as weeds and brush). If a range fire breaches the facility boundary, the response is as described for a fire.

7.4.6 Aircraft Crash

Response to an aircraft crash would be appropriate for the condition created. For example: A fire due to explosion or electrical shorts would initiate the fire response actions specified in Section 7.2.4.

7.5 Security Contingencies

7.5.1 Bomb Threat/Suspicious Object

7.5.1.1 Telephone Threat

Personnel receiving telephoned threats attempt to get as much information as possible from the caller. A form is available for personnel to keep by their telephone to use as a guide for getting useful information from the caller. On conclusion of the call, personnel notify the BED and Security.

The BED evacuates the facility and questions personnel at the staging area regarding any suspicious objects in the facility. When Security personnel arrive, their instructions are followed.

7.5.1.2 Written Threat

Receivers of written threats handle the letter as little as possible and notify the BED and Security. Depending on the content of the letter, the facility may or may not be evacuated. The letter is turned over to Security personnel and their instructions are followed.

7.5.2 Hostage Situation/Armed Intruder

The discoverer of a hostage situation/armed intruder reports the situation to the BED and to the POC via 911 or 373-3800, if possible. The BED, after conferring with Security personnel, may covertly evacuate areas of the facility not observable by the hostage taker(s)/intruder. No alarms will be sounded.

Security will determine the remaining response actions and will activate the Hostage Negotiating Team, if necessary.

7.5.3 Suspicious Object

The discoverer of an suspicious object reports it to the BED and to the POC via 911 or 373-3080, and, if possible, ensures that the object is not disturbed.

The BED orders evacuation of the facility and (based on the description provided by the discoverer) attempts to determine the identity or owner of the object. This may be done by questioning facility personnel at the staging area.

If the identity/ownership of the object cannot be determined, then Security assumes command of the incident. The canine unit is used to determine if the package contains explosives. If there is a positive indication of explosives or it cannot be assured that there are no explosives, then the Richland Police Department's Emergency Ordinance Disposal Team is dispatched to the facility to properly dispose of the device.

8.0 TERMINATION OF EVENT, INCIDENT RECOVERY, AND RESTART OF OPERATIONS

The DOE/RL-94-02, *Hanford Emergency Response Plan*, Section 8.0, describes these considerations. The extent by which these actions are employed is based upon the incident classification of each event. In addition, DOE/RL-94-02 contains considerations for the management of incompatible wastes, which may apply.

8.1 Termination of Event

For events where the DOE-RL Emergency Operations Center (RL-EOC) is activated, the DOE-RL Emergency Manager has the authority to declare event termination. This decision is based on input from the BED, Incident Commander, and other emergency response organization members. For events where the RL-EOC is not activated, the incident command system and staff declare event termination.

8.2 Incident Recovery and Restart of Operations

A recovery plan is developed when necessary. A recovery plan is needed following an event where further risk could be introduced to personnel, the facility, or the environment through recovery action and/or to maximize the preservation of evidence. Depending on the magnitude of the event and the effort required to recover from the event, recovery planning may involve personnel from DOE-RL and other contractors. If a recovery plan is required, it is reviewed by appropriate personnel and approved by a Recovery Manager before restart. Restart of operations is performed in accordance with the approved plan.

If this plan is to be implemented for a WAC emergency (see Section 4.0), the Washington State Department of Ecology is notified before operations can resume. The DOE/RL-94-02, *Hanford Emergency Response Plan*, Section 6.1 discusses different reports to outside agencies. This notification is in addition to other required reports and includes information documenting the following conditions:

1. There are no incompatibility issues with the waste and released materials from the incident.

2. All the equipment has been clean, fit for its intended use, and placed back into service. The notification may be made via telephone conference. Additional information that Ecology requests regarding these restart conditions will be included in the required 15-day report identified in WAC 173-303-360(2)(k).

For emergencies not involving activation of the RL-EOC, the BED ensures that conditions are restored to normal before operations are resumed. If the Hanford Site Emergency Organization was activated and the emergency phase is complete, a special recovery organization could be appointed at the discretion of DOE-RL to restore conditions to normal. This process is detailed in DOE-RL and contractor emergency procedures. The makeup of this organization depends on the extent of the damage and its effects. The onsite recovery organization is appointed by the appropriate contractor's management.

8.3 Incompatible Waste

After an event, the BED or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Cleanup actions are taken by facility personnel or other assigned personnel. DOE/RL-94-02, Section 8.3, describes actions to be taken.

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility before storage is performed as necessary. Incompatible wastes are not placed in the same container. Containers of waste are placed in storage areas appropriate for their compatibility class.

If incompatibility of wastes was a factor in the incident, the BED or the onsite recovery organization ensures that the cause is corrected.

8.4 Post Emergency Equipment Maintenance and Decontamination

All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumable and disposed materials are restocked. Fire extinguishers are recharged or replaced.

The BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished, self-contained breathing apparatus are cleaned and refilled, protective clothing is cleaned or disposed of and restocked, etc.

9.0 EMERGENCY EQUIPMENT

Hanford Site emergency resources and equipment are described and listed in DOE/RL-94-02, Appendix A.

9.1 Fixed Emergency Equipment

FIXED EMERGENCY EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Safety shower/eye wash stations (ETF only)	1 - 2025E Rm 122 Decon Station 1 - 2025E South Wall of Process Area 1 - 2025E Rm 134 1 - Outside south 2025E near acid/caustic tanks 1 - Outside at Load-in station	Assist in flushing chemicals/materials from the body and/or eyes and face of personnel.
Wet pipe sprinkler (ETF only)	Throughout the ETF except those areas protected by pre-active sprinklers.	Assist in the control of a fire.
Preactive sprinkler (ETF only)	Control room, communications room, electrical equipment room	Assist in the control of a fire. Maintained dry to prevent accidental damage to equipment.
Fire alarm pull boxes (ETF only)	All high traffic areas in operations administration and support areas, truck bay, and process area	Activate the local fire alarm

9.2 Portable Emergency Equipment

PORTABLE EMERGENCY EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Fire extinguisher ABC type	Throughout ETF (Administrative/Support areas), LERF, and TEDF	Fire suppression for Class A, B, and C fires
Fire extinguisher BC type	Throughout ETF (process area and electrical room)	Fire suppression for Class B and C fires
Portable safety showers and Eye Wash Stations	As needed for special evolutions and maintenance	Assist in flushing chemicals/ materials from the body and/or eyes and face of personnel.

9.3 Communications Equipment/warning Systems

COMMUNICATIONS EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Fire alarms (ETF only)	Corridors, locker rooms, process area, drum storage, and truck bay	Audible throughout ETF
Take cover/evacuation	Site Emergency Alarm System	Audible outside buildings and inside administrative buildings
Public address system (ETF Only)	Throughout the ETF	Audible throughout ETF
Portable radios	Operations and maintenance personnel	Communication to control room
Telephone	ETF - control room, 2025E, 2025EA offices, MO-269. LERF - MO-727 and 242AL71 instrument building TEDF - 225E(pump house 1), 225W (pump house 2), 6653 (sample building), 6653A (pump house 3)	Internal and external communications. Allows notification off outside resources (POC, HFD, Hanford Patrol, etc,.)
Crash alarms (ETF only)	Control room, 2025EA Rm 101	Audible in ETF control room
Process alarm (ETF only)	ETF - beacon near IX columns	Visible from ETF control room

9.4 Personal Protective Equipment

PERSONAL PROTECTIVE EQUIPMENT		
Self contained breathing apparatus (SCBA)	5 - 2025E Rm 122 2 - 2025E Control room area 2 - Outside southeast 2025E.	Breathable air for initial response to emergency, and recovery activities when required
Acid suits	3 each included in the spill response cabinets in 2025E.	Chemical protection for personnel during containment and isolation.
Respirators	2025E Rm 203	Filtered air for recovery of known hazards.

9.5 Spill Control and Containment Supplies

SPILL KITS AND SPILL CONTROL EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Spill bag	1 - TEDF 6653 Disposal Sampling Building. 1 - 90-day storage CONEX East of 2025E building	Support containment and cleanup of 6 gallons of acids or bases.
Drum spill kit	2 - 2025E building in process area. 1 - MO-727 Change Trailer	Support containment and cleanup of 51 gallons of acids or bases.
Spill cart	2 - 2025E building in process area	Support containment and cleanup of 77 gallons of acids or bases.
Spill response cabinet	1 - 2025E Rm 122 1 - outside southeast side of 2025E.	Support equipment for spill response.
Spill bag	1 - 2025E Rm 112 1 - 2025E upper level process area.	Support containment and cleanup of 10 gallons of acids or bases.

9.6 Emergency Response Center

For emergencies not requiring evacuation, the BED and support personnel will assemble in the ETF control room, ETF control room, or other location as identified by the BED.

10.0 COORDINATION AGREEMENTS

DOE-RL has established a number of coordination agreements, or memoranda of understanding (MOU) with various agencies to ensure proper response resource availability for incidents involving the Hanford Site. A description of the agreements is contained in DOE/RL-94-02, Table 3-1.

11.0 REQUIRED REPORTS

Post incident, written reports are required for certain incidents on the Hanford Site. The reports are described in DOE/RL-94-02, Section 6.1.

12.0 PLAN LOCATION

Copies of this plan are maintained at the following locations:

- ETF control room
- 242-A Evaporator control room
- Operations Managers office (Building 2025EA, room 101)
- 200 LWPF regulatory file

13.0 BUILDING EMERGENCY ORGANIZATION

BED	TITLE	WORK LOCATION	WORK PHONE
PRIMARY	Shift Operation Manager (SOM)	2025E Building - ETF control room or 242-A Evaporator control room	373-9000 373-2737
ALTERNATE	Operations Manager	2025EA Building, room 101	373-4565

The complete building emergency organization listing of positions, names, work locations and telephone numbers for essential LWPF personnel is maintained in the organization administrative procedures. Copies are distributed to appropriate facility locations and to Emergency Preparedness. In addition, work and home telephone numbers of the BEDs and alternates are available from the POC (373-3800) in accordance with Hanford Facility RCRA Permit, Dangerous Waste Portion, General Condition II.A.4.

14.0 REFERENCES

DOE-0223, *Emergency Plan Implementing Procedures*:

DOE-0232.1, "Occurrence Reporting and Processing of Operations Information", U.S. Department of Energy, Washington D.C.

DOE/RL-94-02, Hanford Site Emergency Response Plan

DOE Order 5500.1B, *Emergency Management Systems*

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, Washington State Department of Ecology, Olympia, Washington.

29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response*

NIOSH, *Pocket Guide to Chemical Hazards*, National Institute of Occupational Safety and Health, U.S. Department of Health and Human Resources, Public Health Service, Centers for Disease Control, Washington, D.C.

ATTACHMENT A

Listing of Procedures and Guides

Site-Wide Procedures

DOE-0223, *Emergency Plan Implementing Procedures*:

- RLEP-1.1, "Hanford Incident Command System and Event Recognition and Classification," Appendix 1-2.K;
- RLEP-3.4, "Emergency Termination, Reentry, and Recovery."

Facility-Specific Emergency Response Procedures and Guides

EP-85B-001	Safety Shutdown
EP-85B-002	Minor Spill
EP-85B-003	Major Chemical Spill
EP-85B-004	Abnormal Radiation Levels
EP-85B-005	Fire/Explosion
EP-85B-006	Loss of AC Electrical Power
EP-85B-007	Take Cover
EP-85B-008	Evacuation

Hanford Facility RCRA Permit Modification Notification Form

Unit: PUREX Storage Tunnels	Permit Part & Chapter: Part III, Chapter 3, and Attachment 28 (Chapter 7.0 and Appendix 7A)

Description of Modification:

Remove Chapter 7.0, Revision 4 and Appendix 7A , Supplemental Unit-Specific Contingency Plan for the 218-E-14 and 218-E-15 Storage Tunnels, HNF-IP-0603 (Issue Date, April 2, 1997), and replace with Chapter 7.0, Revision 4A and Appendix 7A, Supplemental Unit-Specific Contingency Plan for the 218-E-14 and 218-E-15 Storage Tunnels, HNF-IP-0603 (Effective Date, July 1, 1998).

Reason for Change:

Modifications to Chapter 7.0 and Appendix 7A of the PUREX Storage Tunnels Part B reflect a new Hanford Site incident command structure per agreements reached between DOE/RL, FDH, and Ecology.

Modification Class: [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: B.6.a.

Enter wording of the modification from WAC 173-303-830, Appendix I citation:
WAC 173-303-830, Appendix I, "General facility standards, Contingency Plan; Changes in emergency procedures (i.e., spill or release response procedures)."

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
L. J. Olguin, FDH — Date 5/13/98	J. E. Mecca, RL — Date 5/19/98	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.

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14.0 PART B CERTIFICATION [K] 14-1

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14.0 PART B CERTIFICATION [K]

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

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date 5/22/98

Co-operator
H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford, Inc.

Date May 14, 1998

Note: This certification addresses modifications to Chapter 7.0 and the Supplemental Unit-Specific Contingency Plan for the 218-E-14 and 218-E-15 Storage Tunnels (Appendix 7A) identified as Revision 4A.

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7.0 CONTINGENCY PLAN [G] 7-1

TABLES

7-1 Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3). 7-2

APPENDIX

7A SUPPLEMENTAL UNIT-SPECIFIC CONTINGENCY PLAN FOR THE 218-E-14 AND 218-E-15 STORAGE TUNNELS . . . . . APP 7A-i

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7.0 CONTINGENCY PLAN [G]

The WAC 173-303 requirements for a contingency plans are satisfied in the following documents: Portions of the *Hanford Emergency Response Plan* [Attachment 4 of the HF RCRA Permit [DW Portions)] and portions of the *Unit-Specific Contingency Plan for the 218-E-14 and 218-E-15 Storage Tunnels*, HNF-IP-0603-218-E-14/15, (Appendix 7A).

The supplemental unit-specific contingency (Appendix 7A) plan may also satisfy other requirements [e.g., Occupational Safety and Health Administration standards (29 CFR 1910), Toxic Substance Control Act (40 CFR 761) and U.S. Department of Energy Orders]. Therefore, revisions made to portions of this contingency plan document that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to WAC 173-303-830 or Hanford Facility RCRA Permit (DW Portion) Condition I.C.3. Table 7-1 identifies which portions of the Building Emergency Plan are written to meet WAC 173-303 contingency plan requirements.

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Table 7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3).

Requirement	Attachment 4 of the HF RCRA Permit (DW Portion)	Supplemental Contingency Plan
-350(3)(a) - A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360.	X[1] Section 1.3.2	X[1] Sections 1.6, 3.0 through 3.6, and 4.1 through 4.5
-350(3)(b) - A description of the actions which shall 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.	X[1] Section 1.3.2	X[1,2] Section 3.6
-350(3)(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).	X Sections 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.1.3, and Table 3-1	Section 6.0
-350(3)(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.		X[3] Section 2.0

Requirement	Attachment 4 of the HF RCRA Permit (DW Portion)	Supplemental Contingency Plan
-350(3)(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.	X Hanford Fire Department: Appendix C	X Section 5.0
-350(3)(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.	X[4] Figure 5-2	X[5] Section 1.6

[1]The *Hanford Emergency Response Plan* contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional description of actions are required if emergency planning activities are addressed. If other credible scenarios exist or if emergency procedures at the unit are different, the language contained in the supplemental unit-specific contingency plan will be used during an event by a Building Emergency Director.

[2]This requirement only applies to TSD units which receive shipments of dangerous or mixed waste defined as off-site shipments in accordance with WAC 173-303.

[3]Emergency Coordinator names and home telephone numbers are maintained separate from any 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, monthly.

[4]The Hanford Facility (site-wide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

[5]An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

This plan covers the following buildings and structures: 218-E-14 (Tunnel Number 1), 218-E-15 (Tunnel Number 2).

Approved by: Ronald W. Bailey — Building Emergency Director — 5/13/98 Date

Approved by: Jeff L. McNeill — Emergency Preparedness — 5-14-98 Date

Approved by: [illegible signature] — Hanford Fire Department — 5-13-98 Date

This document will be reviewed annually and updated if necessary by the Building Emergency Director unless Hanford Facility RCRA Permit coordination requirements provides otherwise. The document will be approved by the primary Building Emergency Director, and approved by the manager of Emergency Preparedness (or delegate) and the Hanford Fire Department.

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FIGURE

1. PUREX Storage Tunnels Evacuation Route 3

1.0 GENERAL INFORMATION

The Plutonium-Uranium Extraction 218-E-14 and 218-E-15 (PUREX Storage Tunnels) are located in the 200 East Area of the 1,450-square kilometer U.S. Department of Energy, Richland Operations Office (DOE-RL) operated Hanford Site in southeastern Washington State. The Hanford Site Emergency Preparedness Program is based upon the incident command system which allows a graded approach for response to emergency events. This plan contains a description of facility specific planning and response. It is used in conjunction with DOE/RL-94-02, *Hanford Emergency Response Plan*. Response to events is performed using facility specific and/or Site level emergency procedures.

1.1 FACILITY NAME: U.S. Department of Energy Hanford Site PUREX Storage Tunnels.

1.2 FACILITY LOCATION: Benton County, Washington; within the 200 East Area. Structures covered by this plan are:

218-E-14 Tunnel Number 1
218-E-15 Tunnel Number 2

1.3 OWNER:
U.S. Department of Energy
Richland Operations Office
825 Jadwin Avenue
Richland, Washington 99352

1.4 FACILITY MANAGER:
B&W Hanford Company
P.O. Box 1200
Richland, WA 99352-1200

1.5 DESCRIPTION OF FACILITY AND OPERATIONS

The PUREX Storage Tunnels consist of two structures, 218-E-14 (Tunnel Number 1) and 218-E-15 (Tunnel Number 2). The tunnels are used for the storage of material from the PUREX Plant and from other onsite sources. The material stored in the tunnels contains dangerous waste and varying amounts of radioactive contamination; therefore, the stored material is managed as mixed waste. Tunnel Number 1 is filled to capacity. Tunnel Number 2 currently has storage positions available and may continue to receive mixed waste from the PUREX Plant and other onsite sources until the tunnel is either filled to capacity or a determination is made that waste will no longer be received.

Mixed waste is stored in the PUREX Storage Tunnels on railcars that are modified to serve as both transporter and storage platforms. Each railcar is retrievable. However, because the railcars are stored on a single, dead-end railroad spur inside each storage tunnel, the railcars can be removed only in reverse order (i.e., last in, first out).

1.6 BUILDING EVACUATION ROUTE

The PUREX Storage Tunnels evacuation route is shown in Figure 1. During an emergency, personnel that enter the storage tunnels during material placement operations will evacuate via the north end of the railroad tunnel.

2.0 EMERGENCY COORDINATORS/BUILDING EMERGENCY DIRECTOR

Emergency Coordinator/Building Emergency Director[a]			
Designation	Job title	Work location	Work phone
Primary	PUREX Project Director	MO-414	373-4999
Alternate	Manager	MO-273	373-4134
Alternate	Manager	MO-273	373-1781

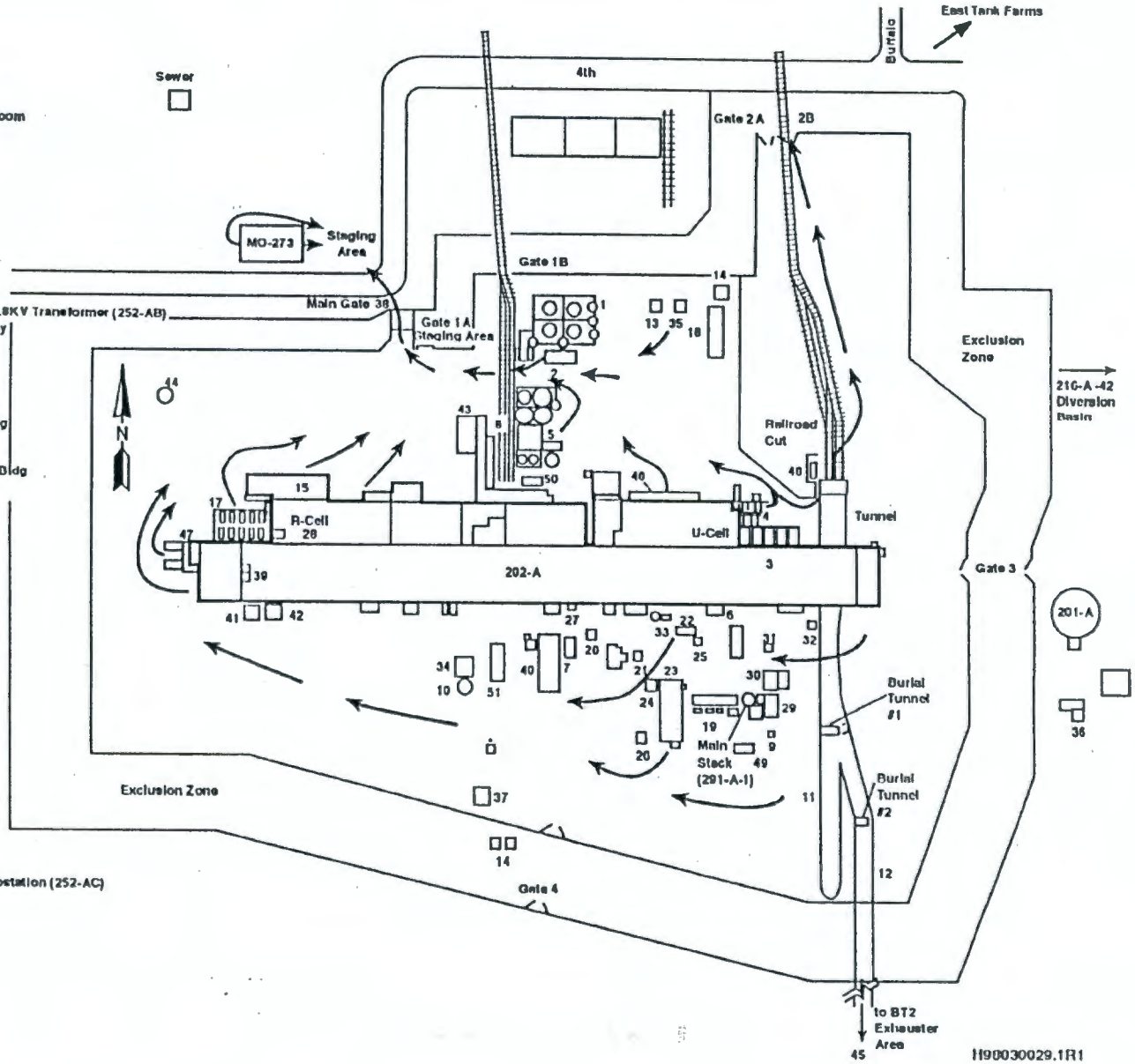
[a]The names and home phone numbers of all Emergency Coordinators/Building Emergency Director (EC/BED) are maintained at the single point-of-contact (the Hanford Patrol Operations Center) telephone number 373-3800 in accordance with the Hanford Facility RCRA Permit, Dangerous Waste Portion, General Condition II.A.4.

[a]Emergency response will be directed by the EC/BED until the Incident Commander arrives. The incident command structure and staff with supporting on-call personnel fulfill the responsibilities of the EC/BED as discussed in WAC 173-303-360.

During events, facility personnel perform response duties under the direction of the EC/BED. The Incident Command Post (ICP) is managed by either the senior Hanford Fire Department member present on the scene or senior Hanford Patrol member present on the scene (security events only). These individuals are designated as the Incident Commander (IC) and as such have the authority to request and obtain any resources necessary for protecting people and the environment. The EC/BED becomes a member of the ICP and functions under the direction of the IC. In this role, the EC/BED continues to manage and direct facility operations.

A listing of the primary and alternate EC/BEDs by title, work location and work telephone numbers is identified in the table above. The EC/BED is on the premises or is available through an "on-call" list 24 hours a day.

Figure 1. PUREX Storage Tunnels Evacuation Route.



3.0 IMPLEMENTATION OF THE PLAN

To meet the requirements of the WAC, this plan will be considered implemented when the EC/BED has determined that a release, fire, or explosion involving dangerous waste, mixed waste or dangerous waste constituents that could threaten human health or the environment (WAC 173-303 Emergency) has occurred at the facility. An incident requiring evacuation of personnel or the summoning of emergency response units will not necessarily indicate that the plan has been implemented. This plan will be used in conjunction with DOE/RL-94-02, Section 4.2. for event recognition and response.

Under DOE guidance, this plan will be considered implemented whenever the EC/BED determines that one of the incidents listed in Section 3.1 has or will occur and that the severity is or will be such that there is a potential to endanger human health or the environment (DOE Unusual Occurrence or Emergency). Incidents listed in Section 3.1 could also be considered DOE emergencies that causes activation of the RL-Emergency Operations Center and offsite emergency response organizations.

The EC/BED must assess each incident to determine the response necessary to protect the personnel, facility, and the environment. If assistance from Patrol, Fire, or ambulance units is required, the Hanford Emergency Response Number (911) must be used to contact the Patrol Operations Center and request the desired assistance. To request other resources or assistance from outside the facility, the Patrol Operations Center business number is used (373-3800).

3.1 DANGEROUS AND/OR MIXED WASTE RELEASE

A seismic event, explosion, tornado, or an aircraft crash could cause damage to the storage tunnels and could involve environmental exposure to mixed waste. These events are considered the only credible sources of a release as the PUREX Storage Tunnels are unoccupied structures and there are no continuous processes associated with waste storage.

Emergency responses for credible dangerous and/or mixed waste releases can be found in the following sections.

3.2 FIRE OR EXPLOSION

The fire or explosion hazard associated with the PUREX Storage Tunnels is considered to be very low because of the minimal amount of combustibles stored within the tunnels and the lack of an ignition source.

Because of the potential for mixed waste to leach, water is not the preferred choice for fire control. Reduction of the air supply to the storage area by isolation of the tunnel exhaust system, if operating, should permit a fire to self-extinguish. Should the fire continue to spread, heavy equipment and cranes will be called to the scene to cover areas of the tunnels that might collapse. In addition, the following actions are taken in the event of a fire or explosion:

- If present in the Tunnels, personnel leave by the nearest safe exit and proceed to the designated staging area for accounting
- The single point-of-contact (911) is notified immediately, who in turn initiates notifications to the EC/BED (or alternate) if necessary
- The EC/BED proceeds directly to the scene (if not already there)
- The EC/BED obtains all necessary information pertaining to the incident
- Depending on the severity of the event, the EC/BED or his/her designee may be required to provide notifications to the site contractor environmental single point of contact, which in turn notifies offsite agencies and/or the occurrence notification center informing them as to the extent of the emergency (including estimates of mixed waste quantities released to the environment) and any actions necessary to protect nearby buildings and/or structures
- Depending on the severity, the EC/BED requests activation of the affected area ICP to establish organizations to provide assistance from DOE/RL, other Hanford site contractors, and outside agencies (if 911 is called, the ICP will automatically be activated)
- The Hanford Patrol establishes roadblocks within the area to route traffic away from the emergency scene
- If necessary, Hanford Fire Department medical personnel remove injured personnel to a safe location, apply first aid, and prepare the injured for transport to medical aid stations or to local hospitals.

Depending on the magnitude of a natural phenomena event, fire, or an explosion, damage to the storage tunnels is possible. The hazards could involve personnel and environmental exposure to mixed waste. In the event of such an occurrence, a recovery plan will be developed. The recovery plan will take into consideration methods, if any, for retrieval of the waste stored within the tunnels.

3.3 SEISMIC EVENT/TORNADO

Depending on the magnitude of the seismic event or tornado, damage to the storage tunnels is possible. The hazards could involve personnel and environmental exposure to mixed waste.

Emergency responses for seismic events and tornados would be the same as those for a fire or explosion. Refer to Section 3.2 of this plan.

3.4 AIRCRAFT CRASH

In addition to the potential for serious injuries or fatalities involved with an aircraft crash, damage to the storage tunnels is possible, which could

result in a fire, explosion, or a mixed waste release. The hazards could involve personnel and environmental exposure to mixed waste.

Refer to Section 3.2 of this plan for emergency responses for fires and explosions.

3.5 BOMB THREAT/EXPLOSIVE DEVICE

Depending on the magnitude of an explosion, damage to the storage tunnels is possible. The hazards could involve personnel and environmental exposure to mixed waste. For emergency responses, refer to Section 3.2 of this plan for explosions.

3.6 DAMAGED DANGEROUS AND/OR MIXED WASTE SHIPMENT

The PUREX Storage Tunnels do not accept shipments from offsite; therefore, the following response procedures only apply to the receipt of a damaged mixed waste shipment from onsite.

If a damaged shipment of hazardous substance, or dangerous waste/mixed waste arrives at the PUREX Storage Tunnels and the shipment is unacceptable for receipt, the damaged shipment should not be moved. The TSD unit personnel instead need to determine if there has been a release. If there has been a release, TSD unit personnel perform the following actions.

- Notify the supervisor or manager to advise of the situation. The supervisor or manager contacts the Emergency Coordinator in order to respond and assist in the evaluation of, and response to, the release (response to spills or releases may result in implementation of the contingency plan if the Emergency Coordinator makes this determination).

- Notify the shipper or generating unit of the damaged shipment and request that they provide any chemical information necessary to assist in responding to the release.

- Actions are taken to contain and/or to stop the spill if all of the following are true:

  - The identity of the substance(s) involved is known

  - Appropriate protective equipment and control/cleanup supplies are readily available

  - Personnel present have received the appropriate training and can safely perform the action(s) without assistance, or assistance is readily available from other trained TSD unit personnel.

If any of the above conditions are not met, or there is any doubt, personnel evacuate the area and remain outside, upwind of the TSD unit, pending the arrival of the Emergency Coordinator. Personnel remain available

for consultation with the Emergency Coordinator, Hanford Fire Department, or other emergency response personnel, as appropriate.

4.0 UNIT/BUILDING EMERGENCY RESPONSE PROCEDURES

The initial response to any emergency is to immediately protect the health and safety of persons in the area. Identification of released material is essential to determine appropriate protective actions. Containment, treatment, and disposal assessment are secondary responses.

Emergency action levels associated with event classifications applicable to the PUREX Storage Tunnels include the following. A Site Area Emergency can be declared for a radioactive material release resulting from an explosion, natural hazards (i.e., seismic event and/or tornado), and aircraft crash. An Alert Emergency can be declared for a fire, explosion, or high winds. Additional detail concerning emergency action levels is identified in *Emergency Plan Implementing Procedures*, DOE-0223, Appendix 1-2.G. The preceding sections describe the process for implementing basic protective actions as well as descriptions of response actions for events.

4.1 NOTIFICATION

Notifications will be made in accordance with the requirements of WAC 173-303-145 and WAC 173-303-360.

4.2 IDENTIFICATION OF RELEASED/SPILLED MATERIALS

Methods for identifying the character, source, amount, and areal extent of any materials when there has been a release or spill to the environment, a fire, or an explosion are outlined in DOE/RL-94-02, Section 4.2.1.

4.3 PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS, RELEASES

The EC/BED, as part of the incident command structure, takes the steps necessary to ensure that a secondary release, fire, or explosion does not occur. The following actions are taken:

- Isolate the area of the initial incident by shutting off power, closing off ventilation systems, if still operating, etc., to minimize the spread of a release and/or the potential for a fire or explosion
- Inspect surface of the tunnels for leaks, cracks, or other damage
- Contain and isolate residual mixed waste material
- Cover or otherwise stabilize areas where residual released mixed waste remains to prevent migration or spread from wind or precipitation run-off

- Install new structures, systems, or equipment to enable better management of mixed waste

- Reactivate adjacent operations in affected areas only after cleanup of residual mixed waste is achieved.

4.4 TERMINATION OF EVENT

For events where the RL Emergency Operations Center (RL-EOC) is activated, the RL Emergency Manager has the authority to declare event termination. This decision is based on input from the EC/BED, Incident Commander, and other emergency response organization members. For events where the RL-EOC is not activated, the Incident Command structure and staff will declare event termination.

4.5 INCIDENT RECOVERY AND RESTART OF OPERATIONS

A recovery plan is developed when necessary. A recovery plan is needed following an event where further risk could be introduced to personnel, the facility, or the environment through recovery action and/or to maximize the preservation of evidence. Depending on the magnitude of the event and the effort required to recover from it, recovery planning may involve personnel from RL and other contractors. If a recovery plan is required, it is reviewed by appropriate personnel and approved by a Recovery Manager before restart. Restart of operations is performed in accordance with the approved plan.

If this plan was implemented for a WAC emergency (see Section 4.0), the Washington State Department of Ecology must be notified before operations can resume. DOE/RL-94-02, Section 6.1, discusses different reports to outside agencies. This notification is in addition to other required reports and must include information documenting the following conditions:

1. There are no incompatibility issues with the waste and released materials from the incident.

2. All the equipment has been clean, fit for its intended use, and placed back into service. Additional information that Ecology requests regarding these restart conditions may be included in the required 15-day report identified in WAC 173-303-360(2)(k).

For emergencies not involving activation of the RL-EOC, the EC/BED ensures that conditions are restored to normal before operations are resumed. An onsite Recovery Manager could be appointed at the discretion of RL to restore conditions to normal. This process is detailed in DOE/RL-94-02, Section 8.0. The makeup of this organization depends on the extent of the damage and its effects. The onsite recovery organization will be appointed by the appropriate contractor's management.

4.6 INCOMPATIBLE WASTE

After an event, the EC/BED or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Cleanup actions are taken by facility personnel or other assigned personnel. DOE/RL-94-02, Section 8.3, describes actions to be taken.

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility before storage is performed, as necessary. Incompatible wastes are not placed in the same container. Containers of waste are placed in storage areas appropriate for their compatibility class.

If incompatibility of waste was a factor in the incident, the EC/BED or the onsite recovery organization ensures that the cause is corrected. Examples include modification of an incompatibility chart or increased scrutiny of waste from a generating unit when incorrectly designated waste caused or contributed to an incident.

4.7 POST EMERGENCY EQUIPMENT MAINTENANCE AND DECONTAMINATION

All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumables and disposed materials are restocked. Fire extinguishers are recharged or replaced.

The EC/BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished, self-contained breathing apparatus are cleaned and refilled, protective clothing is cleaned or disposed of and restocked, etc.

5.0 EMERGENCY EQUIPMENT

Because personnel only enter the storage tunnels during material placement operations, no permanent emergency equipment, communications equipment, warning systems, personal protective equipment, or spill control and containment supplies are located in the tunnels.

During storage tunnel operations or an emergency response event, personnel use portable emergency equipment, which could include heavy equipment and cranes (Section 3.2). Also, for such operations, work plans are followed and pre-job safety meetings take place.

6.0 COORDINATION AGREEMENTS

The DOE-RL has established a number of coordination agreements, or memoranda of understanding (MOU) with various agencies to ensure proper response resource availability for incidents involving the Hanford Site. A description of the agreements is contained in DOE/RL-94-02, Table 3-1.

7.0 REQUIRED REPORTS

Post incident written reports are required for certain incidents on the Hanford Site in accordance with DOE/RL-94-02, Section 6.1.

8.0 REFERENCES

DOE/RL-94-02, Hanford Emergency Response Plan, as amended.

Hanford Facility RCRA Permit, Dangerous Waste Portion, Washington State Department of Ecology, Olympia, Washingtony, as amended.

DOE-0223, Emergency Plan Implementing Procedures, as amended.

CHANGES INCLUDED FOR THE HANFORD FACILITY DANGEROUS WASTE PERMIT APPLICATION,
242-A Evaporator

ATTACHMENT 35

Chapter 6.0, Procedures to Prevent Hazards

- Table 6-2. Inspection Schedule of Safety, Security, and Emergency Equipment. (Sheet 1 of 2), Revision 1A

- Table 6-4. Inspection Schedule for Maintenance and Other Inspections. (Sheet 1 of 2), Revision 1A

Chapter 7.0, Contingency Plan, Revision 1A

Chapter 14.0, Part B Certification, Revision 1A

Appendix 7A, Building Emergency Plan for 242-A Evaporator, HNF-IP-0263-242-A, Revision 4

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
242-A Evaporator	Permit application: Chapter 6 Permit: Section III.5.A

Description of Modification:

1. Chapter 6.0, Table 6-4, Line 17: change the frequency of surveillance of "Diesel Generator" from "Weekly" to "Monthly".

Reason for change: The diesel generator starts immediately following loss of normal power to provide emergency power to perform a controlled shutdown of the 242-A Evaporator. Procedures originally called for a weekly no load functional check of the diesel generator. This was subsequently changed to a monthly functional check to avoid excessive wear on the diesel engine (e.g., buildup on the fuel injectors). A monthly test is considered acceptable based on the small likelihood of failure during the short 242-A Evaporator campaigns.

2. Chapter 6.0, Table 6-4, Line 19: change the frequency of surveillance of "Uninterruptible power supply" from "Monthly" to "Annually".

Reason for change: During loss of normal power, the uninterruptible power supply (UPS) provides approximately 20 minutes backup power, allowing time for the diesel generator to come to full power without disrupting the computerized Monitoring and Control System. The UPS has a low battery output voltage alarm (YSL-UPS-1) which annunciates at the 242-A Evaporator Control Room. Given this continuous alarm, and that the 242-A Evaporator only operates in short campaigns several times a year, a monthly voltage check is not necessary. Instead, the annual maintenance check, which includes a load test, is adequate to meet 242-A Evaporator needs.

3. Chapter 6.0, Table 6-2, Lines 16 and 17: change the frequencies of surveillance of "Telephones" (Line 16) and "Intercom/public address system" (Line 17) from "Monthly" to "Quarterly".

Reason for change: The telephone/public address systems are used for standard communications and warnings in the 242-A Building. The system is similar to a standard phone system and has proven very reliable. Based on this reliability, quarterly surveillances are adequate to meet facility needs.

Modification Class: [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: Item A.4.b

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

---

[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.

WAC 173-303-830, Appendix I, Item A.4, states "Changes in the frequency of or procedures for monitoring, reporting, sampling, or maintenance activities by the permittee" are Class 2 modifications (Item A.4.b), except if they increase the frequency of monitoring, which are Class 1 modifications (Item A.4.a).		
Submitted by Co-Operator: Kenneth J. Sobotta for 5/13/98 C. G. Mattsson Date	Reviewed by RL Program Office: 5/19/98 H. E. Bilson Date	Reviewed by Ecology: 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.

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Table 6-2. Inspection Schedule of Safety, Security, and Emergency Equipment. (sheet 1 of 2)

Item	Inspection	Frequency[1]	Responsible organization	Comments
Security				
Building external doors	Verify external doors are closed and locked.	Daily	Operations	Entrances to office areas are allowed to be unlocked.
Posted warning signs	Verify signs are present, legible, and visible at 7.6 meters.	Weekly	Operations	
Outdoor lighting	Verify outdoor lighting is sufficient.	Weekly	Operations	
Communications				
Crash alarm telephone	Verify crash alarm telephone is operable.	Monthly	Operations	
Emergency sirens	Perform functional check to verify operability.	Monthly	Operations	
Radios	Verify radios are operable and batteries are charged.	Monthly	Operations	
Telephones	Verify telephones are operable.	Quarterly	Operations	
Intercom/public address system	Verify systems are working properly.	Quarterly	Operations	
Emergency Equipment				
Safety showers/ eyewash station	Verify safety showers and eyewash station are operable.	Monthly	Operations	
Emergency lanterns	Verify emergency lanterns are operable.	Monthly	Maintenance	

Table 6-4. Inspection Schedule for Maintenance and Other Inspections. (sheet 1 of 2)

Item	Inspection	Frequency[1]	Responsible organization	Comments
Instrumentation Functional Checks and Calibrations				
Leak detectors	Perform leak detector functional checks.	Refer to comment	Maintenance/ Operations	Perform functional checks within 92 days of campaign startup and every 92 days thereafter until the campaign is over.
Vapor-liquid separator high level alarms: WFSH-CA11 WFSH-CA12	Perform calibrations of loop instruments.	Annually	Maintenance	
Pump room sump level: WFI-SUMP1	Perform calibrations of loop instruments.	Annually	Maintenance	
Emergency Electrical Equipment				
Diesel generator	Verify operability.	Monthly	Maintenance	
Uninterruptible power supply	Verify output voltage and inspect battery for signs of damage or tampering.	Annually	Maintenance	
Cathodic Protection				
Rectifiers	Check rectifiers for leaks, murky oil, signs of damage, or component degradation.	Bimonthly (62 days)	Maintenance	
System operation	Verify operation meets NACE requirements.	Annually	Maintenance	

Hanford Facility RCRA Permit Modification Notification Form

Unit: 242-A Evaporator	Permit Part & Chapter: Part III, Chapter 5 and Attachment 35 242-A Evaporator Appendix 7A

Description of Modification:

Remove Chapter 7.0, Revision 1, and Appendix 7A, Building Emergency Plan for 242-A Evaporator, HNF-IP-0263-242-A, Revision 3, and replace with Chapter 7.0, Revision 1A, and Appendix 7A, Building Emergency Plan for 242-A Evaporator, HNF-IP-0263-242-A, Revision 4.

Reference:

1. Hanford Facility Dangerous Waste Permit Application, 242-A Evaporator, Chapter 7.0, Revision 1A

2. Hanford Facility Dangerous Waste Permit Application, 242-A Evaporator, Appendix 7A, Building Emergency Plan for 242-A Evaporator, Revision 4.

Modification Class: [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: B.6.a.

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

"Changes in emergency procedures (i.e., spill or release response procedures)"

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
Kenneth J. Sloboda for 5/13/98	5/19/98	
C. G. Mattsson Date	H. E. Bilson 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.

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APPENDIX

7A BUILDING EMERGENCY PLAN FOR THE 242-A EVAPORATOR ..... APP 7A-i

TABLE

7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3) T7-1

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7.0 CONTINGENCY PLAN [G]

The WAC 173-303 requirements for a contingency plan are satisfied in the following documents: Portions of the *Hanford Emergency Response Plan* [Attachment 4 of the Hanford Facility RCRA Permit (DW Portion)] and portions of the *Building Emergency Plan for the 242-A Evaporator* (Appendix 7A).

The unit-specific building emergency plan also serves to satisfy a broad range of other requirements [e.g., Occupational Safety and Health Administration standards (29 CFR 1910), TSCA (40 CFR 761) and U.S. Department of Energy Orders]. Therefore, revisions made to portions of this contingency plan document that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to WAC 173-303-830 or Hanford Facility RCRA Permit (DW Portion) Condition I.C.3. Table 7-1 identifies which portions of the Building Emergency Plan are written to meet WAC 173-303 contingency plan requirements.

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Table 7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3). (sheet 1 of 2)

Requirement	DOE/RL-94-02*	Building Emergency Plan
-350(3)(a) - A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360.	X[1] Section 1.3.2	X[1] Section 7.1 through 7.3
-350(3)(b) - A description of the actions which shall 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.	X[1] Section 1.3.2	X[1,2] Section 7.2
-350(3)(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).	X Table 3-1	
-350(3)(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.		X[3] Section 13.0
-350(3)(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.	X HFD: Appendix C	X Section 9.0

Table 7-1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3). (sheet 2 of 2)

Requirement	DOE/RL-94-02*	Building Emergency Plan
-350(3)(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.	X[4] Figure 5-2	X[5] Section 1.5

* Attachment 4 of the HF RCRA Permit (DW Portion).

[1]The *Hanford Emergency Response Plan* contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional description of actions are required if emergency planning activities are addressed. If other credible scenarios exist or if emergency procedures at the unit are different, the language contained in the BEP will be used during an event by a BED.

[2]This requirement only applies to TSD units which receive shipment of dangerous or mixed waste defined as off-site shipments in accordance with WAC 173-303.

[3]Emergency Coordinator names and home telephone numbers are maintained separate from any 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.

[4]The Hanford Facility (sitewide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

[5]An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

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14.0 PART B CERTIFICATION [K] 14-1

14.0 PART B CERTIFICATION [K]
Modification D 14-3

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14.0 PART B CERTIFICATION [K]
Modification D

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

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date 5/22/98

Co-operator*
H. J. Hatch,
President and Chief Executive Officer
Fluor Daniel Hanford, Inc.

Date May 14, 1998

Note: This certifies the following: Chapter 6.0 (Procedures to Prevent Hazards), Table 6-2, Page 1 of 2, Revision 1A and Table 6-4, Page 1 of 2, Revision 1A; Chapter 7.0 (Contingency Plan), Revision 1A; Appendix 7A (Building Emergency Plan for 242-A Evaporator, HNF-IP-0263-242-A), Revision 4.

* Fluor Daniel Hanford, Inc. is responsible for information presented in Chapters 1.0 through 4.0 and 6.0 through 15.0, including the associated appendices.

This plan covers the following buildings and structures:

242-A Building, 242-AB Building, 242-A-81 Water Service Building, 207-A North Retention Basin.

Approved:

Building Emergency Director	5-14-98 Date
Emergency Preparedness	5-14-98 Date
Hanford Fire Department	5-13-98 Date

This document will be reviewed annually and updated if necessary by the Building Emergency Director unless Hanford Facility RCRA Permit coordination requirements provides otherwise. The document will be approved by the primary Building Emergency Director, and approved by the Manager of Emergency Preparedness (or delegate) and the Hanford Fire Department.

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1.0 GENERAL INFORMATION

The 242-A Evaporator, which is part of the 200 Area Liquid Waste Processing Facilities (LWPF), is located on the Hanford Site, a 560-square-mile U.S. Department of Energy (DOE) site in southeastern Washington State. The 242-A Evaporator is located in the southeast portion of the 200 East Area near the center of the Hanford Site. The Hanford Site Emergency Preparedness Program is based upon the incident command system which allows a graded approach for response to emergency events. This plan contains a description of facility specific emergency planning and response. It is used in conjunction with DOE/RL-94-02, *Hanford Emergency Response Plan*. Response to events is performed using facility specific and/or site-level emergency procedures.

1.1 Facility Name: U.S. Department of Energy Hanford Site,
200 Area Liquid Waste Processing Facility,
242-A Evaporator.

1.2 Facility Location: Benton County, Washington; within the 200 East Area.

Buildings/facilities covered by this plan are:

242-A Building
242-AB Building
242-A-81 Water Service Building
207-A North Retention Basin

1.3 Owner: U.S. Department of Energy
Richland Operations Office
825 Jadwin Avenue
Richland, Washington 99352

FACILITY MANAGER: Waste Management Federal Services of Hanford, Inc.
P.O. Box 700
Richland, Washington 99352

1.4 Description of the Facility and Operations

The 242-A Building is a five-story, concrete structure consisting of a main process area (i.e., pump room, load-out room, evaporator room, condenser room), support system area (i.e., aqueous makeup room, heating ventilation and air conditioning (HVAC) room, etc.), and the adjacent office area (i.e., lunch room, lavoratories, offices, etc.). The main process and support system areas are designed and constructed to withstand a 0.25 g horizontal acceleration seismic event, and a 100-mile-per-hour, high wind/tornado.

The evaporator room and pump room are posted as high radiation/high contamination/airborne radioactivity areas, with some hot spots inside. The load-out room is posted as a radiation/contamination area. The condenser room is posted as a radiological buffer/fixed contamination area with some small contamination areas inside.

The 242-AB Building was constructed to house the upgraded 242-A Evaporator monitoring and control system. This building adjoins the 242-A Building and includes the control room (room 18) and electrical room (room 19).

The 207-A North Retention Basins are located east of the 242-A Building, and north of the AP Tank Farm. The Water Service Building (242-A-81) is located directly south of the 242-A Building.

The 242-A Evaporator is connected to Double-Shell Tank (DST) system tanks and valve pits through underground piping that is used for transferring feed and slurry solutions and miscellaneous drainage.

There is a satellite accumulation area located south of the 242-A Building.

1.5 Building Evacuation Routing

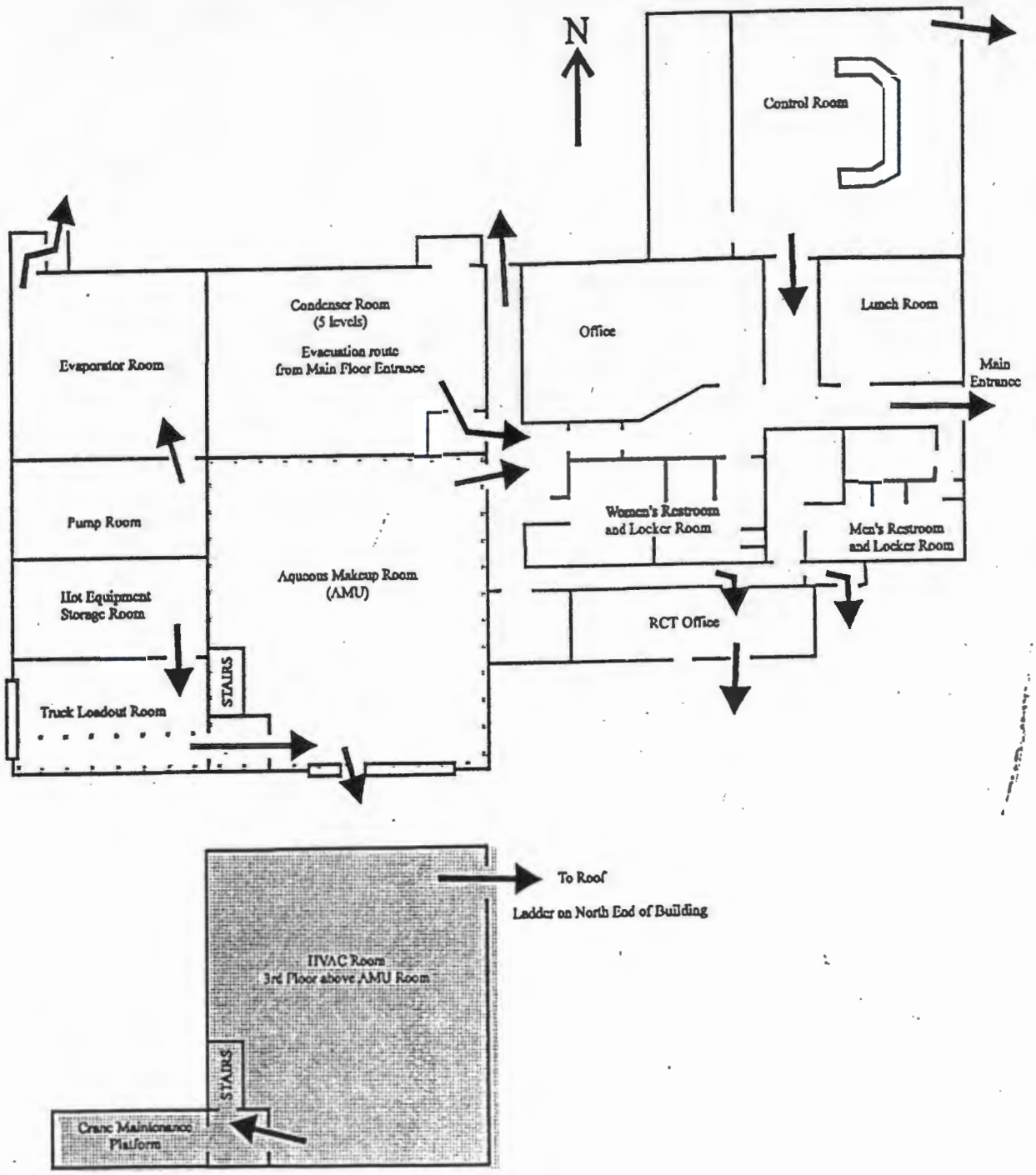
Figure 1 shows 242-A Evaporator evacuation routes. Figure 2 shows 242-A Evaporator staging areas.

2.0 PURPOSE

This plan describes both the facility hazards and the impacts of upset and/or emergency conditions. "Emergency" as used in this document includes events meeting the Washington Administrative Code (WAC) 173-303 definition of Emergency as well as DOE-0232.1, "Occurrence Reporting and Processing of Operations Information," categories of Unusual Occurrence and Emergency. These events include spills or releases, fires and explosions, transportation activities, movement of materials, packaging, storage of hazardous materials, and natural and security contingencies. When used in conjunction with DOE/RL-94-02, *Hanford Site Emergency Response Plan*, this plan meets the requirements for contingency planning as required by WAC 173-303.

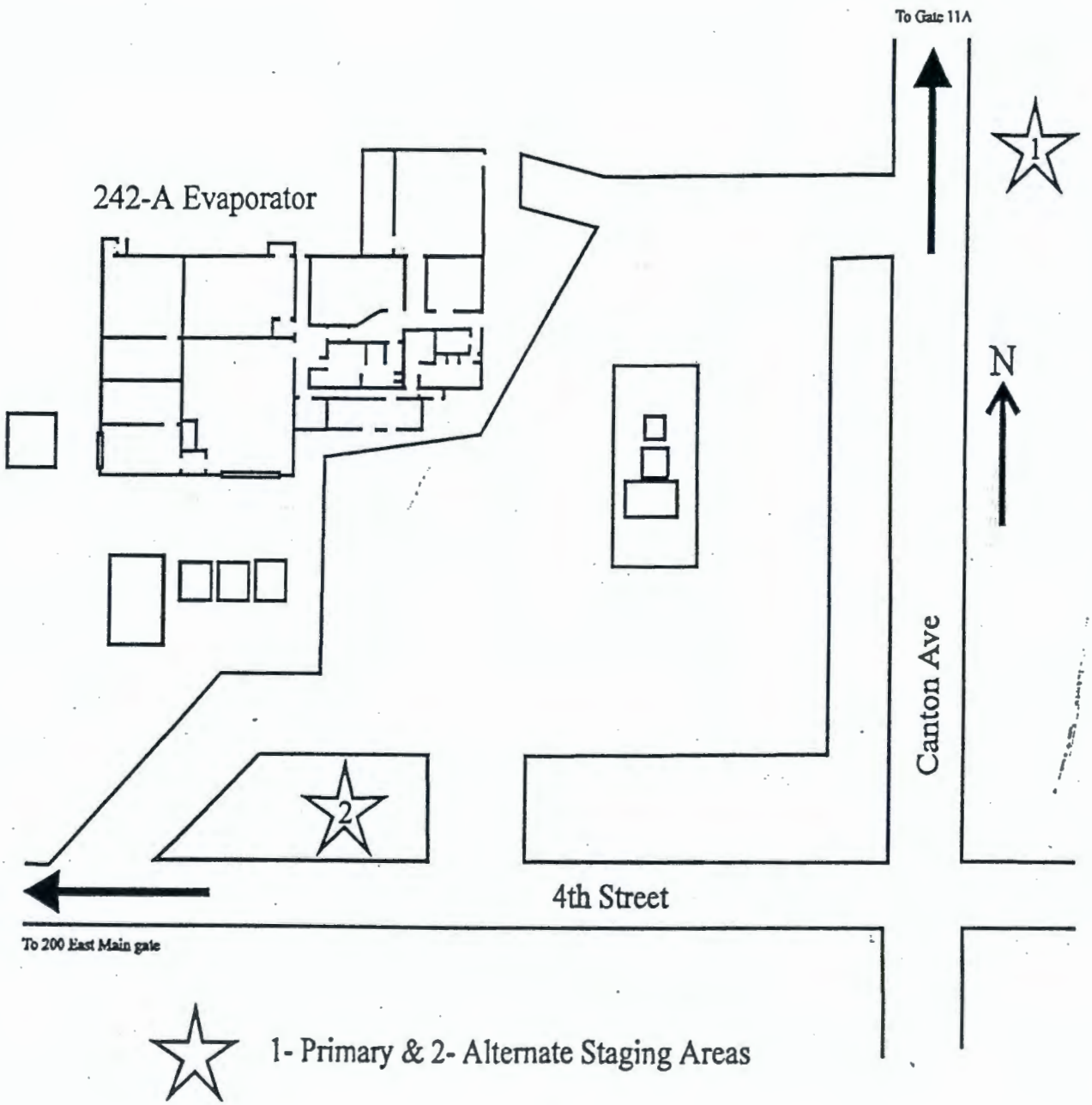
Figure 1, 242-A Evaporator Evacuation Routes

RCT: radiation control technologist



HVAC: heating, ventilation, and air conditioning

Figure 2, 242-A Evaporator Staging Areas



3.0 BUILDING EMERGENCY ORGANIZATION

The LWPF is staffed 24 hours each day, and is prepared to respond to emergencies through designated personnel with specific primary, on-call and alternate responsibilities. The 242-A Building Emergency Director (BED) directs the emergency response until the Incident Commander arrives at the event scene. The BED is on duty 24 hours each day. The on-duty Shift Operations Manager is the designated primary BED. There is a designated alternate BED on day shift available for directing emergency response if required. Other personnel required as part of the building emergency organization are also on duty with either primary or alternate responsibilities. The following paragraphs describe this organization and the duties of designated personnel.

3.1 Building Emergency Director

Emergency response is directed by the Building Emergency Director (BED) until the Incident Commander arrives. The incident command structure and staff with supporting on-call personnel fulfill the responsibilities of the Emergency Coordinator as discussed in WAC 173-303-360.

During events, facility personnel perform response duties under the direction of the BED. The Incident Command Post (ICP) is managed by either the senior Hanford Fire Department member present on the scene or senior Hanford Patrol member present on the scene (security events only). These individuals are designated as the Incident Commander (IC) and as such have the authority to request and obtain any resources necessary for protecting people and the environment. The BED becomes a member of the ICP and functions under the direction of the IC. In this role the BED continues to manage and direct facility operations.

A listing of the primary and alternate BEDs by title, work location, and work telephone numbers is contained in Section 13 of this plan. The BED is on the premises or is available through an "on-call" list 24 hours a day. Emergency Preparedness maintains a listing of BED names and work and home telephone numbers at the Patrol Operations Center (POC) in accordance with *Hanford Facility RCRA Permit*, Dangerous Waste Portion, General Condition II.A.4.

3.2 Other Members

As a minimum, the BED or designee appoints and trains individuals to perform as Personnel Accountability Aides and Staging Area Managers. The accountability aides facilitate the implementation of protective actions (evacuation or take cover) and the accountability of personnel after the protective actions have been implemented. Staging Area Managers coordinate/conduct activities at the staging area. Staging Area Managers and Personnel Accountability Aids are trained annually and are required to participate in two drills per year. In addition, the BED may identify additional support personnel (Radiological Control, Maintenance, Engineering, Hazardous Material Coordinators, etc.) to be part of the building emergency organization. Sections 13.0, BUILDING EMERGENCY ORGANIZATION, of this plan discusses the location of information regarding positions, names, and telephone numbers. Copies are distributed to appropriate facility locations and to the Hanford Site Emergency Preparedness organization.

4.0 IMPLEMENTATION OF THE PLAN

To meet the requirements of WAC 173-303, this plan will be implemented when the BED has determined that a release, fire, or explosion involving dangerous waste or dangerous waste constituents that could threaten human health or the environment (WAC 173-303-350, Emergencies) has occurred at the facility. An incident requiring evacuation of personnel or the summoning of emergency response units will not necessarily indicate that the plan will be implemented. The incident classification process is described in DOE/RL-94-02, Section 4.2.

Under DOE guidance, this plan will be implemented whenever the BED determines that one of the incidents listed in Section 6.0 of this plan has or will occur and that the severity is or will be such that there is a potential to endanger human health or the environment (DOE Unusual Occurrence or Emergency).

DOE Declared Emergencies are assigned one of three classifications which in the order of increasing severity are: 1) Alert Emergency, 2) Site Area Emergency, and 3) General Emergency. The 242-A Evaporator implements responses to these DOE emergencies through this plan and criteria identified in DOE-0223, RLEP 1.1, Appendix 1-2.M, and other documents listed in Attachment A of this plan.

The BED assesses each incident to determine the response necessary to protect personnel, the facility, and the environment. If emergency assistance from Hanford Patrol, Hanford Fire Department, or ambulance units is required, the Hanford Emergency Response Number (911) is used to contact the POC and request the desired assistance. To request other resources or assistance from outside the facility, the POC business number is used (373-3800).

5.0 FACILITY HAZARDS

Facility hazards and potential targets are identified and evaluated in a hazards assessment required by DOE Orders for the 242-A Evaporator. The hazards assessment is not used in the Hanford Facility contingency planning program. This section describes hazards that pose significant risks to human health or the environment and identify quantitative values for those risks.

Certain information in this plan pertains only to DOE Order considerations (e.g., discussions pertaining to hazards from hazardous materials and radioactive-only materials). Terms such as Emergency Response Protective Guidelines (ERPG), Alert Emergencies, Site Area Emergencies, and General Emergencies pertain only to DOE Order planning considerations. These hazards and terms are not part of the Hanford Facility contingency planning program. The only portion of this section that is part of the Hanford Facility contingency planning program are the chemical constituent hazards discussed in Section 5.3.

5.1 Hazardous Materials

- Materials at the 242-A Evaporator defined in DOE Order guidance as potentially hazardous are used for normal maintenance and support functions. These could include acids, caustics, oils, diesel fuel and solvents. Diesel fuel also presents a flammability hazard. A significant release of materials would be classed as a WAC 173-303 or DOE Emergency.

An ammonia cylinder, capable of releasing 0.34 cubic meters of 5000 part per million (ppm) ammonia, is located on the third floor level in the northeast corner of the HVAC room. The ammonia is used for calibration of the stack ammonia monitor. The worst case ammonia concentration from release of the entire contents of the cylinder would be less than 25 ppm in the HVAC Room. This is less than the ERPG-1 value and the threshold limit value. No emergency planning is required.

Material Safety Data Sheets (MSDSs) are at the following locations:

- 2025EA Building:
  - Room 101
  - Room 104
- 2025E Building
  - Maintenance Shop, Room 103
  - Control Room
- 242-A Evaporator Control Room.

5.2 Industrial Hazards

Industrial hazards associated with the 242-A Evaporator include electrical equipment, pressurized equipment, high temperature equipment, rotating equipment, confined spaces, and compressed gas cylinders. These industrial hazards do not pose a threat to the health and safety of the general public or the environment. Industrial hazards are addressed in the building health and safety plan and maintenance programs.

5.3 Dangerous/Mixed Waste Hazards

5.3.1 Solid Form

Dangerous/mixed waste is generated at the 242-A Evaporator during sampling, decontamination, and maintenance activities. This waste is accumulated in a designated accumulation area south of the 242-A Building and transported to a 90-day accumulation area when required.

5.3.2 Liquid Form

Highly radioactive mixed waste solution is processed at the 242-A Evaporator and contained in the vapor-liquid separator, C-A-1, and ancillary equipment. Low radioactive, mixed waste solution is contained in the condensate collection tank, C-100, and ancillary equipment. Although the mixed waste solution contains chemicals that are hazardous (primarily ammonia and sodium hydroxide), the bounding consequence for spills or releases of this waste are based on its radiological components. Major radioactive isotopes and potential concentrations in the waste are shown in Table 1.

Table 1. Major Contributors to the 242-A Evaporator Waste Bounding Source Term

Isotope	Bq/L	Ci/L
Sr-90	8.14E+09	2.20E-01
Ru-106	1.96E+09	5.30E-02
Cs-137	5.55E+10	1.50E+00
Pu-239	5.92E+06	1.60E-04
Pu-241	5.55E+08	1.50E-02
Am-241	3.70E+07	1.00E-03

The total volume of the vapor-liquid separator and recirculation loop (85,000 to 95,000 liters) is used to determine the potential radiological hazard. Sr-90 and Cs-137, along with their daughter products (Y-90 and Ba-137m), are the primary radiological hazards. Ru-106, Pu-239, Pu-241, and Am-241 also are significant contributors.

5.3.3 Gaseous Form

A waste blending error in the DST system potentially could generate large amounts of ammonia gas from the 242-A Evaporator vent system during processing. This could require an emergency classification

5.4 Radioactive Materials

Radioactive material in solid form consists of waste materials which have not contacted mixed waste solutions. Radioactive waste materials removed from radiation areas are packaged and transported to an approved radioactive waste storage facility.

Radioactive materials in liquid form are mixed wastes and are described in Section 5.3.2.

Radioactive materials in gaseous form are emitted from the vessel vent and building exhaust ventilation systems. These systems have HEPA filters to remove radioactive particulate, reducing emissions to acceptable discharge levels. Failure of HEPA filters could result in a loss of confinement as described in Section 6.1.8.

5.5 Criticality

A criticality is not a credible accident at the 242-A Evaporator. Emergency planning is not required.

6.0 POTENTIAL EMERGENCY CONDITIONS

The objective of this section is to identify WAC 173-303 and DOE Order potential emergency conditions and to identify the appropriate DOE Order emergency classification level. Protective action responses based on these classifications are discussed in Section 7.0. Technical justification for the values and limits identified in this section are provided in the

hazards assessment required by DOE Orders for the 242-A Evaporator. The hazards assessment is not used in the Hanford Facility contingency planning program.

Potential emergency conditions fall into three basic categories: operational (process upsets, fires and explosions, loss of utilities, spills, and releases), natural phenomena (earthquakes and storms), and security contingencies (bomb threats, hostage situations). For operational emergencies, event frequency coupled with accident severity provide the criteria for emergency plan response.

Potential radioactive/dangerous/mixed waste release modes include fires, explosions, spills, or releases. These events are evaluated based on the potential impact to operations and subsequent release of waste materials. Potential consequences to human health or the environment are the ultimate criteria for event classification and protective response actions. Additionally, prolonged small releases are evaluated for their potential to impact human health or the environment.

6.1 Operational Emergencies

The conditions for operational emergencies are present only when mixed waste is present in the vapor-liquid separator, C-A-1, recirculation loop, and ancillary equipment.

6.1.1 Loss of Utilities

6.1.1.1 Loss of Electrical Power

A loss of electrical power could lead to a loss of compressed air, causing the vapor-liquid separator, C-A-1, drain valve to open and suddenly dump the contents to DST system tank 241-AW-102. A potential over pressurization and subsequent radiological release could occur from that tank. Mitigating actions for a radiological release from the DST system are taken by Tank Waste Remediation System (TWRS) per the tank farms building emergency plan.

A loss of electrical power would interrupt processing but would not produce an emergency event at the 242-A Evaporator.

6.1.1.2 Loss of Compressed Air

A loss of compressed air would cause the vapor-liquid separator, C-A-1, drain valve to open and suddenly dump the contents to DST system tank 241-AW-102. A potential over pressurization and subsequent radiological release could occur from that tank. Mitigating actions for a radiological release from the DST system are taken by TWRS per the tank farms building emergency plan.

A loss of compressed air would interrupt processing but would not produce an emergency event at the 242-A Evaporator.

6.1.1.3 Loss of Raw Water

Raw water can be used as seal water for the mechanical seals on P-B-1 recirculation pump and P-B-2 slurry pump when the normal supply of process condensate is not available. If raw water is supplied to the seals, and loss of raw water occurs, failure of mechanical seals could occur, causing a spray release of mixed waste into the facility. The spray release scenario is discussed in Section 6.1.8. Interlocks are provided to stop the pumps on low seal water flow.

Raw water supplies cooling to the air compressors, with sanitary water available as a backup. If loss of raw water occurs, and backup cooling by sanitary water is not initiated within 15 to 20 minutes, the air compressors could overheat, causing a loss of compressed air. A loss of compressed air is discussed in section 6.1.1.2.

6.1.1.4 Loss of Sanitary Water

If sanitary water is supplying cooling to the air compressors with raw water unavailable, the air compressors could overheat causing a loss of compressed air. A loss of compressed air is discussed in section 6.1.1.2.

6.1.1.5 Loss of K1 or Vessel Ventilation System

The K1 ventilation system maintains contaminated areas of the 242-A Building at a negative pressure (with respect to atmospheric) to prevent contamination spread to uncontaminated areas. The ventilation system includes two stages of high efficiency particulate air (HEPA) filters, two exhaust fans, and stack sampling and monitoring equipment. Both fans are electrically powered, however the backup fan can be powered by a diesel powered standby generator. The fans are interlocked so that if primary electrical power is lost, the backup fan automatically starts once the generator is on line. The K1 ventilation system is interlocked to shut down the primary fan and prevent the secondary fan from starting if high radioactive particulate level is detected in the exhaust stream.

The vessel ventilation system maintains the condenser vent system and the C-100 tank under vacuum to prevent contamination spread from the processing equipment to the rooms. The vessel vent system includes a demister, prefilter, heater, two HEPA filters in series, an exhaust fan, and stack sampling and monitoring equipment. The vessel ventilation monitoring system alarms in the control room if high radiation is detected.

The K1 and vessel ventilation systems are required for 242-A Evaporator processing. A loss of either ventilation system would require the 242-A Evaporator to be shut down but would not result in an emergency condition. A ventilation system shutdown due to a radiological material release is discussed in section 6.1.8.1. A loss of confinement is discussed in section 6.1.8.3.

6.1.1.6 Loss of Steam

A loss of steam would interrupt the processing but would not produce an emergency event. Emergency planning is not required.

6.1.2 Major Process Disruption/Loss of Plant Control

A major process disruption/loss of plant control would be caused by failure of the Monitor and Control System (MCS) computer. A loss of MCS could cause the vapor-liquid separator, C-A-1, drain valve to open and suddenly dump the contents to DST system tank 241-AW-102. A potential over pressurization and subsequent radiological release could occur from that tank. Mitigating actions for a radiological release from the DST system are taken by TWRS per the tank farms building emergency plan.

6.1.3 Pressure Release

Consequences of a pressure release of mixed waste during processing are radiological in nature and are discussed in Section 6.1.8.

6.1.4 Fire and/or Explosion

A fire/explosion could generate highly toxic and/or corrosive fumes. Flying debris could result from explosions or compressed gas cylinder failure. Process system disruption, loss of plant control, and breach of process system boundaries could result from the flying debris.

An Alert Emergency in accordance with DOE Orders would be declared if mixed waste is present in the vapor-liquid separator, C-A-1, process recirculation loop, and ancillary equipment and a fire occurs in the control room, aqueous makeup room, HVAC room, condenser room, pump room, or evaporator room lasting longer than 30 minutes and requiring fire department actions for suppression.

An Alert Emergency in accordance with DOE Orders would be declared if an explosion is confirmed to have occurred at the 242-A Evaporator and the explosion threatens areas containing hazardous chemicals and/or radioactive material. An alert Emergency would also be declared if the explosion breaches the external 242-A Building walls when the vapor-liquid separator contains solution. Emergency classifications are per site-wide procedures listed in Attachment A.

6.1.5 Hazardous Material Spill or Release

A waste blending error in the DST system potentially could generate large amounts of ammonia gas from the 242-A Evaporator vent system during processing. Ammonia releases of more than 5 grams per second (40 pounds per hour) meet Alert Emergency criteria in accordance with DOE Orders. Ammonia releases of more than 38 grams per second (300 pounds per hour) meet Site Area Emergency criteria in accordance with DOE Orders.

The bounding consequences for mixed waste releases are radiological in nature. Radiological releases are discussed in Section 6.1.8.

6.1.6 Radioactive/Mixed Waste Spill

The bounding consequences for mixed waste releases are radiological. Radiological releases are discussed in Section 6.1.8.

6.1.7 Transportation and/or Packaging Incidents

A transportation and/or packaging incident involving hazardous chemicals or samples could result in exposure to hazardous and radioactive materials. Potential environmental damage by their release could also occur. General criteria discussed in Section 5.0 will be used to classify these events.

6.1.8 Radiological Material Release

6.1.8.1 Ventilation System Release

If a mixed waste release causes K1 ventilation or vessel ventilation system high radiation, it is necessary to quickly assess whether any radioactive material was released. A Cutie Pie (CP) open window (near contact) reading of $\geq$ 15 millirad per hour but < 150 millirad per hour on a ventilation system sample filter, requires an Alert Emergency classification in accordance with DOE Orders. Results $\geq$ 150 mr/hr require a Site Area Emergency classification in accordance with DOE Orders.

6.1.8.2 Release of Mixed Waste into Facility

An Alert Emergency classification is required for a catastrophic dumping of vapor-liquid separator C-A-1 contents into the evaporator room or pump room .

A Site Area Emergency Classification is required for a catastrophic dumping of vapor-liquid separator C-A-1 contents into the evaporator room or pump room, the K1 vent system high radiation shutdown interlock fails, and the ventilation system fans continue to operate.

6.1.8.3 Loss of Confinement

An Alert Emergency is required for a loss of confinement in the 242-A Building, as indicated by activation of two or more Area Radiation Monitors in the AMU and HVAC room, or Continuous Air Monitor alarm in the survey area, and local confirmation [on two of the three contamination area pressure indicators for rooms A, B, or C (located on the HVAC panel)] that pressure is greater than 0.0 inches water gauge.

6.1.9 Criticality

A criticality is not a credible accident at the 242-A Evaporator. Emergency planning is not required.

6.2 Natural Phenomena

The conditions for natural phenomena emergencies are present only when mixed waste is present in the vapor-liquid separator, C-A-1, recirculation loop, and ancillary equipment.

6.2.1 Seismic Event

Depending on the magnitude of the seismic event, severe structural damage could occur at the 242-A Evaporator, resulting in serious injuries or fatalities and the release of hazardous or radioactive materials to the environment. Damaged electrical circuits and wiring could result in the initiation of fires.

Any seismic event that is felt by personnel, with some minor facility damage, and disturbance of tall objects at the 242-A Evaporator locations that house hazardous chemicals and/or radioactive materials requires classification as an Alert Emergency. An emergency classification upgrade could occur based on facility conditions and/or actual hazardous material or radioactive/dangerous/mixed waste releases determined by personnel assessing quake damage.

6.2.2 Ashfall/Snow Fall Roof Overloading

Ash or snow accumulation causing actual roof or other structural damage to buildings containing hazardous material or radioactive/dangerous/mixed waste is classified as an Alert Emergency. There should be ample warning of an approaching large ashfall to allow the facilities to be placed in a stable condition.

6.2.3 High Winds/Tornados

An Alert Emergency classification is suggested when sustained wind speeds in excess of 40 meters per second (90 miles per hour) are observed and cause degradation of the facility safety equipment/confinement barriers. An emergency classification upgrade could occur based on actual facility damage or release of hazardous materials, radioactive/dangerous/mixed waste.

6.2.4 Flood

A flood is not a credible accident at 242-A Evaporator because the facility is not within the Columbia River flood plain. Emergency planning is not required.

6.2.5 Range Fire

An Alert Emergency is suggested in the event that a range fire threatens any 242-A Evaporator building containing hazardous material or radioactive/dangerous/mixed waste.

6.2.6 Aircraft Crash

A Site Area Emergency classification is suggested if an aircraft crash occurs into or near the 242-A Evaporator. An emergency classification upgrade could occur based on actual facility damage or release of hazardous material or radioactive/dangerous/mixed waste.

6.3 Security Contingencies

6.3.1 Bomb Threat/Suspicious Object

An Alert Emergency classification is required if there is a credible bomb threat or a confirmed explosive device located in the 242-A Building rooms housing hazardous chemicals and/or radioactive material. If the device explodes, classification of the event will be performed as stated in Section 6.1.4.

6.3.2 Hostage Situation/Armed Intruder

A hostage situation or armed intruder(s) at the 242-A Evaporator requires an Alert Emergency classification. An emergency classification upgrade could occur based on actual facility damage or release of hazardous material or radioactive/dangerous/mixed waste.

6.3.3 Suspicious Object

The major effect on the facility due to recognizing a suspicious object is that the facility should be placed in a safe configuration, if time permits, and the facility evacuated.

7.0 INCIDENT RESPONSE

The initial response to any emergency is to immediately protect the health and safety of persons in the immediate area. Identification of released material is essential to determine appropriate protective actions. Containment, treatment, and disposal assessment are secondary responses.

The following sections describe the process for implementing basic protective actions as well as descriptions of response actions for the events listed in Section 6.0. DOE/RL-94-02, Section 1.3, provides concept of operations for emergency response on the Hanford Site

Incident responses are coordinated from the 242-A Evaporator control room or a designated alternate location.

7.1 Protective Actions Responses

7.1.1 Evacuation

The objective of a facility evacuation order is to limit personnel exposure to hazardous materials or radioactive/dangerous/mixed waste by increasing the distance between personnel and the hazard. The scope of the evacuation includes evacuation of the facility due to an event at the facility as well as evacuation of the facility in response to a site evacuation order. Evacuation is directed by the BED when conditions warrant and applies to all personnel not actively involved in the event response or in emergency plan-related activities.

The BED initiates the evacuation by directing an announcement be made to evacuate along with the evacuation location over the public address system and facility radios, activate the evacuation siren for three minutes, and, as conditions warrant, by activating the 200 Area

evacuation alarms by calling the POC using 911 (preferred) or 373-3800. Personnel proceed to a predetermined staging area (shown in Figure 1), or other safe upwind location, as determined by the BED. The BED determines the operating configuration of the facility and identifies any additional protective actions to limit personnel exposure to the hazard.

Emergency organization personnel or assigned operations personnel conduct a sweep of occupied buildings to ensure that all non-essential personnel and visitors have evacuated. For an immediate evacuation, accountability is performed at the staging area. The BED assigns personnel as accountability aides and staging area managers with the responsibility to ensure that evacuation actions are taken at the 242-A and 242-AB Buildings. All implementing actions executed by the aides/managers are directed by the emergency response procedures identified in Attachment A. When evacuation actions are complete, the aides/managers provide a status report to the BED. The BED provides status to the Incident Commander.

7.1.2 Take Cover

The objective of the take cover order is to limit personnel exposure to hazardous or radioactive/dangerous/mixed waste when evacuation is inappropriate or not practical. Evacuation might not be practical or appropriate because of extreme weather conditions or the material release might limit the ability to safely evacuate personnel.

The BED initiates the take cover by directing an announcement be made over the public address system and facility radios, by activating the take cover siren for three minutes, and, as conditions warrant, by activating the 200 Area take cover alarms by calling the POC using 911 (preferred) or 373-3800. Actions to complete a facility take cover order are directed by the emergency response procedure in Attachment A. Protective actions associated with operations include configuring, or shutting down, the ventilation systems. Determination of additional take cover actions is based on operating configuration, weather conditions, amount and duration of release, and other conditions, as applicable to the event and associated hazard. As a minimum, personnel exposure to the hazard are minimized. The BED assigns personnel as accountability aides with responsibility to ensure that take cover actions are taken at all occupied buildings at the 242-A Evaporator. All implementing actions executed by the aides/managers are directed by the emergency response procedures in Attachment A. When take cover actions are complete the aides/managers provide the BED with a status report.

7.2 Response to Operational Emergencies

Operational activities to isolate, contain, and mitigate the event can be performed in parallel with classification and protective action implementation. The responses are structured to allow parallel activity with clearly established priorities. The division of actions and workload between various personnel is such that coordinated team responses result in the successful implementation of both emergency operating actions and emergency planning requirements. Specific event mitigation strategy for each type of accident is provided in the following sections.

7.2.1 Loss of Utilities

7.2.1.1 Loss of Electrical Power

Should there be a loss of electrical power to the 242-A Evaporator, all personnel are evacuated from radiation areas due to the potential loss of radiation monitoring equipment (i.e., continuous air monitors, area radiation monitors). In addition, all non-essential personnel leave the facility. Access into the radiation and adjacent areas is restricted to response personnel who are properly clothed and equipped. Radiation monitoring by radiological control personnel is established, and facility operations are properly shutdown to a safe configuration.

If back-up power is not automatically placed in service, the diesel powered standby generator is manually placed in service. Operation of the Backup K1 Ventilation system exhaust fan is checked and, if not operating, actions are taken to start the fan, to restart the normal fan, or to secure the confinement area. If an exhaust fan is operating, verification is made that the exhaust stack radiation monitor is returned to service.

If the evaporator is in operation mode and a dump of C-A-1 vessel does occur, AW Tank Farm personnel are notified of impending pressurization of DST system tank 241-AW-102, and all personnel in the AW Tank Farm evacuate to the change trailer. The 200 East Area Tank Farms Shift Manager is notified of the event as is the 242-A Evaporator plant management.

All implementing actions executed by the aides/managers are directed by the emergency response procedures in Attachment A.

7.2.1.2 Loss of Compressed Air

Upon loss of the compressed air at the 242-A Evaporator, restoration of the air supply system is immediately attempted. If this fails, non-essential personnel are notified to exit the facility. Automatic dumping of the C-A-1 vessel is stopped; the vessel could dump later when air pressure that holds the drain valve fails open. If a dump of C-A-1 vessel does occur, AW Tank Farm personnel are notified of impending pressurization of DST system tank 241-AW-102, and all personnel in the AW Tank Farm evacuate to the change trailer.

Plant conditions are monitored as components fail and shutdown interlocks activate, and the facility is placed into a safe shutdown condition. The K1 ventilation system is monitored for potential failure due to loss of damper control (caused by loss of air supply), and plant management is notified of the facility condition. A backup air compressor is placed in service as soon as possible.

7.2.1.3 Loss of Raw Water

On loss of the raw water system, 242-A Evaporator personnel are immediately notified, and non-essential personnel are directed to leave the facility. Essential personnel are directed to the 242-A Evaporator control room for support as required.

The P-B-1 and P-B-2 pumps are shutdown to prevent damage to the mechanical seals. If seal water is being supplied by the process condensate system, pump operation may continue through a controlled shutdown. The compressors are placed on sanitary water cooling. If air compressor failure occurs due to loss of cooling water, the automatic dumping of the C-A-1 vessel is terminated; the vessel could dump later when air pressure that holds the drain valve fails open. If a dump of C-A-1 vessel does occur, AW Tank Farm personnel are notified of impending over-pressurization of DST system tank 241-AW-102, and all personnel in the AW Tank Farm evacuate to the change trailer. The 200 East Area Tank Farms Shift Manager is notified of the facility condition.

Facility operations are properly shutdown, and plant management is notified of the facility condition.

7.2.1.4 Loss of Sanitary Water

On loss of the sanitary water, 242-A Evaporator Operations personnel perform the following:

1. Notify facility personnel
2. Ensure all air compressors are placed on raw water cooling
3. Ensure all chemical operations are terminated until safety showers and eye wash stations are operational (i.e., return of sanitary water system).

7.2.1.5 Loss of K1 Ventilation System

On loss of the K1 ventilation system, restoration of the primary backup K1 ventilation exhaust fan is immediately attempted. If the K1 ventilation system cannot be restored immediately, personnel are notified to exit contaminated areas, and non-essential personnel are directed to exit the facility. Essential personnel report to the 242-A control room for support as required. Continued adequate contamination control is ensured by having the K2 ventilation system operating. The K2 ventilation system maintains positive pressure in non-contaminated areas. If the primary and backup K1 ventilation system exhaust fans are not running, actions are taken to shutdown the facility and tape up contamination area entrances. Plant management is notified of facility conditions.

7.2.2 Major Process Disruption/Loss of Plant Control

Upon loss of the MCS, the 242-A Evaporator Shift Operations Manager is notified while an attempt is made to return the MCS to service. If a dump of C-A-1 vessel does occur, AW Tank Farm personnel are notified of impending over-pressurization of DST system tank 241-AW-102, and all personnel in the AW Tank Farm evacuate to the change trailer. Non-essential personnel exit the 242-A Evaporator facility.

The system condition is assessed, and corrective actions are implemented. Operations are placed on recirculation by securing the slurry pump and waste feed to the plant. Facility shutdown is accomplished by performing manual, localized actions such as system isolation, equipment shutdown, etc.

7.2.3 Pressure Release

If mixed waste release occurs, perform actions identified in Section 7.2.5.

7.2.4 Fire and/or Explosion

On becoming aware of a fire and/or explosion, the discoverer notifies personnel (if any) in the immediate area and directs them to a safe location. The discoverer then activates the nearest fire alarm pull station, contacts 911 to request fire fighting assistance, and contacts the 242-A Evaporator control room to report the fire. As soon as non-essential personnel are notified of a fire (verbally or by fire alarm activation), they immediately exit the facility to a safe upwind location, account for their personnel, and follow the instructions of responding personnel. If personnel are reported as missing, and might be within the facility, the Hanford Fire Department conducts a search.

The BED is notified and initiates activation of the event command post and resources.

Operations personnel initiate a plant shutdown with the method (controlled or emergency) depending on the location and severity of the fire and the location and type of hazards in the affected area. A controlled shutdown is performed unless it is unsafe to remain in the control room. An emergency shutdown is performed if the control room must be evacuated. The Shift Operations Manager interfaces with the Hanford Fire Department and provides the following:

a. Location and health of personnel, including missing personnel and possible locations for fire fighters to search.

b. Location and severity of fire.

c. Known hazardous (radiological and nonradiological) conditions.

d. Facility operating status.

e. Utility systems status.

f. Support by radiological control personnel (i.e., monitoring, surveys, sampling, decontamination).

g. Facility layout, and facility known hazardous conditions, (i.e., electrical, thermal, flammable materials, pressurized cylinders, toxic gas, pressure systems, batteries, radiation areas, etc.).

h. Support for fire fighter activities as required.

Once the fire is extinguished, the Shift Operations Manager/BED ensures administrative restrictions are implemented to protect the facility, the workers, and the environment. The Shift Operations Manager/BED makes notifications as required and assists with recovery actions.

7.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spills or Releases

If a spill or release is discovered, the discoverer performs the following actions:

1. Notifies the 242-A Evaporator control room and evacuates to a safe area
2. Remains available for consultation with the BED, Hanford Fire Department, or other emergency response personnel.

The control room operator performs the following actions:

1. Uses the public address system to notify the facility occupants of the event
2. Notifies the BED/HFD and relays information received from the event scene
3. Places the facility in a safe condition
4. Remains available to support further notification and response activities

The BED performs or arranges for personnel to perform the following actions:

1. Coordinates response activity and establishes a command post at a safe location
2. Obtains all available information pertaining to the incident and determines if the spill or release warrants implementation of the contingency plan in accordance with Sections 4.0, 6.1.5, and 6.1.8. In the case of ammonia releases, described in Section 6.1.5, this information includes monitoring stack ammonia concentrations.
3. Determines need for assistance from outside agencies and arranges for their mobilization and response
4. Initiates the appropriate announcements, if building or area evacuations are necessary
5. Arranges for care of any injured persons
6. Requests activation of the affected area emergency sirens/crash alarm system if a threat to surrounding facilities
7. Provides for event notification
8. Maintains access control at the incident site by keeping unauthorized personnel and vehicles away from the area. Security personnel can be used to assist in site control if control of the boundary is difficult. In determining controlled access areas, considers environmental factors such as wind speed and direction

9. Arranges for proper remediation of the incident after evaluation

10. Remains available for HFD, Hanford Patrol, and other authorities on the scene and provide all required information

11. Enlists the assistance of alternate BED(s), if around-the-clock work is anticipated

12. Refers media inquiries to the Media Relations/Communications offices of the contractors or DOE-RL.

13. Ensures the use of proper protective equipment, remedial techniques (including ignition source control for flammable spills), and decontamination procedures by all involved personnel, if remediation is performed by 242-A Evaporator personnel

14. Remains at the command post to oversee activities and to provide information, if remediation is performed by the HFD Hazardous Materials Response Team or other response teams

15. Ensures proper containerization, packaging, and labeling of recovered spill materials and overpack containers

16. Ensures decontamination (or restocking) and restoration of emergency equipment used in the spill remediation before resuming operations

17. Provides required reports after the incident.

7.2.5.1 Damaged and/or Unacceptable Shipments

The 242-A Evaporator does not receive dangerous or mixed waste shipments.

7.2.6 Radiological Material Release

7.2.6.1 K1 Ventilation or Vessel Ventilation System Release

If high radiation alarms or HEPA filter failure indicate a radiological material release from the K1 ventilation or vessel ventilation system, the ventilation system is immediately shutdown. A near contact radiation survey is performed on a ventilation system sample filter to determine extent of the radiological material released. The actions described in Section 7.2.5 are then performed.

7.2.6.2 Release of Mixed Waste into Facility

If a catastrophic dumping of mixed waste from vapor-liquid separator C-A-1 occurs, the facility is immediately shutdown. AW Tank Farm personnel are notified of impending over-pressurization of DST system tank 241-AW-102, and all personnel in the AW Tank Farm evacuate to the change trailer. The 200 East Area Tank Farms Shift Manager is notified of facility condition. The actions in Section 7.2.5 are then performed.

If a catastrophic dumping of the vapor-liquid separator causes high radiation alarm on the K1 ventilation system, the actions described in Section 7.2.6.1 are performed.

7.2.6.3 Loss of Confinement

If a loss of confinement occurs, the proper operation and lineup of the K1/K2 ventilation systems are verified. The actions described in Section 7.2.5 are performed. If the high radiation alarm on the K1 ventilation system is actuated, the actions described in Section 7.2.6.1 are performed. If the loss of confinement results in a radiological release outside the facility, the actions described in Section 7.1.2 are performed.

7.2.7 Criticality

A criticality is not a credible accident at the 242-A Evaporator. Emergency planning is not required.

7.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The BED, in coordination with emergency response organizations, takes the steps necessary to ensure that a secondary release, fire, or explosion does not occur. The area of the initial incident is isolated by shutting off power, closing off ventilation systems, etc. The affected area containment is inspected for leaks, cracks, or other damage and for toxic vapor generation. Released material and waste remaining inside of containment structures are removed as soon as possible, and residual waste material is contained and isolated using dikes and adsorbents. Outside areas where residual released materials remain are covered or otherwise stabilized to prevent migration or spread from wind or precipitation run-off.

New structures, systems, or equipment are installed as required based on engineering evaluations to enable better management of hazardous materials or dangerous waste. Adjacent operations in affected areas are reactivated only after residual waste materials are removed to levels acceptable to control contamination spread.

7.4 Response to Natural Phenomena

If other emergency conditions arise as a result of a natural phenomena event, response is appropriate for the condition created. For example: A fire due to lightning initiates the fire response actions and a spill of hazardous material due to an earthquake initiates spill response actions.

7.4.1 Seismic Event

The Hanford Site emergency response organization's primary role in a seismic event is coordinating the initial response to injuries, fires, and fire hazards, and acting to contain or control radioactive and/or hazardous material releases.

Individuals should remain calm and stay away from windows, steam lines, and hazardous material storage locations. Once the shaking has subsided, individuals evacuate carefully and assist personnel needing help. The locations of any trapped individuals are reported to the BED or are reported to 911 or 373-3800.

The BED takes whatever actions are necessary to minimize damage and personnel injuries, including:

- Coordinating searches for personnel and potential hazardous conditions (fires, spills, etc.),
- Conducting accountability,
- Securing utilities and facility operations,
- Arranging for rescue efforts, and notifying 911 or 373-3800 for assistance,
- Determining if hazardous materials were released,
- Determining current local meteorological conditions,
- Warning other facilities and implementing protective actions if release of hazardous materials poses a danger,
- Providing personnel and resource assistance to other facilities.

7.4.2 Volcanic Eruption/Ashfall

When notified of an impending ashfall, the BED implements measures to minimize the impact of the ashfall, including the following:

- Installing filter media over building ventilation intakes,
- Installing filter media or protective coverings on outdoor equipment that could be adversely affected by the ash (diesel generators, equipment rooms etc.),
- Shutting down some or all operations and processes,
- Sealing secondary use exterior doors,

7.4.3 High Winds/Tornados

On notification of impending high winds, the BED takes steps necessary to secure all outside doors and windows, and secure all outdoor waste and hazardous material handling activities. All doors and windows are shut, and personnel are warned to use extreme caution when entering or exiting the building.

7.4.4 Flood

Flooding of the 242-A Evaporator is not credible. No emergency planning response is required.

7.4.5 Range Fire

Responses to range fires are handled by preventive measures (i.e., keeping hazardous material and waste accumulation areas free of combustible materials such as weeds and brush). If a range fire breaches the facility boundary, the response is as described for a fire.

7.4.6 Aircraft Crash

Response to an aircraft crash is appropriate for the condition created. For example, a fire due to explosion or electrical shorts, initiates the fire response actions specified in Section 7.2.4.

7.5 Security Contingencies

7.5.1 Bomb Threat/Suspicious Object

7.5.1.1 Telephone Threat

Personnel receiving telephoned threats attempt to get as much information as possible from the caller. A form is available for personnel to keep by their telephone to use as a guide for getting useful information from the caller. On conclusion of the call, personnel notify the BED and Security.

The BED evacuates the facility and questions personnel at the staging area regarding any suspicious objects in the facility. When Security personnel arrive, their instructions are followed.

7.5.1.2 Written Threat

Receivers of written threats handle the letter as little as possible and notify the BED and Security. Depending on the content of the letter, the facility may or may not be evacuated. The letter is turned over to Security personnel and their instructions are followed.

7.5.2 Hostage Situation/Armed Intruder

The discoverer of a hostage situation/armed intruder reports the situation to the BED and to the POC via 911 or 373-3800, if possible. The BED, after conferring with Security personnel, may covertly evacuate areas of the facility not observable by the hostage taker(s)/intruder. No alarms will be sounded.

Security will determine the remaining response actions and will activate the Hostage Negotiating Team, if necessary.

7.5.3 Suspicious Object

The discoverer of a suspicious object reports it to the BED and to the POC via 911 or 373-3080, and, if possible, ensures that the object is not disturbed.

The BED orders evacuation of the facility and (based on the description provided by the discoverer) attempts to determine the identity or owner of the object. This may be done by questioning facility personnel at the staging area.

If the identity/ownership of the object cannot be determined, then Security assumes command of the incident. The canine unit is used to determine if the package contains explosives. If there is a positive indication of explosives or it cannot be assured that there are no explosives, then the Richland Police Department's Emergency Ordinance Disposal Team is dispatched to the facility to properly dispose of the device.

8.0 TERMINATION OF EVENT, INCIDENT RECOVERY, AND RESTART OF OPERATIONS

The DOE/RL-94-02, *Hanford Emergency Response Plan*, Section 8.0, describes these considerations. The extent by which these actions are employed is based upon the incident classification of each event. In addition, DOE/RL-94-02 contains considerations for the management of incompatible wastes, which may apply.

8.1 Termination of Event

For events where the DOE-RL Emergency Operations Center (RL-EOC) is activated, the DOE-RL Emergency Manager has the authority to declare event termination. This decision is based on input from the BED, Incident Commander, and other emergency response organization members. For events where the RL-EOC is not activated, the incident command system and staff declare event termination.

8.2 Incident Recovery and Restart of Operations

A recovery plan is developed when necessary. A recovery plan is needed following an event where further risk could be introduced to personnel, the facility, or the environment through recovery action and/or to maximize the preservation of evidence. Depending on the magnitude of the event and the effort required to recover from the event, recovery planning may involve personnel from DOE-RL and other contractors. If a recovery plan is required, it is reviewed by appropriate personnel and approved by a Recovery Manager before restart. Restart of operations is performed in accordance with the approved plan.

If this plan is to be implemented for a WAC emergency (see Section 4.0), the Washington State Department of Ecology is notified before operations can resume. The DOE/RL-94-02, *Hanford Emergency Response Plan*, Section 6.1 discusses different reports to outside agencies. This notification is in addition to other required reports and includes information documenting the following conditions:

1. There are no incompatibility issues with the waste and released materials from the incident.

2. All the equipment has been clean, fit for its intended use, and placed back into service. The notification may be made via telephone conference. Additional information that Ecology requests regarding these restart conditions will be included in the required 15-day report identified in WAC 173-303-360(2)(k).

For emergencies not involving activation of the RL-EOC, the BED ensures that conditions are restored to normal before operations are resumed. If the Hanford Site Emergency Organization was activated and the emergency phase is complete, a special recovery organization could be appointed at the discretion of DOE-RL to restore conditions to normal. This process is detailed in DOE-RL and contractor emergency procedures. The makeup of this organization depends on the extent of the damage and its effects. The onsite recovery organization is appointed by the appropriate contractor's management.

8.3 Incompatible Waste

After an event, the BED or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Cleanup actions are taken by facility personnel or other assigned personnel. DOE/RL-94-02, Section 8.3, describes actions to be taken.

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility before storage is performed as necessary. Incompatible wastes are not placed in the same container. Containers of waste are placed in storage areas appropriate for their compatibility class.

If incompatibility of wastes was a factor in the incident, the BED or the onsite recovery organization ensures that the cause is corrected.

8.4 Post-Emergency Equipment Maintenance and Decontamination

All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumable and disposed materials are restocked. Fire extinguishers are recharged or replaced.

The BED ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished, self-contained breathing apparatus are cleaned and refilled, protective clothing is cleaned or disposed of and restocked, etc.

9.0 EMERGENCY EQUIPMENT

Hanford Site emergency resources and equipment are described and listed in DOE/RL-94-02, Appendix C.

9.1 Fixed Emergency Equipment

FIXED EMERGENCY EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Safety shower/eye wash station	1 - Aqueous makeup room - south side. Next to truck load-in airlock and chem storage tank. 1 - Condenser room basement, SE corner. 1 - Condenser room 4th floor	Assist in flushing chemicals/materials from body and/or eyes and face.
Wet pipe sprinkler system	Located throughout the facility.	Assist in the control of fire.
Fire alarm pull boxes	Located throughout the facility.	Activates the building fire alarm and notifies the HFD.
Emergency lighting - (lanterns)	Located throughout the facility	Provide 1 hour of temporary lighting.
Back-up diesel generator	50 ft SE of the 242-A main entrance	Provide back-up power.

9.2 Portable Emergency Equipment

PORTABLE EMERGENCY EQUIPMENT		
TYPE	LOCATION	CAPABILITIES
General purpose fire extinguishers	Throughout the 242-A Evaporator facility.	Fire suppression for class A,B,C, fires.
Halon fire extinguishers	Two in control room.	Suppress electrical fires.

9.3 Communications Equipment/Warning Systems

COMMUNICATIONS EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Fire alarms	Located throughout the facility in halls, corridors, and locker rooms.	Audible throughout the 242-A Evaporator Building
Roof siren	242-A Evaporator roof	Provide warning to personnel to take cover or evacuate.
Operations process alarm	242-A Evaporator control room	Audible in the 242-A Evaporator control room.
Public address system (PAX)	Located throughout the 242-A Evaporator Building (except in pump and evaporator rooms)	Provides communications and public address capabilities.
Portable Radios	242-A control room	Communication to the 242-A control room.
Telephone	242-A control room, office area's, AMU room, and condenser room.	Internal and external communications. Allows notification of outside resources (HFD, Hanford Patrol, etc.)
Crash alarm	242-A control room	Audible in the 242-A control room

9.4 Personal Protective Equipment

PERSONNEL PROTECTIVE EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Self-contained breathing apparatus (SCBA)	Two located in the 242-A Evaporator control room	Provides breathable air for initial response to emergency, and recovery activities when required
Respirators	242-A respirator storage room	Filtered air for recovery of known hazards

9.5 Spill Control and Containment Supplies

SPILL KITS AND SPILL CONTROL EQUIPMENT		
TYPE	LOCATION	CAPABILITY
Organic and inorganic spill kits.	Survey area next to personnel protective equipment storage room, wall mounted	Provides spill control for organic and inorganic materials

9.6 Emergency Response Center

For emergencies not requiring evacuation, the BED and support personnel will assemble in the 242-A Evaporator control room, or other location as identified by the BED.

10.0 COORDINATION AGREEMENTS

DOE-RL has established a number of coordination agreements, or memoranda of understanding (MOU) with various agencies to ensure proper response resource availability for incidents involving the Hanford Site. A description of the agreements is contained in DOE/RL-94-02, Table 3-1.

11.0 REQUIRED REPORTS

Post incident, written reports are required for certain incidents on the Hanford Site. The reports are described in DOE/RL-94-02, Section 6.1.

12.0 PLAN LOCATION

Copies of this plan are maintained at the following locations:

- 242-A Evaporator Control Room
- 200 Area Effluent Treatment Facility Control Room
- Operations Managers Office (Building 2025EA Room 101)
- 200 Area LWPF Regulatory File

13.0 BUILDING EMERGENCY ORGANIZATION

BED	TITLE	WORK LOCATION	WORK PHONE
Primary	Shift Operation Manager (SOM)	242-A Evaporator control room or 200 Area Effluent Treatment Facility Control Room	373-2737, Evap control room 373-4446, Evap shift office 373-0993, ETF shift office 373-9000, ETF control room
Alternate	Operations Manager	2025EA Building, Room 101	373-4565

The complete building emergency organization listing of positions, names, work locations and telephone numbers for essential LWPF personnel is maintained in the organization administrative procedures. Copies are distributed to appropriate facility locations and to Emergency Preparedness. In addition, work and home telephone numbers of the BEDs and alternates are available from the POC (373-3800) in accordance with Hanford Facility RCRA Permit, Dangerous Waste Portion, General Condition II.A.4.

14.0 REFERENCES

DOE-0223, *Emergency Plan Implementing Procedures*:

DOE-0232.1, "Occurrence Reporting and Processing of Operations Information", U.S. Department of Energy, Washington D.C.

DOE/RL-94-02, Hanford Site Emergency Response Plan

DOE Order 5500.1B, *Emergency Management Systems*

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, Washington State Department of Ecology, Olympia, Washington.

29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response*

NIOSH, *Pocket Guide to Chemical Hazards*, National Institute of Occupational Safety and Health, U.S. Department of Health and Human Resources, Public Health Service, Centers for Disease Control, Washington, D.C.

ATTACHMENT A

Listing of Procedures and Guides

Site-Wide Procedures

DOE-0223, *Emergency Plan Implementing Procedures*:

- RLEP-1.1, "Hanford Incident Command System and Event Recognition and Classification," Appendix 1-2.M;
- RLEP-3.4, "Emergency Termination, Reentry, and Recovery."

Facility-Specific Emergency Response Procedures and Guides

HNF-IP-1053, *242-A Evaporator Response Manual*
(includes the ERGs and PCPs listed below)

Emergency Response Guides

- ERG No. 1 Evacuation
- ERG No. 2 Take Cover
- ERG No. 3 Volcanic Eruption and Ashfall
- ERG No. 4 Seismic Event
- ERG No. 5 Fire and/or Explosion
- ERG No. 6 High Area Radiation
- ERG No. 7 Bomb Threat

Plant Casualty Plans

- PCP No. 1 Emergency Shutdown of Utility Systems
- PCP No. 2 Loss of Electrical Power
- PCP No. 3 Loss of the Raw Water System
- PCP No. 4 Loss of the K1 Ventilation system
- PCP No. 5 Loss of the Steam System
- PCP No. 6 Loss of Compressed Air System
- PCP No. 7 Loss of MCS Control
- PCP No. 8 Pressure Hazard
- PCP No. 9 Process Upset

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
325 Hazardous Waste Treatment Units (HWTUs)	Part III, Chapter 6 (Application Chapter 7)

Description of Modification:

Providing complete revision to Chapter 7, "Contingency Plan" and Appendix 7A, "Building Emergency Procedure, 325 Building" in accordance with revised Hanford Site Emergency Plan (DOE/RL 94-02) and integration with internal documents used for the same purpose. This version of Chapter 7 will be Revision 2. The certification page (Chapter 14) is also being updated to serve as the certification for the Class 2 modification package and will be Revision 2.

Modification Class: [1] [2]	Class 1	Class [1]1	Class 2	Class 3
please check one of the Classes:			x	

Relevant WAC 173-303-830, Appendix I Modification: B.6.a.

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

B. General Facility Standards
   6. Contingency Plan:
      a. Changes in emergency procedures (i.e., spill or release response procedures)

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
G. W. McNair 5/19/98 Date	R. F. Christensen 5/20/98 Date	Date

[1]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.

[2]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.

CONTENTS

7.0 CONTINGENCY PLAN [G] 7-1

APPENDIX

7A BUILDING EMERGENCY PLAN FOR THE 325 HAZARDOUS WASTE TREATMENT UNITS ..... APP 7A-I

TABLE

7.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3) T7-1

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7.0 CONTINGENCY PLAN [G]

The WAC 173-303 requirements for contingency plans are satisfied in the following documents: Portions of the *Hanford Emergency Response Plan* [Attachment 4 of the HF RCRA Permit (DW Portion)] and portions of the *Building Emergency Procedure, Radiochemical Processing Laboratory (325 Building)* (Appendix 7A).

The cited contingency plan documents also serve to satisfy a broad range of other requirements (e.g., Occupational Safety and Health Administration standards and U.S. Department of Energy Orders). Therefore, revisions made to portions of the contingency plan documents that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to review or approval by Ecology. Table 7-1 identifies which portions of the Building Emergency Procedure are written to meet WAC 173-303 contingency plan requirements.

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Table 7.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3). (Sheet 1 of 2)

Requirement	Attachment 4 of the HF RCRA Permit (DW Portion)	Building Emergency Plan
-350(3)(a) – A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360.	X[1] Section 1.3.2	X[1] Part I, Section 3.4; Part V, Section 5
-350(3)(b) – A description of the actions which shall 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.	X[1] Section 1.3.2	X[1,2,3] Part I, Section 3.4; Part V, Section 5.8
-350(3)(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).	X Table 3-1	
-350(3)(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.		X[4] Part I, sections 3.2 and 3.3
-350(3)(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.	X Hanford Fire Department: Appendix C	X Part I, Section 3.7
-350(3)(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.	X[5] Figure 5-2	X[3,6] Part I, Section 3.1

Table 7.1. Hanford Facility Documents Containing Contingency Plan Requirements of WAC 173-303-350(3). (Sheet 2 of 2)

NOTES

[1] The Hanford Emergency Response Plan contains descriptions of actions relating to the Hanford Site Emergency Preparedness System. No additional description of actions is required if emergency planning activities are addressed. If other credible scenarios exist or if emergency procedures at the unit are different, the language contained in the Building Emergency Procedure will be used during an event by the Building Emergency Director.

[2] This requirement only applies to TSD units which receive shipment of dangerous or mixed waste defined as off-site shipments in accordance with WAC 173-303.

[3] Some of this unit-specific information is contained in other parts of DOE/RL 92-35, Rev. 1 (Attachment 36 to the HF-DW Permit.)

[4] Emergency Coordinator names and home telephone numbers are maintained separately from any 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, monthly.

[5] The Hanford Facility (sitewide) signals are provided in this document. No unit/building signal information is required unless unique devices are used at the unit/building.

[6] An evacuation route for the TSD unit must be provided. Evacuation routes for occupied buildings surrounding the TSD unit are provided through information boards posted within buildings.

APPENDIX 7A

BUILDING EMERGENCY PROCEDURE
325 BUILDING

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BUILDING EMERGENCY PROCEDURE RADIOCHEMICAL PROCESSING LABORATORY

(325 BUILDING)

MARCH 1999
Scheduled Revision Date

Approvals:

4-17-98 **Date**

PJ Gaither
RPL Building
Building Manager

4-17-98 **Date**

GD Buckley
RPL Building
Facility Manager

4/17/98 **Date**

JB Schuette
PNNL Emergency Preparedness Office

INTRODUCTION

It is the policy of the Pacific Northwest National Laboratory (PNNL) to provide for the Safety of its Staff; Contractor/Subcontractor Personnel; Visitors; and members of the public in case of an Emergency Incident. PNNL Line Management has the responsibility to execute this policy and ensure that all staff understand this procedure, their responsibilities, and know the action to be taken in an emergency. Every staff member is responsible for doing his or her job by safety instructions and procedures, and to remain alert to unsafe conditions or acts. The purpose of the Building Emergency Procedure is to give building occupants the information necessary to react to emergencies that may occur to:

Maximize Personnel Safety

Ensure Continuity of Leadership in Emergencies

Reduce the Effects of an Accident

Ensure Prompt Communications/Notifications

Ensure an Appropriate Response

It will be the responsibility of the RPL Building Emergency Director (BED) to review and update the RPL Building Emergency Procedure annually.

INTRODUCTION

It is the policy of the Pacific Northwest National Laboratory (PNNL) to provide for the Safety of its Staff; Contractor/Subcontractor Personnel; Visitors; and members of the public in case of an Emergency Incident. PNNL Line Management has the responsibility to execute this policy and ensure that all staff understand this procedure, their responsibilities, and know the action to be taken in an emergency. Every staff member is responsible for doing his or her job by safety instructions and procedures, and to remain alert to unsafe conditions or acts. The purpose of the Building Emergency Procedure is to give building occupants the information necessary to react to emergencies that may occur to:

Maximize Personnel Safety

Ensure Continuity of Leadership in Emergencies

Reduce the Effects of an Accident

Minimize Property Damage

Ensure Prompt Communications/Notifications

Ensure an Appropriate Response

It will be the responsibility of the RPL Building Emergency Director (BED) to review and update the RPL Building Emergency Procedure annually.

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PART I – RPL Building Emergency Procedure

1.0 INTRODUCTION

The Radiochemical Processing Laboratory (RPL), (325 Building) Building Emergency Procedure has been designed to provide information necessary to minimize risks to personnel, facilities, programs and the environment in the event of an emergency. This procedure applies to all resident staff, visitors, vendors and contractor/subcontractor personnel.

This facility contains both radioactive and hazardous materials in operations, storage, and handling. The RPL Facility poses a possible significant hazard to adjacent facilities, personnel, programs and the environment.

Emergencies may arise from, but are not limited to the following:

Fire
Explosion
Loss of service systems
A medical emergency
Bomb threats
Criticality
Criminal activity
Incidents at other facilities
Natural hazards or natural forces
Loss of contamination control
Hazardous materials release

Expected responses are those activities, which are intended to minimize the effects of a situation while providing optimum protection to personnel. Expected responses include; notification to the PNNL Single-Point-Contact (SPC), Building Manager (BM), Building Emergency Response Organization (BERO) and personnel in the facility. This procedure also provides plans for notifying personnel to take safe actions, such as "Take Cover", "Evacuate" or other planned actions dictated by the event. The procedure provides for formal notification and reporting.

1.1 Facility Name

Radiochemical Processing Laboratory (RPL)
325 Building

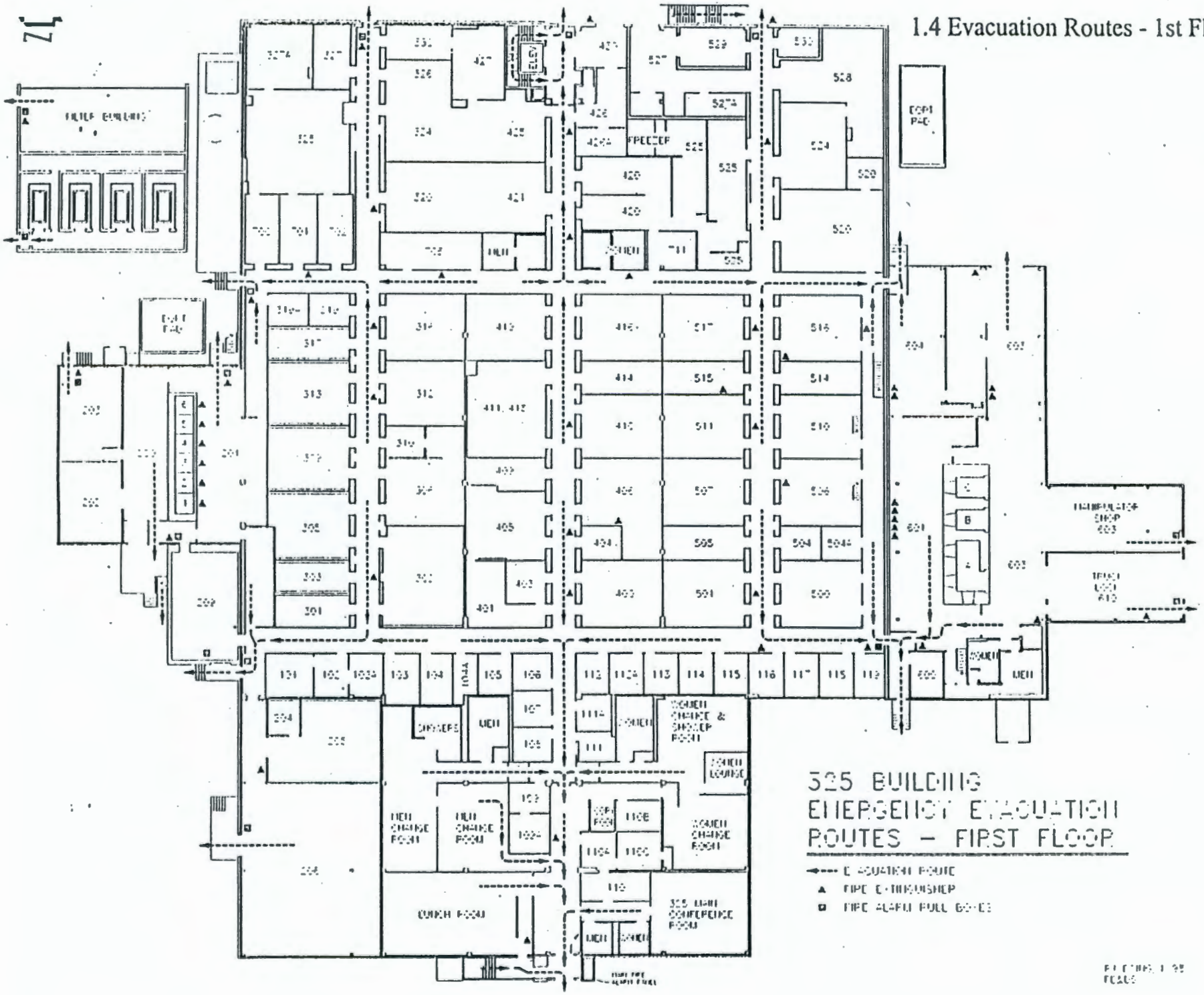
1.2 Facility Location

The RPL Facility is in the Southern portion of the 300 Area, East of the 329 Building and West of the 308 Building.

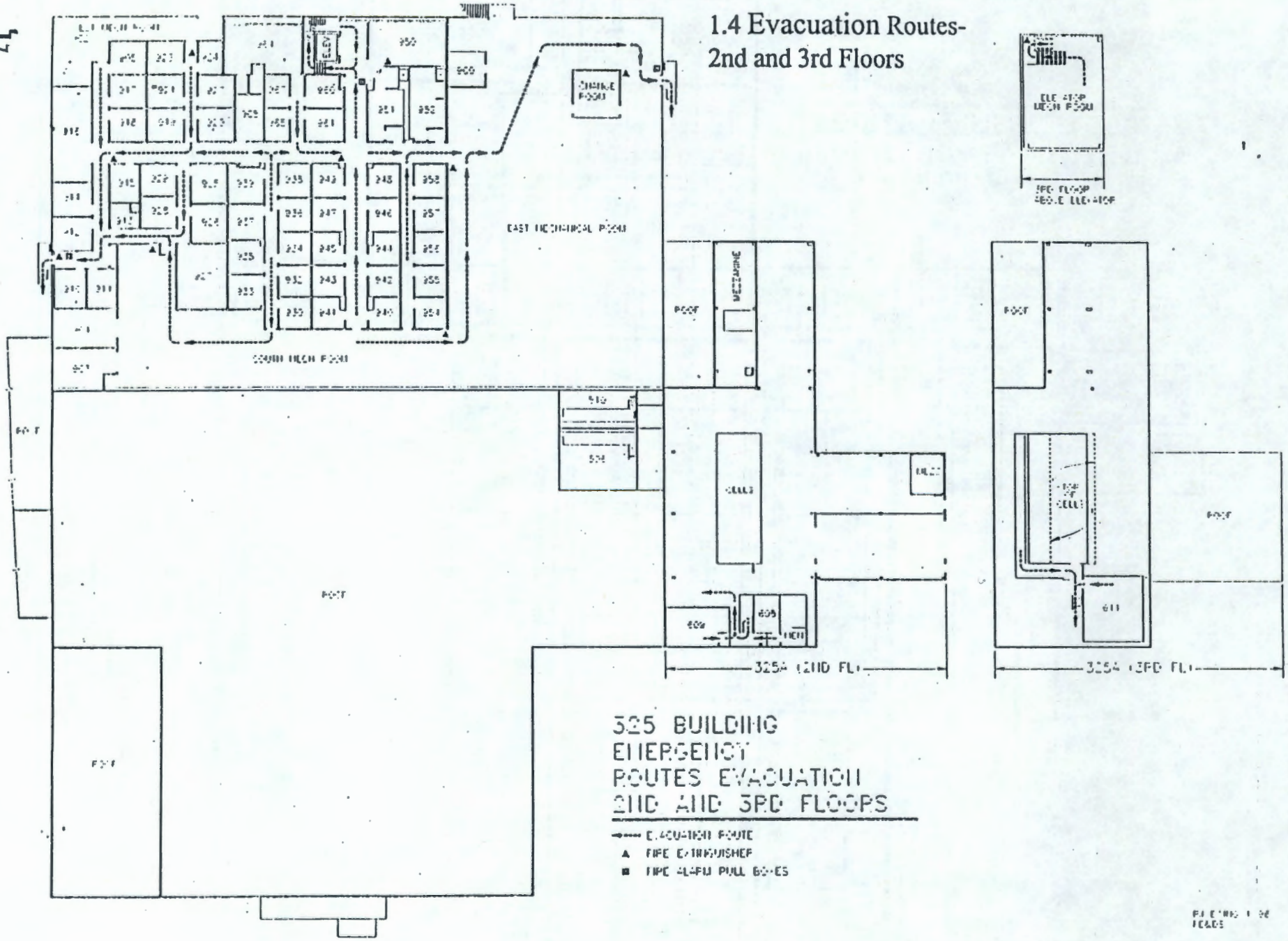
1.3 Facility Description

The RPL Building houses laboratories and specialized facilities ranging from work with non-radioactive materials, to work with a microgram to kilogram quantities of fissionable materials and megacurie activities of other radionuclides. Including general-purpose chemical laboratories, high-level radiochemistry facility, shielded analytical laboratory, fissionable material storage areas and hazardous waste treatment facilities. The general-purpose laboratories characterize fuel, single and double-shell tank waste, environmental samples, fusion/tritium samples, samples from the PUREX and UO_3, plants and other wastes. The radiochemistry facility includes areas for glove boxes, hot cells, cask handling, storage and the isolation of isotopes for unique applications like medical use. Analytical laboratory operations are conducted on small amounts of highly radioactive materials such as samples of single-shell tank waste. The Hazardous Waste Treatment Facility treats hazardous, mixed, low-level and transuranic waste.

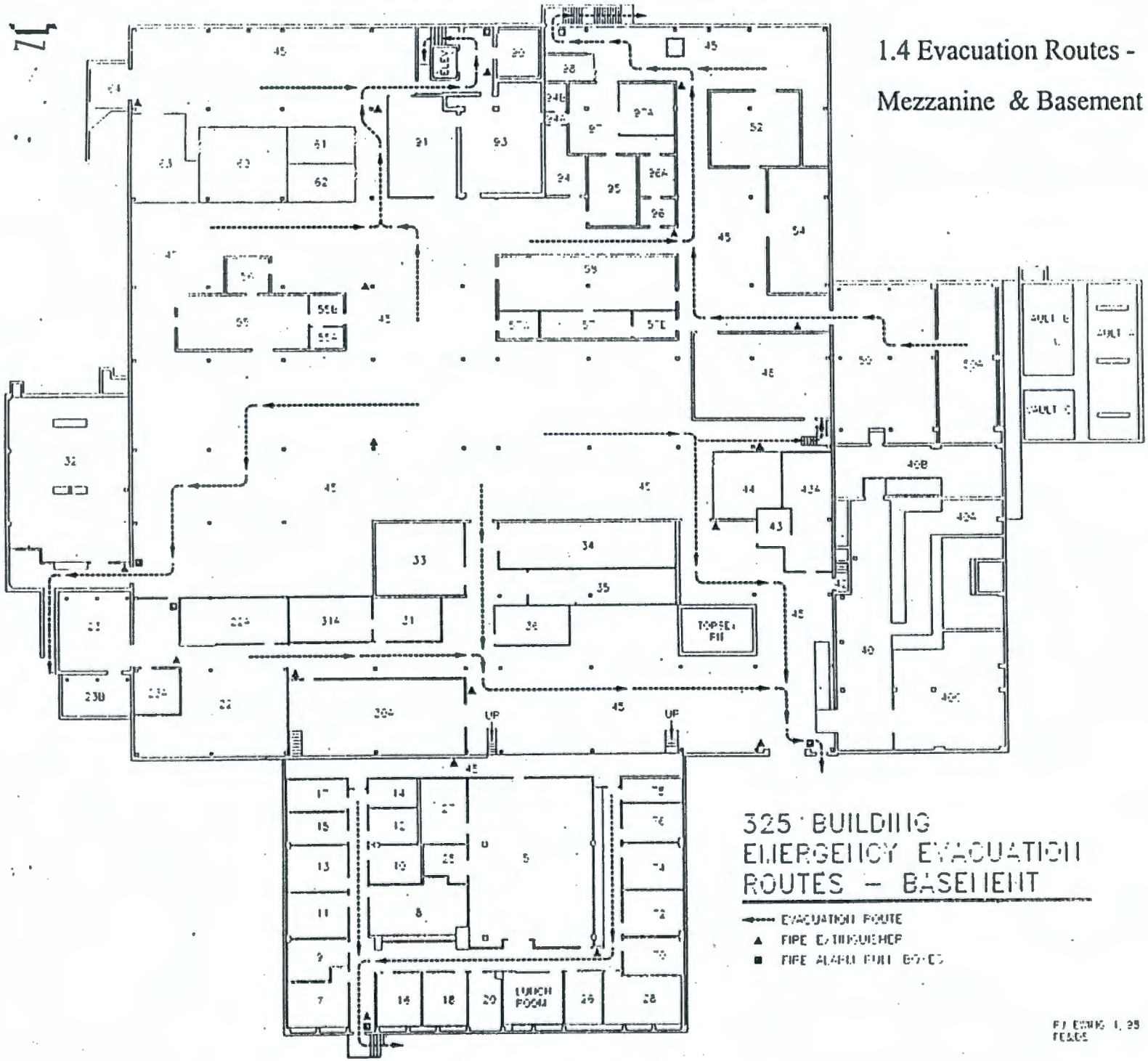
1.4 Evacuation Routes - 1st Floor



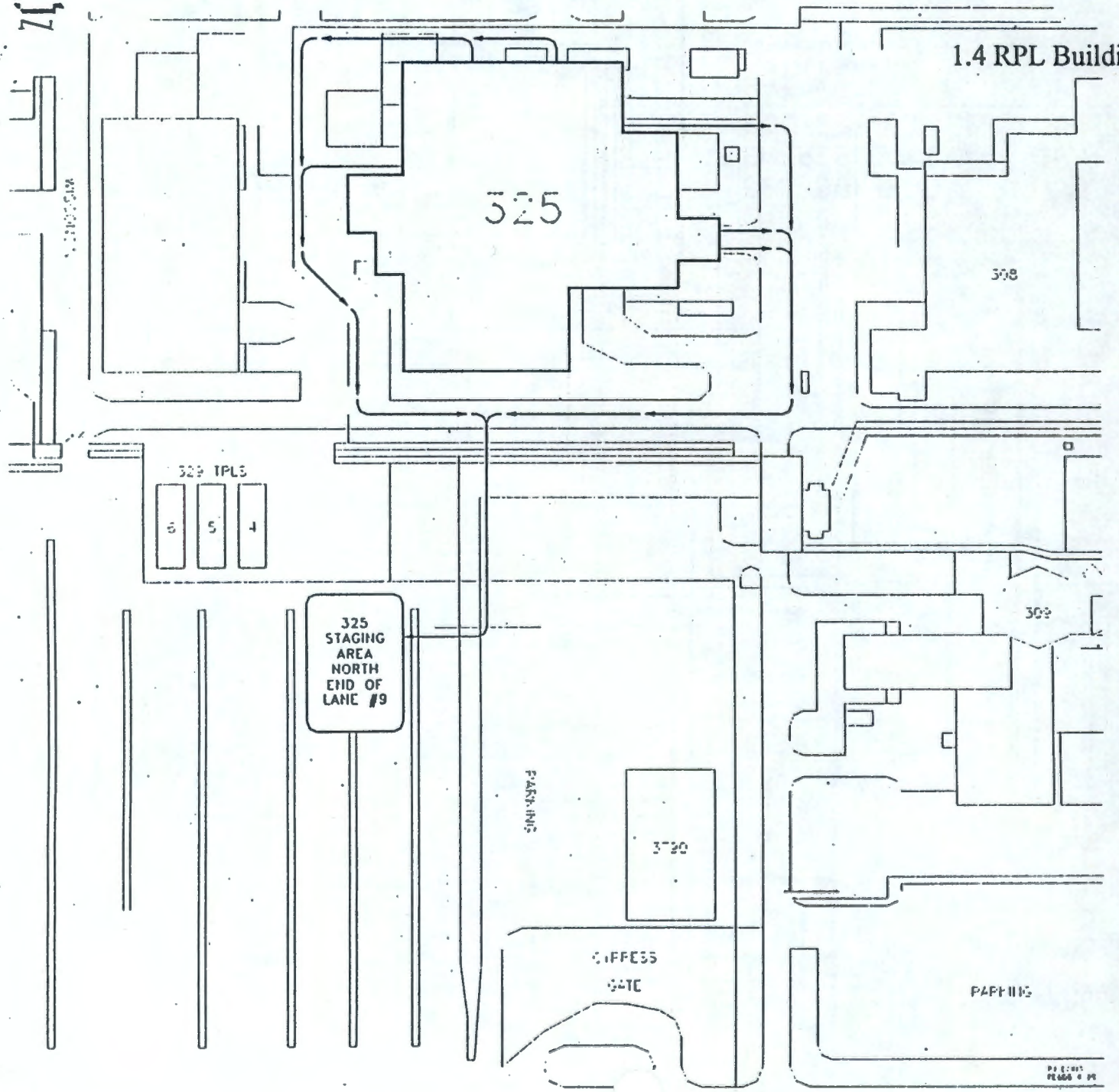
1.4 Evacuation Routes- 2nd and 3rd Floors



1.4 Evacuation Routes - Mezzanine & Basement



1.4 RPL Building Staging Area



2.0 PURPOSE

2.1 Purpose of the Procedure

The purpose of the RPL Building Emergency Procedure is to provide staff and visitors information necessary to react to emergencies in order to:

Maximize safety, minimize risk to life and provide prompt Efficient treatment for injured staff.

Ensure continuity of leadership always and in all situations.

Reduce the effects on the health and safety of PNNL staff, property, Environment, programs and the public.

Ensure prompt internal and external notifications be made to the Responsible authority.

The BEP, in conjunction with the Contingency Plan, complies with the contingency plan requirements of WAC 173-303.

Meet the requirements of DOE Order 151.1 series and 232.1A.

Meet the requirements of SBMS Subject Area "Emergency Preparedness"

2.2 Staff Requirements

Line management has the responsibility to ensure that each PNNL staff member annually reviews this procedure and documents that review with their Training Coordinator.

All new assignees to the RPL Facility will receive initial training within 10 working days of assignment. All temporary personnel are required to receive training before beginning work in the RPL Facility.

2.3 PNNL Single-Point-Contact

SINGLE-POINT-CONTACT

BEFORE PROCEEDING WITH ANY FURTHER ACTION, CALL:

375-2400

STATE THE PROBLEM, REQUEST ANY NEEDED EMERGENCY ASSISTANCE AND REQUEST NOTIFICATION OR APPROPRIATE PERSONNEL. IF YOU NEED FURTHER INSTURCTIONS, BE SURE THE 2400 OPERATOR HAS THE TELEPHONE NUMBER WHERE YOU CAN BE REACHED. THIS APPLIES TO DAYS, NIGHTS and HOLIDAYS.

3.0 EMERGENCY REFERENCE DATA

3.1 Hanford Site Emergency Signals

EMERGENCY SIGNALS	MEANING	REPSONSE
STEADY SIREN (3-5 minutes)	Area Evacuation	Get car keys if time permits. Go to the staging area **(Lower South Parking Lot, North End of Lane #9).**
WAVERING SIREN	Take cover (seek shelter)	Take cover in nearest building, close windows and doors, wait for further instructions.
HOWLER (ah-OO-gah)	Criticality, Nuclear excursion	Run away from alarm sound. Go directly to the staging area **(Lower South Parking Lot, North End of Lane #9).**
GONG/ STROBE LIGHT	Fire	Evacuate building via nearest exit. Assemble at the staging area **(Lower South Parking Lot, North End of Lane #9).**
TELEPHONE BELL – (intermittent ringing **RED telephone)**	Crash Alarm	Answer crash alarm phone. Follow instructions given on telephone. Report instructions to the **Building Emergency Director.**

3.2 Emergency Telephone Numbers *

ANY EMERGENCY PNNL SINGLE-POINT-CONTACT 375-2400

Hanford Fire Department	375-2400 If Inoperable 911
Hanford Ambulance	375-2400 If Inoperable 911
Benton County Sheriff	375-2400 If Inoperable 911
RPL Building Emergency Director (BED) (Contacted via the Single Point Contact, 375-2400.)	
RPL Building, First Alternate BED (Contacted via the Single Point Contact, 375-2400.)	
RPL Building, Second Alternate BED (Contacted via the Single Point Contact, 375-2400.)	
PNNL Duty Officer	375-2154
300 Area ONC	376-2900
Off-Normal Event Reporting	375-2400

3.3 Building Emergency Response Organization (BERO)

The RPL Building Manager is also the RPL Building Emergency Director (BED) for any event within the RPL Building. In the event of an emergency, as defined in the RPL Building Emergency Action Levels (EALs), the BED will activate the Building Emergency Response Organization (BERO), evacuate the facility, notify the PNNL Single-Point-Contact (SPC, 375-2400), and establish the Incident Command Post. In addition, the BED will establish a support team (Management Support Team, headed by the Facility Manager or his delegate) to assist in handling the communications, notifications, equipment and needed supplies. Refer to checklists in Part II for BED, ICP Communicator, ICP Hazards Assessor, and Hazardous Facilities. For follow on actions related to Dangerous Waste Management refer to Part IV, Contingency and Emergency Procedures for Hazardous Waste Management Activities and Part V, Hanford Facility Contingency Plan.

The Zone Wardens are a Key Player in the RPL Building Emergency Response Organization (BERO). They are responsible for determining if all personnel have left their assigned work areas in the facility, reporting the occupancy/accountability status to the Staging Area Supervisor and determining if aid or rescue is required. The Zone Wardens must perform a thorough room-by-room inspection (if safe to do so) in order to provide a high degree of assurance that the facility is free of personnel. The Zone Wardens will assist as required in additional duties as determined by the BED or Staging Area Supervisor.

The Staging Area Supervisor shall direct all activities at the Staging Area and is responsible for notifying the BED if all personnel are accounted for, or if help is needed to locate or account for missing persons. The BED has the authority to enlist building staff in managing the event.

A. Building Emergency Director (BED)

The Building Emergency Director (BED) has the responsibility for the welfare and safety of the building personnel and for directing efforts to control, evaluate, and terminate the event if the building is the site of the event.

RPL Building Emergency Director	
(Contacted via the Single Point Contact, 375-2400.)	

RPL Building, First Alternate BED	
(Contacted via the Single Point Contact, 375-2400.)	

RPL Building, Second Alternate BED	
(Contacted via the Single Point Contact, 375-2400.)	

B. Zone Wardens

The Zone Wardens provide information to the Staging Area Supervisor to ensure that no one is unaccounted for, and assists as required in additional duties determined by the BED. The Zone Wardens may be assigned additional duties as needed, to assist in mitigation of an event.

Duties & Responsibilities

Determine if all personnel have left their assigned work areas in the facility, including unoccupied spaces, such as stairwells, corridors, elevators, and closets.

Perform a thorough room-by-room search (if safe to do so) to provide a high degree of assurance that the facility is free of personnel.

Report the occupancy/accountability status to the Staging Area Supervisor, and determine if aid or rescue is required.

Ensure that disabled persons receive whatever assistance may be required for a safe and orderly evacuation.

The safety of building visitors is the responsibility of the facility host, who shall ensure that visitors are provided a safe and orderly evacuation. The facility host will report the visitor status to the Staging Area Supervisor as soon, as is practical after the evacuation.

Zone Warden Assignments

ZONE 1		
Rooms: 200, 201, 201A, 202, 203, 209, 300, 301, 303, 305, 306, 308, 309, 310, 312, 313, 316, 317, 319, 319A, 320, 324, 325, 330, 327, 327A, 700, 701, 702, 703, and 705		
Primary	**(Contacted via the Single Point Contact, 375-2400.)**	
Secondary		

ZONE 2		
Rooms: 400, 401, 403, 404, 405, 406, 409, 410, 411, 414, 415, 416, 419, 420, 421, 425, 426, 427, 430, 500, 501, 504, 504A, 505, 506, 507, 510, 511, 514, 515, 516, 517, 520, 524, 525, 527, 527A, 528, 529, 530, 706, 710 and 711		
Primary	**(Contacted via the Single Point Contact, 375-2400.)**	
Secondary		

ZONE 3		
Rooms: 600, 601, 603, 604, 607, 608, 609, 610 and 611		
Primary	(Contacted via the Single Point Contact, 375-2400.)	
Secondary		

ZONE 4		
Rooms: 22, 22A, 23, 23A, 23B, 30A, 31, 33, 34, 35, 36, 43, 43A, 44, 48, 52, 54, 55, 55A, 55B, 56, 57, 57E, 57W, 58,, 60, 61, 62, 63, 91, 93, 94, 95, 96, 97, 97A, 98, and the Basement Common Space		
Primary	(Contacted via the Single Point Contact, 375-2400.)	
Secondary		

ZONE 5		
Rooms: 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 25, 26, 27, 28, 70, 72, 74, 76 and 78		
Primary	(Contacted via the Single Point Contact, 375-2400.)	
Secondary		

ZONE 6		
Rooms: 905, 910, 911, 912, 914, 915, 917, 918, 919, 920, 921, 923, 924, 925, 926, 927, 928, 929, 933, 935, 937, 939, 968, and the South & West Equipment Rooms		
Primary	(Contacted via the Single Point Contact, 375-2400.)	
Secondary		

ZONE 7		
Rooms: 930, 932, 936, 938, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 954, 955, 956, 957, 958, 960, 961, 964, 965, 967, and the East Equipment Room		
Primary	(Contacted via the Single Point Contact, 375-2400.)	
Secondary		

ZONE 8		
Rooms: 101, 102, 102A, 103, 104, 104A, 105, 106, 107, 108, 109, 109A, 204, 205, 206, and the Men's Change Room & Lunchroom		
Primary	(Contacted via the Single Point Contact, 375-2400.)	
Secondary		

ZONE 9		
Rooms: 110, 110A, 110B, 110C, 111, 111A, 112, 112A, 113, 114, 115, 116, 117, 118, 119, the Women's Change Room, Main Conference Room		
Primary	(Contacted via the Single Point Contact, 375-2400.)	
Secondary		

C. Staging Area Supervisor

The Staging Area Supervisor shall direct all activities at the Staging Area and is responsible for notifying the BED if all personnel are accounted for or if help is needed to locate or account for missing personnel. In the event of an extended building evacuation during inclement weather, the 3760 facility (Old PNNL Library) will be used as an alternate staging area.

Collect Building Occupancy/Accountability Status from Zone Wardens at Staging Area.

Report status to the BED at the Staging Area or Incident Command Post.

Staging Area Supervisors

Name		Phone
Staging Area Supervisor	(Contacted via the Single Point Contact, 375-2400.)	
First Alternate		
Second Alternate		

D. Facility Expertise

In the Event of an Emergency, Specific Detailed Facility Information may be Needed. Knowledge for the Building, Utilities and Radiation Hazards can be obtained from the following staff:

(Contacted via the Single Point Contact, 375-2400.)

Name/Title	Work Phone	Cellular & Pager	Home Phone
Building Emergency Director (BED) RPL Building Manager			
First Alternate BED			
Second Alternate BED			
RPL Building Ventilation & Power Operations Supervisor			
RPL Building Radiological Control Supervisor			
RPL Building Maintenance Services Supervisor			
PNNL Single Point of Contact	375-2400		
Environmental Safety & Health			
Occupational Safety/Fire Protection			
Industrial Hygiene			
Waste Management			

Section 8.1.4 of PNL-MA-11 requires the BED to keep the Emergency Preparedness Office (EPO) advised of all changes in the Building Emergency Response Organization.

This may be accomplished by memo to the EPO, including a pen and ink change to the BEP. The BEP must be reviewed annually and revised as necessary.

E. Unique Program Laboratory Expertise

The technical knowledge of specific programs/laboratory activities are usually known by the laboratory occupant or program manager. When applicable, Cognizant Space Managers, Alternate Cognizant Space Managers, and Team Leads may be contacted in regards to Emergencies or Off-Normal Events in assigned laboratories. **As Posted at Each Laboratory Entrance.**

F. Staff Members

Give the appropriate alarm if an Off-Normal or Emergency Condition is observed. Respond as required in Section 3.4 of this procedure. Remain at the Staging Area and follow the insiructions of the BED.

3.4 Specific Emergency Actions

For an Off-Normal Event or Emergency Condition not specifically addressed, call the PNNL Single-Point-Contact (SPC) on 375-2400. PNNL staff who observe a facility condition which may include, but not limited to the following: smoke, heat, vibration, or unusual sounds such as hissing should leave the area immediately and make the appropriate emergency notifications. The following guidance is offered for specific listed incidents:

A. Fire

a. **(Signal): GONG/STROBE LIGHT** (Hanford Site)
b. **Response/Action**

If you are notified of a fire (if time permits):
Shut down equipment
Close doors/windows
Secure Nuclear Materials
Secure classified documents or carry them with you
Evacuate the building through the nearest normal exit that you can safely use
Remove PPE clothing prior to exiting the facility, (if possible)

Assemble at the Staging Area, located at the Lower South Parking Lot, North End of Lane #9. ***(Report your presence to your appropriate Zone Warden).***

Zone Wardens and all staff are to remain at the staging area unless directed/released by the RPL Building Emergency Director.

If wearing PPE clothing, separate yourself from other building occupants and await a Survey by Radiological Control Personnel.

If you discover a fire, the following steps are to be performed:

Sound the alarm
Notify PNNL Single-Point-Contact (SPC) 375-2400
Fight the fire, (if able to do so *safely*)
Initiate the same response as listed for the situation in which you are notified of a fire

B. **Criticality**

Criticality is an event, which is limited to a few specific facilities. This information is provided to all personnel entering a PNNL Nuclear Facility (RPL Building).

a. **(Signal): HOWLER** (ah-OO-gah)

b. **Responses/Action**

Leave the Building Immediately
Run away from Alarm Sound/Building
Assemble at the Staging Area, located at the Lower South Parking Lot, North End of Lane #9 (*Report your presence to your appropriate Zone Warden).*

If wearing PPE clothing, isolate yourself from other building occupants and await survey by Radiological Control Personnel.

Zone Wardens and all Staff are to remain at the Staging Area and follow the instructions of the RPL Building Emergency Director.

Planned Response to Nuclear Criticality Accidents: Instrumentation and procedures shall be provided for determining the radiation dose levels at the staging area and in the evacuated area following a criticality accident. Information should be correlated at a central control point.

C. **Area Evacuation**

a. **(Signal): STEADY SIREN** (3 to 5 minutes)

b. **Response/Action**

Follow instructions; evacuate through normal exits
Shut down equipment (if time permits)
Secure Nuclear Materials (s)
Secure classified documents, or carry them with you
Remove PPE clothing prior to exiting the Radiological Control Areas (if possible)

Assemble at the Staging Area, located at the Lower South Parking Lot, North End of Lane #9 *(Report your presence to your appropriate Zone Warden).*

Zone Wardens and all Staff remain at the Staging Area and follow the instructions of the RPL Building Emergency Director.

D. <u>Area Take Cover</u>

a. **(Signal): WAVERING SIREN**

b. **Response/Action**

Stay inside the RPL Building
Exit Radiological Control Areas in an orderly manner and report to the RPL main floor lunchroom/lobby
If outside, take cover inside nearest Building
Remain in the lunchroom/lobby and follow the instructions of the RPL Building Emergency Director

E. <u>Criminal Activity</u> (e.g., suspicious objects, threats, sabotage)

a. **(Signal): NONE**

b. **Response/Action**

When condition is observed, notify the PNNL Single-Point-Contact (SPC) 375-2400
If necessary, clear the area of personnel
Do not move any suspicious objects
Post warnings if applicable
Provide Emergency Responders with Appropriate Information

F. <u>Loss of Electrical Power</u>

a. **(Signal): NONE**

b. **Response/Action**

Close Fume Hoods Sashes
Shut down all equipment (if time permits)
Secure Special Nuclear Material(s)
Secure Classified Documents
Exit Radiological Control Areas in an orderly manner and report to the RPL main floor lunchroom/lobby
<u>If Standby Power Fails</u>:
Assemble at the Staging Area, located at the Lower South Parking Lot, North end of Lane #9 ***(Report your presence to the appropriate Zone Warden).***

Zone Wardens and all staff are to remain at the Staging Area and follow the instructions of the RPL Building Emergency Director

G. **Leaks or Spills** (radioactive, non-radioactive, [a] toxic, or hazardous material)

a. **(Signal): NONE**

b. **Response/Action**

Move away from substance
Notify the PNNL Single-Point-Contact (SPC) 375-2400
Prevent personnel exposure [e.g., set up barricade(s)]
Take steps to contain if possible
Spill Clean-Up Materials are located in Specific Laboratories within the Facility
Follow the instructions of the RPL Building Emergency Director

H. **Unusual, Irritating or Strong Odors**

a. **(Signal): NONE**

b. **Response/Action**

Activate Building Fire Alarm
Evacuate Building to Staging Area, located at the Lower South Parking Lot, North end of Lane #9
Notify the PNNL Single-Point-Contact (SPC) 375-2400
Zone Wardens and all staff are to remain at the Staging Area and follow the instructions of the RPL Building Emergency Director

If the occupant has knowledge of the source and scope of the release and believes the release poses no danger, to staff:

Notify the Building Manager
Notify Your Manager

If an Unusual Odor is detected and the source is unknown, the RPL Building Emergency Director will determine if the building should be evacuated.

The 315 Building (located East of the RPL Building and North of the 337 Building) contains large quantities of Chlorine Gas. If Chlorine Gas were released into the atmosphere, follow the instructions of the RPL Building Emergency Director.

I. **Natural Forces Response**

Follow directions given by Crash Alarm Telephone or RPL Building Emergency Director.

J. **Discovery of Bomb or Suspicious Object**

Contact the PNNL Single-Point-Contact (SPC) 375-2400 or the RPL Building Emergency Director.

K. Telephone or Written Bomb Threats

If a Telephone Bomb Threat is received, attempt to get as much information as possible from the caller the then Notify the PNNL Single-Point-Contact (SPC) 375-2400, give the information obtained from the caller. If you receive a Written Bomb Threat, Notify the PNNL Single-Point-Contact (SPC) 375-2400 and provide the Written Bomb Threat to PNNL Security Personnel.

L. Reduced Ventilation Flows (due to normal power failure or exhaust fan failure)

a. **(Signal): NONE**

b. **Response/Action**

Close Fume Hood Sashes
Exit Radiological Control Areas in an orderly manner
Stage in the main floor lunchroom/lobby
Remain in the lunchroom/lobby area and follow the instructions of the RPL Building Emergency Director

M. Response to Local Alarms in the RPL Building

The following Local Alarms are located within Radiological Control Areas of the RPL Building. Facility staff that have unescorted access to Radiological Control Areas shall be cognizant of the response to these alarms. Staff/Vendors who are under escort shall follow the directions of their escort.

Area Radiation Monitor (ARM) Alarm:

Exit the Radiological Control Area that is being monitored by the ARM, contact an RCT.

Contact the PNNL Single-Point-Contact (SPC) 375-2400.

Continuous Air Monitor (CAM) Alarm:

Exit the Radiological Control Area that is being monitored by the CAM, contact an RCT.

Contact the PNNL Single-Point-Contact (SPC) 375-2400.

Local Audible Differential Pressure Alarms:

Local Audible Alarms are installed on the A-annex hot cells, B-annex hot cells,mini hot cell/shielded glove box in room 23, and glove boxes in rooms 201, 406, 411/415, 414, 506, 517 and 528. Loss of negative pressure will activate the Local Audible Alarm to alert staff of the situation. Evacuate the Immediate Area; notify an RCT, Building Manager, and the PNNL Single-Point-Contact (SPC) 375-2400.

3.3 Utility Disconnects

The location of Utility Disconnects may be necessary under extreme emergency conditions. The RPL Building Emergency Director will determine if utility disconnects need to be disconnected/shut. Locations of the utility disconnects or values are described as follows:

A. Electrical

The RPL Building Main Electrical Control Center SwitchGear is located along the central West Wall in the basement. Extreme caution shall be used in the disconnection of this power.

B. Potable/Process Water

The Internal Valves are located in the Southwest corner of Room 22 in the basement. The External PIV (black standpipe PIV) is located outside at the Southwest corner of the RPL Building.

C. Gas Supplies

The Acetylene, Methane, and P-10 Gas Distribution Systems are located at the Northeast end of the North Gas Cylinder Dock. Turn cylinders off as directed by the RPL Building Emergency Director.

D. Steam

The High Pressure Steam Supply Valves are located above the Power Operator's workstation entry door on the second floor East Equipment Room.

E. Air

The High Pressure Compressed Air Supply Valve is located at the Northeast wall of the basement near the Air Receiver Tank.

F. Ventilation

Facility Exhaust and Supply Fan Control Center is located on the second floor East Equipment room. The Emergency Power Transfer Switches for Exhaust Fans 1 and 2 are located at the Northwest outside corner of the Final Filter Building.

G. Fire Protection Supply Water

Fire Suppression Supply Water Post Indicator Valves (Red PIVs) for Riser 1 through 5 are located outside the RPL Building in the following locations:

Riser #1 PIV, is located at the Northwest corner of the RPL Building by the boiler annex for the 328 Building.
Riser #2 PIV, is located at the North area inside the fenced area South of the 328 Building.
Riser #3 PIV, is located at the Southwest corner of the RPL Building.
Riser #4 PIV, is located Southeast of the RPL-A annex.
Riser #5 PIV, is located Southeast of the RPL-A annex.

H. Dry Pipe OS&Y

The Dry Pipe OS&Y Valve for the Dry Pipe Fire Protection System on the North/Receiving Gas Cylinder Dock is located on the second floor in the East Equipment Room at the Northeast wall. This system is supplied suppression water from Riser #2.

3.6 Alternative Housing

In the Event of an Extended Building Evacuation during Inclement weather, the 3760 Building may be used for housing staff at the direction of the Building Emergency Director.

3.7 Emergency Equipment Location

A. Fire Extinguishers

Portable Fire Extinguishers are located throughout the facility. The locations are identified on the RPL Building Floor Plans.

B. Fire Alarm Pull Boxes

Fire Alarm Pull Boxes are located throughout the facility. The primary locations are at all **Exits of the RPL Facility.** All locations are shown on the RPL Building Floor Plans.

C. Spill Kits

Spill Kits are located throughout the facility and are maintained by the Cognizant Space Managers. Additional Spill Kit materials can be obtained in Room 527. Spill kit locations are shown on the RPL Building Floor Plans.

D. Crash Alarm Phone

The Crash Alarm Phone is located in Room 109, which is in the lobby area of the RPL Building. The Crash Alarm Phone is shown on the RPL Building Floor Plans.

3.8 Emergency Decontamination Facilities

The RPL Facility Personnel Decontamination Room is located in the RPL-A annex. Radiological Control Personnel are the only staff that may perform Personnel Decontamination.

If a Contamination Occurs that requires an Evacuation of the RPL Facility and re-entry is not possible to decontaminate affected personnel, Radiological Control Supervision may utilize the 329 Building Personnel Decontamination Facility or transfer affected staff to the Hanford Site Emergency Decontamination Facility.

3.9 Emergency Radiological Exposure Guideline

In extremely rare cases, Emergency Exposure to Radiation may be required to Rescue Personnel on Protect Major Property. Emergency Exposure may be authorized in accordance with the provisions contained in 10 CFR 835. The dose limits for personnel performing these operations are listed as follows:

DOSE LIMIT (Total Effective Dose Equivalent)	ACTIVITY PERFORMED	CONDITIONS
5 rem	All	
10 rem	Protecting major property	Only on a voluntary basis where lower dose limit not practicable
25 rem	Lifesaving or protection of large populations	Only on a voluntary basis where lower dose limit not practicable
>25 rem	Lifesaving or protection of large populations	Only on a voluntary basis to personnel fully aware of the risk involved

The lens of the eye dose limit should be three times the listed values.

The shallow dose limit to the skin of the whole body and the extremities is ten (10) times the listed values.

4.0 IMPLEMENTATION

This procedure shall be viewed from RPL Homepage at ; HTTP.IIW3.pnl.gov/ Facops2/325/info/rplfac.htm. Printed copies may be obtained at the Access Control Station in the main lobby.

5.0 TERMINATION OF EMERGENCY

The Incident Commander in consultation with the RPL Building Emergency Director will recommend termination of the event when conditions indicate that it is safe to do so.

6.0 RECOVERY

A Recovery Team, consisting of the Incident Commander, RPL Building Emergency Director, and appropriate representation of all facility interests, will develop and recommend a recovery plan. The recovery plan will be reviewed and approved, as appropriate.

7.0 EVACUATION OF DISABLED PERSONS

The RPL Building Occupants shall be aware of Resident Staff who are disabled and may require assistance in evacuating the building. A Specific Evacuation Plan may be required for disabled staff. Alternate housing for temperately disabled staff may be required due to Emergency Response Actions. The Zone Warden, as part of assigned responsibilities, will ensure that Disabled Persons receive whatever assistance may be required for a Safe and Orderly Evacuation.

Staff who are planning to bring a Disabled Visitor to the RPL Building shall contact the RPL Building Emergency Director to determine if a Specific Evacuation Plan will be required.

The Safety of RPL Building Visitors is the responsibility of the host, who shall ensure that visitors are provided a Safe and Orderly Evacuation. The host shall report the visitor status to the appropriate Zone Warden as soon as practical, after the evacuation.

325 Building Emergency Action Level

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FACILITY EMERGENCY EVENTS		
Table 1A. Generic Emergency Classification Criteria (Alert)		
Initiating Condition	**Emergency Action Level**	**Event Classification**
Classification Criteria For Alert Emergency (Any degradation of safety not otherwise directly covered in other specific EALS)	An Alert Emergency shall be declared when events are in progress or have occurred that involve an actual or potential substantial degradation of the level of safety of the facility, OR Substantial actual/potential degradation of level of protection or the loss or potential loss of special nuclear material (SNM). OR If you need assistance from the RL Emergency Operations Center to mitigate the event, or if you anticipate that Alert emergency conditions are imminent, declare an Alert.	ALERT EMERGENCY
The Below Information for Unified Dose Assessment Center Use Only		
Classification Criteria For Alert Emergency (Any degradation of safety not otherwise directly covered in other specific EALS)	Any release of radioactive or chemical material meeting the following criteria: **Radioactive Material Release:** Projected dose greater than a 100 mrem total effective dose equivalent, calculated at the facility boundary, OR **Chemical Material Release:** Exposure limits (air concentrations) greater than ERPG-1 but less than ERPG-2 at the facility boundary.	ALERT EMERGENCY

FACILITY EMERGENCY CLASSIFICATION DESCRIPTIONS

Table 1A. Generic Emergency Classification Criteria (Site Area)

Initiating Condition	Emergency Action Level	Event Classification
Classification Criteria For Site Area Emergency Site Area Emergency (Any degradation of safety not otherwise directly covered in other specific EALS)	A Site Area Emergency shall be declared when events are in progress or have occurre that involve actual or likely major failures of facility functions needed for protection of workers and public, **OR** Actual malevolent acts resulting in major failures of protective systems	SITE AREA EMERGENCY
The Below Information for Unified Dose Assessment Center Use Only		
Classification Criteria For Site Area Emergency(Any degradation of safety not otherwise directly covered in other specific EALS)	Any release of radioactive or chemical material meeting the following criteria: **Radioactive Material Release:** Projected dose greater than a 1 rem total effective dose equivalent, calculated at the facility boundary, **OR** **Chemical Material Release:** Exposure limits (air concentrations) greater that ERPG-2 at the facility boundary, but less than ERPG-2 at the Hanford Site boundary.	SITE AREA EMERGENCY

FACILITY EMERGENCY EVENTS

Table 1A. Generic Emergency Classification Criteria (General)

Initiating Condition	Emergency Action Level	Event Classification
Classification Criteria For General Emergency (Any degradation of safety not otherwise directly covered in other specific EALs)	A General Emergency shall be declared when events are in progress or have occurred that involve actual or imminent catastrophic failure of facility safety systems with a potential for loss of confinement or containment integrity, **OR** Malevolent action resulting in catastrophic degradation of protection systems that could -lead to substantial offsite impacts.	GENERAL EMERGENCY ☐
The Below Information for Unified Dose Assessment Center Use Only		
Classification Criteria For General Emergency (Any degradation of Safety not otherwise directly covered in other specific EALs)	For any release of radioactive or chemical m the following criteria: **Radioactive Material Release:** Projected dose greater than a 1 rem total effective dose equivalent, calculated at the Hanford Site boundary, **OR** **Chemical Material Release:** Exposure limits (air concentrations) greater that ERPG-2 at the Hanford Site boundary.	GENERAL EMERGENCY

FACILITIES EMERGENCY EVENTS

Table 1B Facility Fire

Initiating Condition	Emergency Action Level	Event Classification
A fire within a hot cell	A hot cell temperature alarm is received with visual confirmation of a fire within the hot cell	ALERT EMERGENCY
325 building fire	A fire discovered within the 325 building, with potential for affecting facility safety, has exceeded facility fire suppression system capability, **AND** Requires Hanford Fire Department action for suppression.	ALERT EMERGENCY
A fire within a glovesbox	A fire which breaches confinement of a Pu glovebox	ALERT EMERGENCY

FACILITIES EMERGENCY EVENTS

Table 1B Facility Fire

Initiating Condition	Emergency Action Level	Event Classification
A hot cell fire with stack	Fire within hot cell occurs with failure of alarm all stages of HEPA filtration, as indicated by: Low Dp alarm across HEPA filter AND ▫ Confirmed 325 Building stack monitor alarm	SITE AREA EMERGENCY
A 325 building fire.	A fire discovered within rooms 305, 504,506 with potential for affecting facility safety, has exceeded facility system capability, AND Requires Hanford Fire Department action for suppression.	GENERAL EMERGENCY

FACILITIES EMERGENCY EVENTS

Table 1C Facility Explosion

Initiating Condition	Emergency Action Level	Event Classification
A process explosion occurs.	Confirmed 325 Building explosion requiring eva entire 325 Building.	ALERT EMERGENCY
A process explosion occurs	Confirmed explosion within 325 Building which threatens facility integrity.	GENERAL EMERGENCY

Note: No site area emergency class defined.

FACILITIES EMERGENCY EVENTS

Table 1D Loss of Radioactive Material Confinement

Initiating condition	Emergency Action Level	Event Classification
Hot cell barrier degradation	An unplanned/uncontrolled breach of the 325A/B Hot cells, as indicated by: □ 325A/B Cell high pressure alarm **AND** □ Adjacent operating gallery CAM alarm **OR** □ 325 Building stack monitor alarm	ALERT EMERGENCY
Glove boxes wall degradation	An unplanned/uncontrolled breach of a glovebox containing radiological materials as indicated by: □ Glovebox high pressure alarm **AND** □ Adjacent Laboratory CAM alarms **OR** □ 325 Building stack monitor alarm.	ALERT EMERGENCY

FACILITIES EMERGENCY EVENTS

Table 1D Loss of Radioactive Material Confinement

Initiating Condition	Emergency Action Level	Event Classification
Hot cell barrier degradation	An unplanned/uncontrolled breach of the 325A/B Hot cells with resulting airborne release AND HEPA filtration system is not operational, or an alternate exhaust pathway to the exterior of the building exists.	GENERAL EMERGENCY

Note: No site area emergency class defined.

FACILITIES EMERGENCY EVENTS

Table 1E Hazardous Material Release

Initiating Condition	Emergency Action Level	Event Classification □
Unknown release of hazardous/toxic material.	Any release of hazardous/toxic material to atmosphere which causes immediate adverse building personnel AND Requires building evacuation.	ALERT EMERGENCY

Note: No site area or general emergency class defined.

FACILITIES EMERGENCY EVENTS

Table 1F Criticality

Initiating Condition	Emergency Action Level	Event Classification
Potential criticality event	Uncontrolled criticality event is judged likely by Facility Management and a Criticality Safety Engineer.	ALERT EMERGENCY
Potential criticality event	Criticality alarm annunciates **AND** Criticality event is confirmed by Health Physics or Operations personnel by indication of increased radiaion readings or positive quick sort result.	GENERAL EMERGENCY

Note: No site area emergency class defined..

FACILITIES EMERGENCY EVENTS

Table IG Stack Release

Initiating Condition	Emergency Action Level	Event Classification
325 Building stack release confirmed.	A stack monitor alarm with confirmed monitor readings at or above the following levels: **Instrument: CPM** Alpha monitor. . . . . *1500* Beta/Gamma monitor . . . .90,000 Iodine monitor 90,000	ALERT EMERGENCY

Note: No site area or general emergency class defined.

FACILITIES EMERGENCY EVENTS

Table IH Loss of Service Systems

Initiating Condition	Emergency Action Level	Event Classification
Loss of electrical power	Normal power and both the alternate and preferred standby power supplies are unavailable through E3-S9 substation for greater than 30 minutes.	ALERT EMERGENCY

Note: No site area or general emergency class defined.

NATURAL EMERGENCIES

Table 2A Seismic Event

Initiating Condition	Emergency Action Level	Event Classification
A seismic event	A seismic event is felt by personnel, with some breakage of windows and disturbance of tall objects at the 300 Area	ALERT EMERGENCY
A seismic event occurs	A seismic event is felt by personnel with evid debris within the 325 Building.	SITE AREA EMERGENCY
A seismic event occurs.	A seismic event causes severe building damage (walls fall, underground pipes broken, ground cracked) within or adjacent to the 325 Building.	GENERAL EMERGENCY

NATURAL EMERGENCIES

Table 2B High Winds/Tornado

Initiating Condition	Emergency Action Level	Event Classification
High winds within the 300 Are	Sustained high winds greater than or equal to 90 mph observed at the 325 Building and which have caused extensive damage.	ALERT EMERGENCY
A tornado strikes within the 300 area	Tornado visually seen striking the 325 building causing extensive damage to physical barrier or HEPA filtration system.	GENERAL EMERGENCY

Note: No site area emergency class defined.

NATURAL EMERGENCIES

Table 2C Range Fire

Initiating Condition	Emergency Action Level	Event Classification
Range fire	A range fire has entered the 300 Area and has oris likely to enter the 325 Building.	ALERT □ EMERGENCY

Note: No site area or general emergency class defined.

SECURITY CONTINGENCIES

Table 3A Explosive Device

Initiating Condition	Emergency Action Level	Event Classification
Explosive Device	A confirmed explosive device is located within the 325 Building	ALERT EMERGENCY
Explosive Device	A confirmed detonation of an explosive device within the 325 Building which has failed or threatens facility integrity.	SITE AREA EMERGENCY
Explosive Device	A confirmed detonation of an explosive device within 325 Building rooms containing hazardous materials and which has failed or threatens facility integrity.	GENERAL EMERGENCY

SECURITY CONTINGENCIES

Table 3B Sabotage

Initiating Condition	Emergency Action Level	Event Classification
Confirmed Sabotage	Credible or confirmed physical damage to any safety system within the 325 Building as a result of sabotage.	ALERT EMERGENCY

Note: No site area or general emergency class defined.

SECURITY CONTINGENCIES

Table 3C Hostage Situation

Initiating Condition	Emergency Action Level	Event Classification
Hostage situation	A confirmed hostage situation involving personnel is occurring within the 325 Building.	ALERT EMERGENCY

Note: No site area or general emergency class defined.

SECURITY CONTINGENCIES

Table 3D Armed Intruder/Security Threat

Initiating Condition	Emergency Action Level	Event Classification
Armed intruder (s) Security threat	Confirmed armed intruder(s) located in the 300 Area	ALERT EMERGENCY
Security threat	Credible threat or ongoing severe security com involving physical attack on the facility.	ALERT EMERGENCY

Note: No site area or general emergency class defined.

SECURITY CONTINGENCIES

Table 3E Aircraft Crash

Initiating Condition	Emergency Action Level	Event Classification
Aircraft crash	An aircraft crash has occurred at or near the which has or is likely to have an adverse aff facility's safety, or has/is likely to release rad hazardous materials.	ALERT EMERGENCY

Note: No site area or general emergency class defined.

SECURITY CONTINGENCIES

Table 3F SNM Incident

Initiating Condition	Emergency Action Level	Event Classification
Special Nuclear Material (SNM) incident	Confirmed diversion or theft of SNM at the 325 Building	ALERT EMERGENCY

Note: No site area or general emergency class defined.

DEFINITIONS

American Industrial Hygiene Association (AIHA)

The organization that has responsibility for the development of exposure limits for nonradiological hazardous material.

area

The designated administrative boundary intended for support of 300 Area missions.

emergency action level (EAL)

EALs originate from generic classification descriptions and are more specifically written for each hazardous facility, based upon specific, predetermined, observable indicators used to detect, recognize and determine the emergency class for operational emergencies. EALs can be an instrument reading; an equipment status indicator; a measurable parameter, onsite or offsite; a discrete, observable event; results of analysis; or other observed phenomenon indicative of an emergency class declaration.

emergency response planning guideline (ERPG)

ERPGs are developed by the American Industrial Hygiene Association (AIHA) to determine the appropriate emergency class for releases of non-radiological material. These guidelines will be used as the basis for non-radiological material releases. ERPG-1 and ERPG-2 exposure limits serve as emergency class indicators for the Hanford Site when available from the AIHA.

ERPG-1

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to I hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor (AIHA, 1990).

ERPG-2

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action (AIHA, 1990).

event

As used in this procedure an event is an adverse condition that requires mitigative responses and may result in the declaration of an emergency.

event classifications

Establishes correlation of initiating conditions and event indicators with projected onsite and offsite consequences. For a description of the three types of event classification referred to as "Emergencies," see Section 6.0, "Event Classification Descriptions."

facility boundaries

The facility boundary may include any process building or hazardous materials handling facility's exterior walls, engineered containment, perimeter fences, barricades or barriers and at a distance of 100 meters from the exterior walls.

Hanford Site boundary

For the purposes of emergency preparedness, the Hanford Site is defined as the near (south and west) bank of the Columbia River from the intersection of the existing western most site boundary and the Columbia River, following the Columbia River to the south boundary of the 300 Area, and proceeding west and north along the existing site boundary. Based on this definition, portions of the existing Hanford Site that fall within Grant and Franklin Counties are considered outside of the site boundary.

initiating condition

Operational status which may indicate a potential condition requiring emergency response.

total effective dose equivalent

The sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures). Deep dose equivalent to the whole body may be used as effective dose equivalent for external exposures.

DOE/RL-93-75, Rev. 2

Hanford Facility Contingency Plan

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Date Published
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Department of Energy
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Quality, Safety, and Health
Environmental Assurance, Permits, and Policy

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IMPLEMENTATION NOTICE

DOE/RL-93-75, *Hanford Facility Contingency P1an*
Revision 2

This document is being issued for use by personnel who are responsible for facilities that are required to meet the contingency planning requirements contained in *Washington Administrative Code (WAC)* 173-303.

The document replaces Attachment *4, Hanford Facility RCRA Permit, Dangerous Waste Portion.*

This document is intended to be used in conjunction with existing TSD unit contingency planning documentation (e.g., building emergency plans) to present a complete picture of contingency planning to regulatory personnel. This document contains descriptions of the Hanford Facility emergency capabilities including equipment, organizations, and standard response actions; descriptions of agreements made with the local agencies; and a description of the occurrence reporting and notification process.

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HANFORD FACILITY CONTINGENCY PLAN

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1.0 GENERAL INFORMATION

The Hanford Facility is defined as a single *Resource Conservation and Recovery Act* (RCRA) *of 1976 facility*, identified by the EPA/State Identification Number WA7890008967, that consists of over 60 treatment, storage, and/or disposal (TSD) units conducting dangerous waste management activities. The Hanford Facility consists of the contiguous portion of the Hanford Site that contains these TSD units and, for the purposes of RCRA, is owned and operated by the U.S. Department of Energy (excluding lands north and east of the Columbia River, river islands, lands owned or used by the Bonneville Power Administration, lands leased to the Washington Public Power Supply System, and lands owned by or leased to the state of Washington).

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2.0 PURPOSE

The Hanford Facility Contingency Plan, together with each TSD unitspecific contingency plan, meets the WAC 173-303 requirements for a contingency plan. Applicability of this plan to Hanford Facility activities is described in the Hanford Facility RCRA Permit, Dangerous Waste Portion, General Condition II.A. General Condition II.A applies to Part III TSD units, Part V TSD units, and to releases of hazardous substances which threaten human health or the environment. Additional information about the applicability of this document may also be found in the Hanford Facility RCRA Permit Handbook (DOE/RL-96-10).

This plan includes descriptions of responses to a nonradiological hazardous substance spill or release at Hanford Facility locations not covered by TSD unit-specific contingency plans or building emergency plans. The term hazardous substances is defined in WAC 173-303-040 as: "any liquid, solid, gas, or sludge, including any material, substance, product, commodity, or waste, regardless of quantity, that exhibits any of the physical, chemical or biological properties described in WAC 173-303-090 or 173-303-100." Whenever the term hazardous substances is used in this document, it will be used in the context of this definition.

This plan includes descriptions of responses for spills or releases of hazardous substances occurring at areas between TSD units that may, or may not, threaten human health or the environment.

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3.0 EMERGENCY COORDINATORS

The overall responsibility for implementation of this plan lies with personnel responsible for performing the duties of the Emergency Coordinator as discussed in WAC 173-303-360. Based upon applicability of this document through the Hanford Facility RCRA Permit to Hanford Facility activities as defined by Section 2.0, the Emergency Coordinator must be discussed in terms of Part III TSD units, Part V TSD units, and releases of hazardous substances.

Part III TSD units: The Emergency Coordinator at Part III TSD units (operating TSD units) will be personnel who are assigned to the TSD unit. Personnel providing outside support for emergency response will not assume the role of the Emergency Coordinator at Part III TSD units; however, they may be in charge of first response activities.

Part V TSD units: For Part V TSD units, the Emergency Coordinator approach will depend on whether a building or structure is present as part of the TSD unit. The Emergency Coordinator will be personnel who are assigned to the TSD unit when a building or structure is present. Personnel providing outside support for emergency response will not assume the role of the Emergency Coordinator at these Part V TSD units; however, they may be in charge of first response activities.

For Part V TSD units that do not have a building or structure present as part of the TSD unit, the initial Emergency Coordinator will be Hanford Fire Department personnel who will also perform first response activities. The Hanford Fire Department will then delegate the Emergency Coordinator duties after the immediate threat of a release has been stabilized or eliminated. Remaining Emergency Coordinator duties will be delegated from the Hanford Fire Department to personnel who are assigned to the TSD unit after they are summoned to the event scene. TSD unit personnel will be summoned to the scene based upon the listing of Emergency Coordinators maintained at the single point-of-contact[a], in accordance with Hanford Facility RCRA Permit (DW Portion) General Condition II.A.4.

Hazardous Substance release: The Emergency Coordinator for a hazardous substance release occurring at Part III TSD units and Part V TSD units undergoing closure will be the personnel discussed above for those locations. For other locations on the Hanford Facility considered areas between TSD units, the Emergency Coordinator title will be held by different personnel based upon two different scenarios.

Scenario 1: Release during transportation from one project[b] to another. In this scenario, the Hanford Fire Department will serve as the initial Emergency Coordinator and will Derform first response activities. The Hanford Fire Department will then delegate the Emergency Coordinator duties after the immediate threat of a release has been stabilized or eliminated. Remaining Emergency Coordinator duties will be delegated from the Hanford Fire Department to the organization that offered the hazardous substance for transportation. Delegation will occur after personnel from the offering organization are summoned to the event scene. Personnel will be

---

a) The single point-of-contact is the Hanford Patrol Operations Center and/or the Pacific Northwest National Laboratory Security Center

b) This term is based upon information found in DOE/RL-91-28, Chapter 1.0, Table 1-1 for Hanford Facility TSD units.

summoned to the event scene based upon the listing of Emergency Coordinators maintained at the single point-of-contact in accordance with Hanford Facility RCRA Permit (DW Portion), General Condition II.A.4.

Scenario 2: Release during transportation to and from the same project or during product or waste storage. In this scenario, the organization responsible for the shipment or the hazardous substance in storage will be notified and will serve as the Emergency Coordinator. Personnel providing outside support for emergency response will not assume the role of the Emergency Coordinator on these transportation events however they may be in charge of first response activities.

For any event, at any location, one Emergency Coordinator will be at the scene. When called to respond, the Hanford Fire Department's involvement will be limited to first response activities.

A list of all Emergency Coordinators and designated alternates is maintained in accordance with the Hanford Facility RCRA Permit (DW Portion) General Condition II.A.4. These individuals can be reached 24 hours per day. The Emergency Coordinator has the authority to commit all necessary resources (both equipment and personnel) to respond to any emergency.

Response by an Emergency Coordinator usually is obtained through the single point-of-contact by dialing the appropriate emergency telephone number: 911 or Pacific Northwest National Laboratory telephones at 375-2400. The Hanford Patrol Operations Center may also be reached by calling their business line, 373-3800. The single point-of-contact has been designated as the contact point to mobilize a response to any Hanford Facility emergency. The single point-of-contact is available at all times and can initiate notifications to the Emergency Coordinator or alternate to begin responses to emergencies, as well as to dispatch emergency responders (Hanford Fire Department, Hanford Patrol, or ambulance services). All emergency notifications to the Emergency Coordinator can be made directly from the affected facility or TSD unit or through the single point-of-contact.

The unit-specific DOE-RL technical contact responds to regulatory agency inquiries regarding this Plan. The unit-specific DOE-RL technical contact is accessed by contacting 373-3800 or 375-2400.

4.0 IMPLEMENTATION OF THE CONTINGENCY PLAN

This Plan describes parallel decision flow paths for evaluating and classifying an incident. DOE orders and WAC 173-303-360 require incident classification. The definition of emergencies according to DOE orders differs from the definition contained in WAC 173-303. Because of this, a dual incident classification decision path is necessary to meet both DOE order and WAC 173-303 requirements. Incident classification according to DOE orders is described in this Plan for completeness only. DOE orders will not be used to evaluate whether an incident requires implementation of a contingency plan.

Implementation of a contingency plan will occur when an Emergency Coordinator has determined that a release, fire, or explosion has occurred at the facility which could threaten human health or the environment in accordance with sections 5.1.4 and 5.1.5 of this plan. A release is defined in WAC 173-303-040 within the definition of "discharge". An incident requiring evacuation of personnel or the summoning of emergency response units will not necessarily indicate that a contingency plan has been implemented.

Any incident that poses a potential threat to human health or the environment discovered by TSD unit personnel requires immediate notification of the Emergency Coordinator and the single point-of-contact who then notifies the Hanford Fire Department. Personnel may respond, in accordance with the procedures described in TSD unit-specific contingency plans, before the arrival of the Emergency Coordinator, as long as such response is within their level of training. The Hanford Fire Department is contacted through the single point-of-contact on all emergency incidents involving dangerous waste, mixed waste, or hazardous substances.

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5.0 INCIDENT RESPONSE

Incident response procedures have been established for each TSD unit. The initial response to any emergency will be to immediately protect the health and safety of persons in the immediate area. Identification of released material is essential to determine appropriate protective actions. Containment, treatment, and disposal assessment will be the secondary responses.

The following sections describe actions for personnel for several different types of incidents, including a generic response, that might occur on the Hanford Facility. Regardless of how an incident is classified, minimum on-site notification requirements exist to ensure the appropriate organizations are contacted and that the incident is correctly classified.

5.1 INCIDENT GENERIC RESPONSES

Unless indicated in subsequent response sections, the incident generic responses will apply to any event.

5.1.1 Discoverer

1. The discoverer makes immediate notifications to potentially affected personnel (including the Emergency Coordinator for a TSD unit incident, if onsite) of the incident.

2. Immediately notifies the single point-of-contact by dialing the appropriate telephone number: 911, or Pacific Northwest National Laboratory telephones at 375-2400 and provides all known information, if the information can be obtained without jeopardizing personnel safety, including the following:

    - Name(s) of chemical(s) involved and amount(s) spilled, on fire, or otherwise involved, or threatened by, the incident
    - Name and callback telephone number of person reporting the incident
    - Location of incident (identify as closely as possible and include information about multiple building numbers)
    - Time incident began or was discovered
    - Where the materials involved are going or might go, such as into secondary containment, under doors, through air ducts, etc.
    - Source and cause, if known, of spill or discharge
    - Name(s) of anyone contaminated or injured in connection with the incident
    - Any corrective actions in progress
    - Anyone else who the discoverer has contacted.

5.1.2 Single Point-of-Contact

1. Initiates notification to the Emergency Coordinator, or one of the alternates if the Emergency Coordinator cannot be reached immediately, to arrange immediate response to the incident

2. Requests immediate response from the Hanford Fire Department for fire, ambulance service, and/or hazardous substances/mixed waste incidents

3. Contacts the Hanford Patrol for traffic control and security measures, as needed, based on the report of the discoverer

4. Initiates notification to appropriate management of the spill or release incident

5. Supports the Emergency Coordinator in providing further notification and coordination of response activities if needed

6. Activates or requests activation of the appropriate alarm signals (as required) for the affected building or affected areas, when the Emergency Coordinator determines that protective actions are necessary

7. Notifies the emergency response organizations

8. Prompts activation of the affected area emergency control centers (ECC) if requested by the Emergency Coordinator or other authorized persons

9. Prompts activation of the DOE-RL Emergency Management Team (EMT), if necessary, to recommend protective actions for areas outside the Hanford Facility.

5.1.3 Emergency Coordinator (or alternate)

1. Sounds appropriate alarms to notify occupants

2. Notifies the single point-of-contact if additional support or an area evacuation is needed

3. Activates the building emergency response organization as necessary

4. Arranges for care of any injured persons

5. Requests the single point-of-contact to activate the affected ECC, if required. Activation of the ECC should be done whenever technical assistance is required in evaluating a spill, when the emergency might affect neighboring buildings, or when otherwise deemed necessary by the Emergency Coordinator.

6. Provides for event notification in accordance with DOE Order 0 232.1 and other established Hanford Facility procedures

7. Provides details of the event to appropriate management as the details become available.

5.1.4 Identification of Hazardous Substances and Dangerous Waste and Assessment of Hazards

The Emergency Coordinator ensures that trained personnel identify the character, source, amount, and areal extent of the hazardous substance or dangerous waste involved in the incident to the extent possible. Identification of waste can be made by visual inspection of involved containers; by sampling; by reference to inventory records, shipping manifests, or waste tracking forms; or by consulting with TSD unit operations personnel. Samples of materials involved in an emergency might be taken by qualified personnel and analyzed as appropriate.

Concurrently, the hazards that the incident poses to human health and the environment must also be assessed. The assessment must take into consideration the direct, indirect, immediate, and long-term effects of the incident. In addition to the information sources identified above, the hazard assessment should include other sources such as Material Safety Data Sheet toxicity and health information, and results from any personnel monitoring examinations conducted at medical facilities. These are the types of tools which will aid in ascertaining the extent in which human health and the environment were threatened.

Upon activation, the ECC is available to assist the Emergency Coordinator if needed. Possible assistance could include determining the extent of an emergency, identifying the hazards associated with the materials or waste involved in the incident, assisting in response to the incident, or coordinating the mobilization of special equipment or supplies to the incident site.

If assessment of all available information does not yield a positive assessment of the danger posed by the incident, a worst-case condition will be presumed and appropriate protective actions will be initiated. The Emergency Coordinator is responsible to initiate any protective actions.

5.1 Incident Classification

After the assessment has been completed in Section 5.1.4, the incident should be ready for classification. If not, the Emergency Coordinator shall take whatever means are necessary to obtain the information to complete the classification. The Emergency Coordinator must classify the incident according to the DOE order and contingency plan implementation criteria in this section.

DOE Order Incident Classification

There are three categories of incidents on the Hanford Facility: offnormal event, unusual occurrence, and emergency as described in DOE Orders. Incidents are categorized based on degradation of TSD-unit safety systems and impact to other TSD units, employees, structures, public safety, and the environment. Incidents categorized as offnormal events and unusual occurrences are communicated as described in Section 9.0. Incidents categorized as an emergency are further classified into one of three emergency classes as required by DOE Orders. Incidents categorized as emergencies will prompt automatic activation of the appropriate ECCs.

2. WAC 173-303 Incident Classification

   Based upon the evaluation and hazard assessment in Section 5.1.4, the Emergency Coordinator may determine that the incident is classified as a release, fire, or explosion that threatens human health or the environment. When this occurs, the Emergency Coordinator must report his/her assessment to the ECC, if activated, or to the Patrol Operations Center by dialing 911 for dissemination to local authorities for evacuation of local areas, if applicable. In addition, the Emergency Coordinator or his/her designee, with assistance from environmental compliance/protection personnel, must immediately (within 2 hours) notify Ecology, and either the government official designated as the on-scene coordinator, or the National Response Center. The information included in the assessment report to these agencies is described in Section 9.0.

5.1.6 Protective Actions

1. Evacuation **(Signal: Steady siren).** Each TSD unit has a building emergency procedure that includes an evacuation plan identifying emergency signals and staging area location. In the event a Facility-wide evacuation is required, TSD unit personnel evacuate to their designated staging area, are accounted for, and receive directions on routes to take to safely evacuate the area. If the primary route is blocked by the emergency, personnel use alternate evacuation routes determined at the time of the event.

   Evacuation routes for the Hanford Facility are shown on Figure 1. Specific routes will be determined at the time of the event based on event magnitude, location, and meteorology.

2. Take Cover **(Signal: Wavering siren).** In the event of a take cover alarm, personnel must go inside or remain inside, close all exterior doors, and turn off all intake ventilation. Personnel secure all waste and classified documents.

5.2 RESPONSE TO MINOR SPILLS OR RELEASES AT TSD UNITS AND OTHER BUILDINGS

(Signal: None) The TSD unit personnel generally perform immediate cleanup of minor spills or releases using sorbents and emergency equipment. Personnel detecting such spills or releases contact their supervisor or manager to notify of the detection of such release and to ensure notification of the Emergency Coordinator. In the event a supervisor or manager is not available, the discoverer may notify the single point-of-contact to ensure an Emergency Coordinator is contacted. Responses to spills or releases occurring within individual storage cells, structures, modules, etc., during routine handling and storage are contained in TSD unit-specific contingency plans and/or procedures. Response to minor spills does not require the implementation of the contingency plan in accordance with sections 5.1.4 and 5.1.5.

A spill or release of hazardous substance or dangerous waste is considered 'minor' if <u>all</u> of the following are true:

- The spill does not threaten human health (e.g., an evacuation is not necessary)
- The spill does not threaten the environment

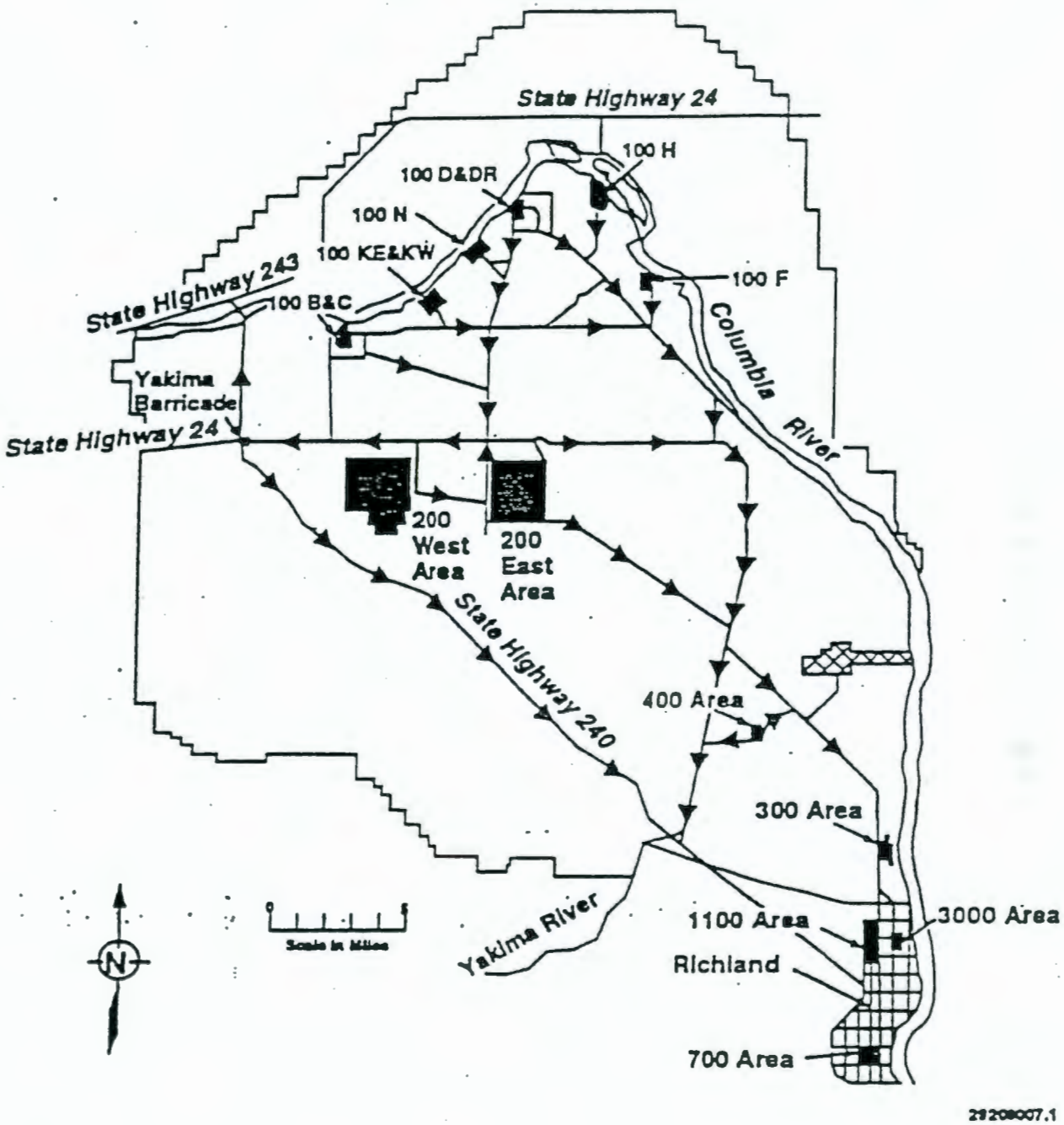

Figure 1. Hanford Facility Evacuation Routes.

- non-emergency response personnel have received training to mitigate the spill and appropriate personal protective equipment is available
- The composition of the material or waste is known or can be quickly determined from label, manifest, material safety data sheets, or disposal request information.

If one or more of the foregoing conditions are not met, responses are performed as outlined in Section 5.3. Notification of the spill as outlined in Section 5.1 is not required for a minor spill or release.

5.3 RESPONSE TO MAJOR SPILLS OR RELEASES AT TSD UNITS OR OTHER BUILDINGS

(Signal: None) The following actions are taken in the event of a major spill or release. Response to major spills or releases may result in implementation of the contingency plan if the Emergency Coordinator makes this determination in accordance with Sections 5.1.4 and 5.1.5.

5.3.1 Discoverer

The discover performs the following:

1. If within the TSD unit, notify personnel (including the Emergency Coordinator) of discovery of spill or release by sounding the appropriate alarm, using the public address (PA) system, etc.
2. Initiate notifications to the single point-of-contact and provide all known information, in accordance with Section 5.1.
3. Takes action to contain and/or to stop the spill if all of the following are true:
   - The identity of the substance(s) involved is known
   - Appropriate protective equipment and control/cleanup supplies are readily available
   - Discoverer has received the appropriate training and can safely perform the action(s) without assistance, or assistance is readily available from other trained TSD unit personnel.

If any of the above conditions are not met, or there is any doubt, the discoverer evacuates the area and remains outside, upwind of the TSD unit, pending the arrival of the Emergency Coordinator. The discoverer remains available for consultation with the Emergency Coordinator, Hanford Fire Department, or other emergency response personnel.

5.3.2 Single Point-of-Contact

The single point-of-contact performs the following:

1. Notifies the Hanford Fire Department and relays information received from the event scene

2. Initiates notification to the Emergency Coordinator if not at the TSD unit

3. Remains available to support further notification and response activities if needed.

5.3.3 Emergency Coordinator

The Emergency Coordinator performs or arranges for the following:

1. Proceeds directly to the TSD unit to coordinate further activity and to establish a command post at a safe location

2. Obtains all available information pertaining to the incident and determines if the incident requires implementation of the contingency plan

3. Determines need for assistance from agencies listed in Section 8.0 and arranges for their mobilization and response through the single point-of-contact

4. Initiates the appropriate alarm, if building or area evacuation is necessary,

5. Arranges for care of any injured persons

6. Requests activation of the affected area ECC via the single-point of contact, if a threat to surrounding buildings or structures exists

7. Provides for event notification in accordance with Section 5.1

8. Maintains access control at the incident site by keeping unauthorized personnel and vehicles away from the area. Security personnel can be used to assist in site control if control of the boundary is difficult (e.g., repeated incursions). In determining controlled access areas, considers environmental factors such as wind velocity and direction

9. Arranges for proper remediation of the incident after evaluation.

10. Remains available for fire, patrol, and other authorities on the scene and provides all required information

11. Enlists the assistance of alternate Emergency Coordinator(s), if around-the-clock work is anticipated

12. Refers media inquiries to the Media Relations/Communications offices of the contractors or DOE-RL.

13. Ensures the use of proper protective equipment, remedial techniques (including ignition source control for flammable spills), and decontamination procedures by all involved personnel, if remediation is performed by TSD unit personnel. Areas of expertise are available in determining necessary equipment or procedures

14. Remains at the scene to oversee activities and to provide information, if remediation is performed by the Hanford Fire Department Hazardous Materials Response Team or other response teams

15. Ensures proper containerization, packaging, and labeling of recovered spill materials and overpacked containers

16. Ensures decontamination (or restocking) and restoration of emergency equipment used in the spill remediation before resuming TSD unit operations

17. Provides required reports after the incident in accordance with Section 9.0.

5.3.4 Hanford Fire Department Response to Major or Unknown Spills

The Hanford Fire Department response to unknown spills is as follows.

1. Initial Hanford Fire Department response includes one engine company, one hazardous materials unit, one ambulance unit, and one battalion commander.

2. The Hanford Fire Department, as the Hazardous Materials Incident Command Agency, establishes command and control of the situation. The first arriving unit assumes incident command and determines location of the command post, and evacuates personnel from a redzone consisting of a minimum of 100 feet (30.5 meters) in all directions. The red zone could be adjusted as deemed necessary by the hazardous materials team leader.

3. The Incident Commander evacuates all personnel within the red zone area.

4. The hazardous materials team leader establishes yellow zone and decontamination corridor.

5. The hazardous materials team leader assigns fully trained and qualified team members specific tasks i.e.,

Team Safety Officer	Decontamination Team Leader
Entry Team	Resource Leader
Backup Team	Science Leader

6. The hazardous materials team safety leader controls and directs the medical evaluations for personnel working in the red and the yellow zones.

7. Team members performing entry, back up, and decontamination, suit up in level "A" protection.

8. Entry team members make entry to obtain samples of unknown hazardous substances, and observe for other pertinent information.

9. Entry team collects sample and exits area going through decontamination by decontamination team.

10. The sample is analyzed on scene by hazardous materials team personnel using available testing equipment. This testing is to determine hazard group classification i.e., poison, acid, flammable, oxidizer, etc.

11. Once hazard classification has been identified, hazardous materials entry team makes re-entry to stabilize and control the hazardous substance to the point that the emergency no longer exists.

12. The entry team exits the area going through decontamination by decontamination team

13. The hazardous materials team leader informs the Emergency Coordinator that the spill site is ready for cleanup by cleanup personnel.

14. The hazardous materials response command is dissolved; all units return to stations.

15. A critique of the hazardous materials incident is held with team members as soon as possible after Hanford Fire Department units have returned to stations.

5.4 RESPONSE TO FIRE

(Signal: Gong) In the event of a fire, the discoverer activates a fire alarm and calls the single point-of-contact in accordance with Section 5.1.1. Automatic initiation of a fire alarm (through the smoke detectors and sprinkler systems) also is possible. The TSD unit personnel are trained in the use of portable fire extinguishers for incipient fires. Personnel use their best judgment whether to fight a fire or to evacuate. Under no circumstances do personnel remain to fight a fire if unusual hazards exist.

The following actions are taken in the event of a fire or explosion.

1. On actuation of the fire alarm, personnel shut down equipment, secure waste (especially mixed waste), and lock up classified documents (or carry the documents with them), ONLY if time permits. The alarm automatically signals the Hanford Fire Department and the Patrol Operations Center.

2. Personnel leave the area/building by the nearest safe exit and proceed to the designated staging area for accounting.[a]

3. The single point-of-contact is notified immediately, who in turn initiates notifications to the Emergency Coordinator (or alternate) if necessary.

4. The Emergency Coordinator proceeds directly to the scene (if not already there).

5. The Emergency Coordinator obtains all necessary information pertaining to the incident.

(a) During a fire alarm condition, all building occupants are required to evacuate unless otherwise stated in their specific building emergency plan.

6. Depending on the severity of the event, the Emergency Coordinator or his/her designee may be required to provide notifications to offsite agencies in accordance with section 5.1.5 and section 9.0 informing them as to the extent of the emergency (including estimates of dangerous waste and/or mixed waste quantities released to the environment) and any actions necessary to protect nearby buildings and/or structures.

7. Depending on severity, the Emergency Coordinator requests activation of the affected area ECC to establish organizations to provide assistance from the DOE-RL, other Hanford Facility contractors, and outside agencies.

8. The Hanford Patrol establishes roadblocks within the area to route traffic away from the emergency scene.

9. Hanford Fire Department medical personnel remove injured personnel to a safe location, apply first aid, and prepare the injured for transport to medical aid stations or to local hospitals in accordance with established memoranda of understanding (MOUs) summarized in Section 8.0. Medical personnel are on standby 24 hours per day.

10. Hanford Fire Department fire fighters extinguish the fire.

11. All emergency equipment is cleaned and fit for its intended use following completion of cleanup procedures.

5.5 UNUSUAL, IRRITATING, OR STRONG ODORS

(Signal: None) If an unusual, irritating, or strong odor is detected, and the discoverer has reason to believe that the odor might be the result of an uncontrolled release of a toxic or dangerous material, the discoverer performs the following:

- Activates the building evacuation alarm or fire alarm system to evacuate the building
- Notifies the single point-of-contact, the building manager, and cognizant line management.

If the discoverer knows of the source and scope of the release, this information is reported quickly to the Emergency Coordinator. Measures are taken to contain the release and ventilate the area, if safe and advisable to do so

If an unusual odor is detected within the building or structure, and the source of the odor is unknown, the Emergency Coordinator considers additional protective actions.

5.6 RESPONSE TO CONTAINER SPILLS OR LEAKS

In addition to the foregoing Plan provisions, the following specific actions could be taken for leaks or spills from containers at TSD units. These actions may be taken only by appropriately trained personnel.

- Container leaks are stopped as soon as possible using appropriate procedures. Appropriate personnel protective equipment is used.
- If it is inadvisable to approach the container, absorbent materials are used, and access is restricted pending notification of the Emergency Coordinator .
- Contents of leaking containers could be transferred to appropriate nonleaking containers. Transfer procedures for fire safety are followed for ignitable or reactive waste (e.g., use of nonsparking tools, bonding and grounding of containers, isolation of ignition sources, and use of explosion-proof electrical equipment).
- Overpacked containers are marked and labeled in the same manner as the contents. All containers of spill debris, recovered product, etc., are managed in the same manner as waste containers received from outside the TSD unit. Overpacks in use at the TSD unit are marked with information pertaining to their contents and noted as to whether the container inside the overpack is leaking or is in good condition.

5.7 RESPONSE TO TRANSPORTATION INCIDENTS

This section describes the actions taken in the event of an unplanned sudden or nonsudden release of hazardous substances, dangerous waste, and/or mixed waste to air, soil, surface water, or groundwater during transportation activities on the Hanford Facility. This includes spills or releases of hazardous substances occurring at areas between TSD units that may, or may not, **threaten human** health or the environment. For spills or releases of hazardous substances occurring at TSD units or other buildings, consult Sections 5.2, 5.3, and 5.6. See Section 2.0 for the definition of hazardous substances.

The following steps are performed by those individuals discovering and responding to a hazardous substance transportation incident at the Hanford Facility. In addition, Emergency Coordinator steps are provided which occur after initial responder actions have been completed. Discoverer notifications for transportation incidents will not be accomplished in accordance with Section 5.1.1. but in accordance with Section 5.7.1.

5.7.1 Discoverer

The discoverer of a hazardous substance spill or release resulting from transportation activities may be the driver of a truck, the engineer of a railroad locomotive, support personnel

associated with the transportation activity, or someone who is not involved in the transportation activity but witnesses the incident. The discoverer:

- Initiates notifications to the single point-of-contact by any means available (telephone, radio, passing motorist, etc.) to request assistance unless personnel associated with the transportation activity have received training to directly contact an Emergency Coordinator

- Remains in a safe location.

- If appropriate training has been completed, the discoverer can assist injured personnel and attempt to isolate the area to prevent inadvertent nersonne1 access.

5.7.2 Initial Responder Actions

The Hanford Fire Department will be the initial responder for most transportation incidents on the Hanford Facility. The Hanford Fire Department will be summoned to the incident scene primarily via the single point-of-contact. In limited cases, TSD unit personnel and/or Hanford Patrol will also provide initial responder actions based upon the training they have received and the severity of the incident. Prevention of further spills or releases is the primary goal to mitigating a transportation incident second only to protection of personnel. The initial responder will:

- Isolate event from personnel:

  - Cordon off access
  - Place apparatus to block roadways
  - Use Hanford Patrol roadblocks
  - Use TSD unit/vehicle PA systems
  - Sound appropriate alarms.

- Determine type of hazardous substances involved by consulting with the driver or locomotive engineer, shipping papers, container placards and labels, and any other resources available to the initial responder.

- Coordinate with emergency response organizations to establish a command post, upwind and uphill of the incident.

- Ensure that all personnel who enter the area are equipped with proper protective clothing and respiratory protection

- Complete other actions necessary to effect control of the scene, including but not limited to the following:

NOTE: The following steps normally are conducted and/or directed by a Hanford Fire Department Hazardous Materials Response Team leader.

  - Secure the scene
  - Use absorbents
  - Use covering (blankets, polyethylene, etc.)

- Overpack
- Plug/patch
- Transfer to new container
- Venting/vapor suppression.

- Summon the Emergency Coordinator to the incident scene if not already there by communicating with the single point-of-contact. The single point-of-contact maintains the list of Emergency Coordinators in order to summon personnel from the organization offering the hazardous substance for transportation. For transportation incidents originating from off the Hanford Facility, the Emergency Coordinator from the receiving organization and/or representatives from the co-operator's central environmental organization will by summoned to the incident scene.

- Delegate Emergency Coordinator duties to the organization offering the hazardous substance for transportation. The Hanford Fire Department will not leave the incident scene until the responsible Emergency Coordinator arrives to delegate the remaining Emergency Coordinator duties.

5.7.3 Emergency Coordinator

The Hanford Fire Department will serve as the initial Emergency Coordinator and will perform first response activities for most transportation incidents. Emergency Coordinator duties met by the Hanford Fire Department will be those pertaining to stabilizing or eliminating the immediate threat of further release of the hazardous substance described above. The Hanford Fire Department will not be the initial Emergency Coordinator when another Emergency Coordinator is at the transportation incident. The Hanford Fire Department may still perform, and be in charge of initial responder actions.

When the Hanford Fire Department is the initial Emergency Coordinator, they will delegate the Emergency Coordinator duties after the immediate threat of a release has been stabilized or eliminated. Remaining Emergency Coordinator actions are to:

- Ensure that the cause of the incident and its possible effects are investigated and evaluated as soon as Possible.

- Assess possible hazards to human health and the environment (considering direct, indirect, immediate, and long-term effects) that might result from the release, fire, or explosion in accordance with Section 5.1.4.

- Determine whether the incident is a release, fire, or explosion that could threaten human health or the environment in accordance with Section 5 1 5.

- Terminate the event and recover from the incident in accordance with section 6.0.

- Complete required reports in accordance with section 9.0.

5.8 DAMAGED, UNACCEPTABLE SHIPMENTS

(Signal: None) When a damaged shipment of hazardous substance, or dangerous waste/mixed waste arrives at a TSD unit and the shipment is unacceptable for receipt, the damaged shipment should not be moved. The TSD unit Personnel instead perform the following steps.

- If the release from damaged package is a 'minor' spill under the criteria of Section 5.2, the following actions are performed.
  - Notify the supervisor or manager to advise of the situation. The supervisor or manager contacts the Emergency Coordinator in order to respond and assist in the evaluation of, and response to, the incident.
  - Notify the shipper or generating unit of the damaged shipment and request that they provide any chemical information necessary to assist in responding to the 'minor' spill.
  - Proceed with remedial action, including overpacking damaged containers, cleanup of spilled material, or other necessary actions to contain the spill.
- Implement the TSD unit contingency plan if applicable in accordance with section 5.1.5, if the release does not meet the criteria of a 'minor' spill as noted previously, or the extent of the spill cannot be determined.

5.9 PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS, OR RELEASES

The Emergency Coordinator, in coordination with emergency response organizations, takes the steps necessary to ensure that a secondary release, fire, or explosion does not occur. The following actions are taken:

- Isolate the area of the initial incident by shutting off power, closing off ventilation systems, etc., to minimize the spread of a release and/or the potential for a fire or explosion
- Inspect containment for leaks, cracks, or other damage
- Inspect for toxic vapor generation
- Remove released material and waste remaining inside of containment structures as soon as possible
- Contain and isolate residual waste material using dikes and adsorbents
- Cover or otherwise stabilize areas where residual released materials remain to prevent migration or spread from wind or precipitation run-off

- Install new structures, systems, or equipment to enable better management of hazardous substances or dangerous waste

- Reactivate adjacent operations in affected areas only after cleanup of residual waste materials is achieved

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6.0 TERMINATION OF EVENT, INCIDENT RECOVERY, AND RESTART OF OPEMTIONS

6.1 TERMINATION OF EVENT

It is a function of the Emergency Coordinator to declare the termination of an event. However, in an event where additional emergency centers are activated only the highest activated level of the emergency organization, in conjunction with the Emergency Coordinator, will declare that an event has ended. If the RL-EMT is activated, only the RL-EMT Emergency Manager officially terminates the event. In all cases, however, the Emergency Coordinator must be consulted before reentry is initiated.

6.2 INCIDENT RECOVERY AND RESTART OF OPERATIONS

A recovery plan is developed when necessary. A recovery plan is needed following an event when further risk could be introduced to personnel, a TSD unit, or the environment through recovery action and/or to maximize the preservation of evidence. If a recovery plan is required, it is reviewed by appropriate personnel and approved before restart. Restart of operations is performed in accordance with the approved plan.

If the contingency plan was implemented, notification must be made to Ecology before operations can resume. Section 9.0 discusses different reports to outside agencies. This notification is in addition to the required reports in Section 9.0. This notification must include that there are no incompatibility issues with the waste and released materials from the incident, and that all the equipment has been cleaned, is fit for its intended use and placed back into service. The notification may be made via telephone conference. Any additional information that Ecology requests regarding these restart conditions may be included in the required 15-day report identified in Section 9.0.

For emergencies not involving activation of the ECC, the Emergency Coordinator ensures that conditions are restored to normal before operations are resumed. If the ECC was activated and the emergency phase is complete, a special recovery organization could be appointed at the discretion of the. Emergency Coordinator to restore conditions to normal. The makeup of this organization depends on the extent of the damage and its effects. The recovery organization will be appointed by the appropriate contractors' emergency director.

6.3 INCOMPATIBLE WASTE

After an event, the Emergency Coordinator or the recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. Cleanup actions are taken by TSD unit operations personnel or other assigned personnel. Actions to be taken might include, but are not limited to, any of the following:

- Neutralization of corrosive spills
- Chemical treatment of reactive materials to reduce hazards
- Overpacking or transfer of contents from leaking containers

- Use of sorbents to contain and/or absorb leaking liquids for containerization and disposal
- Decontamination of solid surfaces impacted by released material, e.g., intact containers, equipment, floors, containment systems, etc.
- Disposal of contaminated porous materials that cannot be decontaminated and any contaminated soil
- Containerization and sampling of recovered materials for classification and determination of proper disposal technique
- Follow up sampling of decontaminated surfaces to determine adequacy of cleanup techniques as appropriate.

Waste from cleanup activities is designated and managed as newly generated waste. A field check for compatibility before storage is performed as necessary. Incompatible wastes are not placed in the same container. Containers of waste are placed in storage areas appropriate for their compatibility class.

If it is determined that incompatibility of waste was a factor in the incident, the Emergency Coordinator or the recovery organization ensures that the cause is corrected. Examples would be modification of an incompatibility chart or increased scrutiny of waste from a generating unit when incorrectly designated waste caused or contributed to an incident.

6.4 POST-EMER6ENCY EQUIPMENT MAINTENANCE AND DECONTAMINATION

All equipment used during an incident is decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment is checked for proper operation before storage for subsequent use. Consumables and disposed materials are restocked. Fire extinguishers are recharged or replaced.

The Emergency Coordinator ensures that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials are replenished, self-contained breathing apparatus are cleaned and refilled, protective clothing are cleaned or disposed of and restocked, etc.

Equipment and personnel decontamination stations are established considering the following information and techniques.

Items to consider when establishing a decontamination station are as follows

- Water supplies
- Containment/catch basins and/or systems
- Staff necessary to accomplish proper decontamination
- Protective clothing

- Decontamination supplies (buckets, brushes, soap, chemicals as needed)
- Risk to personnel
- Weather conditions; i.e., severe heat, cold (current and forecasted)
- Toxicity of material
- Porosity of equipment to be decontaminated
- Disposal requirements of decontamination rinse
- Use of controlled zones to maintain contamination control.

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7.0 EMERGENCY EQUIPMENT AND RESOURCES

7. ANFORD FACILITY EMERGENCY CENTERS

e emergency centers are those locations staffed to provide assistance to building e: ency organizations in an emergency situation. The emergency centers are established to s: rt and to provide overall direction of emergency events occurring at locations within their g: aphic area of responsibility, within the Hanford Facility. This includes acquisition of and a: ment of resources to respond to emergency events. Responsibilities also include p nel protection (employee and public), TSD unit safety, and environmental protection. The e: shment of emergency centers ensures that notification and communication of emergency c: ions are communicated properly.

here are several emergency centers located throughout the Hanford Facility and Hanford S Table 1).

7. OMMUNICATIONS EQUIPMENT

he Hanford Facility has alarm systems that are monitored by the Hanford Fire Department a he Patrol Operations Center. The alarm signals that exist at the Hanford Facility are i fied in Table 2. The TSD unit operations personnel also may use telephones, building PA s ms, portable radios, and cellular telephones to summon assistance.

IRE CONTROL EQUIPMENT

any Hanford Facility buildings are equipped with automatic firesuppression (sprinkler) ms. Portable fire extinguishers are located in working areas in compliance with National Fire ction Association safety codes. Each Class ABC extinguisher is capable of suppressing fires ving ordinary combustible materials, flammable liquids, oils, paints, flammable gases, and rical equipment. All extinguishers comply with the National Fire Code standards for portable guishers and are inspected monthly. The inspections are recorded on tags attached to each guisher.

PERSONAL PROTECTIVE EQUIPMENT

The TSD units have safety showers and eyewash stations, located as necessary, for onnel protection. Drainage from these stations is contained. In addition to these stations, able eyewash equipment is maintained at protective storage areas as necessary. These wash/shower stations are inspected regularly.

Protective clothing and respiratory protective equipment are maintained for use during both tine and emergency operations. This equipment is identified in the unit-specific contingency ns.

Table 1. Emergency Centers.

Emergency Centers	Responsibility
Northern Area Emergency Control Center Location: 2750-E, 200 East Area	Geographic area of responsibility: All 100 and 200 Areas plus the 600 Area north of the WYE Barricade bounded by the Columbia River and Highway 240.
300 Area Emergency Control Center Location: 3701-D, 300 Area	Geographic area of responsibility: RCHS, RCHC, RCHN, 1100 and 3000 Areas plus the 600 Area south of the WYE Barricade bounded by the Columbia River and Highway 240.
400 Area Emergency Control Center Location: Fast Flux Test Facility, 400 Area	Geographic area of responsibility: 400 Area.
North Richland Emergency Control Center Location: Pacific Northwest Laboratory Materials Reliability Center Building	Battelle, Pacific Northwest National Laboratories operated facilities located in the RCHN area
DOE-RL Emergency Operations Center Location: Federal Building, Richland	Area of responsibility: Responsible for the remaining 600 Area not covered by the area emergency centers, assisting area emergency centers, coordinating the Facilitywide response to emergencies, serving as the focal point for other Hanford Site contractors and DOE-RL during emergencies and for providing overall direction for all Hanford Facility emergency situations involving the DOE-RL and/or contractor personnel, ensuring direct interface with-all offsite agencies for mitigation and protection of offsite populations, facilities, and the environment.

RCHS = Richland South.
RCHC = Richland Central.
RLHN = Richland and North

Table 2. Hanford Facility Alarm Systems.

Signal	Meaning	Response
Crash Alarm Telephones (red telephone)	Emergency message	Lift receiver, do not speak, listen to caller and relay message(s) to building occupants and Emergency Coordinator or alternate.
Gong (2 gongs/second)	Fire	Evacuate building. Move upwind. Keep clear of emergency vehicles.
Siren (steady blast)	Area evacuation	Proceed promptly to accountability area. Follow instructions.
Wavering Siren	Take cover	Close all exterior doors, turn off all intake ventilation and notify manager of whereabouts. Request call back for status and monitor portable radios.
Howler (AA-00-GAH)	Criticality	Immediately run to the nearest exit and move and remain at least 100 feet (30.5 meters) from the building.

7.5 SPILL CONTROL AND CONTAINMENT SUPPLIES

Supplies of absorbent pillows are located in operating areas as necessary. These pillows absorb organic or inorganic materials and have a rated absorption capacity of approximately 0.26 gallon (1 liter) of waste each. Absorbents might be used for barriers to contain liquid spills as well as for absorbent purposes. Diatomaceous earth for absorption of liquid waste spills is available. Neutralizing absorbent is available for response to acid or caustic spills. A supply of empty containers and salvage containers (overpacks) also are maintained as well as brooms, shovels, and miscellaneous spill response supplies.

7.6 HANFORD STTE EMERGENCY ORGANIZATIONS

The Hanford Facility has fire and patrol personnel trained and equipped to respond in emergency situations. The Hanford Fire Department is the Hazardous Materials Incident Command Agency for the Hanford Site and has a Hazardous Materials Response Team that is trained to stabilize and control hazardous substances emergencies. A description of equipment for hazardous substances responses available through the Hazardous Materials Response Team is given in Table 3. Locations of the four fire stations on the Hanford Facility are shown on Figure 2.

The Hanford Patrol provides support to the Hanford Fire Department during an incident, including such activities as activation of area crash alarm telephone systems or area sirens (for evacuation or take cover), access control. traffic control, and assistance in emergency notifications.

Table 3. Fire Department Equipment List. (sheet 1 of 2)

Equipment	Description	*Normally Located
Engines 4 Ladders 4 Pumpers	Examples of equipment contained on engines: • 1,500-2,000 gal/min (5,678.1-7,570.8 L/min) pump • 300-500 gal (1,135.6-1,892.7 L) portable tank • Telescoping nozzle • Jaws of Life.	1 at each station
Tankers 6 Each	Examples of equipment contained on tankers and pumpers: • 500 gal/min (1,892.7 L/min) pump • 1,500 gal (5,678.1 L) tank • 6x6 with 2,000 gal (7,570.8 L) porti-tank • Hose, nozzles, fittings, and tools.	1 at Station 1 2 at Station 2 1 at Station 4 1 at Station 3
Water Tenders 1 Each	Examples of equipment contained on water tenders: • 450 gal/min (1,703.4 L/min) pump • 4,500 gal (17,034.3 L) tank • Hose, nozzles, fittings, and tools.	Station 1
Grass Fire Units 4 Each	Examples of equipment contained on grass fire units: • 100 gal/min (378.5 L/min) pump • 250 gal (946.3 L) tank • 4-wheel drive • Hose, nozzles, fittings, and tools.	1 at each station
Ambulances 5 Each	Examples of equipment contained on ambulances: • Life support systems • Medical supplies and emergency response supplies.	1 at Station 1 2 at Station 2 1 at Station 3 1 at Station 4
Command Vehicles 3 Each	Contains communications equipment and protective equipment for commander.	Station 2
Attack Vehicles 1 Each	Examples of equipment contained on attack vehicles: • 450 lb (204.1 kg) of purple-K • 300 gal (1,1335.6 L) aqueous film-forming foam concentrate • 300 gal (1,135.6 L) of aqueous film-forming foam pre-mix solution • Hose, nozzles, fittings, and tools.	Station 2

Table 3. Fire Department Equipment List. (sheet 2 of 2)

Equipment	Description	*Normally Located
Hazardous Materials Vehicle 2 Each	Examples of equipment contained on hazardous material vehicle: • Protective clothing for Hazardous Materials Response Team • Breathing apparatus for Hazardous Materials Response Team • Diking, plugging, and damming equipment • Detection instruments for Hazardous Materials Response Team • Tools for plugging and repairing leaking containers • Overpack containers for leaking containers • Command module with material safety data sheets, software, and portable meteorological station • Tools and communications devices necessary to provide communications during emergency response activities.	1 at Station 2 1 at Station 3
Metal Fire Response Vehicle 1 Each	Examples of equipment contained on metal fire response vehicle: • Equipment for response to special metals fire • 500 lb (226.8 kg) of extinguishing powder • 1,000 lb (453.6 kg) of carbon microspheroids.	Station 4
Mobile Air Vehicle 1 Each	Examples of equipment contained on mobile air vehicle: • Mobile air compressor, recharges self-contained breathing apparatus cylinders • Tools and fittings for operation of vehicle and spare cylinders.	Station 4

*The Hanford Fire Department Chief has the authority to direct the placement of Fire Department equipment as needed to control emergency events. The Hanford Fire Department Chief also has the authority to take pro-active action and assign different vehicle locations based on such conditions as fuel moisture content, area fire history, work in progress, or other conditions that could arise.

gal = gallon(s)
gal/min = gallon(s) per minute
kg = kilogram(s)
L = liter(s)
L/min = liter(s) per minute
lb = pound(s)

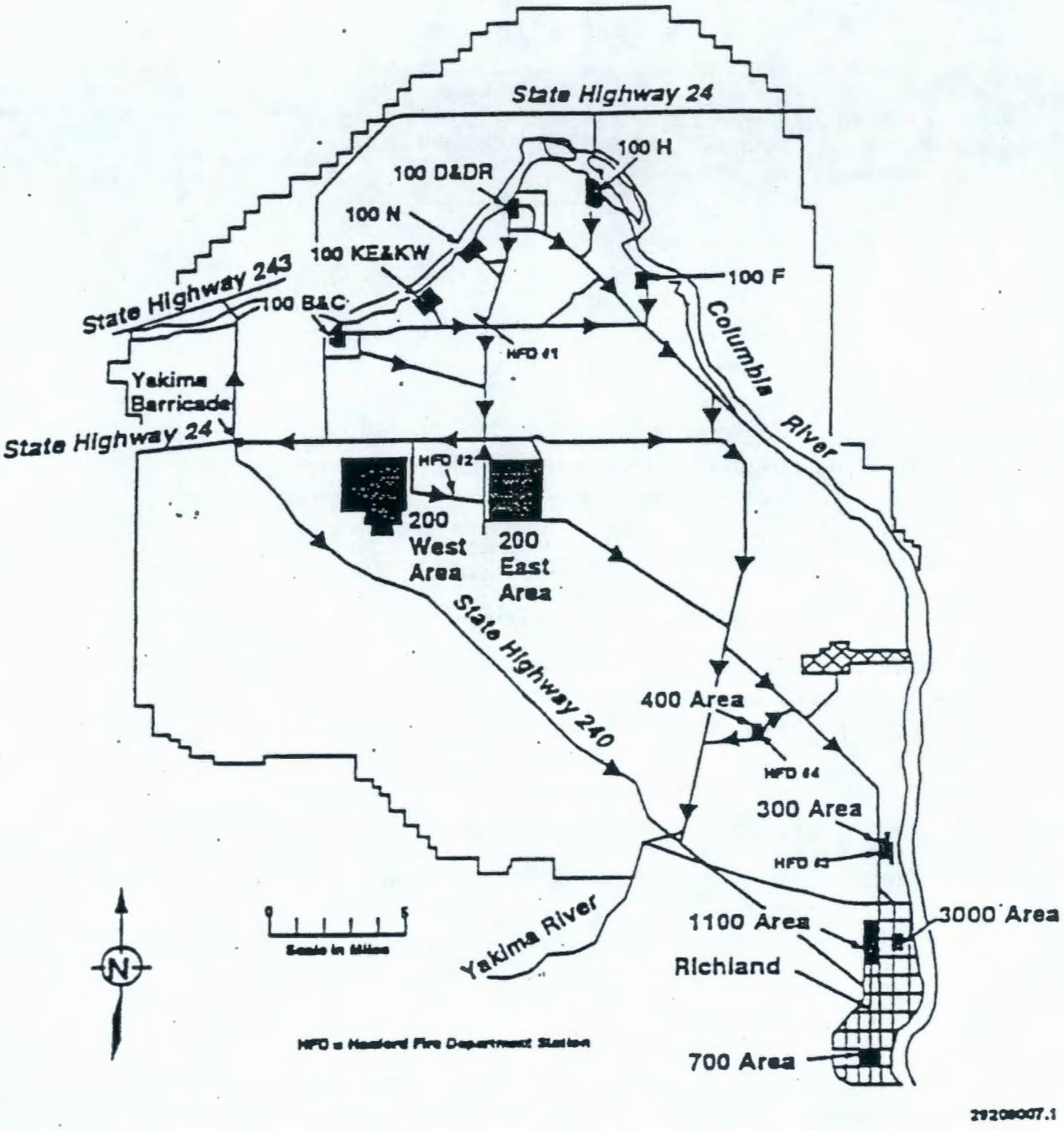

Figure 2. Locations of the Fire Stations on the Hanford Facility.

8.0 COORDINATION AGREEMENTS

This section describes a number of coordination agreements (MOUs) established by and through the DOE-RL to ensure proper response resource availability for incidents involving the Hanford Facility.

An agreement among the major Hanford Site contractors (an operations, engineering and construction contractor, an environmental restoration contractor, a research and development contractor, and a medical and health services contractor) defines the interfaces and notifications required during an emergency. The DOE-RL has the overall responsibility for emergency preparedness. Per the agreements, the operations and engineering contractor has responsibility for Site-wide emergency preparedness while each contractor retains responsibility for emergency preparedness at individual units. Agreements have been established with a number of offsite authorities to reduce the impact to human health and/or the environment in the event that an incident has offsite public health implications, or if an onsite emergency warrants offsite assistance. These agreements are activated through the emergency notification of the DOE-RL (Section 4.1).

8.1 LOCAL, STATE, AND FEDERAL AUTHORITIES

Various agreements have been established among the DOE-RL and Benton, Franklin, and Grant Counties and the states of Washington and Oregon. These agreements describe the cooperative arrangements among these agencies for any onsite emergency that warrants offsite assistance. These agreements describe the planning for, communication of, and response to emergencies at the Hanford Facility that might have offsite consequences.

8.2 HANFORD FIRE DEPARTMENT MUTUAL AID

The Hanford Fire Department provides fire department services for the Hanford Site and Hanford Facility. Mutual aid agreements have been established with Richland, Kennewick, and Pasco fire departments; with Benton County Fire Districts 1 through 6, Franklin County Fire District 3, and Walla Walla Fire District 5.

8.3 MEDICAL AND FIRST AID

Professional medical help is provided onsite by the DOE-RL through the Hanford Environmental Health Foundation. Doctors and nurses are available for emergency assistance at all times. These medical personnel are trained in procedures to assist personnel contaminated with hazardous and/or radioactive material. Emergency call lists are maintained to provide professional medical consultation at all times.

Referral to offsite hospital facilities is made by the Hanford Environmental Health Foundation physician providing emergency assistance by telephone or in person. The primary hospital used in emergencies is Kadlec Hospital, Richland. Kennewick General Hospital, Kennewick, and Our Lady of Lourdes Hospital, Pasco, are used as backup facilities. Agreements have been established among these hospitals and the DOE-RL.

8.4 AMBULANCE SERVICE

Ambulance service is provided by the Hanford Fire Department, which uses paramedics and emergency medical technicians as attendants. This service is available from area fire stations on a 24-hour, 7-day basis. Additional ambulance service is available from other local city fire departments through the mutual aid agreements (Section 8.2).

8.5 UNIFIED DOSE ASSESSMENT CENTER

The Unified Dose Assessment Center (UOAC) is the technical extension of the DOE-RL-EMT, providing services to both the DOE-RL-EMT and the ECCs. The primary mission of the UDAC is to provide recommendations for protective actions, dose calculations and projections, and consultation in the area of industrial hygiene for hazardous substances, biology, environmental monitoring, and meteorology to support the DOE-RL-EMT and the ECCs.

Industrial hygiene and biological consultants at the UDAC advise and assist in determining proper response procedures for spills or releases of toxic, flammable, carcinogenic, and pathogenic materials. The UOAC personnel are responsible to provide a central unified assessment of the dispersion and impact of environmental releases from the Hanford Facility. In communication with the ECC, UOAC coordinates the assessment of impacts and assists in the determination of actual and potential release scenarios.

8.6 HANFORD PATROL/BENTON COUNTY SHERIFF

The Hanford Patrol serves as the security agency for the Hanford Facility. The Benton County Sheriff's Department provides law enforcement for the Hanford Facility. In the event of an emergency, the Hanford Patrol provides services such as activating the crash alarm systems or area sirens, coordinating the movement of emergency responders through security gates, assisting evacuation, establishing barricades, and making necessary notifications through the single point-of-contact. Benton County Deputies will assist with traffic control activities. Agreements also have been established with the Richland, Kennewick, and Pasco police departments to provide additional backup capabilities if required.

8.7 ALERTING OF PERSONNEL ON THE COLUMBIA RIVER

An agreement exists among the DOE-RL, the Washington Public Power Supply System, Benton and Franklin Counties, and the Thirteenth Coast Guard District to ensure safety on the Columbia River during an emergency at the Hanford Facility and to coordinate response activities for alerting personnel on the Columbia River.

8.8 METEOROLOGICAL INFORMATION

An agreement is in place between the DOE-RL and the National Weather Service to define mutual responsibilities for providing meteorological information in an emergency situation. Additional meteorological information can be obtained from the Hanford Site weather station.

8.9 WASHINGTON PUBLIC POWER SUPPLY SYSTEM

An agreement has been established between the DOE-RL and Washington Public Power Supply System for providing mutual assistance as needed. This assistance is available in the use of facilities and equipment for personnel decontamination, first aid, evacuation and reassembly areas, respiratory protective equipment, protective clothing, radiological survey equipment, resources for river evacuation, and radiological assistance response.

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9.0 REQUIRED REPORTS

Three types of written post-incident reports are required for incidents at the Hanford Facility. These reports are summarized in the following sections.

9.1 ASSESSMENT REPORT TO ECOLOGY AND GOVERNMENT OFFICIAL OR NATIONAL RESPONSE CENTER

Immediately following classification of an incident as a WAC 173-303 emergency, as assessment report must be transmitted when the regulatory agencies are notified. This initial assessment report will be submitted by the Emergency Coordinator and must include:

- Name and telephone number of reporter
- Name and Address of facility
- Time and type of incident (e.g., release, fire)
- Name and quantity of material(s) involved, to the extent known
- The extent of injuries, if any; and
- The possible hazards to human health and the environment outside the facility

9.2 WRITTEN REPORT TO ECOLOGY

Following an incident that requires implementation of the contingency plan, the Emergency Coordinator must ensure that the time, date, and details of the incident are recorded in the TSD units operating record. Within 15 day of the incident, a written report must be submitted to Ecology by the Emergency Coordinator. The report generated through the DOE-RL reporting system may be used to supplement this written report, but will not be used as a substitute unless Ecology approval is obtained. The 15 day report will be submitted by DOE-RL and must include;

- Name, address, and telephone number of RL contact
- Name, address, and telephone number of the affected TSD unit
- Date, time, and type of incident (e.g., fire, explosion)
- Name and quantity of material(s) involved
- The extent of any injuries if any
- Assessment of any actual or potential hazards to human health or the environment caused by the incident, where this is applicable;
- Estimated quantity and disposition of recovered material that resulted from the incident

- Cause of the incident
- Description of corrective action taken to prevent reoccurrence of the incident.

9.3 OCCURRENCE REPORTING

Under DOE Order O 232.1 an occurrence report is required for incidents occurring at the Hanford Facility involving hazardous substances release, fire, etc. Specific details of this reporting system are found in the DOE Order. To summarize, the event is categorized within 2 hours and proper notifications are completed to onsite and offsite agencies to include contractor, DOE, county, and state organizations.

These occurrences are investigated, reported, and analyzed promptly to ensure that effective corrective actions are taken in compliance with contractual and statutory requirements. All such occurrences are recorded in the building manager's log book, and the log book is audited to ensure that incidents were reported and handled properly. In the DOE reporting system, three levels of incidents are described, in descending order of severity: emergency. unusual occurrence. and offnormal occurrences

9.3.1 Emergency Event Reporting

An emergency event involves an incident in progress or having occurred that is the most serious occurrence and requires an increased alert status for onsite and, in specified cases, for offsite authorities. There are three classifications associated with emergency events: Alert, Site Area Emergency, and General Emergency. Occurrences are classified into one of the three levels based on real or potential consequences to personnel, facilities, or the environment, both on and off of the Hanford Facility. Current MOUs between the state of Washington and the Hanford Site identify events that would be classified at the stated levels. Emergency events require notification of classification to affected populations.

9.3.2 Unusual Occurrence Reporting

An unusual occurrence is a nonemergency occurrence that has significant impact or potential for impact on safety, environment, health, security, or operations. Generally, these types of events result in release of radioactive or hazardous substances in minor amounts, involve degradation of unit safety systems, result in fatalities, exposures to hazardous or radioactive materials, or significant contamination incidents.

9.3.3 Offnormal Event Reporting

An offnormal event is a significant deviation from normal operations that requires categorization and reporting. Hanford Facility management is required to evaluate an event to determine the depth of investigation and level of reporting required.

10.0 CONTINGENCY PLAN LOCATTON

Copies of this Plan are maintained at the following locations:

- Each specific Part III TSD unit
- Hanford Fire Department (area fire stations)
- Area Emergency Centers
- Occurrence Notification Center
- The DOE-RL Emergency Operations Center, Federal Building; Richland
- Patrol Operations Center
- Kennewick Police Department
- West Richland Police Department
- Washington State Patrol
- Pasco Fire Department
- Richland Fire Department
- City of Kennewick
- Kadlec Medical Center
- Our Lady of Lourdes Health Center
- Benton County Emergency Management Center
- Franklin County Emergency Management Center
- Grant County Emergency Management Center

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11.0 REFERENCES

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HAZARDS ASSESSMENT

1.0 INTRODUCTION

This report documents the emergency preparedness hazards assessment for the 325 Building located in the 300 Area of the U.S. Department of Energy (DOE) Hanford Site. The 325 Building Applied Chemistry Laboratory is part of the Pacific Northwest Laboratory (PNNL), operated by Battelle Memorial Institute under contract to DOE.

This hazards assessment was conducted to provide the emergency planning technical basis for the facility. DOE Order 5500.3A requires that an emergency planning hazards assessment be performed for each facility that has the potential to reach or exceed the lowest level emergency classification.

Much of this document was taken from a draft Safety Analysis Report (PNNL-7748) for the 325 Building. This Safety Analysis Report (SAR) will be reformatted to comply with DOE 5480.22 and DOE 5480.23 before formal issue but was used as a basis for this hazards assessment since it is the most complete and current safety analysis of the building. The draft SAR is referred to as PNNL-7748 in the remainder of this document.

2.0 BUILDING DESCRIPTION

Detailed descriptions of the Hanford Site and the 325 Building are found in the Hanford Site characterization document (Cushing, 1992) and PNNL-7748. The following brief summary is derived from those descriptions.

2.1 Facility Mission

The 325 Building Applied Chemistry Laboratory is a general purpose, nuclear research and development laboratory. The building provides specially shielded, ventilated, and equipped laboratories for radiochemical analyses and nuclear process development studies. Because the 325 Building is a Research and Development (R&D) facility, the work being done in the building changes as programs are concluded and others are started.

2.2 Location

The 325 Building is located in the southern part of the 300 Area of the DOE Hanford Site. The nearest site boundary (the 300 Area fence) is 580 meters east of the 325 Building. The nearest possible resident is 1600 meters east across the Columbia River.

The 300 Area is located in the south-eastern corner of the 560 square mile DOE Hanford Reservation in the south central part of the State of Washington along the west bank of the Columbia River (see Figure 2.1). The size of the Hanford Site will be reduced in 1994. The new boundary will likely be the Columbia River on the north and highway 240 on the south. In addition to the 300 Area, the Hanford Site

contains the following major facilities or activities: six reactor areas designated 100-B/C, 100-N, 100-KE/KW, 100-D/DR, 100-H, and 100-F, which contain eight shutdown production reactors and one shutdown dual purpose reactor (N Reactor); two areas for waste processing and waste storage designated 200-E and 200-W Areas; a commercial nuclear waste burial operation on land leased to the State of Washington; the shutdown Fast Flux Test Facility (FFTF); and an operating Washington Public Power Supply System nuclear power plant. Major metropolitan areas within the broad vicinity of Hanford (see Figure 2.1) include Spokane, Washington, about 120 air miles to the northeast; Seattle, Washington, about 130 air miles to the northwest; and Portland, Oregon, about 150 air miles to the southwest. Two other areas of significant population density include Moses Lake, Washington, about 30 miles north of the K-area and the Yakima Valley, in Washington, extending from Yakima, about 45 miles west of Hanford, to the Tri-Cities, in Washington. The nearest of the Tri-Cities, Richland, is immediately south of the 300 Area.

2.2.1 Floods

Large Columbia River floods have occurred in the past (DOE 1987), but the likelihood of recurrence of large-scale flooding has been reduced by the construction of several flood control/water storage dams upstream of the Site. Major floods on the Columbia River are typically the result of rapid melting of the winter snowpack over a wide area augmented by above-normal precipitation. The maximum historical flood on record occurred June 7, 1894, with a peak discharge at the Hanford Site of 21,000 cubic meters per second (cms) (742,000 cubic feet per second (cfs). The 325 Building is not in the flood plain associated with the 1894 flood. The largest recent flood took place in 1948 with an observed peak discharge of 20,000 cms (706,280 cfs) at the Hanford Site. The probability of flooding at the magnitude of the 1894 and 1948 floods has been greatly reduced because of upstream regulation by dams.

There are no Federal Emergency Management Agency (FEMA) flood plain maps for the Hanford Reach of the Columbia River. FEMA only maps developing areas, and the Hanford Reach is specifically excluded.

There have been fewer than 20 major floods on the Yakima River since 1862 (DOE 1986). The most severe occurred in November 1906, December 1933, and May 1948; discharge magnitudes at Kiona, Washington, were 1,870, 1,900, and 1,050 cms (66,000, 67,000, and 37,000 cfs), respectively. The recurrence intervals for the 1933 and 1948 floods are estimated at 170 and 33 years, respectively. The development of irrigation reservoirs within the Yakima River Basin has considerably reduced the flood potential of the river. The 325 Building is not within lands susceptible to a 100-year flood on the Yakima River.

Evaluation of flood potential is conducted in part through the concept of the probable maximum flood (PMF), which is determined from the upper limit of precipitation falling on a drainage area and other hydrologic factors, such as antecedent moisture conditions, snowmelt, and tributary conditions, that could result in maximum runoff. The probable maximum flood for the Columbia River below Priest Rapids Dam has been calculated to be 40,000 cms (1.4 million cfs) and is greater than the 500-year flood. The PMF would probably surround the 300 area with water (see figure 4.2-10 in Cushing, 1992) but is not expected

to inundate the 325 building. According to projections by the U.S. Corps of Engineers, the PMF would result in a groundwater level of 116 meters (382 feet) above maximum surface level (msl) at the 325 building (the ground floor is 123 meters (402 feet) and the basement is 118 meters (387.5 ft) above msl).

The U.S. Army Corps of Engineers (1989) has derived the Standard Project Flood (SPF) with both regulated and unregulated peak discharges given for the Columbia River below Priest Rapids Dam. Frequency curves for both natural (unregulated) and regulated peak discharges are also given for the same portion of the Columbia River. The regulated SPF for this part of the river is given as 15,200 cms (54,000 cfs) and the 100-year regulated flood as 12,400 cms (440,000 cfs). No maps for the flooded areas are given.

Potential dam failures on the Columbia River have been evaluated. Upstream failures could arise from a number of causes, with the magnitude of the resulting flood depending on the degree of breaching at the dam. The U.S. Army Corps of Engineers evaluated a number of scenarios on the effects of failures of Grand Coulee Dam, assuming flow conditions of the order of 11,000 cms (400,000 cfs). For purposes of emergency planning, U.S. Army Corps of Engineers hypothesized that 25% and 50% breaches, the "instantaneous" disappearance of 25% or 50% of the center section of the dam, would result from the detonation of nuclear explosives in sabotage or war. The discharge or floodwave resulting from such an instantaneous 50% breach at the outfall of the Grand Coulee Dam was determined to be 600,000 cms (21 million cfs). In addition to the areas inundated by the probable maximum flood (see Figure 4.2-10 in Cushing, 1992), the remainder of the 100 Areas, the 300 Area, and nearly all of Richland, Washington, would be flooded (DOE 1986; see also ERDA 1976). No determinations were made for failures of dams upstream, for associated failures downstream of Grand Coulee, or for breaches greater than 50% of Grand Coulee, for two principal reasons: The 50% scenario was believed to represent the largest realistically conceivable flow resulting from either a natural or human-induced breach (DOE 1986); that is, it was hard to imagine that a structure as large as the Grand Coulee Dam would be 100% destroyed instantaneously. It was also assumed that such a scenario as the 50% breach would only occur as the result of direct explosive detonation, not because of a natural event such as an earthquake, and that even a 50% breach under these conditions would indicate an emergency situation in which there might be other overriding major concerns.

The possibility of a landslide resulting in river blockage and flooding along the Columbia River has also been examined for an area bordering the east side of the river upstream from the city of Richland. The possible landslide area considered was the 75-meters- (250-feet-) high bluff generally known as White Bluffs. Calculations were made for an 8×10^5 m^3 (1×10^6 yd^3) landslide volume with a concurrent flood flow of 17,000 cms (600,000 cfs) (a 200-year flood) resulting in a flood wave crest elevation of 122 meters (400 feet) above mean sea level. Areas inundated upstream from such a landslide event would be similar to those shown in Figure 4.2-10 of Cushing, 1992.

In summary, the 325 Building is above the PMF flood plane and the likelihood of flooding is considered to be quite low. The emergency planning for major failures of upstream dams is beyond the scope of this Hazards Assessment.

2.2.2 Seismology

The Hanford Site is in a region of low to moderate seismicity. The historic record of earthquakes in the Pacific Northwest dates from about 1840. The early part of this record is based on newspaper reports of structural damage and human perception of the shaking, as classified by the Modified Mercalli Intensity (MMI) scale, and is probably incomplete because the region was sparsely populated. Seismograph networks did not start providing earthquake locations and magnitudes of earthquakes in the Pacific Northwest until about 1960.

Large earthquakes (magnitude greater than Richter 7) in the Pacific Northwest have occurred in the vicinity of Puget Sound, Washington, and near the Rocky Mountains in eastern Idaho and western Montana. A large earthquake of uncertain location occurred in north-central Washington in 1872. This event had an estimated maximum MMI ranging from VII to IX and an estimated Richter magnitude of approximately 7. The distribution of intensities suggests a location within a broad region between Lake Chelan, Washington, and the British Columbia border. Seismicity of the Columbia Plateau, as determined by the rate of earthquakes and the historical magnitude of these events, is relatively low when compared to other regions of the Pacific northwest, the Puget Sound area and western Montana/eastern Idaho. In the central portion of the Columbia Plateau, the largest earthquakes near the Hanford Site are two earthquakes that occurred in 1918 and 1973. These two events had magnitudes of 4.4 and intensity V and were located north of the Hanford Site. For more information concerning the seismology and geology of this area, see Section 4.2.3 of the Hanford Site National Environmental Policy Act (NEPA) Characterization (Cushing, 1992).

2.2.3 Wind and Tornado

The Site is subject to frequent strong westerly winds. The all-time peak wind recorded at the Hanford Meteorology Station tower in the 200 West area at the 15-m level was a gust of 81 mph recorded January 11, 1972. The 80 mph gust is expected to occur once every 30 years. A peak of 85 mph would be expected to occur once every 100 years (Cushing, 1992).

The Site is well outside of established tornado alleys. The probability of a tornado in any year at any point within the 100 mile radius of the Hanford Meteorology Station is 6.8×10^{-6}/yr (Stone 1972).

2.2.4 Ashfall

The Hanford Site is in a region subject to ashfall from volcanic eruptions. The three major volcanic peaks closest to the project are: Mt. Adams about 100 miles away, Mt. Rainier at about 110 miles away, and Mt. St. Helens approximately 130 miles away.

Important historical ashfalls affecting this location were from eruptions of Glacier Peak about 10,000 BC, Mt. Mazama about 4000 BC, and Mt. St. Helens about 6000 BC. The most recent ashfall

resulted from the May 18, 1980 eruption of Mt. St. Helens. The table below indicates the estimated ash depth deposited at the Hanford Site from past volcanic eruptions in the region.

Table 2-1. Estimated Ash Depth at Hanford from Major Eruptions

Volcano	Time	Equivalent Roof Depth of Ash	Loading Dry (psf)	Loading Wet (psf)
Glacier Peak	12,000 B.P.	1 in.	6	8.4
Mt Mazama	6,000 B.P.	6 in.	36	50
Mt. St. Helens	3,600 B.P.	1 in.	6	8.4
Mt. St. Helens	1980	0.5 in.	3	4.2

B.P. - Before Present

Figure 2.1 Site Location

Figure 2.2 300 Area

2.3 Facility Description

The 325 Building consists of 1) a central portion containing general purpose laboratories for low-level radiochemical work; 2) a south (front) wing containing office space, locker rooms, a lunch room and maintenance shops; and 3) east and west wings provided with shielded enclosures with remote manipulators (hot cells) for high-level radiochemical work. The exhaust fans and final stages of the high-efficiency particulate air (HEPA) filters are housed in a detached structure along the west side of the building at the north end. A storage area for potentially contaminated liquids is located in the vault below ground level along the east side of the building near the north end of the east wing.

The central portion of the building is 59.1 by 59.8 meter (194 by 196 feet) on three floors (basement, ground, and second) and contains over 100 laboratories and offices. The south wing is 22.6 by 40.5 meter (74 by 133 feet) on two floors and contains offices, a conference room, a machine shop, a lunch room, and rest rooms. The east wing (325A), housing the shielded process research hot cells, truck lock, and manipulator repair, is 14.6 by 39.6 meter (48 by 130 feet) with a 12.2 by 12.8 meter (40 by 42 feet) service area/truck lock addition, The west wing (325 B) is 16.2 by 16.5 meter (53 by 54 feet) and houses additional shielded process research hot cells.

The building frame is welded steel. The parapeted roof has a slightly sloped steel deck with gravel-finished roofing. Exterior walls are industrial-insulated panels of fluted steel.

2.3.1 General Purpose Chemical Laboratories

These laboratories are located on the first floor and basement of the central portion of the 325 Building. The chemical, radiochemical and microstructural laboratories consist of approximately 70 rooms with a combined area of approximately 4,75 meters^2 (46,000 feet^2). Installed facilities include radiochemistry hoods, gloveboxes for transuranic materials, inert atmosphere gloveboxes, and laminar-flow clean hoods for analysis of sodium, lithium, and tritium.

Standard laboratories are multiples of 3.0- by 3.7-meter (10- by 12-feet) bays. Free-standing laboratory benches made of steel are arranged along the walls, with peninsulas in the large laboratories. The hoods have heavy stainless steel tray bottoms and steel bases. The hood sash moves over a bypass for a constant volume rate of exhaust flow. Besides the hoods, many stainless steel gloveboxes are provided. The gloveboxes have individual HEPA filters located at the exhaust and intake ports. Gloveboxes and hoods exhaust through testable, self-contained, primary HEPA filters before exhausting through the general ventilation exhaust system. The general exhaust system to the stack consists of banks of final testable HEPA filter located in the exhaust fan/filter addition.

2.3.2 High-Level Radiochemistry Facility (325A)

This facility consists of four primary elements described below.

2.3.2.1 Cell Area

The 325A east wing contains three interconnecting cells (A-Cell, B-Cell, and C-Cell) and supporting facilities for work with megacuries of radionuclides. These cells are shielded with walls of 1.2-meter (4-feet) thick, high-density concrete on the front and sides and 0.9-meter (3-feet) thick, high-density concrete on the back. The front side contains manipulator ports, service ports, and high-density lead-glass windows having equivalent shielding to that of the walls. The cells are equipped with shielded doors, entry ports and through-the-wall remote Manipulators. Each cell is fully lined with stainless steel and equipped with floor drains that drain to critically safe sump tanks in a shielded basement vault.

In 1978, A-cell and C-Cell were cleaned out, renovated, and re-equipped to process 50 kg/d (110 lb/d) of light-water reactor fuel as part of the Nuclear Waste Vitrification Project (NWVP). The equipment includes dissolvers, feed preparation tanks, a battery of four 4.3-meters (14-feet) pulse columns, a continuous raffinate concentrator, ion-exchange columns for the recovery and purification of plutonium, and supporting tanks and instrumentation. The equipment extracted the fission product waste and transferred it to the 324 Building for conversion to borosilicate glass. The project was shut down in 1980, but no funds were provided for cleanup. Some of the unused equipment still remains. Space has been made in front of each window to conduct other research. Currently, that space is used for the tank sludge characterization program. B-Cell was not used during the NWVP program. It currently contains a core extruder and analytical measuring equipment used for the sludge characterization program.

2.3.2.2 Catalyzed Electrochemical Plutonium Oxide Dissolution

The catalyzed electrochemical plutonium oxide dissolution (CEPOD) process, which was developed for dissolving plutonium oxide and leaching plutonium contaminated scrap and waste, was installed in room 604 within the east wing. The process is performed in a stainless steel glovebox (2.4- meters high by 1.0-meters wide by 4.1-meters long) (7.9 by 3.3 by 13.4 feet) that has been covered with a 1.27-centimeters (0.5-inches) lead plate for radiation shielding. Two other gloveboxes are located in the north end of room 604 and are interconnected with a pass-through. The larger of the two is 1.2-meters high by 1.0-meters wide by 1.8-meters long (3.9 by 3.3 by 3.3 feet). Two solution transfer lines, doubly encased of stainless steel, connect the two largest gloveboxes.

2.3.2.3 Cask-Handling Area

The support area (Room 603) immediately east of Room 604 is used for handling both solution and solid waste casks and moving manipulators between the cells and the repair/storage room.

The truck lock has doors on each end and serves as a ventilation buffer between the cask-handling area and the outside. The truck lock is of sufficient length that a tractor and cask trailer can be totally contained and isolated from the outside. The casks are on-and off-loaded by backing the trailer into the cask-handling area and using the bridge crane. The large solution casks are typically transferred between the cask trailer and the cask transfer station. The cask can be connected with the transfer lines leading to the hot cells, the gloveboxes, or to any of the vault tanks.

2.3.2.4 325A Storage Area for Liquids

The 325A high-radiation-level storage area for liquids consists of three underground vaults (A-,B-, and C-vaults). The cover blocks over the vaults are 0.9-meters (3-feet) normal concrete on A vault and 1.2-meters (4-feet) normal concrete on B and C vaults. A vault is 13.4 by 4.3 meters (44 by 14 feet), B vault is 7.9 by 4.3 meters (26 by 14 feet), and C vault is 4.3 by 4.3 meters (14 by 14 feet). A vault contains one 68,000 L (18,000 gal) stainless steel waste storage tank and one 1,514 liter (400 gallon) transfer tank. B vault contains two 14,800 liter (3,900 gallon) stainless steel tanks. C vault contains one 1,514 liter (400 gallon) and two 1,040 liter (274 gallon) stainless steel tanks. A vault has a stainless steel liner that is 0.9 meters (3 feet) high. B and C vaults have stainless steel liners that are 30.5 centimeters (1 foot) high.

2.3.3 Shielded Analytical Laboratory (325B)

The 325B west wing contains six interconnecting hot cells. The cells are 1.7 by 1.7 meters (5.5 by 5.5 feet) compartments inside shielding walls. These compartments are divided into three groups of two compartments each, separated by hollow 10.2 centimeters (4 inches) thick sheet metal dividers. The shielding walls on the east and north sides of the cells are 30.5 centimeters (12 inches) of Meehanite iron. Shielding walls on the west and south sides are 66 centimeters (26 inches) of magnetite concrete. The east side of each compartment is equipped with two manipulators and with high-density, lead glass viewing windows. In a separate room (room 202) west of the six interconnecting hot cells are two all-metal cells. One cell is 2 meters (6.5 feet) long by 1.4 meters (4.5 feet) wide by 2.5 meters (8.33 feet) high, inside dimensions, with 15 centimeters (6 inches) thick walls and roof. The other cell (westerly) is 1.7 meters (5.5 feet) long by 1.5 meters (5 feet) wide by 1.5 meters (5 feet) high, inside dimensions, with 15 centimeters (6 inches) thick walls and roof. This cell sits on a pedestal that is 81 centimeters (32 inches) above the floor. Both cells have shielded viewing windows, two master-slave manipulators, an access door, and a pass-through port.

2.3.4 Fissionable Material Storage Room

Room 530 on the first floor near the back of the 325 Building has been designated as a storage

area for fissionable material. It contains a rack 1.7 meters (5.7 feet) high and 2.6 meters (8.5 feet wide), having 10 cubicles, each 0.6 meters^2 (2 feet^2), arranged in a diamond pattern. the rack is made of steel and bolted to the wall. The cubicles have lips and locked, hinged gates to prevent material from falling out.

3.0 IDENTIFICATION AND SCREENING OF HAZARDS

The hazardous material stored and used at the 325 Building changes as programs are terminated and new programs started. Presently, there is radioactive material in hot cells, gloveboxes, and variety of other containers such as cabinets, waste drums, safes, and drawers. The material is in a variety of forms such as sealed sources, spent fuel segments, powder, liquid, contaminated wipes, etc. Table 3.1 summarizes the location of fissionable material in the building on December 30, 1993. An Operational Safety Requirement for the building limits the maximum inventory of radionuclides to the risk equivalent of 170 Ci of plutonium-239. The risk equivalent is the quantity of plutonium-239 that would have the same dose consequences from a seismic event and uncontrolled fire as the given quantity of a radionuclide in a specified form and location. The seismic event/uncontrolled fire is a general emergency (9.7 rem at the site boundary). Therefore, the allowed inventory is sufficient to warrant an emergency plan for the building.

The 325 Building has over a thousand chemicals. Many of these are either common household products such as dish soap or laboratory quantities of common chemicals.

The exclusion of common materials is consistent with 40CFR Part 355.20(3) where the EPA definition of "Hazardous Chemicals" specifically excludes the following:

> "Any substance to the extent it is used for personal, family or household purposes or is present in the same form and concentration as a product packaged for distribution and use by the general public."

The exclusion of laboratory materials is consistent with 40CFR Part 355.20(3), where the EPA definition of "Hazardous chemicals" specifically excludes the following:

> "Any substance to the extent it is used in a research laboratory or a hospital or other medical facility under the direct supervision of a technically qualified individual."

This exclusion applies generally to the 325 Building since there are no large scale demonstration projects that involve potentially hazardous chemicals at this time. All the current research projects that involve chemicals are small scale laboratory operations that are under the direction of a technically qualified researcher. Table 3.2 shows the small quantities of individual chemicals that are used in the building. This list was taken from a January 24, 1994, inventory and shows the amount of each chemical that was classed as "Extremely Hazardous" per 40 CFR Part355. The quantity of each chemical is less than threshold planning quantity (TPQ) specified in the regulation. Two chemical spill scenarios are

included in section 5.0 to further demonstrate that chemical spills are not expected to be a problem outside the building.

Table 3.1 Fissionable Material Location

Room	Location	Isotopes
55A	Entire room	^{235}U(30.7 g), ^{237}Np(11.6 g), Pu(91.3 g)
305/307	gloveboxes, hoods, cabinet	Pu(63.8 g)
406	gloveboxes, hoods	^{235}U(0.5 g)
504	glovebox, hood, waste drum	^{233}U(2.3 g), ^{237}Np(20.6 g), ^{238}Pu(15.0 g), Pu(125.6 g), ^{241}Am(0.5 g), ^{243}Am(8.4 g)
201	cells 1,2,3,4,5,6	^{233}U(5.1 g), ^{235}U(75 g), ^{237}Np(3.2 g), Pu (116.4 g)
202	entire room and shielded cubicles	^{237}Np (48.6 g)
506	gloveboxes, hoods	Pu(224.1 g)
530	storage array	^{235}U(160.2 g), Pu(107.4 g)
528	drum storage, cabinet	^{233}U(12.4 g), ^{235}U(49.6g), ^{237}Np(16.7 g), ^{238}Pu(0.7 g), Pu(315.4 g), ^{241}Am(0.6 g)
44	drum storage	^{233}U(0.1 g), ^{235}U(1.8 g), ^{237}Np(2.3 g), ^{238}Pu(0.3 g), Pu(98.0 g), ^{241}Am(1.3 g), ^{243}Am(0.5 g), ^{244}Cm(2.9 g)
46	storage cage	^{238}Pu((8.8 g), Pu(0.1 g), ^{241}Am(0.9 g)
48	safe	^{237}Np(14.9 g), ^{238}Pu(0.3 g), Pu(3.3 g), ^{241}Am(2.5 g)
317	hoods, cabinet	^{233}U(0.2 g), ^{235}U(2.4 g), ^{237}Np(0.3 g), Pu(0.7 g)
411	cabinet and drawer	^{233}U(1.0 g), ^{235}U(5.8 g), ^{237}Np(8.7 g), Pu(5.7 g), ^{241}Am(0.5 g)
516	gloveboxes, hoods, special center island	^{235}U(115.3 g), ^{237}Np(1.1 g), Pu(6.6 g)

Table 3.1 Fissionable Material Location		
601	cells A,B	^{235}U(88.7 g), ^{237}Np(32.6 g), Pu(75.6 g), ^{241}Am(24.5 g), ^{243}Am(7.2 g), ^{244}Cm(4.6 g)
604	gloveboxes, drum storage	Pu(860.7 g), ^{241}Am(0.1 g)
414	cabinet in NW corner	^{233}U(0.1 g), ^{235}U(7.1 g), ^{237}Np(0.1 g), Pu(0.7 g)
56	hood, cabinet drawers	^{235}U(148.3 g), ^{237}Np(1.2 g), ^{241}Am(0.1 g)

Table 3.2 325 Building Extremely Hazardous Chemicals

Material	Quantity(pounds)	Threshold*(pounds)
Ammonia	19.8	500
Bromine	5.3	500
Carbon Disulfide	5.3	10,000
Chloroform	37.4	10,000
Formaldehyde	6.3	500
Hydrofluoric acid	31.9	100
Hydrogen Peroxide	74.2	1000
Mercuric Oxide	11.1	500/10,000
Nitric Acid	437.8	1,000
Nitric Oxide	13.7	100
Phenol	7.3	500/10,000
Sulfuric Acid	195.1	1,000
Titanium Tetrachloride	9.0	100
Vanadium(V) oxide	5.5	100/10,000

* TPQ is from 40 CFR pt 355 Appendix A. Extremely hazardous solid substances are subject to either of two TPQs. The lower quantity applies to powder with particle size less than 100 microns or liquid solutions or molten material.

4.0 HAZARD CHARACTERIZATION

The historical at-risk radionuclide inventory in the 325 Building has been larger than those that are

currently permitted by the established Operational Safety Requirements. Furthermore, the inventory changes as programs are terminated and new programs started. Therefore, the size and makeup of the inventory cannot be historically defined. The approach that was taken in PNL-7748 was to begin by describing a reference inventory that represents an upper-range historical inventory. After that, reduction factors were applied to the historical inventory to obtain the inventory used in the accident scenario calculations. The several at-risk inventories in the 325 Building include that in the main laboratories, that stored in the basement, that in the CEPOD process area, that in the 325A liquid waste tanks, that in the hot cells, and that held up within the building.

4.1 Main Laboratories

Historically, most of this inventory has been at risk in gloveboxes, drawers, cabinets, hoods, and benches. A relatively small amount of material has been kept in pipe nipples, transport casks, sealed sources, closed safes, and other containers that could withstand crushing and jarring during an earthquake.

To estimate the relative amounts of plutonium and other fissionable materials that were in different physical forms, the PNL safety analysis group surveyed some of the laboratories. The laboratories surveyed were Rooms 302, 305, 306, 307, 308, 317, 406, 410, 411, and 414. The distribution of uranium and plutonium at the time of the survey (1990) is shown in table 4.1.

Table 4.1 Distribution of Uranium and Plutonium in Main Laboratories

	Fractions		
	Total U	U-235	Pu
Not at risk	0.04	0.02	0.01
Glovebox			
powder	0.08	0.30	0.14
fused or pellets	0.02	0.07	0.04
solution	0.01	0.01	0.39
Hood/bench			
powder	0.36	0.23	
pellets	0.08	0.04	
solution	0.02	0.02	0.01
Drawer/cabinet			
powder	0.31	0.23	0.24
pellets	0.08	0.08	0.07
solution		0.01	

HAZARDS ASSESSMENT

Inventory

The inventory changes as programs are completed and new programs started. Table 4.2 compares the present inventory of fissionable material with the January 30, 1990 inventory.

Table 4.2 Total 325 Building Fissionable Material Inventory

Nuclide/Material	Jan. 30, 1990	Dec. 27, 1993
U-238	168.4 kg	40.1 kg
U-233	22.2 g	26.3 g
U-235	1.33 kg	0.63 kg
Np-237	150.7 g	164.8 g
total Pu (All Isotopes)	3276 g	1957.6 g
Pu-238	14.9 g	25.4 g
Am-241	33.7 g	31.1 g
Pu-242	0.7 g	1.1 g
Am-243	16.1 g	16.1 g
Cm-244	5.8 g	7.5 g

These inventories, which were derived from accountable materials inventories, are not a complete description of the plutonium isotopic breakdown. Therefore, to approximate the building plutonium inventory, the isotopic breakdown for the Fast Flux Test facility mix was used, Table 4.3. PNL-7748 concluded that this mix was representative of the plutonium in the building in 1990.

Table 4.3 Pu Isotopic Mix

Isotope	Weight Fraction
Pu-238	0.00048
Pu-239	0.86613
Pu-240	0.1196
Pu-241	0.0122
Am-241	0.00136
Pu-242	0.00180

The source term for the earthquake was derived by applying the distribution in table 4.1 and the isotopic mix in table 4.3 to the entire 2000 grams of plutonium permitted in the main building.

HAZARDS ASSESSMENT

Properties of Plutonium

Since its discovery in the winter of 1940-1941, plutonium has been extensively studied and is one of the most characterized chemical elements. Many references are available on the nuclear and chemical properties. The following brief summary was taken from the DOE Health Physics Manual of Good Practices for Plutonium Facilities(DOE 1988).

Plutonium is a silvery-white metal, much like nickel in appearance. In moist air or moist argon, the metal rapidly oxidizes producing a mixture of oxides and hydrides. If exposed long enough, an olive-green powdery surface coating of PuO_2 is formed. With this coating the metal is pyrophoric.

Plutonium metal has a low melting point (640 °C) and an unusually high boiling point (3327 °C). At room temperature, plutonium exists in the alpha phase with a density of about 19.86 g/cm^3. Heating that is caused by high specific activity or machining operations can cause large changes in volume.

At room temperature, the most stable oxide is PuO_2. Loose PuO_2 powder usually has a density of about 2 grams/centimeters^3. If the oxide is pressed and sintered into pellets, it may have a density of 10.3 to 11.0 grams/centimeters^3.

The chemistry of plutonium is complex and many different chemical species often coexist. Plutonium is the fifth element in the actinide series, which consists of elements with properties that stem from partial vacancies in the 5f electron shell. In general, there are four oxidation states: (III), (IV), (V), and (VI). The complicated chemistry of plutonium is discussed in detail in Section III of Volume I of the Plutonium Handbook: A Guide to the Technology (Wick 1967) and in Plutonium (Tauble 1964).

The problems of oxidation of metallic plutonium during storage were recognized shortly after the discovery of plutonium. Massive (i.e., not finely divided) plutonium is relatively inert in dry air and is comparatively easy to handle and store for a few days. Special precautions must be taken when storing metallic plutonium for longer periods of time.

The health physics aspects of an accidental plutonium fire can be serious. A fire can burn through containment structures, resulting in the dispersal of PuO_2 over a wide area and the potential for inhalation exposure during the fire or during subsequent decontamination efforts. Plutonium, some plutonium alloys, and some plutonium compounds are pyrophoric. Finely divided plutonium, such as turnings or powder, are definitely pyrophoric and must be handled with care. Certain solvents and organic compounds form flammable mixtures with plutonium. Chlorinated solvents have been involved in several fires with plutonium and its alloys.

Pyrophoric products may be formed on plutonium and certain alloys if they are stored for long times in closed containers. When a container is opened, spontaneous ignition may occur, which can result in the destruction of the container, damage to the glovebox, and spread of finely divided or particulate oxides throughout the glovebox and its ventilation system.

The primary emergency preparedness concern with plutonium is entry into the body from inhalation. The distribution pattern of inhaled material within the lung is related to the activity median aerodynamic diameter (AMAD) of the aerosol provided that the particle sizes of the particulates follow a log-normal distribution (International Commission on Radiological Protection (ICRP) 1979). The ICRP (1979) has published a mathematical model for estimating the distribution of an aerosol in the respiratory system based on the AMAD. The AMAD for a particular aerosol may be estimated (e.g., Knutson and Lioy 1983), although it is common to assume an AMAD of 1 μm.

The length of time that an aerosol will be expected to remain in the lung following inhalation is based on its solubility class. There are three solubility classes described by the ICRP in their Publication 30 (ICRP 1979): D (day), W (week) and Y (year); the times listed indicate the order of magnitude of the half-life of the material in the lung. The biological half-lives for D, W, and Y materials in the lung are 0.5, 50, and 500 days respectively. The actual solubility class can be estimated by measurement of the materials solubility in simulated lung material or by using the solubility class determined by the ICRP for various chemical compounds (seed Table 4.4).

Table 4.4 Solubility classes of Plutonium Compounds

Compound	Solubility Class
None	D
All except oxide	W
Oxide	Y

4.2 Basement Storage

Westinghouse Hanford Company (WHC) stored uranium and thorium in the basement of the 325 Building for several years. This material has been removed.

4.3 CEPOD Process Area

The CEPOD process was designed to make up to 14 runs per year. At the end of each run is a period during which the entire plutonium oxide output of the run was contained in the process gloveboxes as powder and was at risk. Thus, the worst-case historical inventory was the 2000 grams of plutonium permitted to the process by PNL's safeguards group, and the worst-case form was plutonium oxide powder.

Inventory

The CEPOD process in not active but approximately 859 grams of plutonium remain in the gloveboxes and drum storage. This includes 48.3 grams of Material Unaccounted For (MUF) in glovebox 36 which is assumed to be holdup.

Properties

The material is in several forms including ash, paste and oxide. The properties of plutonium are briefly described above.

Conditions of Storage and Use

Most of the inventory, 606.8 grams, is in three type 6M drums. The remainder is in gloveboxes #36 and #38. All of the glovebox inventory is in process vessels, cans and holdup. The CEPOD process in room 604 is not active at this time.

4.4 Liquid Waste Tanks

The exact inventory of radionuclides in the liquids stored in the 325A tanks varies from project to project. However, concentrations are generally quite low. Each of the three vaults in the 325A high-level liquid storage area has a criticality-based limit of 230 g plutonium, or a total of 690 g plutonium for the seven storage tanks(total volume of which is 102,700 L).

4.5 Hot Cells

The maximum historical inventory for the 325A hot cells resulted from handling large quantities of spent fuel. Under those circumstances, the most significant radionuclides present, from a dose standpoint, would be 265 Ci of krypton-85 and 1.7 Ci of tritium. No operations of this magnitude are currently under way or approved. The historical inventory is the bounding inventory because of its size and its immediate releasability.

4.7 Holdup

There are few measurements of plutonium holdup as surface contamination, or non-testable filter contents. One set of measurements in 1989 showed that of five glovebox holdup measurements, the maximum value was 14.5 g plutonium. Another glovebox holdup measurement in 1990 showed holdup of 0.83 g plutonium. This included smearable, nonsmearable, and filter contamination. PNL-7748 estimated that the total building holdup including gloveboxes, ducts, and primary and secondary filters is 380 g of plutonium with the FFTF plutonium isotopic mix.

5.0 EVENT SCENARIOS

PNL-7748 identified various scenarios that could breach the barriers that maintain control over each of the hazardous materials discussed in the previous section. The paragraphs below determine the emergency category of various scenarios using the consequences reported in PNL-7748 and the criteria listed in tables 5.1 and 5.2.

Table 5.1 Radiological Release Criteria

Emerg. Category	Criteria*
Alert	> 100 mrem committed dose equivalent at facility boundary
Site Area	≥ 1 rem committed dose equivalent at facility boundary
General	> 1 rem committed dose equivalent at site boundary

Table 5.2 Non-Radiological Release Criteria

Emerg. Category	Criteria*
Alert	> ERPG 1 at facility boundary
Site Area	≥ ERPG 2 at facility boundary
General	≥ ERPG 2 at site boundary

*The criteria apply to a peak concentration of the substance in air. If ERPG values have not been established for a substance, alternative criteria specified in the Emergency Management Guide for Hazards Assessments shall be used.

There are general criteria for emergency classification in addition to the numerical values in the tables above. The threshold between reportable occurrences and the Alert classification is difficult to establish based solely on a numerical value. The following general criteria apply in addition to the airborne release concentration values specified in the tables above.

ALERT

An Alert Level Emergency shall be declared when events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the facility with an increased potential for a release.

In general, the Alert classification is appropriate when the severity and/or complexity of an event may exceed the capabilities of the normal operating organization to adequately manage the event and its consequences.

SITE AREA

A Site Area Emergency shall be declared when events are in progress or have occurred which involve actual or likely major failures of facility functions needed for protection of workers and the public.

GENERAL

A General Emergency shall be declared when events are in progress or have occurred that involve actual or imminent catastrophic failure of facility safety systems with a potential for loss of confinement or containment integrity.

There is additional emergency classification guidance in the Emergency Management Guide on Event Classification and Emergency Action Levels (EALs). The Hazards Assessment in the following sections is based primarily on a comparison of calculated consequences with the numerical criteria in the tables above. However, some recommendations are provided based on the more General Emergency classification criteria.

5.1 Facility Emergency Events

All significant quantities of radioactive materials are handled inside gloveboxes and hotcells. The paragraphs below briefly describe possible containment barrier failure modes.

Gloveboxes

Failure of Primary Barrier

The primary barrier for gloveboxes are the walls, gloves, ports and ventilation openings. A loss of glovebox confinement could be caused by one of the following:

1. Torn or ripped off glove - While the potential for this type of accident is relatively high, the consequences are low. Gloveboxes operate at a pressure that is negative compared to the room. A glove breach will cause little spread of contamination as air will be drawn into the box.

2. Glovebox overpressurization - Compressed air is supplied to those gloveboxes requiring dry air atmospheres. These gloveboxes have been equipped with individual over-pressurization control systems. The consequences of an overpressurization could be a breach of the box integrity and release of a portion of the glovebox contents to the adjacent laboratory.

3. Fires - Glovebox fires can result in loss of confinement in the glovebox and local contamination of the adjacent laboratory. Administrative controls provide some control of solvents and flammable materials. The exhaust system will work to maintain the glovebox at a negative pressure, which would reduce the spread of contamination. Gloveboxes that take air from the room could, if overpressurized by an energy release such as a fire, expel radioactive material into the room through the air intake. Intake HEPA filters are provided against this eventuality. However, the filters are not testable in place.

4. Explosions in gloveboxes - These have occurred in various facilities. In this type of event, contamination could spread to the corridor and adjacent laboratories before the exhaust system could control the event.

Hot Cells

Failure of Primary Barrier

The primary barrier for hot cells are the walls, windows, manipulator boots, ports and ventilation openings. The loss of hot cell confinement could be caused by one of the following:

1. Leaking manipulator boot or unsecured port - The consequences for this type of accident depend upon the size of the leak relative to ventilation air flow. The confinement system is based on maintaining a negative air pressure in the cell relative to the adjacent laboratory. Alarms are provided to warn of a loss of cell pressure differential. Even during an air pressure differential loss, it would be unlikely that a spread of contamination of any significance would occur in the absence of air currents within the cells to expel contamination. The primary concern for an unsecured port or missing plug is radiation streaming.

2. Loss of Hot Cell Ventilation - An electrical power failure, failure of ventilation fans, or faulty ventilation damper alignment could cause a loss of air pressure differential. Various alarms are provided to warn of these conditions. All operations in the cells would be curtailed and sources of contamination secured until the ventilation system is returned to normal.

3. Fires - Hot cell fires have occurred in several facilities and can result in loss of confinement by disrupting the ventilation system and providing air currents to move the material. Exhaust filters can be plugged with smoke causing either reverse air currents out the inlet openings or failure of the filter because of high differential pressure. In extreme cases, flame or burning embers can ignite an exhaust filter. The chance of loss of both stages of HEPA filtration is very small because of the physical separation.

4. Explosions in Hot Cells - These have occurred in various facilities. If the explosion breaches containment, contamination could spread to the corridor and adjacent laboratories before the exhaust system could control the event.

Loss of HEPA filtration - The ventilation and filter systems provide the principal engineered features for contamination control within the building. HEPA filter damage could result from maintenance, construction, overloading, age or manufacturing defect. The probability of undetected failure of the HEPA filters is reduced by annual and post-installation inspection and testing. The loss of the primary testable HEPA filter on the hot cells, gloveboxes, and fume hoods is unlikely in the event of explosions, fires and other events because protection is provided by the nontestable HEPA filter at the point of origin and by several right angels in the exhaust duct upstream of the primary HEPA filter.

Effects of Other Barriers

The building structure and ventilation system provide a secondary barrier to a release from a glovebox, hot cell or fume hood. The building is not designed as a containment structure. Therefore, some leakage is possible around or through doors, windows and building penetrations. However, the building ventilation system is designed and operated to assure safe confinement of radioactive materials under normal and likely failure modes. Cascading pressure levels are used to maintain proper air flow balance and direction. The main exhaust air system for the building consists of four exhaust fans, primary and final testable stages of HEPA filters, an exhaust plenum, connecting ductwork, and a 16.8 m (55 ft) high stack. An intact and operating exhaust system would reduce a particulate release by a factor of at least 10^5.

Range of Possible Releases

Common problems such as torn gloves in a glovebox are not an emergency preparedness concern since potential releases from the building are far below the level that would create an Alert emergency. Several major failures of material confinement are analyzed below. They include the bounding glovebox and hot cell fires, glovebox and hot cell explosions and loss of electrical power. These events cover a range of possible releases from non-emergencies to a Site Area emergency. Events such as large fires that involve more than one room have the potential to reach a General emergency as described below.

5.1.1 Facility Fire

PNL-7748 analyzed four fire scenarios. They range in severity from a glovebox fire to a post-seismic uncontrolled building fire. These scenarios and their consequences are reviewed below to provide insight on establishing the emergency classification of 325 Building fires.

5.1.1.1 Hot Cell Fire

This scenario is the bounding Hot Cell fire. In this scenario, waste materials from the Nuclear Waste Vitrification Program (NWVP) inside the "A" hot cell, including rags soaked with organic solvent, are ignited by spontaneous heating. The scenario further assumes that the initial fire causes failure of the

connections on a solvent extraction scrub column. The organic solvent is ejected, causing failure of the floor-level exhaust column. Flame propagation along the exhaust duct surfaces causes loss of both the primary and secondary HEPA filters, together with any charcoal filter that may be in place. The final filter bank is assumed to remain intact. This scenario is from a program that is no longer active in the cell. However, it represents the bounding case since current and projected inventories of combustibles and radionuclides are believed to pose lower consequences.

The hot cell inventory was selected as a bounding case, although the Nuclear Waste Vitrification Program (NWVP) under which the inventory was provided is no longer in existence. The bounding nature of the inventory arises from its being dissolved in combustible solvent and its high quantity of highly radiotoxic Pu radionuclides. Current and projected inventories of combustibles and radionuclides are believed to pose lower consequences.

There were 25 liters of solvent present in the three columns and two organic headpots for the NWVP. It is assumed that all of the solvent was ejected when the heat and flames from the spontaneous trash fire caused column connections to fail. Of the solvent release, 10% (or 2.5 liters) was assumed to cover various surfaces in the cell and to be burned in the fire with the remainder going into the drain. A release fraction of 11.4% (Ayer et al. 1988) was used for the uranium and plutonium dissolved in a combustible liquid. The iodine has a release fraction of 84.3%. The respirable fraction is 66% (Mishima 1973). The floor level in cell filters are assumed to be splashed by the burning liquid and rendered nonfunctional. Incomplete combustion is assumed to permit flame propagation to the primary HEPA filters causing loss of both of these filter banks. Because the final filters are located in a separate building, the final filters are assumed to survive. A release fraction of 0.001 (99.9% efficiency) is attributed to these filters. The charcoal filters are not currently in place, but would be if work involving iodine radioisotopes were under way. It is assumed that the charcoal filters are exposed to combustion and they fail. Table 5.3 summarizes the source term for this event.

Table 5.3 Hot Cell Fire Source Term

Nuclide	Solvent Conc. (Ci/L)	Solvent Released (liters)	Release Fraction	Respirable Fraction	Filter Factor	Source (Ci)
I-129	1.5E-07	2.5	0.843	1	1	3.16E-07
U-234	6.0E-05	2.5	0.114	0.66	0.001	1.13E-08
U-235	1.3E-06	2.5	0.114	0.66	0.001	2.45E-10
U-236	2.3E-05	2.5	0.114	0.66	0.001	4.33E-09
U-237	1.9E-04	2.5	0.114	0.66	0.001	3.57E-08
U-238	2.5E-05	2.5	0.114	0.66	0.001	4.70E-09
Pu-238	2.2E-01	2.5	0.114	0.66	0.001	4.14E-05
Pu-239	2.5E-02	2.5	0.114	0.66	0.001	4.70E-06
Pu-240	3.7E-02	2.5	0.114	0.66	0.001	6.96E-06
Pu-241	7.8E+00	2.5	0.114	0.66	0.001	1.47E-03
Pu-242	1.1E-04	2.5	0.114	0.66	0.001	2.07E-08

All plutonium is assumed to be converted to oxide by the fire: hence lung clearance class Y is used in the dose calculation. The release was modeled as a ground level release with a 600 m^2 building wake factor. The calculated dose given in PNL-7748 is 15 mrem at the facility boundary and 1.5 mrem at the site boundary. These doses are well below the criteria for an "Alert" emergency.

This scenario models a hot cell fire and shows that significant consequences are not expected outside the facility if the release is filtered through at least one bank of HEPA filters.

The scenario, however, demonstrates the difficulty of classifying events solely on the basis of the calculated consequences. Other more general criteria also apply. The scenario assumes that two of the three HEPA filter banks breach leaving only one bank intact to prevent a release. The final bank would be challenged by the smoke from the fire. Based on the barrier approach outlined in the Emergency Management Guide for Event Classification and EALs, this scenario would be classified at the highest emergency class possible for the available inventory and release mode since two of the barriers have failed and the third is challenged. The highest emergency class possible is a General Emergency since the site boundary dose from the release would be approximately a factor of 1000 higher, or 1.5 rem, if the final HEPA filter failed.

Hot Cell fires in the 325 Building are expected to range from non-emergencies to General emergencies depending upon the severity of the fire, inventory at risk in the hot cell and the condition of the cell ventilation system.

5.1.1.2 Consuming Glovebox Fire

The bounding glovebox fire scenario is a fire in a glovebox containing plutonium oxide powder. A solvent vapor in the glovebox is postulated to ignite causing an explosion and fire. The fire continues until the gloves and the combustible glovebox windows are consumed. The fire is then rapidly controlled. A portion of the plutonium oxide powder becomes airborne through the explosion and through burning as contamination of combustible liquids and solids. Additional plutonium is carried away by the water used to fight the fire. A small fraction of this plutonium reaches the pavement and soil outside the building through doors left open to accommodate firehoses. A fraction of the plutonium carried outside by the water is resuspended by the wind.

The source term was based on as assumed inventory of 230 g of PuO_2 in a can inside the glovebox and 14.5 g of PuO_2 holdup in the glovebox. The overall combined release/respirable fraction is about 0.00016 to the air outside the building. Section B.4 in PNL-7748 provides the details of release fraction calculations. The material is assumed to be powder for FFTF fuel. The activity release is shown in table 5.4.

Table 5.4 Source Term for Consuming Glovebox Fire

Nuclide	Ci
Pu-238	0.00032
Pu-239	0.00202
Pu-240	0.0010
Pu-241	0.05110
Am-241	0.00017
Pu-242	2.7E-07

This scenario represents a worst case combination of circumstances that bound a single glovebox fire. The release was modeled as a ground level release with a 600 m^2 building wake calculation. The calculated dose of 630 mrem at the facility boundary places this scenario in the Alert category. Smaller fires that do not challenge the glovebox and ventilation integrity would not be emergency events.

5.1.1.3 Fire During Sprinkler Outage

Two possible situations could lead to a fire that spreads from one room to another. The first is a fire during maintenance on the sprinkler system. The second is a fire following a seismic event that disrupts both the sprinkler and building ventilation systems. The combined ventilation/sprinkler outage has more severe consequences.

In this scenario, two adjacent rooms are involved in a fire following disruption of the sprinkler and building ventilation systems. A glovebox containing 230 g of dispersable plutonium is substantially destroyed in each room by the fire. Each glovebox is equivalent in radiological and combustible inventory to the one postulated in the consuming glovebox fire. Because of the loss of ventilation postulated in this event, the building release fraction is 0.25 compared to about 0.02 for the consuming glovebox fire. The nuclides released to the air outside the building (source term) are shown in table 5.5. The calculated dose from the fire is 14.8 rem at the facility boundary and 2 rem at the site boundary. These results place this scenario in the General Emergency category.

Table 5.5 Source Term for Sprinkler Outage Fire

Nuclide	Ci
Pu-238	0.00772
Pu-239	0.0488
Pu-240	0.0248
Pu-241	1.234
Am-241	0.00406
Pu-242	6.4E-06

5.1.1.4 Post-Seismic Uncontrolled Fire

The post-seismic fire is the bounding analyzed event in PNL-7748. The scenario is initiated by an earthquake with a peak horizontal acceleration of 0.135 grams, which has an annual frequency of 1 in 5000 years. The basic building structure survives the event but the ventilation and sprinkler systems are damaged. Release paths are created by broken windows and doors jammed in a partially open position. A fire starts that the Hanford Fire Department is unable to control because of confusion caused by the earthquake, damage to fire fighting equipment, hazards to fire fighters or assignment to higher priority fires. Early in the fire, a deflagration that breaches the building wall or roof is assumed to occur. The explosive material is a room-sized cloud of flammable gas or vapor. The cloud is assumed to accumulate in a room because of the failure of the HVAC system. The explosion not only breaches the building but damages and spreads hot gases over much of the inside of the building, leading to the spread of the fire throughout the building.

All of the material in the main laboratories, whether in gloveboxes, drawers, cabinets, hoods, or benches, is assumed to be at risk from fire and/or heating, except for the small amount kept in pipe nipples, closed safes, and other containers that could withstand both the earthquake and the fire. Only one-third of the material is considered to be subject to the blast effects of the explosion.

The inventory from the CEPOD process is not considered to be at risk from explosion, since it is separated by a wall from the main building where solvents and flammable gases are used and since such flammables are not used in the area. There is a release, however, due to the fire and the earthquake.

It is conservatively assumed that the contents of all the tanks in the 325 Building vault spill into the vault. The inventory is not considered to be at risk from fire or explosion because of the lack of combustibles. The limit on the amount of material release is the amount of waste solution fog that can be suspended in the volume of stagnant air in the vault.

Both the 325A and 325B hot cells would remain undamaged by the postulated seismic event. However, the exhaust ducting may be sheared off in the basement and the primary filters damaged. The hot cell atmosphere is assumed to leak through the sheared ducts and be partially released through openings in the building walls. The hot cells are not considered to be at risk from the fire.

The holdup in the 325 Building is in the form of dust and plated-out material in the gloveboxes, plated-out material in the exhaust ducts, and the contents of the non-testable glovebox and cell filters and the downstream testable filters. This scenario assumes 14.5 g of plutonium in each of 26 gloveboxes. The plutonium is assumed to be divided between the inside of the glovebox walls (10.5 grams) and the glovebox nontestable filter (4 grams). If the glovebox walls are combustible, the holdup on the walls is assumed to burn. If not, the holdup is subject only to resuspension.

The activity released during the first two hours following a seismic event and uncontrolled fire is shown in Table 5.6.

Table 5.6 Source Term for Post-Seismic Uncontrolled Fire

Nuclide	Ci
H-3	0.0425
Kr-85	66.2
Th-232	9.95E-7
U-238	2.73E-5
U-235	1.20E-6
U-233	6.63E-5
Np-237	3.35E-5
Pu-238	0.112519
Pu-239	0.190783
Pu-240	0.096653
Pu-241	4.82295
Am-241	0.050242
Pu-242	2.61-05
Am-243	0.001015
Cm-244	0.152243

The calculated dose is 94 rem at the facility boundary and 9.7 rem at the site boundary. This event would be a General Emergency.

The 325 Building contains a large number of chemicals in small quantities. The main danger in a large fire is potentially high concentrations in local areas within the building. The building would be evacuated in these circumstances limiting the exposure to individuals. No significant impact from chemical exposure is expected outside the building.

5.1.1.5 Conclusion for 325 Building Fires

The Guidance Document for Hazards Assessments specifies that a broad range of events should be considered. The scenarios described above demonstrate the wide range of possible consequences from 325 Building fires. Small fires such as smoldering rags in a hot cell would not require activation of the emergency response centers. The building operations organization and the Hanford Fire Department would likely extinguish the fire with no release of hazardous materials outside the building. Conversely, a building-wide uncontrolled fire would be a General Emergency since there is a substantial amount of hazardous material in the building and the building is located near the Hanford Site boundary. The paragraphs below describe the expected range of severity for glovebox, hot cell, and building fires.

Fires in a single Glovebox are expected to range from non-emergencies to Alert emergencies depending upon the severity of the fire, material in the box and the potential for an unfiltered release path. Fires that involve more than one glovebox could release enough material to cause a General Emergency.

Fires in a single hot cell are expected to range from non-emergencies to General emergencies. The

key determining factors are the inventory in the cell, severity of the fire and the condition of the cell ventilation/cell containment systems.

The emergency classification of building fires range from non-emergencies to General emergencies. For example, a waste basket fire in an office area would not be an "emergency" condition. Conversely, large fires that involve hazardous materials can create a General Emergency condition. The main factors that determine the emergency classification are the fire severity and duration, proximity of the fire to hazardous materials and, damage to confinement and containment barriers.

5.1.2 Facility Explosion

Two glovebox explosion scenarios and one building breach explosion scenario are described below. The glovebox scenarios are similar in that they postulate that an explosion breaches a glovebox but the plutonium made airborne from the events passes through two stages of HEPA filters before release from the building. The two scenarios differ in the magnitude of the source term and the postulated cause of the explosion. Both glovebox explosion scenarios are reviewed in section 5.1.2.1 below. The building breach event is postulated to occur from the buildup of an explosive vapor or gas mixture inside a room containing 230 grams of plutonium. This scenario has worse consequences than the glovebox explosions since the building is breached. The building breach explosion is described in section 5.1.2.2 below.

5.1.2.1 Glovebox Explosions

The first glovebox explosion scenario is an explosion in an Ion-exchange column inside a glovebox. Ion-exchange columns are used in the 325 Building to separate plutonium from other impurities in solutions. Resins used in the past in these types of columns have been involved in explosions under conditions in which the resins were exposed to high nitric acid concentrations, elevated temperatures, and drying or oxidation of the resin. As a result of the explosion, the column is assumed to break with enough energy to breach the glovebox window. Hot liquid and resin spray into the room and throughout the interior of the glovebox.

The plutonium nitrate solution contains 100 grams/liter. For an energy level similar to that expected in this scenario, an aerosol concentration of 1.6 milliliter/meter^3 was achieved in flashing spray experiments. The glovebox is about 10 meters^3 in volume. Thus 16 milliliters of solution are assumed to be suspended in the glovebox from the accident with 62% in the respirable size range. Approximately 26% of this amount escapes to the room via the broken glovebox window. In addition, 0.25 grams of solution are resuspended from the remaining solution spilled onto the floor of the glovebox over the 2 hours following the explosion. The plutonium made airborne from the event passes through two stages of HEPA filter assumed to be 99.9% and 99.8% efficient. The release from the building is 2.4E-06 grams of Pu. The calculated facility boundary dose is 4×10^{-5} rem.

The second glovebox explosion scenario involves the CEPOD process. Hydrogen generation is postulated to occur by the electrolysis of water at the cathode. The 15-centimeters by 1.2-meters glass

reaction vessel in the offgas scrubber system fills with a mixture of hydrogen and air and the mixture is ignited. The explosion shatters the reaction vessel and destroys a glovebox window or glove, causing liquid to be blown out into the room. Two HEPA filters at 99.9% and 99.8% reduce the atmospheric release to 4.5×10^{-6} grams plutonium. The calculated dose at the facility boundary is 7.1×10^{-5} rem.

These two scenarios are similar in that the calculated dose outside the building for both postulated events is well below the criteria for an Alert emergency. However, a glovebox explosion could injure and contaminate workers inside the facility. Emergency classification would depend upon the number of people injured and contaminated and the extent of outside assistance required to control the event.

In general, the Alert classification is appropriate when the severity and/or complexity of an event may exceed the capabilities of the normal operating organization to adequately manage the event and its consequences.

5.1.2.2 Building Breach Explosion

The 325 Building contains a number of potential explosives including gas cylinders and volatile flammable solvents. An explosion equivalent to 1.8 kilograms of TNT is postulated to occur from the accumulation of flammable gas or vapor from a leak. The explosion buckles the metal siding in the exterior building wall and blows 14% of the plutonium oxide located near the wall through the hole. The source term is derived starting with 230 g of Pu, 10% of which is in the respirable size range. Fifteen per cent is airborne from the explosion. The material is assumed to be plutonium for FFTF fuel. The activity release from the building is summarized in table 5.7 below.

Table 5.7 Source Term for Building Breach Explosion

Nuclide	Ci
Pu-238	0.004161
Pu-239	0.026298
Pu-240	0.013323
Pu-241	0.664806
Am-241	0.002183
Pu-242	3.48E-06

The calculated dose is 11 rem at the facility boundary and 1.1 rem at the site boundary. These results place this scenario in the General Emergency category.

5.1.3 Loss of Containment/Confinement

Containment is defined in PNL-7748 as a region designed to meet code requirements for containment and that is leak tested. Examples include liquid waste tanks and shipping casks. The PNL-7748 loss-of-containment accident that involves radiological material is a spill from a liquid waste cask. Chemical loss of containment accidents are described in the Hazardous Material Release section of this

document.

Confinement is an area in which the spread of contamination is reduced or eliminated by the use of engineered barriers and controlled airflow to minimize leakage. The gloveboxes, hot cells, and fume hoods are examples of confinement regions. The PNL-7748 loss of confinement events included a loss of ventilation caused by a complete power failure and a breach of a primary filter. The loss of containment and loss of confinement scenarios are described below:

5.1.3.1 Liquid Waste Cask Accident

Liquid wastes can be transferred to the cask-handling station east of the 325A hot cells from the hot cells, gloveboxes, or any of the vault tanks. The casks are moved into and out of the station by an overhead bridge crane. This scenario postulates the spill of 550 gallons of liquid waste during cask loading. Actual spills would likely be smaller since there are many administrative and engineering barriers to the release of contaminated liquid. For example, the transfers are accomplished by vacuum so there is little or no driving force to cause a spill if a line were to break or become disconnected.

The source term is derived assuming a bowling-ball cask that contains 550 gallons of liquid waste spills. Wastes with many different isotopic compositions have passed through the cask handling station. Two types of wastes were considered in PNL-7748. The one that gave the highest consequences was waste from the NWVP program. The isotopic concentration for this waste stream was:

Pu-238 0.00029 Ci/L with a total inventory in the spill of 0.6037 Ci

Pu-239 3.2E-05 Ci/L with a total inventory in the spill of 0.0666 Ci

Pu-240 4.8E-05 Ci/L with a total inventory in the spill of 0.0999 Ci

Pu-241 0.0097 Ci/L with a total inventory in the spill of 20.19 Ci

Pu-242 1.4E-07 Ci/L with a total inventory in the spill of 2.91E-04 Ci

The maximum spill height is about 8 feet, the approximate height of the top of a cask when in the station. The airborne release fraction from the falling liquid is 2.4E-05. Additional material is resuspended over the next two hours. The total release fraction including the spill and resuspension for the first two hours is 1.5E-04. The airborne material must pass through two stages of HEPA filtration with a total reduction factor of 2E-06. Table 5.8 below summarizes the activity released from the building in the first two hours following the spill.

Table 5.8 Source Term for Liquid Waste Cask Spill

Nuclide	Ci
Pu-238	1.77E-10

Pu-239	1.95E-11
Pu-240	2.93E-11
Pu-241	5.91E-09
PU-242	8.53E-14

The calculated dose at the facility boundary is 6.2 x 10^{-8} rem which is well below the Alert dose criteria. The calculation takes credit for both the primary and exhaust HEPA filters and therefore does not apply to a cask spill outside the facility. The dose would be a factor of 2E+06 higher outside the building or 120 mrem. A spill outside the building would be an Alert level emergency.

5.1.3.2 Complete Loss of Electrical Power

Confinement of material within the 325 Building hot cells and gloveboxes depends, in part, upon maintaining a negative pressure in the cell/box relative to the gallery or laboratory. The negative cell pressure causes air flow into the cell through openings in the cell wall. Air is exhausted out of the cell through a ventilation system that includes three stages of HEPA filters. Loss of ventilation can result in reverse air currents out the inlet openings and into the gallery. From there, hazardous material can be released from the building through gaps under closed doors and other similar openings. The building is not designed to be a leak tight containment structure.

The bounding loss-of-confinement accident results from a loss of building ventilation caused by a complete loss of electrical power. The event is postulated to occur during the process of dissolving spent nuclear fuel in a hot cell. Furthermore, the ventilation loss is postulated to result in solvent vapor concentration in a glovebox containing plutonium. The vapor explodes releasing more material. The source term for this release is shown in Table 5.9. Details of the source calculation may be found in Appendix B, Section B.7 of PNL-7748.

Table 5.9 Source Term for Loss of Electrical Power

Nuclide	Ci
H-3	0.017
Kr-85	2.65
Pu-238	2.05E-03
Pu-239	1.30E-02
Pu-240	6.56E-03
Pu-241	0.326
PU-242	1.71E-06
Am-241	1.07E-03

The calculated dose at the facility boundary is 4.0 rem. The site boundary dose is 0.42 rem. These results place this postulated release in the Site Area emergency category.

The hot cell source term for this scenario was derived from a program that is not currently active in the 325 Building, the NWVP. This source was selected since it includes a large inventory of gaseous fission products which could be released if ventilation is lost. Liquid or solid material would normally not be released immediately following a ventilation loss unless some other condition such as air currents from a fire existed to move significant quantities of the material out of the cell. Loss of hot cell and/or glovebox ventilation would range from a non-emergency to a Site Area Emergency condition depending upon the form and size of the inventory in the confinement structure and the existence of a condition that could move the material. The gallery/room CAMs could provide a key indication of a release from confinement.

5.1.4 Hazardous Material Release

Two hazardous material release scenarios are summarized below. The first is a spill of a bottled chemical in one of the chemistry laboratories. The second scenario is the spill of 80 liters of 4 molar nitric acid from a tank in another laboratory.

5.1.4.1 Bottled Chemical Spill

Spills occasionally occur in chemistry laboratories. PNL-7748 selected Thionyl chloride as the bounding case for the spill of a single bottle of a potentially harmful chemical. This toxic chemical has been used in the building but was not present on the January 1994 chemical inventory list. The scenario postulates that a 1 kilogram bottle of thionyl chloride is dropped and broken against the edge of a hood. The resulting puddle evaporates completely. The calculated source term is 0.735507 grams/second or the complete evaporation of the 1 kilogram in 22.7 minutes. It is assumed that condensation and filtration do not act to reduce the vapor concentration before it leaves the building. The calculated airborne concentration at the facility boundary was 0.88 miligrams/meters^3 and 0.1 miligram/meter^3 at the site boundary. The only concentration limit parameters that have been established for this chemical is a American Conference of Governmental Industrial Hygeinists (ACGIH) ceiling value of 5 mg/m^3 (1 ppm) and

an Immediately Dangerous to Life and Health (IDLH) value of 500 ppm. The ceiling value is an alternative parameter for ERPG 2, and the IDLH value is an alternative for ERPG 3. Therefore, this spill is not a Site Area emergency since the concentration is below the ERPG 2 value at the facility boundary. Pending the development of a ERPG 1 equivalent concentration, this event would be conservatively classified as an Alert Emergency if the pungent odor caused building evacuation.

5.1.4.2 Nitric Acid Tank Spill

The second loss-of-containment chemical accident is a spill from a ruptured acid tank. The accident involves a fire or explosion in Laboratory 510. The event breaks lines or glass pipe tanks in the hood and releases 80 liters of 4 molar (22 weight/percent) nitric acid. The hood airflow is assumed to continue throughout the event; this, together with the increased temperature resulting from the initiating fire or explosion, accelerates the evaporation of nitric acid from the puddle. The source term is 0.56 grams/second with the entire spill evaporating in 9.8 hours. It is further assumed that condensation and filtration do not act to reduce the vapor concentration before it leaves the building. The calculated concentration is 0.26 ppm at the facility boundary. This concentration is less than the criteria for an Alert Emergency, 2 ppm for nitric acid. Therefore, this accident would not be an emergency condition unless extensive outside assistance was required to mitigate and control the event.

5.1.4.3 Conclusion for Chemical Accidents in the 325 Building

The 325 Building has relatively small inventories of over a thousand chemicals. The screening process described in section 3 above did not identify any chemicals that would be expected to be a problem outside the facility if spilled inside the building. There is always the possibility that inadvertent mixing of chemicals would result in a product that is more toxic than any of the ingredients. However, the number of possible combinations is so large that it is difficult to bound this potential problem. The suggested approach is to have an Alert EAL tied to an adverse condition that requires facility evacuation. Some examples of conditions that could prompt an evacuation are a pungent suffocating odor in the hall or widespread reports of people with irritated eyes.

5.1.5 Criticality

The fissionable materials that are received, handled, stored, and analyzed in the 325 Building can be of any type and form with varying isotopic content. The majority of the operations in the facility involve analysis of small samples of materials. The safeguards limit is currently less than 2000-g plutonium (or its equivalent) for the whole building, with an additional less than 2000-grams plutonium limit for the CEPOD process. By the nature of operations, the inventory is generally spread throughout the building with only small amounts in any given glovebox or fume hood.

The limiting criticality scenario is a glovebox criticality involving two kilograms of Pu in solution. The energy release is taken from NRC Regulatory Guide 3.35. There is an initial pulse of 1.0×10^{18} fissions followed by 47 bursts of 1.9×10^{17} fissions each at ten-minute intervals. The noble gas and halogen

radionuclides that are released escape unhindered out the stack over an 8-hour period. Salt particles are also formed during evaporation of the solution. The salt particles release out the stack is mitigated by two HEPA filters. The source term for the first two hours of this event is shown in Table 5.10. Section B.9 in PNL-7748 provides the details of the calculation.

Table 5.10 Source Term for Glovebox Criticality

Nuclide	Ci
Kr-83m	3.4E+01
Kr-85m	2.2E+01
Kr-85	2.5E-04
Kr-87	1.3E+02
Kr-88	7.1E+01
Kr-89	4.0E+03
Xe-131m	3.1E-02
Xe-133m	6.8E-01
Xe-133	8.4E+00
Xe-135m	1.0E+03
Xe-135	1.3E+02
Xe-137	1.5E+04
Xe-138	3.4E+03
I-131	3.4E+00
I-132	3.7E+02
I-133	5.0E+01
I-134	1.3E+03
I-135	1.4E+02
Pu-238	3.7E-09
Pu-239	3.7E-08
Pu-240	7.8E-09
Pu-241	2.0E-07
Pu-242	1.0E-12
Am-241	6.3E-10

Experience has shown that the radiation dose from an unshielded criticality would likely be fatal to anyone within 25 feet of the event. The facility boundary (100 meters) individual is assumed to remain within 100 meters of the building for 2 hours after the first burst. The calculated dose from inhalation and submersion is 9.3 rem to the facility boundary individual. The calculated inhalation and submersion site boundary dose is 1.6 rem. In addition, the direct radiation dose is calculated to be 14.1 rem at 100 meters if someone remains stationary at this distance for two hours. These doses place this event in the General Emergency category.

The Hanford policy is to classify a near criticality as an Alert Emergency and an actual criticality as at least a Site Area Emergency (unless the calculated consequences put the actual criticality in the

General Emergency category). A near criticality is an event where the safety margin is known to be lost and the potential for a criticality is high. The Alert classification for this situation is based upon the general criteria that an Alert Emergency Level should be declared when events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety. A near or actual criticality will require worker evacuation and access restrictions. Resources outside the facility will be required to control access, evaluate the situation, and recover to a safe subcritical configuration. For these reasons, activation of the emergency response organization is required whenever an unshielded, uncontrolled criticality is judged to be likely.

5.2 Natural Emergencies

Seismic events, high winds/tornados, floods, ash/snow roof loading and range fires are natural phenomena with potential emergency consequences. As described in section 2.2.1, the 325 Building is above the PMF flood plane and the likelihood of flooding is considered to be quite low. The emergency planning for major failures of upstream dams is beyond the scope of this Hazards Assessment. The roof design is adequate to withstand ash and snow loading. A range fire that ignites the building would have the same consequences as the uncontrolled building-wide fire discussed in section 5.1.1.4 above. The paragraphs below summarize the PNL-7748 analysis of the seismic and high winds events. The classification that has been adopted at Hanford for a range fire is also discussed.

5.2.1 Earthquake

The site-specific seismic criteria for existing High Hazard facilities in the 300 Area is a horizontal ground acceleration of 0.1 g with appropriate response spectrum, damping values, and soil-structure interaction parameters. The probability of an event of this size is 4×10^{-4} per year (return period of 2500 years). However, the ongoing seismic evaluation has investigated the central portion and east and west wings of the building structure and the cell structures as new, nonreactor nuclear facilities, which must meet a 0.135g horizontal acceleration with a 5000-year return period. The hot cells and many of the external walls are expected to retain their integrity during the event. However, the ventilation system and some building windows could fail. Doors could be jammed open by door frame displacements. The driving force for material to leave the building is wind coming through openings in the building. Table 5.11 shows the activity released in the first 2 hours from the earthquake scenario. Section B.1 in PNL-7748 shows how the source was determined.

Table 5.11 Source Term for Earthquake Without Fire

Nuclide	Ci
H-3	0.0425
Kr-85	66.2

	nitrate	oxide
Nuclide	Ci	Ci
Th-232	2.23E-10	2.32E-06

U-238	1.04E-08	4.17E-05
U-235	5.34E-10	1.16E-06
U-233	1.36E-06	4.68E-07
Np-237	6.88E-07	2.36E-07
Pu-238	0.002016	0.000772
Pu-239	0.002047	0.001203
Pu-240	0.001037	0.000609
Pu-241	0.051751	0.030407
Am-241	0.000877	0.000343
PU-242	2.88E-07	1.65E-07
Am-243	2.09E-05	7.17E-06
Cm-244	0.00313	0.001075

The calculated facility boundary dose is 2.3 rem and the offsite dose is 0.24 rem. These values put this event in the Site Area Emergency category. The calculated consequences of an earthquake followed by a fire are 94 rem at the facility boundary and 9.7 rem at the site boundary. The earthquake followed by a fire would be a General Emergency.

A major seismic event can be preceded by tremors and followed by after-shocks. The after-shocks can cause additional damage to already weakened structures. Because of these possibilities, the Hanford policy is to declare an Alert Emergency if a seismic event is felt at a High Hazard facility and some damage such as broken windows is observed. A Site Area Emergency is declared if the damage is more severe but a significant release has not occurred. Major structural or service system damage at the 325 Building is classified as a General Emergency based on the calculated consequences reported in PNL-7748 for a seismic event followed by a fire.

5.2.2 High Winds/Tornado

The 325 Building was designed and built to survive an 86 mph wind with a safety factor of 2.5 based on the ultimate strength of the structural members. The building has experienced two wind storms in recent years with gust to 80 mph (1972) and 73 mph (1990) with no damage. The estimated peak credible (E-6 probability) wind is 120 mph with gust to 130 mph. The 300 area design basis wind (E-4 probability) is 90 mph. Preliminary analyses of the effect of this wind indicate that the building can with-stand both windblown missiles and the pressures imposed on the upwind side. However, the suction caused by the wind could cause a failure of the members supporting the roof of the south part of the 325A annex(the part containing hot cells). The hot cells because of their structure are not expected to suffer significant damage from the failure of the roof above them. The consequences of a tornado striking the 325 Building were not analyzed in PNL-7748 since the analysis is not required by the current Hanford Site design criteria.

A graded precautionary approach is recommended for high winds at the 325 Building. An Alert Emergency should be declared if sustained 300 area winds exceed 90 mph or 325 Building damage from high winds is observed. PNL-7748 concludes that some building damage is expected for a 90 mph wind

speed. The Alert classification is based on a potential or actual degradation of the level of safety at the facility.

A General Emergency should be declared if substantial 325 Building damage and/or disruption of service systems occurs due to high winds, tornado or other phenomena. The analysis of a seismic event shows that a significant offsite radiation dose can occur if building integrity is not maintained.

5.2.3 Range Fire

The Hanford Site is in a semiarid region with sagebrush and grasses growing between areas. Range fires periodically occur and can sweep over large regions before they are controlled. The summer months are historically the most likely time for a large fire to occur because of the combustible condition of the cheatgrass and buchgrasses.

The 325 Building would probably not be the first building in the 300 Area affected by a range fire since it is surrounded by other buildings, roads and parking lots. A range fire that threatens the 300 Area is an Alert Emergency based on the potential degradation of safety at facilities that contain hazardous material. An actual fire at the 325 Building would be classified per the discussion in section 5.1.1 above.

5.3 Security Contingencies

DOE Order 5500.3A specifies that the facility hazards assessment shall consider the broad range of emergency events that could affect the facility. These events may result from hostile attack, terrorism, sabotage, or malevolent acts as well as the more traditional accidents and natural phenomena covered in a SAR. Closely related DOE Order 5630.3 requires a graded assessment of radiological and toxicological sabotage vulnerability. Events of this type are not within the scope of a SAR. A document called a Vulnerability Analysis (VA) has been written for some Hanford facilities to characterize the risk from these events and the effectiveness of security measures to detect and prevent the events. The VA is usually classified since it discusses security systems and could be useful to someone that wishes to damage the facility. The paragraphs below are not from a 325 Building VA. Instead, they reflect the general Hanford emergency preparedness policy toward events of this type and the potential for onsite and offsite significant consequences.

5.3.1 Explosive Device

A presence of an explosive device in a High Hazard facility such as the 325 Building is classified as an Alert emergency. Activation of the emergency response organization will assist in building evacuation and access control. Furthermore, activation of the emergency response organization when the device is found will speed the response if the device detonates. A confirmed detonation of an explosive device near any of the locations that contain hazardous material is classified as a General Emergency. The analysis of a building breach explosion shows offsite dose values over a rem for an explosion in the 325 Building.

5.3.2 Sabotage

Confirmed physical damage from sabotage to any safety system within the 325 Building is classified as an Alert Emergency since the level of safety has been degraded and there could be additional damage that has not yet been discovered. Any release that occurs due to sabotage is classified based on the known or potential severity of the release.

5.3.3 Hostage Situation/Armed Intruder

A confirmed hostage situation or armed intruder within the 300 Area is classified as an Alert emergency since the perpetrator(s) could attempt to damage a facility. Furthermore, the resources of the emergency response organization will be useful in controlling access to the area and identifying and assessing potential damage scenarios. The emergency classification should be upgraded to a Site Area Emergency if the armed intruder(s) are located in areas that have control over large inventories of hazardous materials. For example, the 325 Building hot cell operating galleries or laboratories that contain plutonium. Any release that occurs from the action of intruders should be classified based on the known or potential severity of the release.

5.3.4 Aircraft Crash

PNL-7748 concluded that the probability of an accidental aircraft crash hitting the 325 Building is less than 1.0 E-6 per year. As a result, the consequences of the crash were not analyzed. This low probability is based on an evaluation that considers the area of the building, distance from the local airports and number of flights per day at the local airports. The Hanford Site contains many facilities with a much larger total area. Whereas the probability of hitting a specific facility may be in the incredible category, the probability of hitting some Hanford facility is not incredible. Furthermore, malevolent events were not included in PNL-7748. For these reasons, the classification of an aircraft crash should be included in emergency procedures.

The range of possible releases from an aircraft crash or missile is quite large. A small aircraft crash near the facility may not release any material whereas a direct hit from a commercial jet liner could cause extensive damage to the facility and a large release. The suggested approach is to classify any aircraft crash near or at the facility as an Alert emergency. If extensive damage or a large fire is caused by the crash, the emergency would be classified based on the loss of confinement or fire EALs.

5.3.5 Stack Release

Most of the air from the 325 Building exits the building through a 16.8-meters (55-feet) tall exhaust stack. The stack has record samplers for alpha particulate, beta/gamma particulate, iodine-131 and tritium and monitors for alpha particulate, beta/gamma particulate and iodine-131. The system will alarm in several locations on high activity.

The paragraphs below compare the release size to reach an Alert Level emergency with the release

size that will trigger an alarm.

The criteria for an Alert emergency is a committed dose equivalent of 100 mrem at the facility boundary. The facility boundary for purposes of the calculation is 100 m east. The calculation is based on Sr-90 for beta/gamma activity and Pu-239 for alpha activity. These isotopes give the highest dose per curie released for alpha and beta emitting isotopes in the 325 Building inventory. In both cases, the majority of the dose is from inhalation.

The dose from inhalation is calculated using the following equation:

Install Equation Editor and double-click here to view equation.

Where, "H" is the committed inhalation dose (rem), "B" is the breathing rate(m^3/s), "E/Q" is the short term normalized time-integrated air concentration (s/m^3) and "C" is the dose conversion factor (rem/Ci). The following data was used in the calculation:

$B = 1.2\ m^3/hr = 3.33 \times 10^{-4}\ m^3/s$ (From ICRP 23 for light activity)

$E/Q = 1.2 \times 10^{-3}\ s/m^3$ (From PNL-7748 section B.2.2.7 at 100 m)

$H = 0.1$ rem (Criteria for an Alert emergency)

Inhalation Dose Conversion Factors
(Adult 50 year dose equivalents from ICRP Publication 56 (1989)

Isotope	mSv/Bq	rem/Ci
Sr-90	6.0E-05	2.2E+05
Pu-239	0.12	4.4E+08
I-131	8.2E-05	3.0E+05

The following release amounts were calculated for an Alert emergency.

Isotope	Release (Ci)
Sr-90	1.1
Pu-239	5.7×10^{-4}
I-131	0.83

These release amounts are based on an airborne concentration that gives an inhalation committed effective dose of 100 mrem at the maximum location. This is the criteria for the lowest level emergency classification. Much smaller releases would be an environmental contamination concern and may exceed discharge permit and reporting levels.

The stack monitor reads in counts per minute(cpm) for all isotopes. The monitor reading equivalent to the "Alert" release is calculated using a stack flow rate of 130,000 cfm, a sample flow rate of 1.5 cfm and a detector efficiency of 20% for beta particles, 10% for alpha particles and 6% for I-131.

Table 5.12 Release Size for an Alert Level Emergency

Isotope	Release (Ci)	Count Rate (cpm)
Sr-90	1.1	5.6E+06
Pu-239	5.7E-04	1.5E+03
I-131	0.83	1.3E+06

The monitor readings for an alert level release are off-scale high for the beta/gamma and alpha monitors and orders of magnitude higher than the normal background and alarm levels for all isotopes as shown in the table below.

Table 5.13 325 Building Stack Monitor

Isotope	Alert Reading	Alarm Set Point	Typical Background	Full Scale Reading
Sr-90	5,600,000 cpm	40,000 cpm	100 cpm	100,000 cpm

Pu-239	1,500 cpm	40 cpm	6 cpm	10,000 cpm
I-131	1,300,000 cpm	10,000 cpm	100 cpm	100,000 cpm

Immediate declaration of an emergency condition based solely on the stack alarm with no other indication of a problem is not required since the alarm levels are far below the emergency levels of concern. A preliminary investigation should be conducted first to determine if the alarm is valid. The first step in the investigation is to observe the indicator and chart recorder. A spike is most likely caused by an instrument problem and not a significant release. A steadily increasing count rate to above the alarm level with no indication of an instrument malfunction, however, indicates a probable release. It is suggested that an Alert emergency be declared if the alarm appears to be valid and the level continues to increase to near a full scale reading for the Beta/gamma and iodine monitors and 1,500 cpm for the alpha particulate monitor. It is suggested that the Alert Emergency Action Levels for beta/gamma particulate and iodine monitor readings be set near the top of the instrument scale (90,000 cpm) since the calculated values that correspond to an Alert are off-scale high with the present instrumentation.

6.0 EVENT CONSEQUENCES

6.1 Calculation Models

Consequences of the events and conditions identified in Section 5.0 were taken directly from SAR-7748. The GENII program (Napier, 1988) was used for radiological dose calculations.

The GENII program was developed by the Battelle Pacific Northwest NationalLaboratory to provide a state-of-the-art, technically peer-reviewed, documented set of programs for calculating radiation doses from radionuclides released to the environment. The program includes the capability to calculate radiation doses for acute releases, with options for annual dose, committed dose, and accumulated dose; for calculating the same types of doses from chronic releases; for evaluating exposure pathways including direct exposure via water (swimming, boating, and fishing), soil (surface and buried sources), air (semi-infinite cloud and finite cloud geometries), inhalation pathways, and ingestion pathways. The various options used for the analyses reported in this document are described below.

1. Radiological releases were estimated for periods of 2 hours during and after the event. This period was assumed to be the maximum duration of exposure onsite and at the fence line, based on conservative response times for the site emergency preparedness program.

2. The facility boundary dose is calculated at 100 meters due north, the location of the minimum 95th percentile dispersion (hence maximum concentration) for that distance. The 95th percentile site boundary doses are calculated 580 meters due east. The 95th percentile values were calculated with the 300 Area joint frequency file based on data from the years 1983 to 1987.

3. All releases were assumed to be ground level and building wake was included. A building area of

600-meters^2 was used in the wake calculation.

4. The types of doses considered were inhalation and immersion.

5. Plutonium and uranium oxide inventories were represented by lung clearance class Y. Lung clearance class W was used for plutonium and uranium in the scenarios where those radionuclides were in nitrate solution and were not exposed to heat severe enough to convert them to oxide.

6.2 Comparison With the HUDU Program

The Hazards Assessment guidance document suggest using the same program that is used in the emergency centers. The Hanford Unified Dose Utility (HUDU) program is used in the centers to project the consequences of a release. HUDU uses the same dispersion algorithms as GENII but the two programs can give different dose values for the same source term. The differences stem from the greater flexibility of the GENII program. For example, lung clearance classes can be specified with GENII but not with HUDU. This can lead to a significant difference in the calculated dose value. For example, the difference between class Y and W is about 30% for Pu-239 but a factor of 16 for uranium-238. Also, GENII has an algorithm to determine the 95th percentile meteorology condition using a historical meteorology file. The wind speed and atmospheric stability class are input in HUDU since the code was designed to use the actual observed meteorology conditions at the time of the release. For a 300 Area ground level release without building wake, "F" class stability with a 0.89 m/s wind speed closely approximates the 95th percentile meteorology with GENII. For 300 Area ground level releases with a 600-m^2 building wake (the conditions that apply to the 325 building), "F" class stability and a 4.7 m/s wind speed approximate the 95% meteorology condition in GENII. Once these differences in assumed meteorology conditions and dose conversion factors are resolved, the two codes give nearly the same answers for inhalation and submersion dose, Table 6.1.

Table 6.1 rem/Ci for a 325 Building Pu-239 Release

Distance	GENII	HUDU
100 m	140 rem	150 rem
580 m	15 rem	15 rem

7.0 THE EMERGENCY PLANNING ZONE

The Emergency Planning Zone (EPZ) is an area within which special planning and preparedness efforts are warranted since the consequences of a severe accident could result in Early Severe Health Effects (ESHE). DOE Order 5500.3A endorses the Emergency Planning Zone (EPZ) concept and requires that the choice of an EPZ for each facility be based on an objective analyses of the hazards associated with the facility. The Emergency Management Guide on Hazards Assessment provides several pages of guidance on establishing the size of the EPZ. The suggested approach is to determine the emergency

classification of the events analyzed in the Hazards Assessment and then base the EPZ size on the larger of a default size for each emergency class or the maximum distance that an ESHE Threshold is exceeded. A final step is to make adjustments to the area, if necessary, based on reasonableness tests in the guidance document. For example, the selected EPZ should conform to natural and jurisdictional boundaries where reasonable. The selection of the EPZ for the 325 Building based on this Hazards Assessment is described below.

7.1 The Minimum EPZ Radius

Three events have been identified that have the potential to cause a General Emergency; large fire, building breach explosion and criticality. In addition, a hot cell fire could reach a general emergency if the integrity of the HEPA filters is not maintained. The EPZ size is the larger of 5 km (the default size for a general emergency) or the maximum radius for ESHE. The Emergency Management Guide Hazards Assessment document provides the following criteria for ESHEs.

Radiological

External or uniformly distributed internal emitters	100 rem
Thyroid	3,000 rem
Skin	1,200 rem
Ovary	170 rem
Bone Marrow	165 rem
Testes	440 rem
Other Organs	550 rem

Non-Radiological

A peak concentration of the substance in air that equals or exceeds the ERPG-3 value, or equivalent.

Conclusion

All of the analyzed releases give consequences less than the ESHE criteria at the default distance of 5 km. Therefore, the EPZ for the 325 Building is a circle with a 5 Km radius around the facility. One adjustment to this boundary is suggested in section 7.2.4 below to conform with the southern EPZ boundary for Washington Public Power Supply System (WPPSS) plant #2.

A 5 km EPZ was recommended for the entire 300 Area to the States of Oregon, Washington, and the adjacent counties. Oregon concurred with proposed EPZs, and Washington accepted them on a interim basis. Following approval by DOE Headquarters, Benton and Franklin counties will establish geo-political boundaries.

7.2 Tests of Reasonableness

The following tests of reasonableness are from the guidance document on emergency preparedness hazards assessments.

1. Are the maximum distances to PAG/ERPG-level impacts for most of the analyzed accident scenarios equal to or less than the EPZ radius selected?

   All of the analyzed accident scenarios give consequences less than the PAG criteria at the default EPZ radius of 5 km.

2. Is the selected EPZ radius large enough to provide for extending response activities outside the EPZ if conditions warrant?

   The 5 km EPZ encompasses the entire 300 area, extends across the Columbia River into Franklin county and extends South into the Richland city limits.

3. Is the EPZ radius large enough to support an effective response at and near the scene of the emergency?

   The 5 km radius encompasses the entire 300 Area, the nearest other occupied Hanford facilities and the public roads leading to the facility.

4. Does the proposed EPZ conform to natural and jurisdictional boundaries where reasonable, and are other expectations and needs of the offsite agencies likely to be met by the selected EPZ.

   There are no natural boundaries near the 5 km EPZ with which it makes sense to align any of the EPZ boundary lines. The adjacent counties will set the geo-political boundaries when the 5 Km EPZ has been approved.

5. What enhancement of the facility and site preparedness stature would be achieved by increasing the selected EPZ radius.

   The Richland Operations Office and Hanford contractors have longstanding relationships and mutual aid agreements with local business, community, county and state emergency planning and response organizations. These relationships are driven by public concern about Hanford in general and the High Level Waste tanks in particular. The DOE and its contractors have a legal obligation and a strong moral commitment to protect the public and the Hanford workers. There is an open and candid dialogue about the hazards at the Hanford facilities as we currently understand them. No additional benefit in emergency preparedness stature is anticipated by increasing the size of the 325 Building EPZ.

8.0 EMERGENCY CLASSES, PROTECTIVE ACTIONS AND EALs

8.1 Emergency Classes

Table 8.1 summarizes the emergency class for each scenario described in section 5.

Table 8.1 Emergency Classification of Event Scenarios

Event	Emergency Classification
Fire	
Hot Cell Fire(Filtered Release)	non-emergency
Hot Cell Fire(unfiltered Release)	General
Consuming Glovebox Fire	Alert
Large Building Fire	General
Process Explosions	
Glovebox explosion	non-emergency
Building Breach explosion	General
Loss of Containment	
Liquid Waste Cask Accident (Indoors)	non-emergency
Liquid Waste Cask Spill (outdoors)	Alert
Complete Loss of Electrical Power	Site Area
Bottled Chemical Spill	non-emergency
Nitric Acid Tank Spill	non-emergency
Criticality	
Near Criticality	Alert
Actual Criticality	General
Natural Disasters	
Earthquake	General
High Winds	Alert
Extensive Wind/tornado damage	General
Range Fire that threatens 300 Area	Alert

Security Events

Confirmed explosive device		Alert	
Malevolent explosion		General	
Sabotage to safety system	Alert		
Hostage Situation/armed intruder	Alert		
Aircraft Crash			Alert

Stack Release

Confirmed beta/gamma near full scale	Alert
Confirmed iodine monitor near full scale	Alert
Confirmed Alpha monitor at 1,500 cpm	Alert

8.2 Emergency Action Levels

An ad hoc committee met in the winter of 1993 to write EAL statements based on the preliminary Hazards Assessment for the 325 building(Marsh, 1993). These statements are consistent with this updated Hazards Assessment with one exception. A hot cell fire with unfiltered release has the potential to reach a General Emergency instead of the Site Area emergency indicated in the reference. The preliminary Hazards Assessment used a filter reduction factor of 100 whereas a review of PNL-7748 indicates that a factor of 1000 was used to determine the source term for this event.

9.0 HEARM CHAPTER

The Hanford Emergency Resource Manual (HEARM) provides information for use during an emergency. Hearm Provides summaries of the locations, operations, and potential accident scenarios for each facility. Several scenarios are selected to summarize the potential consequences of the event types that are applicable to the facility. The scenarios are selected to include the upper bound of worst-case conditions for each event type. The updated HEARM chapter based on this Hazards Assessment will be issued in a HEARM update.

10.0 MAINTENANCE AND REVIEW OF THIS HAZARDS ASSESSMENT

The maintenance of this Hazards Assessment is the responsibility of Pacific Northwest National Laboratory. The building emergency plan including the EALs and Hazards Assessment are on an annual review cycle.

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14.0 CERTIFICATION [K]

The following certification*, required by WAC 173-303-810(13), for all applications and reports submitted to Ecology is hereby included:

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

for 5/22/98

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date

for 5-20-98

Co-operator
William J. Madia, Director
Pacific Northwest National Laboratory

Date

* This certification addresses modifications to Chapter 7.0 and Appendix 7A (Building Emergency Plan) for the 325 Hazardous Waste Treatment Units identified as Revision 2.

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Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part & Chapter:
303-K Storage Facility	Part III, Chapter 14 and Attachment 32 Permit Condition V.14.A.

Description of Modification:

Page 69 of 76, Permit Condition V.14.A., line 16:

Chapter 7.0 Closure Activities, the Permittees shall comply with the "Supplemental Schedule for Closure of the 303-K Storage Facility". This schedule shall be included in DOE/RL-90-04, Revision 2.

Modification Class: [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: D.1.b.

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

D. Closure
  1. Changes to the closure plan:
    b. Changes in the closure schedule for any unit, changes in the final closure schedule for the facility, or extension of the closure period, with prior approval of the director.

Submitted by Co-Operator:	Reviewed by RL Program Office:	Reviewed by Ecology:
L. J. Olguin 7/9/98 Date	L. D. Romine 7-13-98 Date	J. K. Bartz Date

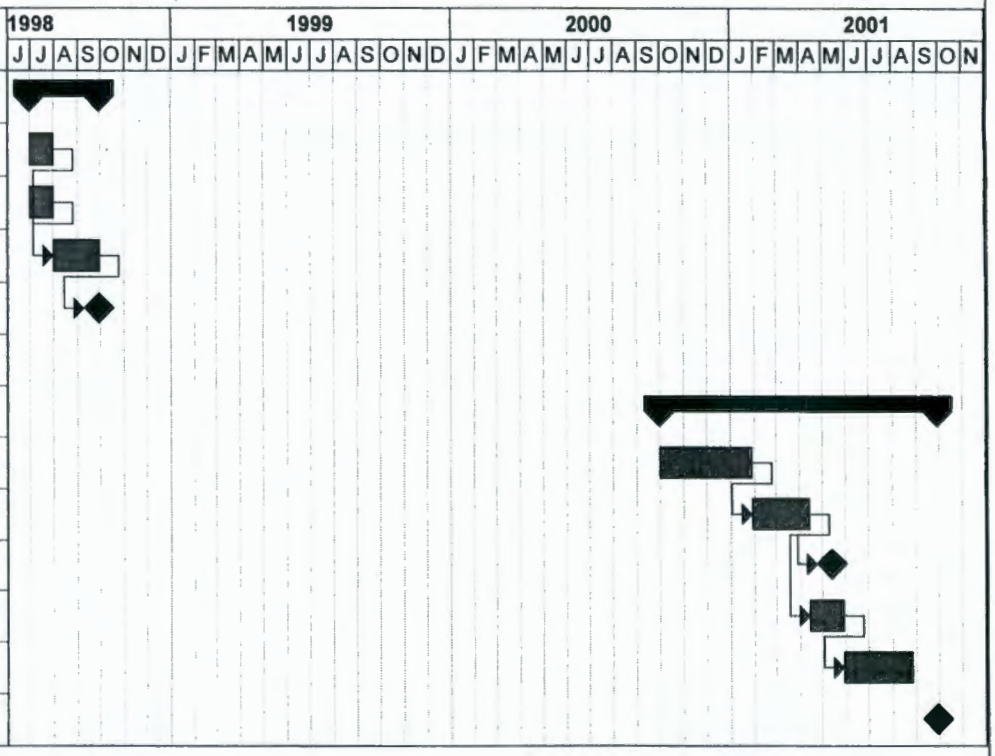
[1]Class 1 modifications requiring prior Agency approval.

[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.

SUPPLEMENTAL SCHEDULE FOR CLOSURE OF THE 303-K STORAGE FACILITY

Task Name	Durati	Start	Finish
COMPLETION OF FY98 CLOSURE ACTIVITIES	**91d**	**7/1/98**	**9/29/98**
Prepare and Issue FY98 Closure Activities Report	31d	7/1/98	7/31/98
Issue PE Certification for FY98 Activities	31d	7/1/98	7/31/98
Transmit FY98 PE Certification and FY98 Report to Ecology	60d	8/1/98	9/29/98
M/S: Transmit FY98 Closure Activities Report to Ecology	0d	9/29/98	9/29/98
FY01 CLOSURE ACTIVITIES	**364d**	**10/1/00**	**9/30/01**
Demolition Activities	120d	10/1/00	1/28/01
Prepare and Issue FY01 Closure Activities Report	75d	1/29/01	4/13/01
M/S: FY91 Report to Ecology	0d	5/13/01	5/13/01
Prepare and Issue PE Certification for FY01 Activities	45d	4/14/01	5/28/01
RL and PHMC Certification	90d	5/29/01	8/26/01
M/S: Closure Certifications Due to Ecology	0d	9/30/01	9/30/01



Date: 8/5/98

Task Milestone Summary

305-B Storage Facility Permit Modifications

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FACILITY CONTINGENCY PLAN
AND
BUILDING EMERGENCY PROCEDURE

305-B STORAGE UNIT

7.0 CONTINGENCY PLAN [G]

The information contained in this chapter is the unit contingency plan, as required under WAC 173-303-806(4)(a)(vii). This chapter is also the Building Emergency Plan (BEP) as required under the DOE-RL Hanford Emergency Response Plan and PNNL Manual, PNL-MA-11. It supersedes all previous contingency plans and BEPs. It is to be maintained in the locations shown in Section 7.9 of this plan.

A building emergency plan (BEP) is required under the DOE-RL Hanford Emergency Response Plan for each building on the Hanford Site. This Contingency Plan has been designed to meet the requirements for a BEP as well as the Ecology requirements for a contingency plan for the 305-B unit. The Hanford Emergency Response Plan details the membership of the DOE-RL Site Management Team (SMT) mentioned in Section 7.4 and following sections, and the procedure for notifying and mobilizing the team.

This plan provides for the safety of employees, other contractor personnel, visitors, and members of the general public in the event of an emergency. It also is designed to minimize hazards resulting from fires, explosions, or any other unplanned sudden or non-sudden release of dangerous waste or dangerous waste constituents to air, soil, or water. The provisions of the plan will be carried out immediately whenever there is a fire, explosion, or release of dangerous waste or dangerous waste constituents which could threaten human health or the environment.

DOE-RL or PNNL shall review and immediately amend, if necessary, this plan whenever:

- Applicable regulations or the facility permit are revised;
- The plan fails in an emergency;
- 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 any way that changes the response necessary in an emergency;
- The list of emergency coordinators changes; or
- The list of emergency equipment changes.

Amendments to the plan, if necessary following review, will be made in accordance with Section 1.5 of the 305-B Part B permit application.

7.1 GENERAL INFORMATION [G-1]

The 305-B Storage Unit is a dangerous and radioactive mixed waste storage facility located in the 300 Area of the Hanford Site. The unit is owned and operated by DOE-RL and co-operated by PNNL. It is used for the collection, consolidation, and packaging of containerized dangerous and radioactive mixed waste. Typically, 305-B handles various types of small volume wastes from research laboratory activities. A more detailed description of 305-B activities is located in Chapter 2.

7.2 EMERGENCY COORDINATORS [G-2]

The overall responsibility for implementation of this Plan lies with the Building Emergency Director (BED) or the designated alternates. The BED has the responsibilities of the Emergency Coordinator as named in WAC 173-303-360. The BED and alternates are on call 24 hours per day and have the authority to commit all necessary resources (both equipment and personnel) to respond to any facility emergency.

Response by an emergency coordinator is usually obtained through the PNNL Single Point Contact at (509) 375-2400. The Single Point Contact has been designated as the contact point to mobilize a response to any PNNL emergency on the Hanford Site. The Single Point Contact is available at all times and has the responsibility to contact the BED or alternate to begin responses to emergencies under this plan.

Due to the security requirements at the Hanford Site, DOE-RL does not submit names or phone numbers of personnel acting as emergency contacts as part of permit applications or other public documents. All emergency notifications to the BED, building managers, etc. are made through the PNNL Single Point Contact. A complete Building Emergency Organization listing of positions, names, work and home telephone numbers for the 305B Unit is maintained in a separate, internally controlled, facility document. Copies are distributed, as a minimum, to appropriate facility locations, the Single Point Contact, and with the contingency plan at the 305-B Unit.

7.3 IMPLEMENTATION OF THE CONTINGENCY PLAN [G-3]

The decision by the BED or alternate to implement this Plan depends on whether an incident in progress may threaten human health or the environment. Immediately after being notified of an emergency, the BED or alternate will go to the site and evaluate the situation. Based on evaluation of the event, the BED or alternate will implement this plan to the extent necessary to protect human health or the environment.

Incidents discovered by unit personnel trained in emergency response may be responded to according to the procedures given in this plan prior to the arrival of the BED. However, immediate notification of the BED is still required prior to implementing these procedures.

7.4 EMERGENCY RESPONSE PROCEDURES [G-4]

Emergency response procedures have been established for the 305-B Storage Unit and are described below.

7.4.1 Notification [G-4a]

Discoverer

1. If within the unit, notify unit personnel of discovery of spill or release.

2. Immediately notify the PNNL Single Point Contact (375-2400) and provide all known information, including:
   - Name(s) of chemical(s) involved and amount(s) spilled, on fire, or otherwise involved, or threatened by, the incident.
   - Name and callback phone number of person reporting the incident.
   - Location of spill or discharge (pinpoint as closely as possible).
   - Time incident began or was discovered.
   - Where the materials involved are going or may go, such as into secondary containment, under doors, through air ducts, etc.
   - Source and cause, if known, of spill or discharge.
   - Name(s) of anyone contaminated or injured in connection with the incident.
   - Any corrective actions in progress.
   - Anyone else who the caller has contacted.

NOTE: DOE-RL and other (non-PNNL) contractor personnel are trained to notify Hanford Emergency number (911 from onsite telephones) operated by the Hanford Patrol who then notifies the PNNL Single Point Contact.

Single Point Contact

1. The single point contact will notify the BED, or one of his alternates if the BED cannot be immediately reached, to arrange immediate response to the incident.

2. The single point contact will arrange for immediate response from Hanford Fire Department for fire or ambulance services as needed based on the report of the discoverer.

3. The single point contact will notify EMSD of the spill or release incident.

4. The single point contact will support the BED in providing further notification and coordination of response activities if needed. Potential activities requiring single point contact participation are:
   - Activate the general evacuation alarm for the 300 Area, if the BED determines that evacuation is necessary.
   - Notify the Emergency Operations Center (EOC) operated for DOE by Project Hanford Management Contractor (PHMC) if evacuation of the 300 Area or adjacent areas is necessary.
   - Notify the DOE-RL Site Management Team (SMT) in accordance with the Hanford Emergency Response Plan if necessary to evacuate areas lying outside the Hanford Site.
   - Any other activities found in the DOE-RL Hanford Emergency Response Plan.

Building Emergency Director (BED) (or alternate)

1. Notify the Single Point Contact if an evacuation is needed. EXCEPTION: If only 305-B needs to be evacuated, activate the fire alarm first, then notify the Single Point Contact.

2. Arrange for care of any injured employees, utilizing the Single Point Contact for notification of ambulance services.

3. Notify the Single Point Contact of any need to activate the Emergency Operations Center (EOC) described in the Hanford Emergency Response Plan. Activation of the EOC should be done whenever technical assistance in evaluating a spill is required, when the emergency may affect other neighboring buildings, or when otherwise deemed necessary by the BED. See Section 7.5.5.

4. Provide for off-normal event notification in accordance with DOE Order 232.1, PNL-MA-07, and PNL-MA-11, and other established site procedures, within 30 minutes of discovery. (Normally this is done through the Single Point Contact.)

5. Provide details on incident to ES&H as they become available.

Environment, Safety & Health

1. Provide telephone notification of incident to DOE-RL contact personnel. Sections 12.4.1.5.1 and 12.4.1.6 of the permit application.

DOE-RL

1. Provide notification of releases to the National Response Center and to Ecology in accordance with the sitewide hazardous waste permit, 40 CFR 302.6, and WAC 173-303-145.

7.4.2 Identification of Hazardous/Dangerous Materials [G-4b]

The BED or alternate will immediately identify the character, exact source, amount, and extent of the hazardous material or dangerous wastes involved in the incident to the degree possible. Identification of waste may be made by visual inspection of involved containers, by sampling, by reference to facility inventory records or shipping manifests, or by consulting with unit operations personnel. The 305-B operating record includes information on the characteristics and storage location of all wastes stored in the unit.
This information is referenced to container identification numbers and can be used to identify containers involved in the emergency.

Samples of materials involved in an emergency can be analyzed by PNNL, HEHF, or other analytical laboratories as appropriate. Samples of spilled or released material(s) shall be taken in accordance with the WAP found in Section 3.2.

7.4.3 Hazard Assessment [G-4c]

Once the materials involved in the incident have been identified by the procedure above, it should be possible to determine the extent of the danger posed by the incident. The BED or alternate on scene should assess both direct and indirect hazards posed by the incident. The EOC is available to assist the BED if needed. Possible aid may be in the form of determining the extent of an emergency, identifying the hazards associated with the materials involved in the incident, assisting in response to the incident, or coordinating the mobilization of special equipment or supplies to the incident site.

If assessment of all available information does not yield a positive assessment of the danger posed by the incident, a worst - case condition will be presumed and evacuation procedures will be initiated. The BED (or alternate) present on scene is responsible to initiate any evacuation through the steps shown in Section 7.4.1 above.

7.4.4 Control Procedures [G-4d]

The initial response to any emergency will be to immediately protect the health and safety of persons in the immediate area. Identification, containment, treatment, and disposal assessment will be the secondary response.

The following is presented to define specific emergency actions for personnel assigned to 305-B for different types of emergencies which could be encountered during normal operations.

7.4.4.1 Area-wide Evacuation. (Signal: Steady siren of 3-5 minutes' duration) In the event of an area-wide evacuation of the 300 Area, 305-B personnel will shut down equipment, secure wastes (especially RMW), and secure classified documents (or carry them with them), if time permits. They will then report to the north parking lot accountability area. The zone warden will account for all facility personnel.

7.4.4.2 Take Cover. (Signal: Wavering siren) In the event a take cover alarm is sounded, 305-B personnel will stay inside the 305-B Storage Unit, close all exterior doors, and turn off all intake ventilation. They will secure all wastes and classified documents. Personnel will then contact Environmental Management Services with their whereabouts and request a call back for status.

7.4.4.3 Response to Minor Spills or Releases. (Signal: None) Unit personnel will generally perform immediate cleanup of minor spills or releases using unit equipment, sorbents and emergency equipment noted in Section 7.5. Personnel detecting such spills or releases shall contact the PNNL Single Point Contact (375-2400) to notify of the detection of such release and arrange for notification of the BED. For spills or releases occurring within individual storage cells during routine handling and storage, see Section 4.1.1.8.

A spill or release of hazardous material or dangerous waste is considered "minor" if all of the following are true:

- The spill is minor in size (generally less than five gallons of liquid or 50 lb. of solids);
- The composition of the material or waste is known or can be immediately determined from label, manifest, MSDS, or disposal request information;
- The spill does not threaten the health and safety of building occupants, i.e. an evacuation is not necessary;
- Unit personnel have received appropriate training in accordance with Section 8.1.5; and
- Unit personnel have appropriate protective equipment, respiratory protection, and emergency response equipment to immediately respond and remediate the spill or release.

If one or more of the foregoing conditions are not met, the provisions of Section 7.4.4.4 should be followed.

Notification of the spill shall take place as shown in Section 7.4.1.

7.4.4.4 Major Dangerous Waste and/or RMW Spill or Material Release. (Signal: None) The following actions will be taken in the event of a major release:

Discoverer

1. If within the unit, notify unit personnel of discovery of spill or release by sounding the fire alarm.

2. Immediately notify the PNNL Single Point Contact (375-2400) and provide all known information, including:
   - Name(s) of chemical(s) involved and amount(s) spilled, on fire, or otherwise involved, or threatened by, the incident.
   - Name and callback phone number of person reporting the incident.
   - Location of spill or discharge (pinpoint as closely as possible).
   - Time incident began or was discovered.
   - Where the materials involved are going or may go, such as into secondary containment, under doors, through air ducts, etc.
   - Source and cause, if known, of spill or discharge.
   - Name(s) of anyone contaminated or injured in connection with the incident.
   - Any corrective actions in progress.
   - Anyone else who the caller has contacted.

3. Take action to contain and/or stop the spill if all of the following are true:
   - The identity of the substance(s) involved is known;
   - Appropriate protective equipment and control/cleanup supplies are immediately available;
   - The employee can perform the action(s) contemplated without assistance, or assistance is immediately available from other trained unit employees; and
   - Time is of the essence, i.e. the spill/discharge will get worse if immediate action is not taken.

   If any of the above conditions are not met, or there is doubt, the employee should evacuate the area and remain outside the unit and upwind from it pending the arrival of the BED. He/she should remain available for consultation with the BED, Hanford Fire Department, or other emergency response personnel.

Single Point Contact

1. The single point contact will notify the BED, or one of the alternates if the BED cannot be immediately reached, to arrange immediate response to the incident.

2. The single point contact will remain available to the BED to support further notification and response activities if needed. Potential activities requiring single point contact participation are shown in Section 7.4.1 and in the DOE-RL Hanford Emergency Response Plan.

Building Emergency Director (BED) (or alternate)

1. Go directly to the unit to coordinate further activity. Take command of the scene from discovering unit employee.

2. Obtain all immediately available information pertaining to the incident. Determine need for assistance from agencies listed in Section 7.6 and arrange for their mobilization and response through the Single Point Contact.

3. If building evacuation is necessary, sound the fire alarm.

4. Arrange for care of any injured employees.

5. If a threat to surrounding facilities exists, activate the Emergency Operations Center (EOC).

6. Provide for event notification in accordance with Section 7.4.1.

7. Maintain access [illegible] site by keeping unauthorized p[illegible] and vehicles away from the area. Security personnel may be used to assist in site control if control of the boundary is difficult, e.g. repeated incursions. In determining controlled-access areas, be sure to consider environmental factors such as wind velocity and direction.

8. Arrange for proper remediation of the incident after evaluation in accordance with Sections 7.4.2 and 7.4.3. Remain available to fire, police, and other authorities on scene and provide all required information. If round-the-clock work is anticipated, enlist the assistance of alternate BEDs to provide coverage. Make no comment to media unless authorized to do so. Refer media inquiries to the Media Relations office.

9. If remediation is performed by unit personnel, ensure use of proper protective equipment, proper remedial techniques (including ignition source control for flammable spills), and decontamination procedures by all involved personnel. Consult a PNNL industrial hygienist for assistance in determining necessary equipment or procedures.

10. If remediation is performed by outside agencies such as the Hanford Hazardous Materials Response Team or other remedial contractors, remain at the site to oversee activities and provide information.

11. Ensure proper containerization, packaging, and labeling of recovered spill materials and overpacked containers.

12. Ensure decontamination (or restocking) and restoration of emergency equipment used in the spill remediation prior to resumption of unit operations in compliance with Section 12.4.1.5.3 of this permit application.

13. Provide reports after the incident in accordance with Section 12.4.1.6.

7.4.4.5 Response to Fire or Explosion. (Signal: Gong -- 2 gongs/second) In the event of a fire or explosion, the discoverer will pull one of the manual fire alarms and call the Single Point Contact. Automatic initiation of a fire alarm (through the smoke detectors and sprinkler systems) is also possible. The personnel operating the facility are trained

in the use of portable fire extinguishers. They will use their best judgment whether to extinguish a fire or evacuate. Under no circumstances will personnel remain in the facility to extinguish a fire if unusual hazards exist. The following actions will be taken in the event of a fire or explosion:

1. Upon actuation of the fire alarm, personnel will shut down equipment, secure wastes (especially RMW), and lock up classified documents (or carry them with them), ONLY if time permits.

2. The alarm automatically signals both the 300 Area Hanford Fire Department Station and the 300 Area Hanford Patrol Headquarters. Both will respond immediately.

3. Personnel shall leave 305-B by the nearest safe exit, and move upwind, keeping the driveway clear.

4. The Single Point Contact shall be immediately notified, who shall in turn notify the BED (or alternate).

5. The BED will go directly to the scene.

6. The BED will obtain all necessary information pertaining to the incident.

7. The BED will contact the Single Point Contact and advise whether to notify the PNNL Occurrence Representative, depending on the severity of the event. Inform the Single Point Contact as to the extent of the emergency (including estimates of dangerous waste or RMW quantities released to the environment) and any actions necessary to protect nearby facilities.

8. Activation of the Emergency Operations Center (EOC) sets into motion the notification process for DOE, other Hanford contractors, and outside agencies.

9. The Hanford Patrol will set up roadblocks within the area to route traffic away from the emergency scene.

10. Emergency medical technicians will remove injured personnel to a safe location, apply first aid, and prepare for transport to the medical department (DOE/HEHF) or to hospitals. Medical personnel are on standby at the medical facility 24 hours/day.

11. The Hanford Fire Department will extinguish the fire.

12. All emergency equipment will be cleaned and restored for its intended use immediately after completion of cleanup procedures.

7.4.4.6 Unusual, Irritating, or Strong Odors. (Signal: None) If an unusual, irritating, or strong odor is detected, and the person detecting it has reason to believe that the odor may be the result of an uncontrolled release of a toxic or dangerous material, they shall:

- Immediately activate the building fire alarm system to evacuate the building, and
- Notify the Single Point Contact, the building manager, and cognizant line management.

In the event that the discoverer has knowledge of the source and scope of the release and believes that the release poses no immediate threat to others, the release shall immediately be reported to the building manager and to the discoverer's manager. Measures shall be taken to contain the release and ventilate the area, if safe and advisable to do so.

In the event that an unusual odor is detected within the facility, and the source of the odor is unknown, the BED must consider whether the facility should be evacuated.

7.4.4.7 Criminal Activity. (Signal: None) In the event of sabotage, threatened action, or a bomb or suspicious object is discovered, unit personnel will clear the immediate area. The Single Point Contact will be notified immediately. Facility personnel shall take whatever steps are necessary to assure that suspicious objects are not moved, opened, or otherwise disturbed. If practicable and safe to do so, personnel may place warning signs, barricades, or guards to protect the object pending the arrival of qualified personnel.

7.4.4.8 "Off-Shift" Conditions. (Signal: None) If a staff member is working outside normal facility working hours, and the need to evacuate the facility occurs, the following procedure should be followed:

- Ensure that anyone else in the facility leaves through the nearest safe exit; provide assistance if necessary.
- Follow the facility evacuation procedure (Section 7.4.4.).
- In case of fire, activate the fire alarm, located at each building exit, and leave the building.
- Stay in a safe place nearby and inform the responding fire personnel of the nature and location of the emergency.
- Notify the Single Point Contact.

7.4.4.9 Power Failure. (Signal: None) In the event of power failure, all containers of waste will be checked for closure and, if the duration of the outage exceeds 30 minutes, will be returned to their storage cells if they have been removed for labpacking or bulking. Facility equipment will be shut down to allow orderly restoration of power.

In a power failure incident, the Building Manager and the BED are to be notified. The Building Manager is responsible to arrange for restoration of power service to the unit. The BED is responsible to evaluate whether the Contingency Plan should be implemented as described in Section 7.3, or whether an evacuation is advisable. If the Contingency Plan is not implemented immediately, site personnel may be required to monitor the unit for continuing release potential during extreme temperature periods. The BED will determine the need for, and extent of, any such monitoring, in consultation with an industrial hygienist if appropriate.

In the event of power loss to site equipment which results in failure of the equipment, the Building Manager is to be contacted to arrange for repair of the affected equipment and/or provide restoration of power. The BED should be contacted in the event that any failure results in a release or potential release to the environment as described in Section 7.3.

7.4.4.10 Damaged, Unacceptable Shipments. (Signal: None) When a damaged shipment of hazardous material or dangerous waste arrives at the unit, the shipment is unacceptable for receipt under the criteria of Section 2.8.3 of this permit application. The damaged shipment should not moved. Unit personnel should instead perform the following steps:

1. If the release from damaged packagings is a "minor spill" under the criteria of Section 7.4.4.3:

   - Immediately notify the Single Point Contact to advise of the situation. The Single Point Contact will notify the BED, who will respond and assist in the evaluation of, and response to, the incident.
   - Notify the generator of the damaged shipment, and obtain any chemical information necessary to assist the response.
   - Unit personnel may proceed with remedial action, including overpacking of damaged containers, cleanup of spilled material, or other necessary actions to contain the spill.

2. If the release does not meet the criteria of a "minor spill" as noted above, or the extent of the spill cannot be immediately determined, the unit contingency plan will be implemented as described in Section 7.3.

7.4.5 Prevention of Recurrence or Spread of Fires, Explosions, or Releases [G-4e]

The BED is responsible for taking the steps necessary to ensure that a secondary release, fire, or explosion does not occur after the initial incident. Procedures that will be implemented may include:

- Inspection of containment for leaks, cracks, or other damage
- Inspection for toxic vapor generation
- Isolation of residual waste materials and debris
- Reactivation of adjacent operations in affected areas only after cleanup of residual waste materials is achieved.

7.4.6 Storage and Treatment of Released Material [G-4f]

Restart of operations after an emergency is conducted in accordance with established procedures for recovery from off-normal events. Treatment and/or storage and disposal of released material and contaminated debris is part of the recovery process leading to restart. These procedures call for cognizant PNNL line management and Laboratory Safety staff to determine the need for a recovery plan. A recovery plan is needed following an event when further risk could be introduced to personnel, a facility, or the environment through recovery action and/or to maximize the preservation of evidence. If a recovery plan is required, it must be approved by PNNL line management before restart. Restart of operations must be performed in accordance with the approved plan.

For emergencies not involving activation of the EOC, the BED is responsible for ensuring that conditions are restored to normal before operations are resumed. If the EOC was activated and the emergency phase is complete, a special recovery organization may be appointed at the discretion of the BED to restore conditions to normal. The makeup of this organization will be dependent upon the extent of the damage and its effects. The recovery organization will be appointed by the Site Emergency Director.

Immediately after an emergency, the BED or the recovery organization will make arrangements for the cleanup phase. Procedures for treatment, storage, and/or disposal of released material and contaminated debris are implemented at this time.

Released material and contaminated debris will be managed in the same manner as wastes received from outside the unit (see Section 4.3 for procedures). All waste so generated will be containerized in drums or other appropriate containers and stored in an appropriate storage area pending analysis and determination of final treatment/disposal requirements. Environmental Management Services will be contacted for support and guidance during this phase of operations.

Cleanup actions will be taken by unit operations personnel or other personnel meeting the training requirements of Chapter 8 of the unit Part B permit application. Actions to be taken may include, but are not limited to, any of the following:

- Neutralization of corrosive spills
- Chemical treatment of reactive materials to reduce hazard
- Overpacking or transfer of contents from leaking containers
- Using sorbents to contain and/or absorb leaking liquids for containerization and disposal
- Decontamination of solid surfaces impacted by released material, e.g. intact containers, facility equipment, floors, containment systems, etc.
- Disposal of contaminated porous materials which cannot be decontaminated, and any contaminated soil
- Containerization and sampling of recovered materials for classification and determination of proper disposal technique
- Followup sampling of decontaminated surfaces to determine adequacy of cleanup techniques as appropriate.

Wastes from cleanup activities will be analyzed and stored in the same manner as are wastes received from outside the unit, i.. in the manner prescribed in Chapter 4 of the Part B permit application for 305-B. A field check for compatibility prior to first storage, if necessary, will be performed as described in *A Method for Determining the Compatibility of Hazardous Waste* (EPA 1980). Incompatible wastes will not be placed in the same container. Containers of waste will be placed in storage areas appropriate for their compatibility class.

If it is determined that incompatibility of wastes was a factor in the incident, the BED or the recovery organization will ensure that the cause is corrected. Corrective examples would be modification of an incompatibility chart, or increased scrutiny of wastes from a generating unit (in accordance with Section 3.2 of the Part B permit application) when incorrectly designated wastes caused or contributed to an incident.

7.4.7 Post Emergency Equipment Maintenance [G-4h]

All equipment used during an incident will be decontaminated (if practicable) or disposed of as spill debris. Decontaminated equipment will be checked for proper operation prior to storage for subsequent use. Consumables and disposed materials will be restocked in the quantities shown in the inventories of Section 7.5. Fire extinguishers will be recharged or replaced.

The BED is responsible to ensure that all equipment is cleaned and fit for its intended use prior to the resumption of operations. Depleted stocks of neutralizing and absorbing materials will be replenished, SCBAs cleaned and refilled, protective clothing cleaned or disposed and restocked, etc. Notification of state and local authorities will be made through DOE-RL of completion of cleanup, decontamination and emergency equipment resupply activities pursuant to WAC 173-303-360(2)(j). Upon notification and approval of PNNL line management, normal facility operations may be resumed.

7.4.8 Response to Container Spills or Leaks [G-4i]

In addition to the foregoing contingency plan provisions, the following specific actions may be taken for leaks or spills from containers at the unit:

- Container leaks will be stopped as soon as possible through tightening closures, tipping the container to stop the leak, use of plugging or patching materials, or overpacking. Appropriate protective equipment will be used.

- If it is inadvisable to approach the container, build a containment of sorbent materials and restrict access pending notification of the BED and implementation of the contingency plan.

- Contents of leaking containers may be transferred to appropriate nonleaking containers. Transfer procedures for fire safety will be followed for ignitable or reactive wastes (e.g., use of nonsparking tools, bonding and grounding of containers, isolation of ignition sources, and use of explosion-proof electrical equipment).

- Overpacked containers will be marked and labeled in the same manner as the contents. All containers of spill debris, recovered product, etc. will be managed in the same manner as waste containers received from outside the unit. Overpacks in use at the facility will be marked with information pertaining to their contents, and noting whether the container inside the overpack is leaking or is in good condition.

7.4.9 Response to Tank Spills or Leaks [G-4j]

This section is not applicable to 305-B because wastes are not stored in tanks.

7.4.10 Surface Impoundment Spills and Leakage [G-4k]

This section is not applicable to 305-B because wastes are not placed in surface impoundments.

7.4.11 Waste Pile Spills and Leakage [G-4l]

This section is not applicable to 305-B because wastes are not stored in waste piles.

7.4.12 Incineration Spills and Leakage [G-4m]

This section is not applicable to 305-B because wastes are not incinerated.

7.4.13 Landfill Leakage [G-4n]

This section is not applicable to 305-B because wastes are not placed in landfills.

7.4.14 Land Treatment Facility Spills and Leakage [G-4o]

This section is not applicable to 305-B because wastes are not treated in land treatment units.

7.5 EMERGENCY EQUIPMENT [G-5]

The emergency equipment available for use during an emergency at the 305-B Storage Unit and at adjacent portions of the Hanford 300 Area are discussed in the following sections. The location of emergency equipment in the 305-B unit is shown in Figure 7-1.

7.5.1 Communication Equipment

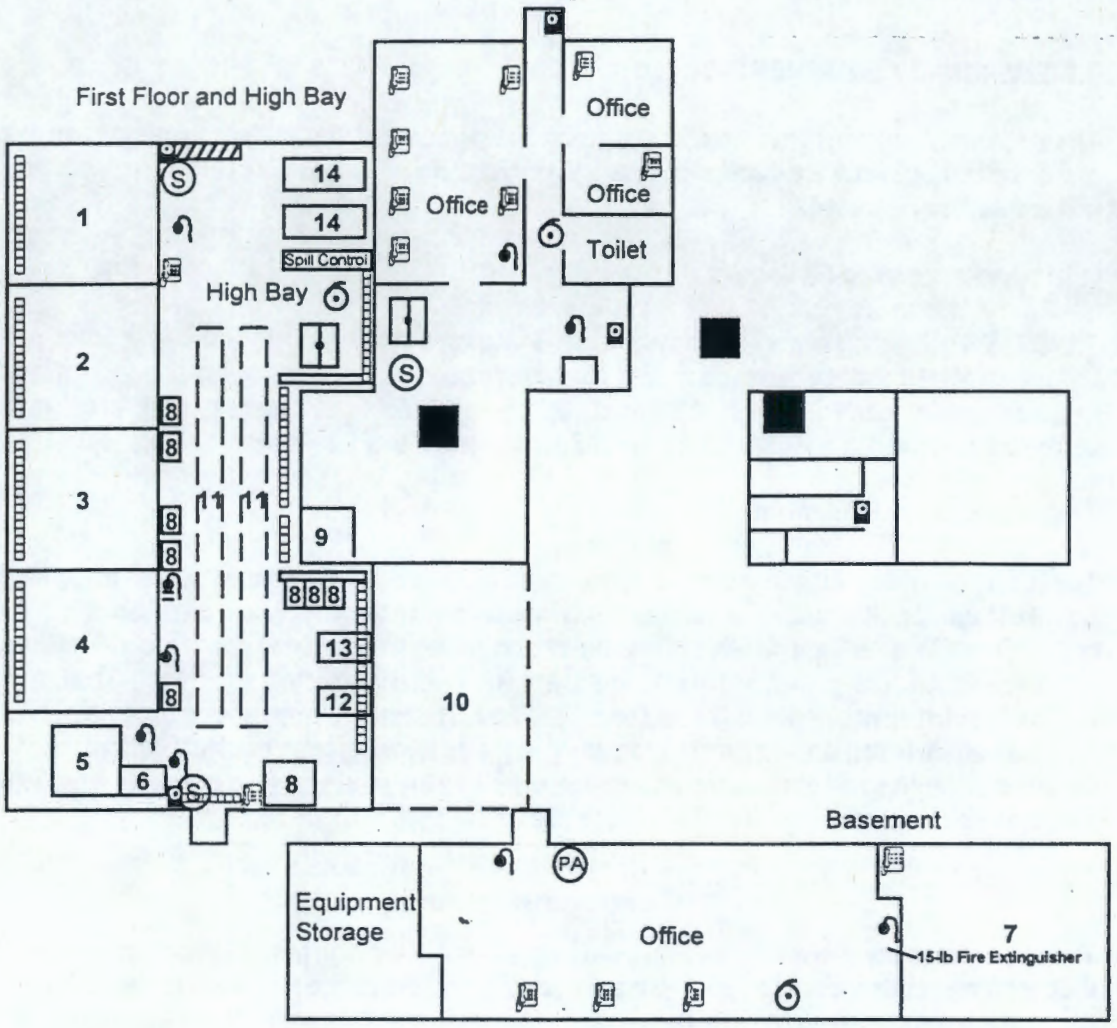
The 305-B Storage Unit has an alarm system that is monitored by the Hanford Fire Department. A manual fire alarm pull box is located near each exit door. Unit operations personnel may also use telephones, the building PA system, or portable radios located throughout the unit to summon assistance. Further description of communication equipment is located in Sections 6.3.1.1 and 6.3.1.2 of Chapter 6 of the Part B permit application.

7.5.2 Fire Control Equipment

The 305-B Storage Unit is constructed of noncombustible materials and equipped with an automatic fire-suppression (sprinkler) system. A portable fire extinguisher is located in each working area in compliance with NFPA safety codes. Each Class ABC extinguisher is capable of suppressing fires involving ordinary combustible materials, flammable liquids, oils, paints, flammable gases, and fires involving electrical equipment. The Class D extinguisher is capable of extinguishing Class D (reactive metals) fires. The Halon extinguisher is capable of extinguishing Class ABC fires where Halon would be more appropriate, e.g. fires involving large electrical equipment. All extinguishers comply with the National Fire Code standards for portable extinguishers and are inspected monthly by the building manager. The inspections are recorded on tags attached to each extinguisher.

7.5.3 Personal Protective Equipment

The unit has a safety shower and eyewash units at each end of the high bay. Drainage from these units flows into the containment trenches. In addition to these units, a portable eyewash unit is maintained at the protective equipment storage area just outside the high bay, adjacent to the office area. These eyewash/shower units are inspected for clear and unobstructed access weekly in accordance with Section 6.2 of the Part B permit application.



Legend

1. Acids, Oxidizers
2. Poisons, Class 9's
3. Alkalines, WSDW, Organic Peroxides
4. Organics and Compressed Aerosols
5. Flammable Liquid Bulking Module and compressed gases
6. Asbestos Cabinet
7. RMW Storage Cell
8. Flammable Storage
9. Small Quantity Flammable RMW
10. Outdoor Non-Regulated Drum Storage
11. WSDW/ORM/Non-Reg Drums
12. Oxidizer Drums
13. Acid Drums
14. Alkaline Drums

- Safety Shower/Eyewash
- Phone
- Fire Alarm Bell
- Fire Alarm Pull Box
- 14-lb Halon Fire Extinguisher
- 10-lb ABC Fire Extinguisher
- 15-lb Class D Fire Extinguisher
- Removable Access to Basement
- Emergency Equipment Cabinet
- Collection Sumps

Figure 7-1. 305-B Storage Unit Emergency Equipment Locations.

Protective clothing and respiratory protective equipment are maintained at the facility for use during both routine and emergency operations. This protective equipment includes at a minimum:

- 6 sets of chemically resistant suits, aprons, boots, and gloves
- 20 protective glasses
- 5 pair chemical goggles
- 4 face shields
- 4 full face respirators
- Respirator cartridges (variety)
- 3 self contained breathing apparatus (30 minute type)

This protective equipment is stored in cabinets located outside of the high bay east entrance. Personnel assigned to 305-B are available to assist other trained personnel (e.g., firefighters) in emergency situations or possible Immediately Dangerous to Life or Health (IDLH) spill cleanup situations.

7.5.4 Spill Control and Containment Supplies

Supplies of absorbent pillows are located in the high bay operating area near the east entrance. These pillows absorb organic or inorganic materials and have a rated absorption capacity of approximately one liter of waste each. They may be used for barriers to contain liquid spills as well as for absorbent purposes. The work area also has an ample supply of diatomaceous earth or vermiculite for absorption of liquid waste spills. Neutralizing absorbent is available for response to acid or caustic spills. A supply of empty drums (DOT UN1A1 closed head and DOT UN1A2 open head) and salvage drums (overpacks) is maintained in the high bay area along with brooms, shovels, and miscellaneous spill response supplies.

7.5.5 Hanford Site Emergency Equipment

The Hanford Site has fire and patrol personnel trained and equipped to respond in emergency situations. These personnel are employees of the site operating contractor. The Hanford Fire Department's Hazardous Material Response Team is trained for mobilization and control of hazardous material emergencies. The Hanford Fire Department will take control of the incident scene until the incident is under control and personnel rescue is complete. A list of available equipment for hazardous materials responses available through the Hazardous Material Response Team is given in Appendix 6A.

The Hanford Patrol provides support to the Fire Department during an incident, including such activities as activation of area crash alarm telephone systems or area sirens (for evacuation or take cover), access control, traffic control, and emergency notifications.

If an emergency threatens other facilities and/or there is a danger of release of hazardous materials to the environment, the 300 Area EOC will be activated. The EOC will provide any assistance requested by the BED, coordinate protective response actions and notifications, and furnish any necessary technical assistance.

7.6 COORDINATION AGREEMENTS [G-6]

This section refers to a number of coordination agreements "Memorandum of Understanding" and (MOU) established by and through DOE-RL to assure proper response resources availability for incidents involving the 305-B unit.

An MOU among the four major site contractors (PHMC, PNNL, BHI and HEHF) defines the interfaces and notifications required during an emergency. DOE-RL has overall responsibility for emergency preparedness. Per the MOU, PHMC has responsibility for Site-wide emergency preparedness while each contractor retains responsibility for emergency preparedness at individual units they co-operate with DOE-RL.

MOUs have been established with a number of offsite authorities to reduce the impact to human health and the environment in the event that an incident has off-site public health implications, or if an on-site emergency warrants off-site assistance. These MOUs are generally activated through the emergency notification of DOE-RL as stated in Section 7.4.1 and in Appendix 7A.

7.6.1 Local, State, and Federal Authorities

Various MOUs have been established between DOE-RL and Benton, Franklin, and Grant Counties and the states of Washington and Oregon. These MOUs describe the cooperative agreements between these agencies for any onsite emergency that warrants off-site assistance, and they describe the planning for, communication of, and response to emergencies at the Hanford Site that might have off-site consequences.

7.6.2 Hanford Fire Department Mutual Aid

The Hanford Fire Department provides fire department services for the Hanford Site. Mutual aid agreements have been established with Richland, Kennewick, and Pasco fire departments; with Benton County Fire Districts 1,2, and 4; Franklin County Fire District 3; and Walla Walla Fire District 5 for support. In events where fire and/or toxic smoke threatens more than one facility, the 300 Area EOC is activated.

7.6.3 Medical and First Aid

Professional medical help is provided by DOE-RL onsite through HEHF. Doctors and/or nurses are available for emergency assistance Monday-Friday, 0730-1600. These medical personnel are trained in procedures to assist personnel contaminated with hazardous and/or radioactive material. Emergency call lists are maintained to provide professional medical consultation at all times. For all other times the 300 Area fire station can be contacted for emergency or ambulance service by calling 375-2400.

Referral to offsite hospital facilities is made by the HEHF physician providing emergency assistance by phone or in person. The primary hospital utilized in emergencies is Kadlec Hospital, Richland. Kennewick General Hospital, Kennewick, and Our Lady of Lourdes Hospital, Pasco, are backup facilities. MOUs between these hospitals and DOE-RL dated February 24, 1989 are in place and incorporated in the DOE-RL Hanford Emergency Response Plan.

7.6.4 Ambulance Service

Ambulance service is provided by the Hanford Fire Department, which uses qualified emergency medical technicians as attendants. This service is available to the 305-B unit from the 300 Area fire station on a 24-hour, 7-day basis. Additional ambulance service is available from other site fire stations and from other local fire departments through the mutual aid agreements noted in Section 7.6.2. An MOU has also been specifically established between DOE-RL and the City of Richland to provide backup ambulance services.

7.6.5 Unified Dose Assessment Center

The Unified Dose Assessment Center (UDAC) is the technical extension of the DOE-RL SMT, providing services to the EOC. The primary mission of the UDAC is to provide recommendations for protective actions, dose calculations and projections, and consultation in the area of industrial hygiene for hazardous

materials, biology, environmental monitoring, and meteorology to support the EOC. Industrial hygiene and biological consultants at the UDAC advise and assist in determining proper response procedures for spills or releases of toxic, flammable, carcinogenic, and pathogenic materials. UDAC staff are responsible to provide a central unified assessment of the dispersion and impact of environmental releases from the Hanford Site. In communication with the ECC, UDAC coordinates the assessment of impacts and assists in determination of actual and potential release scenarios.

7.6.6 Hanford Patrol Mutual Aid

The Hanford Patrol serves as the security and enforcement agency for the Hanford Site. In the event of an emergency, the Hanford Patrol provides services such as activating the crash alarm systems or area sirens, coordinating the movement of emergency responders through security gates, assisting evacuation, establishing barricades, and making necessary notifications through the Single Point Contact. MOUs have also been established with the Tri-Cities police departments to provide additional backup capabilities if required.

7.6.7 River Evacuation

An MOU among DOE-RL, the Washington Public Power Supply System (WPPSS), Benton and Franklin Counties, and the Thirteenth Coast Guard District exists to ensure safety on the Columbia River during an emergency at the Hanford Site and to coordinate response activities for a river evacuation.

EMERGENCY SIGNALS

Signal	Meaning	Response
Gong (2 gongs/sec)	Fire	Evacuate building. Move upwind. Keep clear of emergency vehicles.
Siren (steady blast)	Area Evacuation	Proceed promptly to north parking lot accountability area. Follow instructions.
Wavering Siren	Take Cover	Close all exterior doors, turn off all intake ventilation and notify EMSD of your whereabouts. Request call back for status and monitor portable radios.
Howler (Aa-oo-gah)	Criticality	Follow "take cover" instructions above. (No criticality will take place in 305-B since fissile materials are not accepted for storage.)
To hear these signals and a description of actions to take, call 373-2345.		

7.6.8 Meteorological Information

An MOA is in place between the DOE-RL and the National Weather Service to define mutual responsibilities for providing meteorological information in an emergency situation. Additional meteorological information can be obtained from the Hanford weather station.

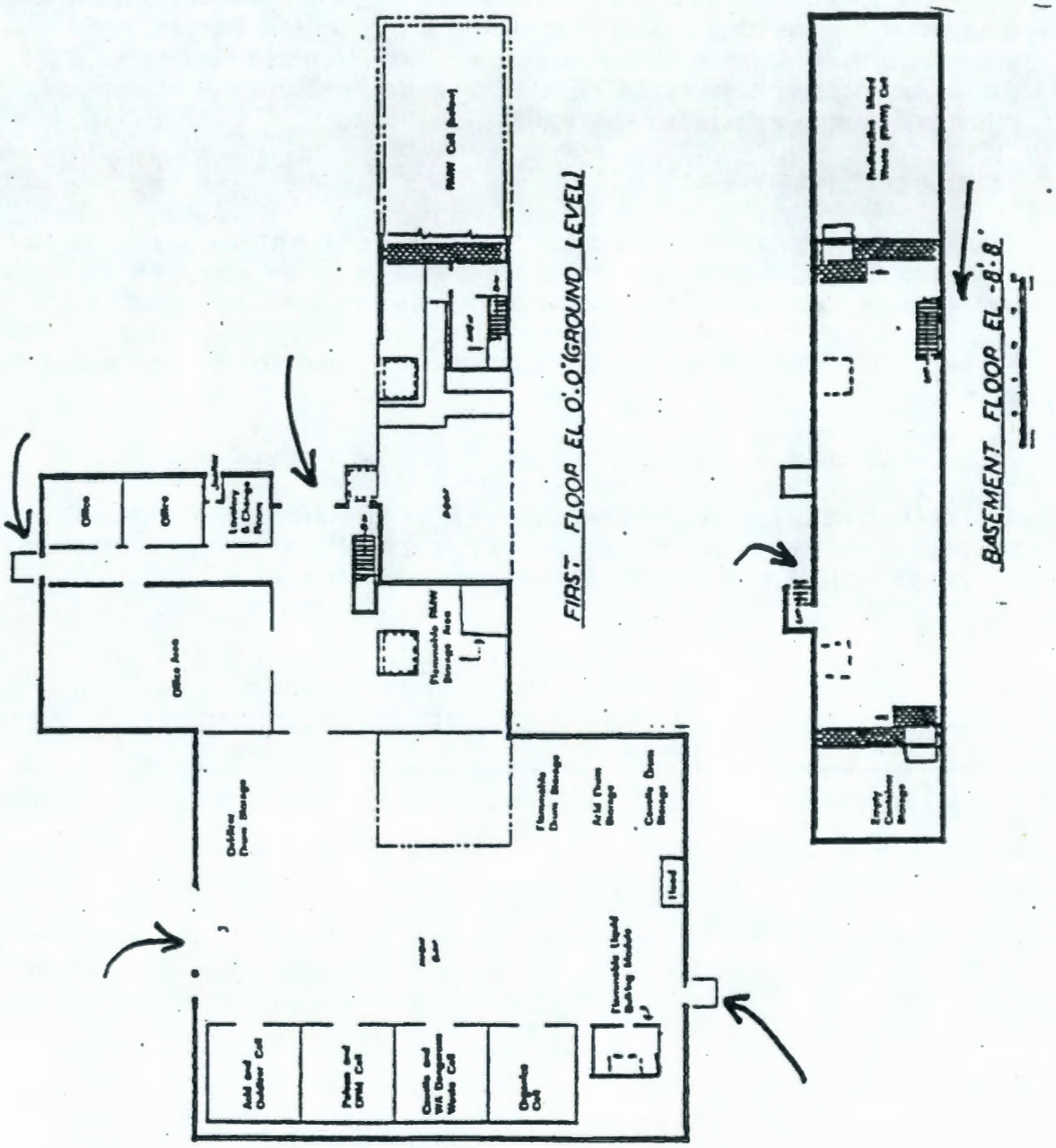


Figure 7-2. 305-B Evacuation Exits.

7.6.9 Washington Public Power Supply System

An MOA has been established between DOE-RL and WPPSS for providing mutual assistance as needed and available in the use of facilities and equipment for personnel decontamination, first aid, evacuation and reassembly areas, respiratory protective equipment, protective clothing, radiological survey equipment, resources for river evacuation, and radiological assistance response.

7.7 EVACUATION PLAN [G-7]

The 305-B unit has an evacuation plan which includes emergency signal identification and staging area location. In the event an evacuation is required, 305-B unit personnel depart by one of the exit doors noted in Figure 7-2 and proceed through the north gate. They are to assemble in the north parking lot accountability area for accounting. If the north gate is blocked by the emergency, personnel may escape through the Apple Street (west) gate opening to Stevens Drive or the south gate.

7.8 REQUIRED REPORTS [G-8]

Three types of written post-incident reports, summarized below are required for incidents at the 305-B unit.

7.8.1 Report to Ecology/EPA

Within 15 days of the incident, a written report will be submitted to Ecology concerning the incident. The report must include:

- Name, address, and telephone number of DOE-RL contact;
- Name, address, and telephone number of 305-B unit;
- Date, time, and type of incident (e.g. fire, explosion);
- Name and quantity of material(s) involved;
- The extent of any injuries;
- Assessment of any actual or potential hazards to human health or the environment caused by the incident;
- Estimated quantity and disposition of recovered material that resulted from the incident;
- Cause of the incident; and
- Description of corrective action taken to prevent recurrence of the incident.

7.8.2 DOE Occurrence Reporting

Under DOE Order 232.1, an occurrence report is required for incidents occurring at the 305-B unit involving hazardous materials release, fire, etc. Specific details of this reporting system are found in the Order. To summarize, the BED is responsible to file the following occurrence reports with DOE-RL under the Order:

- Within 24 hours of discovery, file a Notification Report.
- File an updated Occurrence Report whenever significant new information relating to the incident becomes available.

- File a final Occurrence Report when cause of the incident has been analyzed, root cause and contributing causes determined, corrective actions determined and scheduled, and "lessons learned" identified.

7.8.3 Off-Normal Event Reporting

Under off-normal event reporting procedures, occurrences shall be promptly investigated, reported, and analyzed to ensure that effective corrective actions are taken in compliance with contractual, statutory, and corporate requirements. All incidents are recorded in the building manager's logbook, and the logbook is audited to assure that incidents were reported and handled properly. In the DOE reporting system, four levels of incidents are described in descending order of severity: emergency, unusual occurrence, off-normal occurrences, and logbook entry only.

An "off-normal event" is a significant deviation from normal operation that requires categorization and reporting as noted above. PNNL management is required to evaluate an event to determine the depth of investigation and level of reporting required.

Reporting of emergencies, unusual occurrences, and off-normal occurrences takes place as described under Section 7.8.2.

The BED is responsible for investigating each event in his/her area(s) of responsibility and submitting the appropriate report.

7.9 CONTINGENCY PLAN LOCATION

Copies of the 305-B contingency plan are maintained at the following locations:

- The 305-B Storage Unit
- Hanford Fire Department (300 Area Fire Station)
- The DOE-RL/EOC, Federal Building, Richland
- All local police and fire departments, hospitals, and state and local response teams that may be called upon to provide emergency services.

CONTENTS

14.0 CERTIFICATION [K] 14-1

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14.0 CERTIFICATION [K]

The following certification*, required by WAC 173-303-810(13), for all applications and reports submitted to Ecology is hereby included:

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

L L Piper for

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

5/22/98
Date

K L Hoewing for

Co-Operator
William J. Madia, Director
Pacific Northwest National Laboratory

5-20-98
Date

* This certification addresses modifications to Chapter 7.0 for the 305-B Storage Facility identified as Revision 2.

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