RPP-15833
Revision 0

System Specification for the Integrated Disposal Facility

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

Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC27-08RV14800

P.O. Box 850
Richland, Washington 99352

Approved for Public Release;
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Revision 0

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A. A. Kruger
Department of Energy - Office of River Protection

Date Published
July 2003

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Assistant Secretary for Environmental Management

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washington river protection solutions
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System Specification for the Integrated Disposal Facility

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Key Words: Integrated Disposal Facility, IDF, System Specification, Level 1.

Abstract: This System Specification identifies the project management philosophy to ensure the Integrated Disposal Facility cost, schedule and technical baselines are met.

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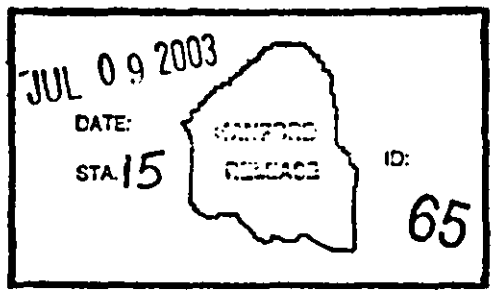

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System Specification for the Integrated Disposal Facility

Prepared for

CH2M HILL, Hanford Group
Richland, Washington

June 2003

EXECUTIVE SUMMARY

The primary mission of the Integrated Disposal Facility (IDF) System will be to dispose of approximately 900,000 cubic meters total capacity/volume of low-level waste (LLW) and mixed low-level waste (MLLW). Consistent with Section CP-02 of DOR/RL-97-55, transuranic (TRU) and Mixed TRU waste is and will continue to be managed in existing facilities. TRU waste management is outside the scope of the IDF. The IDF will not accept Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) waste. The IDF will be designed to handle vitrified Immobilized Low Activity Waste (ILAW) from the River Protection Project Waste Treatment and Immobilization Plant (RPP-WTP), mixed waste generated through waste operations, other low-level radioactive waste, offsite generated mixed and low-level waste, alternative ILAW forms, and low-activity waste and high-level waste melters.

The IDF will be designed and operated to minimize exposure of the general public and operating personnel. Shielding, contamination control, control of toxic or dangerous material, and safety procedures will be used to keep exposure As Low As Reasonably Achievable (ALARA). Waste acceptance criteria will ensure the required treatment has been performed before the waste is disposed in the IDF and will prohibit the disposal of ignitable, reactive, and incompatible waste at the IDF.

The IDF project consists of a single landfill with two separate, expandable cells. One cell is permitted as a Resource Conservation and Recovery Act (RCRA) Subtitle C compliant landfill system with the other cell not permitted. Both landfill cells will include a double liner, a leachate collection and removal system, and a leak detection system. The landfill liner system will comply with RCRA requirements for hazardous waste landfills. The IDF shall be designed to allow for future expansion. Each future liner construction project will connect to the previously constructed liner and the operations systems and then extend the disposal area. The disposal landfill cover will be designed and located to satisfy the dangerous waste disposal requirements once a decision is made to construct the final cover over the landfill.

This IDF Level 1 System Specification establishes the functional, performance, design interface, and test requirements necessary to receive, handle, and dispose of the ILAW packages and provides disposal capacity for LLW and MLLW from the solid waste operations. This specification was structured to be consistent with the format contained in TFC-ENG-DESIGN-C-01, *Development of System and Subsystem Specifications*, and with the guidance provided in RPP-MP-618, *Systems Engineering Management Plan for the Tank Farm Contractor*. This document is generated to provide a consistent source for performance requirements and to support acquisition and life cycle management that clearly describes essential technical requirements for the design of systems, structures, and components within the IDF.

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ACRONYMS AND ABBREVIATIONS

ALARA	as low as reasonably achievable
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CH2M HILL	CH2M HILL Hanford Group, Inc.
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
FH	Fluor Hanford
HLW	high-level waste
ICD	interface control document
IDF	Integrated Disposal Facility
ILAW	immobilized low-activity waste
LAW	low-activity waste
LLW	low-level waste
MLLW	mixed low-level waste
N/A	not applicable
NEPA	*National Environmental Policy Act of 1969*, et seq.
ORP	U.S. Department of Energy, Office of River Protection
RCRA	*Resource Conservation and Recovery Act of 1976*, et seq.
RPP	River Protection Project
RPP-WTP	River Protection Project – Waste Treatment and Immobilization Plant
SEMP	*Systems Engineering Management Plan*
SSC	structures, systems, and components
TBD	to be determined
TFC	Tank Farm Contractor
TFC OUP	Tank Farm Contractor Operations and Utilization Plan
TRU	Transuranic

RPP- 15833
Rev 0

Close

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Attached is the System Specification for the IDF. Most of you have read, commented and met with me to disposition your comments. This revision is significantly reformatted and is consistent with the recently approved engineering procedure for System Specs. I would appreciate your diligence in looking it over, providing any comments and allowing me the opportunity to disposition them in the next week. I am looking forward to the pleasure of visiting with each of you next Friday to sign the final copy for release.

Thank you,

Al

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1.0 SCOPE

1.1 IDENTIFICATION

- **Program:**

  River Protection Project (RPP), Immobilized Tank Waste Storage and Disposal

- **Project:**

  Integrated Disposal Facility

1.2 INTEGRATED DISPOSAL FACILITY (IDF) OVERVIEW

The Integrated Disposal Facility (IDF), located in the 200 East area on the Hanford Facility, will consist of a single landfill with two separate, expandable cells. The landfill will be divided lengthwise with one cell for disposal of low-level radioactive waste and the other cell permitted as a Resource Conservation and Recovery Act (RCRA) compliant landfill system for disposal of mixed low level and immobilized low-activity waste. The mission of the Integrated Disposal Facility (IDF) will include the following functions:

- Provide an approved disposal facility for the permanent, environmentally safe disposition of mixed low-level waste (MLLW) including vitrified immobilized low-activity waste (ILAW) packages that meet the environmental requirements and are approved by the U.S. Department of Energy (DOE) and the Washington State Department of Ecology (Ecology)

- Provide an approved disposal facility for low-level waste (LLW) that meets the requirements of DOE.

- Conduct solid waste operations to receive and dispose of onsite and offsite generated mixed waste, and low-level solid waste.

The overall Integrated Disposal Facility System is divided into five major functional elements, as shown in Figure 1-1, and as briefly identified below:

- Disposal, includes:

  - Provide the landfill and necessary SSCs to receive, handle, and dispose ILAW, LLW, and MLLW packages.

  - Installation of a closure barrier upon completion of disposal operations.

- Transportation, includes:
  - Transport of the ILAW packages in a designed/procured transportation system and transport any failed melters for placement within the disposal trench.
  - Transportation will be provided by others for the MLLW, low-activity waste (LAW) and large components (other than melters).
- Sample Transportation and Disposal, includes:
  - Receipt and transport of the ILAW samples to an existing sample testing laboratory.
  - Providing for analysis and disposition of analyzed ILAW samples (by others).
- Facility Operations, includes:
  - Control and tracking of the ILAW, LLW, and MLLW packages during disposal operations.
  - Maintaining a safe and compliant disposal facility during the operational period.
  - Environmental monitoring the IDF during long-term disposal. Receipt of compliant ILAW, LLW, and MLLW packages, including failed melters, for placement within the disposal trench.
  - Operation of the disposal facility through contracted services for receipt of ILAW, LLW, and MLLW packages (including failed melters) and secure the packages in preparation for long-term disposal.
- IDF Expansion, includes:
  - Subsequent phases will be constructed after waste has been placed in the landfill and the additional disposal capacity is needed.
  - Future landfill construction and design will be subject to improvements in disposal and waste management techniques.
  - Additional development for mixed waste will be subject to an approved permit modification in accordance with the Hanford Facility RCRA Permit.

The Integrated Disposal Facility design and operational basis is a result of identifying guidance from the following documentation:

- HNF-SD-WM-MAR-008, Revision 4, *Tank Waste Remediation System Mission Analysis Report.*

- HNF-8859, *Fluor Hanford Integrated Environmental Management Life-Cycle Baseline.*

- RPP-MP-618, Revision 0, *Systems Engineering Management Plan for the Tank Farm Contractor.*

- 89-10, Revision 5, *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement), as modified by Department of Ecology Final Determination letter dated March 29, 2000.

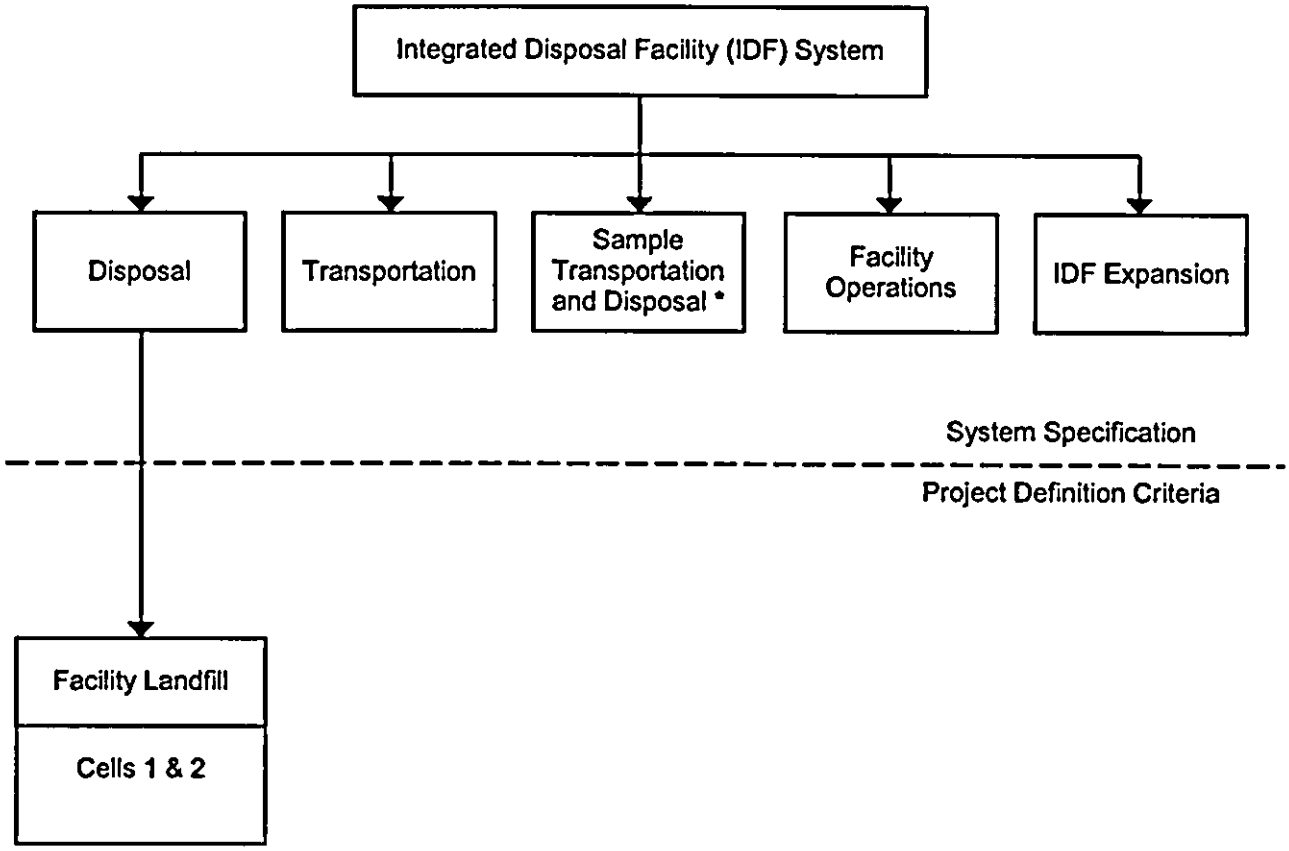
- 99-DPD-006, *Decision to Change the Immobilized Low-Activity Waste (ILAW) Disposal Baseline to Proceed with the Remote-Handled Trench Alternative.*

- RPP-8402, *Waste Acceptance Criteria for the Immobilized Low-Activity Waste Disposal Facility.*

- RPP-6877, *Remote-Handled Immobilized Low-Activity waste Disposal facility Preoperational Monitoring Plan.*

- HNF-EP-0063, *Hanford Site Solid Waste Acceptance Criteria.*

Figure 1-1: Integrated Disposal Facility Functional Elements



* Not an assigned project (procurement action)

1.3 DOCUMENT OVERVIEW

This Level 1 System Specification establishes the functional, performance, design interface, and test requirements of the Integrated Disposal Facility necessary to receive, handle, and dispose of the ILAW packages produced at the RPP Waste Treatment and Immobilization Plant (RPP-WTP), and provides disposal capacity for LLW and MLLW from the solid waste operations.

The functional and performance requirements in this document provide the basis of the design of the Integrated Disposal Facility and provide traceability from the program-level requirements to the project implementation activities. It represents the allocation of system requirements from the various governing documents to the IDF.

Certain documents referenced in this specification are configuration managed through the RPP-WTP. As such they are available from the WTP Project Document Control function.

Given that certain aspects of the IDF System requirements cannot be fully defined at this time, the use of the phrases "TBD" and "Hold" may appear throughout this document. The meanings of these phrases are as follows:

- "TBD" indicates that information will be provided as it becomes available.
- "Hold" means that information is tentative, subject to change and therefore not currently provided.

The use of the words "shall," "should," "may," and "will" within this specification express the following meanings:

- "Shall," indicates a provision that is binding.
- "Should" and "may" indicate non-mandatory, but conceptually desirable provisions. Design development could render the "should" and "may" provisions infeasible, impractical, excessively costly, or otherwise cannot be implemented from the designer's perspective.
- "Will" is a simple declaration of purpose or futurity.

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2.0 APPLICABLE DOCUMENTS

2.1 GOVERNMENT DOCUMENTS

The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this specification, the contents of this specification are considered a superceding requirement.

2.1.1 Federal Acts

National Environmental Policy Act of 1969, as amended, 42 USC 4321 et seq.
Resource Conservation and Recovery Act of 1976, as amended, 42 USC 6901 et seq.

2.1.2 Code of Federal Regulations and Federal Register

Number	Title
10 CFR 20	*Standards for Protection Against Radiation*
10 CFR 61, Subparts C and D	*Licensing Requirements for Land Disposal of Radioactive Waste*
10 CFR 71.51	*Additional Requirements for Type B Packages*
10 CFR 830	*Nuclear Safety Management*
10 CFR 835	*Occupational Radiation Protection*
10 CFR 962	*Byproduct Material*
29 CFR 1910	*Occupational Safety and Health Standards*
29 CFR 1926	*Safety and Health Regulations for Construction*
40 CFR 61	*National Emission Standards for Hazardous Air Pollutants*
40 CFR 264	*Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*
40 CFR 268	*Land Disposal Restrictions*
47 CFR 15	*Radio Frequency Devices*
49 CFR 173	*Shippers--General Requirements for Shipments and Packaging*

2.1.3 U.S. Department of Energy Manuals and Orders

Number	Title
DOE O 420.1A	*Facility Safety*
DOE O 425.1C	*Startup and Restart of Nuclear Facilities*
DOE M 435.1-1 Chg 1	*Radioactive Waste Management Manual*, Chapters 1 and 4
DOE O 440.1A	*Worker Protection Management for DOE Federal and Contractor Employees*
DOE O 451.1B Chg 1	*National Environmental Policy Act Compliance Program*
DOE O 460.1A	*Packaging and Transportation Safety*
DOE O 470.1 Chg 1	*Safeguards and Security Program*
DOE O 472.1B	*Personnel Security Activities*
DOE Order 5400.1	*General Environmental Protection Program*
DOE Order 5480.10	*Contractor Industrial Hygiene Program*
DOE Order 5480.11 Chg 1-3	*Radiation Protection for Occupational Workers*
DOE Order 5480.19 Chg 1	*Conduct of Operations Requirements for DOE Facilities*
DOE Order 5480.20A	*Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*
DOE Order 5480.21	*Unreviewed Safety Questions*
DOE Order 5480.22	*Technical Safety Requirements*
DOE Order 5480.23 Chg 1	*Nuclear Safety Analysis Reports*
DOE Order 5480.4	*Environmental Protection, Safety, and Health Protection Standards*
DOE Order 5632.1C	*Protection and Control of Safeguards and Security Interests*
DOE Order 5820.2A	*Radioactive Waste Management*

2.1.4 U.S. Department of Energy, Richland Operations Office Documents and Directives

Number	Title
DE-AC27-00RV14136	*Bechtel National, Inc., Contract Section C*, U.S. Department of Energy, Office of River Protection, Richland, Washington.
DE-AC27-99RL14047	*CH2M HILL Hanford Group, Inc., Contract* U.S. Department of Energy, Office of River Protection, Richland, Washington.
DOE/RL-92-36	*Hanford Site Hoisting and Rigging Manual*
DOE/RL-93-33 Rev 1	*Focused Feasibility Study of Engineered Barriers for Waste Management Units in the 200 Area*
DOE/RL-94-02	*Hanford Emergency Management Plan*
DOE/RL-96-109 Chg 2	*Hanford Radiological Control Manual*
DOE/RL-97-67	*Pollution Prevention and Best Management Practice Plan*
RLID 473.1	*Protection of Safeguards and Security Interests*
RLID 5480.19	*Conduct of Operations Requirements for RL*
RLPD 450.1	*Hanford Environment, Safety and Health Policy*

2.1.5 Washington Administrative Code and State Publications

Number	Title
RCW46.44.010	*Revised Code of Washington, outside width limits*
RCW46.44.020	*Revised Code of Washington, Maximum height -- Impaired clearance signs*
RCW46.44.041	*Revised Code of Washington, Maximum gross weights—wheelbase and axle factors*
TPA M-90-10	*Tri-Party Agreement Milestone 90-10; Initiate Placement of ILAW Waste Canisters in ILAW Disposal Facility. Low Activity Waste packages placed within these facilities will be retrievable.*
WAC 173-200	*Water Quality Standards for Groundwater of the State of Washington*
WAC 173-216	*State Waste Discharge Permit Program*
WAC 173-303	*Dangerous Waste Regulations*
WAC 173-340	*Model Toxics Control Act -- Cleanup*
WAC 173-400	*General Regulations for Air Pollution Sources*
WAC 173-401	*Operating Permit Regulation*
WAC 173-460	*Controls for New Sources of Toxic Air Pollutants*
WAC 246-220	*Radiation Protection - General Provisions*
WAC 246-247	*Radiation Protection – Air Emissions*
WAC 246-272	*On-Site Sewage Systems*
WAC 246-290	*Public Water Supplies*
WAC 296-155 Part N	*Safety Standards for Construction Work; Excavation, Trenching, and Shoring*
Washington State Department of Health Publication #331-123	*Water System Design Manual*

Copies of specifications, standards, drawings, and publications required by suppliers in connection with specified procurement functions should be obtained from the contracting agency or as directed by the contracting agent.

2.2 NON-GOVERNMENT DOCUMENTS

The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this specification, where the specification is more restrictive, the contents of this specification shall be considered the superceding requirement.

2.2.1 Hanford Site Documents and Procedures

Number	Title
24590-WTP-ICD-MG-01-003	*Interface Control Document for Radioactive Solid Waste*
24590-WTP-ICD-MG-01-015	*Interface Control Document for Immobilized Low-Activity Waste*
HNF-5183	*Tank Farms Radiological Control Manual (TFRCM)*
HNF-8410	*Waste Analysis Plan for the Integrated Disposal Facility*
HNF-EP-0063	*Hanford Site Solid Waste Acceptance Criteria*
TFC-ENG-STD-06	*Design Loads for Tank Farm Facilities*
HNF-IP-0842, Vol. XVIII, Section 2.1	*Radioactive Material/Waste Shipments*
RPP-6911	*Preliminary Closure Plan for the Immobilized Low-Activity Waste Disposal Facility*
RPP-6227	*Storage and Disposal Program Product Sampling Support*
RPP-6270	*The Remote-Handled Immobilized Low-Activity Waste Disposal Facility Environmental Permits and Approvals Plan*
WHC-S-045	*Specification for Radioactive Mixed Waste Disposal Facility*

2.2.2 National Codes and Standards

National and State codes shall apply as appropriate. The design shall be consistent with recognized standards such as National Fire Protection Association codes, building codes, and life-safety standards.

Specific codes and standards applicable to the IDF shall be referenced in the Project Definition Criteria.

2.2.3 Hanford Site Permits

Number	Title
Permit No. WA 7890008967	*Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste at the Hanford Facility*
State of Washington, Department of Ecology State Waste Discharge Permit No. ST 4500	*200 Area Effluent Treatment Facility Permit*
State of Washington, Department of Ecology State Waste Discharge Permit No. ST 4508	*Site-wide Hydrotest, Maintenance, and Construction Discharges*

Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups using Federal Agencies.

3.0 IDF FUNCTIONS AND REQUIREMENTS

The following sections are divided into the same five functional elements as shown in Figure 1-1 and specify the functions and requirements for the IDF in support of the RPP-WTP phased vitrification strategy and the Hanford Site Performance Management Plan.

3.1 SYSTEM DEFINITION

The IDF System provides for the safe, economical, environmentally sound receipt, handling, and disposal of ILAW, LLW, and MLLW packages (including melters) in a near-surface landfill. The overall system is divided into five functional elements to support the major activities associated with the compliance of system implementation. All of the identified functions will be operated and maintained within the boundaries of the Hanford Site.

3.1.1 Disposal

This functional element provides the Structures, Systems, and Components (SSC) necessary to receive, handle, and dispose ILAW, LLW, and MLLW packages, including failed melters, within the approved, near surface, landfill cells within the IDF. This element includes the following functional requirements:

- Waste disposal cells.
- Integrated Disposal Facility support systems.
- Integrated Disposal Facility instrumentation and control system.
- Leachate Handling Systems.
- Maintain a safe and compliant disposal facility during the operational period.
- IDF Landfill Closure System upon completion of disposal operations.

3.1.2 Transportation

This functional element consists of the SSC necessary to transport ILAW packages and MLLW such as failed melters to the disposal facility. Included is the capability to unload both the ILAW from ILAW Transport System and failed melters from Failed Melter Transport System. Transportation of other treated wastes is not included in the definition of this system. This element includes the following functional requirements:

- ILAW Disposal Facility waste package transporter.
- ILAW shielded transportation container.
- Failed melter transporter.

3.1.3 Sample Transportation and Disposal

This functional element consists of those SSC necessary to receive ILAW samples from the RPP-WTP, transport them to the appropriate sample testing laboratory, ensure that samples are disposed of in a qualified facility, and provide for analysis and disposition of analyzed ILAW samples (by others). This element includes the following functional requirements:

- ILAW sample transporter.
- ILAW Sample Handling System.
- ILAW Sample Disposal.

3.1.4 Facility Operations

This functional element consists of those SSC necessary to receive, handle, and dispose of the ILAW, LLW, and MLLW packages (including failed melters) to provide long-term disposal. This element includes the following functional requirements:

- ILAW package handling systems.
- LLW and MLLW handling systems.
- Failed melter handling systems.
- Control and track the ILAW, LLW, and MLLW during disposal operations.
- IDF post-closure systems.
- Environmental monitoring of the IDF during long-term disposal.

3.1.5 IDF Expansion

This functional element consists of the SSC necessary to receive, handle, and dispose of the ILAW, LLW, and MLLW packages (including failed melters) to provide IDF expansion long-term disposal. This element includes the following functional requirements:

- Waste disposal expansion cells
- IDF support system expansion.
- IDF instrumentation and control system expansion.
- ILAW package handling systems
- LLW and MLLW handling systems
- Failed melter handling systems

3.2 CHARACTERISTICS

This section continues with the same five functional elements as shown in Figure 1-1 and provides the primary performance characteristics for the elements.

3.2.1 Performance Characteristics

The IDF System shall provide for the receipt, handling, and disposal of ILAW, MLLW, and LLW waste forms. The system consists of receiving packaged waste forms and melters from the RPP-WTP, transporting and handling these wastes at the disposal site, and disposing of them and other mixed wastes received from other facilities in an approved mixed low-level waste landfill. The IDF shall comply with the design requirements identified in 10 CFR 61 Subparts C and D, Land Disposal Restrictions found in 40 CFR 268 and WAC 173-303-140, and design requirements identified in WAC 173-303-665.

3.2.1.1 Disposal

Disposal of compliant ILAW, LLW, and MLLW packages, including failed melters, in the disposal trench shall be consistent with the regulations provided in WAC 173-303. The waste acceptance criteria will prohibit the disposal of ignitable, reactive, and incompatible waste and will ensure the required treatment has been performed before the waste is disposed at the IDF.

- **Integrated Disposal Facility Cells**

  The Integrated Disposal Facility will be an engineered complex that provides disposal cells; handling equipment to unload the waste packages from the transportation vehicles; equipment to handle the waste packages in a safe, secure manner within each disposal cell; leachate collection, leak detection, and leachate removal systems; the closure system for providing environmentally sound containment; and long-term monitoring systems.

  MLLW and ILAW portions of the facility will be permitted as a *Resource Conservation and Recovery Act of 1976* (RCRA) compliant landfill with a modified Subtitle C barrier system.

  Disposal shall provide the capability to periodically backfill the burial cell and monitor the location of wastes as dictated by the facility's (unit-specific) performance assessment, RCRA permit stipulations and safety evaluations. The disposal complex design shall be consistent with unit specific RCRA Part B Permit Application and Dangerous Waste Treatment and Disposal Permit No. WA 7890008967.

- **Integrated Disposal Facility Cover System**

  In general, the closure system shall be designated as a modified Subtitle C barrier system consistent with the concept reflected in DOE/RL-93-33. In particular, the closure system shall be designed as a modified Subtitle C barrier system consistent with the operations concept reflected in RPP-6911, *Preliminary Closure Plan for the Immobilized Low-Activity Waste Disposal Facility*, IDF HOLD-003. The unit specific permit application shall require modification to include the barrier system design, when available. The disposal facility shall be provided with capabilities for environmental monitoring after its closure for a period of time in accordance with the unit-specific permit stipulations.

3.2.1.2 Transportation

This functional element specifies the performance characteristics for the transport of ILAW packages and failed melters to the disposal facility. The transportation systems comply with applicable Federal and Washington State laws and DOE Orders and guidance for onsite transportation. Since the transportation system is not intended for operation on public highways, it will not be licensed or operated under U.S. Nuclear Regulatory Commission (NRC) or U.S. Department of Transportation regulations. Therefore, NRC regulations, such as 10 CFR 71, will be used for design guidance only and not as strict requirements. Transportation and

packaging shall be in accordance with HNF-IP-0842, Vol. XVIII, Section 2.1 per the guidance provided in DOE O 460.1A.

- **Immobilized Low-Activity Waste Shielded Transportation Container**

  This transportation container is the vessel to safely and economically transport the ILAW packages from the RPP-WTP to the ILAW Disposal Facility. The container shall provide physical protection and radiological shielding for the ILAW packages during transport.

- **Immobilized Low-Activity Waste Transporter**

  This transporter is the vehicle, which moves the ILAW shielded transportation container from the RPP-WTP to the ILAW Disposal Facility. This vehicle will meet the physical and functional constraints to safely transport the transportation containers from origin to destination via the Hanford Site road system. The vehicle size shall be selected such that there is no damage to the existing roadbeds and that clearance is provided to prevent impact with structures adjacent to the transport path.

- **Failed Melter Transporter Receipt, Throughput, and Disposal Capacity**

  The Failed Melter Disposal System shall provide for failed melter transport and receipt. This function entails the conveyance and custodial receipt of failed melters from the RPP-WTP for subsequent processing through the other functions that comprise the Failed Melter Disposal System of the IDF.

  While melter failure is a random and infrequent event, the maximum design basis melter failure rate is three per year. Failed melter transportation shall accommodate the failed melter receipt rate (*i.e.*, a sufficient quantity of transporters shall be procured, leased, or otherwise acquired). IDF HOLD-001.

  Failed melter transportation shall be capable of conveying a single melter from the RPP-WTP to the disposal site per transporter. Based on 24590-WTP-ICD-MG-01-003, the total design basis failed melter capacity shall be 18 failed melters [nine high-level waste (HLW), nine LAW, including a contingency of one melter of each type]. The Failed Melter Disposal System shall accommodate this total mission disposal capacity. IDF HOLD-002.

3.2.1.3 Sample Transportation and Disposal

This functional element provides for the receipt and transport of ILAW samples to an existing sample testing laboratory. This element provides the sample transport containers and transportation systems necessary to safely transport and deliver the ILAW samples to the identified existing sample testing laboratory. This element will be acquired through procurement of existing Hanford Site Services and will be consistent with the planning assumptions in RPP-6227, *Storage and Disposal Program Product Sampling Support.*

- **Sample Transport System**

  The sample transportation system shall be developed or procured consistent with requirements defined in HNF-IP-0842, Vol. XVIII, Section 2.1 per the guidance provided in DOE O 460.1A.

- **Sample Transport Container**

  This sub-function provides the container used to secure, protect, and provide radiological shielding for ILAW samples being transported from the RPP-WTP to an existing sample testing laboratory for ILAW qualification testing. The container design shall comply with the requirements identified in HNF-IP-0842, Vol. XVIII, Section 2.1 per the guidance provided in DOE O 460.1A.

- **Sample Disposition**

  Others (*i.e.*, existing sample testing laboratory) will dispose of the ILAW samples via existing Hanford Site burial grounds.

3.2.1.4 Facility Operations

This facility will be an engineered complex that includes the cells, operational support facilities, and the monitoring systems to protect the area from intrusion and/or inadvertent release. ILAW packages shall be retrievable consistent with the requirement identified in the Tri-Party Agreement, M-90-10.

Operational considerations dictate that MLLW and ILAW portions of the facility shall be hydraulically segregated from LLW, and that remote-handled operations shall be physically segregated from contact-handled operations. Packaged waste and waste components will be accepted in accordance with HNF-EP-0063, *Hanford Site Solid Waste Acceptance Criteria* and the unit specific waste acceptance criteria (RCRA Part B Waste Analysis Plan: HNF-8410). Operational considerations shall also include the requirements identified in DOE Order 5480.11, HNF-5183, 10 CFR 61 Subparts C and D, Land Disposal Restrictions found in 40 CFR 268, and design requirements identified in WAC 173-303-665.

The disposal facility, including cells and support facilities, has a design life of 60 years. The facility will be operated for up to 30 years with an end date of 2033, the expected completion of the Hanford clean-up mission. The facility will then have a 30 years post-closure monitoring period after the IDF final cover system has been constructed.

3.2.1.5 IDF Expansion

The IDF disposal facility consists of expandable landfill cells. The landfill liner system complies with RCRA requirements for hazardous waste landfills and the initial phase of the IDF liner will be complete at the north end of the landfill. The south side slope of the IDF is not lined to allow for future expansion. Each future liner construction project will connect to the south edge of the

previously constructed liner and the operations systems and then extend the disposal area further to the south. As the landfill cells are expanded to accommodate future disposal capacity, the functional elements necessary to provide for receipt, handling, and disposal of ILAW, LLW, and MLLW packages (including failed melters) will be evaluated to ensure compliance with the appropriate regulations and requirements.

3.2.2 System Relationships

The relationships of the various systems and functions identified in the previous sections are controlled through the Immobilized Waste Storage and Disposal Project. Although the receipt, handling, and disposal of the ILAW, LLW, and MLLW packages is the primary mission of this system, the disposal of the qualifying samples also must be planned.

3.2.3 External Interface Requirements

Various interfaces for the Integrated Disposal System are paramount to the success of system development. Primary organizational interfaces are identified based on the five functional elements shown on Figure 1-1.

3.2.3.1 River Protection Project-Waste Treatment Plant Interface

The interfaces with the RPP-WTP are formally documented in Interface Control Documents (ICDs) to address the functional processes and physical constraints required to receive the products described. The RPP-WTP physical interfaces and interface requirements are documented in ICDs as identified in DE-AC27-00RV14136.

- **Immobilized Low-Activity Waste, Disposal / Transportation**

  The transfer and acceptance descriptions for ILAW packages from the RPP-WTP are contained in 24590-WTP-ICD-MG-01-015, Sections 3.3 and 3.4.

- **Failed Melters, Disposal / Transportation**

  The transfer and acceptance descriptions for failed melter packages from the RPP-WTP are contained in 24590-WTP-ICD-MG-01-003. The RPP-WTP is responsible for the failed melter solid waste certification. In general, the as-received melter package (*i.e.*, failed melter and any over pack) will comply with HNF-EP-0063 and HNF-5183.

  Failed melters consist of non-combustible solid materials (refractory and metal) and will be designated MLLW with RCRA listed waste codes F001 through F005. The accepted failed HLW melters will constitute waste incidental to reprocessing as defined by DOE M 435.1-1. Consistent with the design constraint identified in 24590-WTP-ICD-MG-01-003, the failed melter package (*i.e.*, melter contained within any overpack assembly as required for shielding and onsite transportation) will exhibit the physical parameters as specified in Table 3-1.

Table 3-1. Failed Melter Package Physical Parameters

Parameter	High-Level Waste Melter Package	Low-Activity Waste melter Package
Length[1]	208 in. (5.29 m)	262 in. (6.79 m)
Width[1]	208 in. (5.29 m)	367 in. (9.38 m)
Height[1]	172 in. (4.38 m)	190 in. (4.86 m)
Melter Weight[2, 3]	222,200 lbs (100.8 metric tons)	726, 000 lbs (329.3 metric tons)
Overpack Weight[3, 4]	500,000 lbs (226.8 metric tons)	Under Development 24590-WTP-ICD-MG-01-003 Table 4
Design Basis Maximum combined weight	410 short tons (372 metric tons)	400 short tons (363 metric tons)
Radiological Inventory – IDF, HOLD-004	525 Ci	1 Ci
Radiation levels[5] – IDF, HOLD-005	<0.16 mSv/h (16 mrem/h)[6]	0.017 mSv/h (1.7 mrwm/h)[7]

- **Sample Transportation and Disposal**

  The interface descriptions regarding acceptance and transfer of qualifying waste samples from the RPP-WTP are contained in 24590-WTP-ICD-MG-01-015 (Section 4). This ICD addresses the sample characteristics, transfer protocols, sample quantities, and delivery rates. Acceptance of ILAW samples will be accomplished by the ORP before transfer to the sample delivery system.

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[1] The LAW and HLW melter dimensions include the melter overpack.

[2] Melter weight includes melter filled with glass.

[3] All weights in table include a 10% contingency associated with the maturity of design. As the design progresses these values will be revised.

[4] The recommended Land Disposal Restriction (LDR) compliance strategy for the LAW melter is to transport the melter to the disposal cell and treat the melter in-situ (encapsulate the melter in grout); however, it is recognized that this path forward may include regulatory hurdles and life-cycle impacts greater than originally anticipated. Therefore, a back-up approach was recommended by the RPP-WTP that includes macro-encapsulation of the LAW melter in a sealed stainless steel box. This would be the limiting case relative to transportation limits (*e.g.*, road load bearing limits).

[5] 0.3 m from the failed melter package.

[6] CCN 14328, 2000, *Memorandum, HLW Melter Overpack Dose Rates* (CSS/069/2000) BNFL, Inc. Richland, Washington.

[7] 24590-LAW-Z0C-20-00001, 2001, *Calculation. LAW Melter Shielding*, RPP-WTP, Richland, Washington.

3.2.3.2 Richland Operations Office–Waste Management Interface

The interface with the Richland Operations Office Waste Management Division is controlled by Memorandum of Understanding and is TBD, IDF-01. This MOU defines waste characteristics, volumes, and disposal capacities required to support the Hanford Site solid waste management needs from FY2008 forward.

3.2.3.3 Additional On-Site Interfaces

Design and development of the Integrated Disposal Facility will require coordination and agreement with the various onsite contractors. The following subsections describe currently identified contractors.

- **Hanford Site Utility Services**

  The Hanford Site utilities group provides all the utility services required to support the development of the IDF. This includes electrical power, sanitary water, sanitary waste, and site improvements such as roads, fences, etc. Specifics on these requirements shall be coordinated with the utilities group to ensure that adequate services are available and the appropriate support identified. The service is currently managed by Fluor Hanford.

- **Fluor Hanford**

  This interface is necessary to coordinate the support of the onsite contractors associated with Project Hanford. Fluor Hanford is responsible for the planning and operation of the various Hanford Site support facilities such as the testing laboratory, the Liquid Effluent Treatment Facility, and the LLW and MLLW disposal facility. Support services shall be identified to ensure that the appropriate activities are planned and coordinated. An Interface Control Document TBD, IDF-02, is the vehicle through which interface affecting items are identified, evaluated, and managed. Among these will be the waste volume projections, hazardous and radiochemical inventories. In addition to the management of the received inventories in compliance with the waste acceptance criteria during operations, a waste tracking and disposal placement for the waste materials will be developed and maintained.

3.2.4 Physical Characteristics

The following sections describe the physical characteristics used in the design and development of various components of the Integrated Disposal System. All systems designed, procured, or developed, as part of this system shall support startup and operational requirements identified in DOE O 425.1 and RLID 5480.19.

3.2.4.1 Disposal

The IDF System consists of a single landfill with two separate, expandable cells. One half the landfill, or one cell, will be a RCRA permitted portion for MLLW including ILAW and the other half for LLW. The landfill shall provide a double liner and leak detection/leachate collection system to collect and remove wastewater and/or storm water flows. The facility shall include development of a modified RCRA Subtitle C Barrier System, as identified in DOE/RL-93-33, to minimize or prevent intrusion by water, plants, animals, or humans. The design shall comply with the applicable requirements identified in WAC 173-303-665.

Suitable facilities shall be acquired and retained for administrative support services (*e.g.*, records management and archival). Shipping manifests shall be handled (*e.g.*, chain of custody) in accordance with procedures and retained for quality assurance record. The Integrated Disposal Facility shall be designed with the following physical characteristics:

- **Capacity:** The first phase of cells shall have a capacity of at least 38,250 cubic meters of ILAW packages, 44,000 cubic meters of MLLW packages, and 81,000 cubic meters of LLW packages. Total facility layout shall have a disposal capacity of up to 900,000 cubic meters of waste.

- **Environmental Protection:** The landfill shall be designed to meet the environmental protection requirements specified for the following conditions, as identified in RPP-6270 and consistent with the requirements identified in WAC-173-303 and 40 CFR 264. The system shall be designed to support emergency planning consistent with the requirements identified in DOE/RL-94-02 consistent with the unit specific RCRA Part B Permit Application and Washington State Dangerous Waste Permit No. WA7890008967.

  - **Nonradioactive Air Emissions:** No air quality emission requirements for critical pollutants are currently identified for this project. There are no processes identified in the transportation or disposal functions that should create any emissions that would require any design remediation actions. The design shall comply with WAC 173-400 and WAC 173-460, if the permitting process determines that there is applicability to these requirements.

  - **Radioactive Air Emissions:** No specific radioactive air emission requirements are anticipated. The ILAW packages are designed to prevent the dispersal of radioactive material for 50 years in a ventilated environment as described in DE-AC27-00RV14136, Section C.8, Specification 2, Paragraph 2.2.2.12.

- **Permitting:** The design shall support the application and approval of those activities necessary to get operational dangerous waste permit approval and comply with final status standards identified in WAC 173-303, WAC 173-401, DOE M 435.1-1, 40 CFR 264. The disposal of the failed melters shall require an incidental waste ruling and is covered in 24590-WTP-ICD-MG-01-003.

- **Hazardous Substances and Petroleum Products:** The design shall avoid the use of hazardous construction materials as identified in 40 CFR 61, DOE Order 5400.1, and DOE Order 5820.2A to minimize the potential for hazardous waste generation. Spills and/or releases of oils and hazardous materials in excess of threshold quantities shall be reported in accordance with the requirements established in WAC 173-303 and WAC-173-340.

- **Radioactive Materials and Waste Management**

  The design shall provide the operational provisions identified in HNF-5183, 10 CFR 962, DOE M 435.1-1, and DOE Order 5820.2A to ensure that the radioactive waste is properly maintained and controlled. The landfill liner material shall be tolerant of 1 million rad cumulative does per cell for material in contact with the liner.

3.2.4.2 Transportation

- **ILAW Transportation Container**

  The ILAW shielded transportation container shall be constructed in such a way as to prevent damage or shifting of ILAW packages during transport. It also shall be constructed to provide adequate radiological shielding between the ILAW packages and the environment to ensure that the public, environment, and workers are adequately protected. The transportation container design shall provide access to all internal and external surfaces to accommodate radiological survey and physical inspection before and after ILAW package transport. The shielded transportation container shall meet the following requirements:

  - **Internal Dimensions:** The cavity shall have minimum internal dimensions of 7 ft 10 7/16 in. (2.4 m) in height and 4 ft 2 in. (1.27 m.) in diameter as identified in Contract DE-AC27-01RV14136, Section C, Paragraph 2.2.2.3.

  - **Weight:** The shielded transportation container shall accept ILAW packages with a maximum weight of 22,050 lb (10,000 kg) as identified in Contract DE-AC27-01RV14136, Section C, Paragraph 2.2.2.4. The empty container weight is still TBD, IDF-03.

- **Radiation Levels:** The radiation level at the outer surface of the transportation container shall not exceed 200 mRem/hr when containing an ILAW package with a maximum radiation surface level of 500 mRem/hr, IDF Hold No. HOLD-006. The maximum radiation level from the vertical surface shall not exceed 10 mRem/hr at a distance of 6 ft 6 in. (2 m) when loaded with ILAW. The design shall comply with established as low as reasonably achievable (ALARA) principles, 10 CFR 835, and 49 CFR 173-441.

- **ILAW Transportation System**

The ILAW transportation system shall accommodate the fully loaded weight and size of a single shipping shielded transportation container. Sufficient quantities of transporters shall be procured to support the maximum daily transfer rate of nine packages per day, as identified in Section 3.2.3 (Interface capacity) of 24590-WTP-ICD-MG-01-015. Each transporter shall meet the requirements identified in HNF-IP-0842, Vol. XVIII, Section 2.1 per the guidance provided in DOE O 460.1A and 49 CFR 173.441. Any new/upgraded roadways or accesses provided as part of this project to accommodate the transport system shall accommodate the limitations contained within the guidance provided in RCW46.44. The ILAW transportation system shall meet the following requirements:

- **Gross Weight:** Each ILAW transporter, when loaded with a fully loaded ILAW shielded transportation container, shall have a maximum gross weight in conformance with the weight limitations identified in RCW46.44.041.

- **Axle Weight:** Maximum axle weight shall be 20,000 lb (9,100 kg) consistent with the design constraints identified in 24590-WTP-ICD-MG-01-015 and shall conform to the weight limitations identified in RCW46.44.041.

- **Height:** The transporter shall not exceed a height of 17.0 ft (5.2 m) when loaded with an ILAW shielded transportation container as identified in 24590-WTP-ICD-MG-01-015.

- **Width:** The transporter shall not exceed a width of 10.0ft (3.05 m) when loaded with an ILAW shielded transportation container identified in 24590-WTP-ICD-MG-01-015.

- **Load Locking Devices:** The transporter shall have a locking mechanism to ensure that a single ILAW shielded transportation container will be transported in a safe and secure manner. Calculations shall be provided to verify the load will not shift or be damaged during transport operations consistent with the requirement of 49 CFR 173.441 and HNF-IP-0842, Vol. XVIII, Section 2.1 and the requirements of DOE O 460.1A.

- **Turning Radius:** The transportation system design shall accommodate a maximum turning radius of 45 ft 0.0 in. (13.71 m).

- **Failed Melter Transportation Systems**

  Failed melter transportation shall meet the requirements identified in HNF-IP-0842, Vol. XVIII, Section 2.1 in accordance with the guidance in DOE O 460.1A and 49 CFR 173.441. The physical characteristics of various components for the Failed Melter Disposal System are described below. These characteristics shall be used in the design and developments of Failed Melter Disposal Systems components.

  - **Transportation Loads:** The transporter shall be designed to accommodate the fully loaded weight and size of a single failed melter package (either an HLW melter or a LAW melter) as specified in 24590-WTP-ICD-MG-01-003. The transporter design shall ensure that a failed melter will be transported in a safe and secure manner (e.g., preclude load shift or melter damage during transport operations).

  - **Road Limits:** A transporter, when loaded with a failed melter package, shall not exceed the physical parameters specified in Table 3.2 for conveyance over existing Hanford Site roadways. The bounding values appearing in Table 3-2 could be further constrained by restrictions dictated by the RPP-WTP interface.

Table 3-2 Transporter - Bounding Physical Parameters (TBD, IDF-04 &-05)

Parameter	Bounding Value
Weight per wheel	≤9,000 lb (4.1 metric tons)
Weight per axle	≤40,000 lb (18.1 metric tons)
Weight per line	≤ 160,000 lb (72.6 metric tons)
Inside turning radius	≤ 50 ft (15.2 meters)
Outside turning radius	≤ 75 ft (22.9 meters)
Height	TBD, IDF-04
Width	TBD, IDF-05

Any new/upgraded roadways or accesses provided as part of the Failed Melter Disposal Sub-System shall accommodate the limitations contained within the guidance in RCW46.44.

3.2.4.3 Sample Transportation and Disposal

The sample transport system shall be designed to accommodate the ILAW sample packages. The sample package dimensions, physical description, and performance specifics are TBD, IDF-06.

3.2.4.4 Facility Operations

- Water and Wastewater Management: The use of and disposal of the various water and wastewater design and treatment features shall comply with the following requirements:

  - **Sanitary Water:** Sanitary water shall be provided to support the Integrated Disposal Facility operations support buildings. This water will be used for drinking water, restroom facilities, and other sanitary purposes to support operational personnel needs. Any sanitary water needs shall be coordinated with the Hanford Site Water Purveyor to ensure compliance with existing water standards, Washington State Department of Health Publication #331-123, and WAC 246-290.

  - **Domestic Wastewater Disposal:** All wastewater associated with the discharge and processing of sanitary waste shall be disposed in accordance with the requirements identified in WAC 246-272 or WAC 173-216. Development of a new septic system, if necessary, shall be coordinated with the Hanford Site sanitary systems manager and the Washington State Department of Health.

  - **Non-Potable Water:** Raw water will be used during construction and during Integrated Disposal Facility operations to control dust and to provide fire protection for support buildings. The use and discharge of this water will be controlled through the Hanford Site Water Purveyor and shall comply with WAC 173-200 and State Waste Discharge Permit No. ST 4508.

  - **Storm Water Drainage:** During construction activities for the IDF, construction wastewater discharges will comply with State Waste Discharge Permit No. ST 4508. A pollution prevention and Best Management Practices plan will be required for all discharges covered by this permit.

    Storm water run-on and runoff in and around the facility outside the boundaries of the leachate collection system shall be controlled compliant with WAC 173-303. After closure of the Integrated Disposal Facility, storm water runoff from the cover for the facility and storm water intercepted before it flows onto the cover shall be controlled compliant with WAC 173-303.

  - **Leachate Management:** During operations, the Integrated Disposal Facility shall control water that contacts waste through physical barriers and collection through a leachate collection system. This system shall collect, pump and store any water that migrates through the landfill and shall provide systems for loading leachate into transport trucks. IDF leachate meeting the Liquid Effluent Retention Facility (LERF) waste acceptance criteria shall be transported by truck for storage at the LERF. The leachate will then be transferred for treatment to the Effluent Treatment Facility (ETF). Subsequent disposal from the ETF shall comply with the State Waste Discharge Permit No. ST 4500.

3.2.5 System Quality Factors

Reliability, maintainability, and availability analyses and design considerations shall comply with DOE O 420.1A and shall be consistent with the ILAW delivery rates and lag storage constraints identified in 24590-WTP-ICD-MG-01-0003, 24590-WTP-ICD-MG-01-015 and the ICD between FH/CH2M HILL for the IDF, IDF-02.

3.2.5.1 Reliability

System reliability criteria will be established for each subsystem. This information shall be used to document any hardware or software purchase decisions and spare part analysis. The reliability goals for the ILAW Disposal System are TBD, IDF-07.

3.2.5.2 Maintainability

System maintainability factors shall be established that reflect the ability to return failed components/system to operation with minimum downtime. Factors to be evaluated during this process are spare parts availability, i.e. ease of maintenance access, special tools, verification of system status (post-repair), automated trouble analysis and/or reporting.
An operations and maintenance concept document will be prepared for the IDF to document how the systems will be monitored, maintained, and operated in compliance with the appropriate procedural requirements. These maintainability analyses shall document the ILAW, LLW, MLLW and Melter Disposal System maintainability goal of TBD, IDF-08.

3.2.5.3 Availability

The overall system availability shall be verified to ensure that the various subsystems will be available to support mission requirements without adversely impacting operational requirements. The activities associated with receipt, delivery, and emplacement of ILAW packages will occur with sufficient frequency to ensure meeting the RPP-WTP capacity requirement as defined in the 24590-WTP-ICD-MG-01-015.

- **ILAW Disposal**

  This ILAW Disposal subsystem shall be capable of receiving ILAW packages within 24 hours, HOLD-007, after notification by the RPP-WTP that the ORP has accepted the ILAW package and it is available for physical transfer. A system and subsystem flow analysis shall be performed to determine the minimum acceptable availability figure. The results of analysis shall be provided to demonstrate that the reliability and maintainability factors support the system availability.

  The Failed Melter Disposal subsystem shall be capable of receiving a failed melter within 30 days HOLD-008, after notification by the RPP-WTP that the ORP has accepted the failed melter and it is available for physical transfer.

- **ILAW Transport and Disposal Availability**

  The subsystems associated with the receipt, handling, and disposal of ILAW packages shall support the production capacity of the RPP-WTP. The total system availability shall support the transport and disposal of an average of at least five ILAW packages per day during normal operations and shall be able to exceed this rate for short durations as specified in 24590-WTP-ICD-MG-01-015, Section 3.2.3 (Interface Capacity). Operations shall be based on the ability to maintain the Waste Treatment Plant throughput rate. This is considered the most conservative value for all wastes.

- **Failed Melter Transport and Disposal Availability**

  The subsystems associated with the receipt, handling, and disposal of failed melters shall support the RPP-WTP. The total system availability shall support the transport and disposal of an average number of melters per year and peak transfer rates as specified is TBD, IDF-09, in 24590-WTP-ICD-MG-01-003, Section 4.2 (Administrative Interfaces).

- **Sample Transport Availability**

  TBD, IDF-10.

3.2.5.4 Additional Quality Factors

The design and material selection shall ensure that the subsystem SSC ensure compliance with all environmental codes, standards, and regulations.

- **Mechanical Equipment:** All mechanical equipment shall be selected and/or designed to reduce the risk of a failure mode that could potentially expose workers, the environment, or the public to a hazardous or radiological release. All lifting devices shall be designed to comply with hoisting and rigging requirements identified in DOE/RL-92-36.

- **Materials:** All materials shall be selected to ensure that they meet the long-term disposal requirements for strength, susceptibility to radiological contamination, cost, design life, and decommissioning.

3.2.6 Environmental Conditions

The IDF shall be designed consistent with TFC-ENG-STD-06.

3.2.6.1 Natural Environments

Environmental conditions of historical import to the IDF are presented in tabular summary on Table 3-3 below:

Table 3-3 Hanford Site Historical Environmental Conditions.

Environmental standard	Value
Elevation (200 East Area)	653 ± 65 ft (200 m ± 20 m)
Ambient air temperatures	
Range	-24 to +113 °F (-31 to + 45 °C)
Barometric pressure (station pressure)	
Range	28.2 to 30.2 in.-Hg (95.36 to 102.37 kPa)
- Maximum rate of increase	0.1 in.-Hg/hr (0.5 kPa/hr)
- Maximum rate of decrease	0.1 in.-Hg/hr (0.5 kPa/hr)
Relative humidity	5% to 100% (rate of change negligible)
Precipitation	
Normal annual precipitation	6.3 in. (160 mm)
- Maximum precipitation rate	0.6 in. (14.7 mm) per hour (100-year return)
- Maximum precipitation amount	2.1 in. (53.6 mm) per 24-hour period (1,000-year return)
- Snowfall	12.1 in. (307 mm) – single storm (100-year return)
- Glazing, annual	23.2 in. (592 mm) maximum accumulation (1,000-year return)
	6 days per year
Blowing dust and smoke	
Visibility	6.2 mi (10 km) or less
Average frequency	5 times per year
Maximum frequency	10 times per year
- Duration	24 hours per occurrence
Wind speed	
Maximum gusts (southwest direction)	81 mi (130 km) per hour @ 6.2 mi (10 m) above grade (100-year return)
- Average (west-southwest direction)	7.6 mi (12.2 km) per hour
Frost line	36 in (.91 m)
Solar radiation	
Daily average over the year	355 Langley
Daily average maximum over the year	840 Langley

*Information reflected in this table is derived from historical climatological data contained in PNNL-13117, 1999, *Hanford Site Climatological Data Summary*, Pacific Northwest National Laboratory, Richland, Washington.

3.2.6.2 Induced Environments

This paragraph does not pertain to this system specification.

3.2.7 Transportability

The system, subsystems, equipment, and materials shall comply with the requirements set forth in HNF-IP-0842, Vol. XVIII, Section 2.1 per the guidance provided in DOE O 460.1A.

3.2.8 Flexibility and Expansion

Consideration shall be given during the selection of each subsystem and component design package to provide the flexibility to accommodate programmatic changes and operational modifications. Guidance pertaining to this analysis is provided in existing CH2M HILL procedures for Design. This selection shall be considered as part of item identification and shall be factored into the maintainability analysis.

3.2.9 Portability

This paragraph does not pertain to this system specification.

3.3 DESIGN AND CONSTRUCTION

This section identifies the design and construction standards applicable to this specification. Applicable codes and standards that are required to support the construction, operation, and decommissioning are considered an essential part of these requirements. The Integrated Disposal Facility shall be designed and constructed according to approved procedures governing design criteria and shall follow the general guidelines in the Uniform Building Code.

3.3.1 Materials

Design, equipment, and construction practices for the actual landfill and associated operational equipment shall be in accordance with industry standards for non-reactor nuclear facilities, consistent with the requirements identified in DOE O 425.1C and the WAC 173-303. Other facilities and equipment shall be designed and constructed consistent their performance category (*e.g.*, classification as general purpose facilities) as delineated in TFC-ENG-STD-06. Specific considerations should be applied to the following areas:

- **Disposal:** The disposal facility materials shall be selected such that the disposal cells construction complies with the RCRA standards for a landfill facility in accordance with the standards established in 40 CFR 264 Part N and WAC 173-303. The landfill shall include a Modified RCRA Subtitle C Barrier. Unless otherwise allowed by RCRA permit stipulations, the cells shall contain a geosynthetic liner system that conforms to specifications identified in WHC-S-045, *Specification for Radioactive Mixed Waste Disposal Facility,* Section 02275, "Geosynthetics." This liner system has been tested and certified as an RCRA-approved barrier system.

- **Transportation:** The transportation system shall consider commercially available transportation vehicles. To the maximum extent possible, consideration should be given to existing Hanford Site systems. Transportation requirements are identified in HNF-IP-0842, Vol. XVIII, Section 2.1 consistent with the guidance provided in DOE O 460.1A.

  The selection of the material for the ILAW Shielded Transportation Container assembly shall consider structural integrity, radiological concerns, and weight considerations. The material selected should minimize the potential for radiological contamination and resist deformity to ensure adequate radiological control. The design shall comply with the environmental protection requirements identified in HNF-5183, and DOE M 435.1-1.

3.3.1.1 Toxic Products and Formulations

Comply with the requirements of DOE O 451.1B Chg 1 and WAC 173-303 to minimize the use, potential for generation, or accumulation of dangerous waste or toxic materials, as identified in 40 CFR 61, DOE O 5400.1, and DOE O 5820.2A. All products used and/or identified shall be accompanied by Material Safety Data Sheets that identify the intended use and safety actions required for use of the product. The use of any toxic products or formulations shall be identified and the use and selection shall comply with 29 CFR 1910.

3.3.2 Electromagnetic Radiation

No electromagnet interference or radio frequency interference sources are currently identified for this system. Any subsystems or components that produce radio frequency interference or potential electromagnet interference shall comply with 47 CFR 15, Subpart B.

3.3.3 Nameplates and Product Markings

The system, subsystems, equipment, and materials shall comply with the nameplate and labeling requirements in 29 CFR 1910 and DOE Order 5480.19, Section XVIII. Human factor engineering guidelines for addressing labeling considerations are contained in Section 3.3.7. To accommodate future changes, identifying devices shall incorporate flexibility, and identifying device components and materials shall be commercially available, nonproprietary products. Exterior identifying devices located in potentially corrosive environments shall be corrosion-resistant or protected against corrosion.

3.3.4 Workmanship

Workmanship issues related to the design/procurement of the SSC of the Integrated Disposal Facility shall verify compliance with the following:

- Verify use of new materials
- Require verification that counterfeit parts are not present.
- Ensure construction complies with approved codes and standards.

- Maintain procurement standards for Safety Class and Safety Significant equipment (as appropriate).

- Ensure that quality standards are established and maintained.

- Only trained workers shall perform the appropriate tasks, and all contractors and vendors shall provide documented evidence of compliance with applicable requirements.

3.3.5 Interchangeability

Equipment and parts used in the Integrated Disposal System shall be interchangeable and standardized to the maximum extent possible. This requirement applies to not only the subsystems and components within the Integrated Disposal Facility, but shall also consider use of standard parts and systems in use on the Hanford Site.

Materials shall be selected to optimize system operations and regulatory compliance. To the maximum extent possible commercial materials, systems, and subsystems will be used to minimize development costs and to increase system operational confidence.

3.3.6 Safety

The safety approach for this system will consist of three facets as identified in the following subsections.

3.3.6.1 Personnel Safety

The systems shall be designed to support safe construction practices. Any specifications written shall support DOE O 231.1, DOE Order 5480.4, and 29 CFR 1926 consistent with the guidance provided in RLPD 450.1.

- All contractors shall comply with the industrial hygiene program described in DOE Order 5480.10.

- All construction-related work shall comply with Occupational Safety and Health Administration standards for construction as identified in 29 CFR 1910 and 29 CFR 1926.

- The systems shall be designed to support DOE Orders 420.1A and DOE Manual 435.1-1 and shall address any issues identified through the evaluation process defined in DOE Order 5480.23 and 10 CFR 830.

- The IDF construction shall be consistent with TFC-ENG-STD-06, Section 3.8 that requires "All shoring and underpinning shall comply with the safety requirements of WAC 296-155, Part N."

3.3.6.2 Equipment Protection

The system design shall be responsive to safety findings identified through the safety evaluation processes defined in DOE Order 5480.21 and DOE Order 5480.22. The processes defined therein are an iterative approach to defining system operational safety evaluations. Design features shall comply with worker protection requirements identified in DOE O 440.1A.

The design shall comply with those safety requirements that prevent equipment degradation without degrading operational capability (*e.g.*, restricting the use of dangerous materials where possible, classifying explosives for purposes of shipping, handling, and storing, gas detection and warning devices, grounding electrical systems, cleanliness and decontamination, explosion proofing). Overall, system safety features shall be consistent with all associated safety basis requirements.

3.3.6.3 Environmental Protection

The Project shall comply with the *National Environmental Policy Act of 1969* and the environmental, safety, and health requirements of DOE Order 5480.4, DOE/RL-97-67, *Pollution Prevention and Best Management Practices Plan for State Waste Discharge Permits ST4508;* and with applicable federal, state, and local laws and regulations to protect the public, worker health and safety, and the environment.

3.3.7 Human Engineering

The system, subsystems, and equipment shall be consistent with good human factors engineering principles as outlined in IEEE 1023, *Guide for Application of Human Factors Engineering to Systems, Equipment, and Facilities of Nuclear Power Generating Stations.*

3.3.8 Nuclear Control

The system shall comply with the nuclear criticality safety requirements of DOE O 420.1A, and in particular Section 4.3 of the Order and Section 4.3 of the Contractor Requirements Document (CRD). System features shall be designed in accordance with requirements identified in WAC 246-220 and DOE/RL 96-109.

3.3.9 Security

The system shall be designed in accordance with DOE O 470.1, DOE O 472.1B, DOE O 5632.1C, RLID 473.1, and 10 CFR 20.

The disposal system security design features and operational procedures shall comply with the security and environmental protection requirements identified in 40 CFR 264.

3.3.10 Government-Furnished Property

This section is not applicable to this specification. No government-furnished equipment is identified for the projects related to this system.

3.3.11 Computer Resources Reserve Capacity

The facility shall include the acquisition of a computer system to maintain the ILAW package identification and tracking system. The computer system requirements shall be TBD, IDF-11.

3.4 DOCUMENTATION

3.4.1 System Requirements

All historical data generated in support of the development and implementation of this system shall be developed on standard software systems. Specific requirements are identified in the contract Statement of Work.

3.4.2 Operational Requirements

A dual-storage system shall be provided that maintains a hardcopy historical record of the canister shipping manifest data and emplacement information contained within the computer record system. This hardcopy storage system shall provide historical storage record keeping. This storage system shall provide fire protection and secure storage capability.

3.5 LOGISTICS

A logistics program shall be developed that addresses the system life-cycle support and includes the following areas.

3.5.1 Spare Parts

The type and number of spare parts required to maintain the system in operation as determined by a reliability analysis shall be identified. TBD, IDF-12. The availability of spares, including identification of two sources, shall be provided. If the identified parts are a unique component, the appropriate spares quantity shall be provided with system delivery to ensure that availability merits are achievable.

If storage facilities are required for these components, the necessary facilities shall be identified. The preferred solution is use of existing Site facilities, but if special storage facilities are required, they shall be included in the Integrated Disposal Facility along with justifications regarding the determinations.

3.5.2 Maintenance

A program to provide for the maintenance, repair, and replacement of the key components of the systems and/or subsystems shall be identified. TBD, IDF-13. If the identified maintenance approach requires onsite servicing, a maintenance program shall be established to ensure proper maintenance and repair capability, or if more economical, recommended contracting sources shall be provided.

3.6 PERSONNEL AND TRAINING

The system shall be designed in accordance with good life-cycle principles. During the selection and/or design of SSC, the maintainability, operability, and reliability of the system will be evaluated to optimize system utilization. System training and operator requirements shall be consistent with the guidance contained in DOE Order 5480.20A.

3.6.1 Personnel Requirements

The skill requirements, quantities, and training requirements necessary to safely operate and maintain the SSC and to ensure that ALARA principles are addressed will be identified. TBD, IDF-14. This process will maximize the use of existing Site personnel who possess the attributes to support system operations.

This identification shall include the recommended number of operators and support personnel required to operate the facility at the maximum delivery rate.

3.6.2 Training Requirements

All training requirements shall be identified and a training program developed in accordance with 40 CFR 264, WAC 173-303, unit specific RCRA Part B Permit Application, and Hanford Washington State Dangerous Waste Permit No. WA7890008967. This training shall be provided on a schedule to ensure that qualified maintenance personnel and operations personnel are available to support testing and initial operations.

3.7 CHARACTERISTICS OF SUBORDINATE ELEMENTS

The characteristics of the subordinate elements of this specification shall be as identified in Section 3.1.2. The various subsystems will have traceability to the functional requirements.

3.8 PRECEDENCE

Except where specifically denoted in the individual requirements or those instances where Washington State has been granted regulatory authority by the U.S. government, the hierarchical relationship among requirements identified in Section 3.0 of this documents is as follows:

- Federal laws (*e.g.*, *Code of Federal Regulations*)
- Revised Code of Washington as specified in *Washington Administrative Codes*
- Local ordinances
- DOE Orders and Standards
- National consensus codes and standards
- Military Standards
- Hanford Site-specific codes and standards.

In the event of conflict between two equivalent documents, the more stringent shall apply.

3.9 QUALIFICATION

The SSC design shall be verified in accordance with Section 4.0. The various subsystems will have traceability to the functional requirements necessary to prevent damage of loss of sensitive information, equipment or materials and prevent site intrusion.

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4.0 DESIGN VERIFICATION

Design requirements verifications shall be conducted during the design and development of the system to provide assurance of compliance with the requirements of this specification.

4.1 RESPONSIBILITIES FOR INSPECTION

The design agent shall be responsible for the performance and documentation of all design requirements verifications (see Section 4.3) for each system developed in accordance with this system specification. Design requirements verifications shall be conducted at the design agent's facilities or the facilities of the design agent's choice with the approval of the sponsor organization. The sponsor organization reserves the right to witness the specific design requirements verifications.

4.2 SPECIAL TESTS AND EXAMINATIONS

No special tests or examinations are presently identified for the IDF. However, if such tests or examinations are required, the design agent shall specify them before the start of construction and procurement of the affected SSC. These special tests or examinations shall be identified to the SSC supplier at the time of procurement and construction.

4.3 DESIGN VERIFICATION METHODS

Design requirements verification shall be performed on the IDF as represented in design drawings, prototypes, engineering models, etc., to verify that the design meets the requirements of this specification. Investigations of the subsystem design to ensure compliance with the requirements of Section 3.0 shall be performed by one or more of the following methods: qualification testing, review, and/or alternate calculation. Table 4-1 identifies the verification method(s) that would usually apply to each specification requirement. The method of verification will be finalized as the design matures. The definitions of qualification testing, review, and alternate calculation are as follows.

- Qualification testing is a design requirements verification method consisting of tests on hardware representative of the design being verified. Qualification testing can be subdivided into methods that consist of checking functional operation (demonstration) and methods that consist of measuring specific hardware inputs/outputs (test) to verify compliance of the design with requirements.

  NOTE: Qualification testing qualifies the design of the item; it does not qualify the delivered item for use.

- Review is a design requirements verification method that consists of an investigation of the existing design information.

- Alternate calculation is a design requirements verification method that uses an alternate means of calculation to confirm the correctness of an original design calculation.

Table 4-1. Verification Matrix. (2 sheets)

Section	Title	N/A	T	R	A
3.1	**System Definition**	X	--	--	--
3.1.1	Disposal	X	--	--	--
3.1.2	Transportation	X	--	--	--
3.1.3	Sample Transportation and Disposal	X	--	--	--
3.1.4	Facility Operations	X	--	--	--
3.1.5	IDF Expansion	X	--	--	--
3.2	**Characteristics**	X	--	--	--
3.2.1	Performance Characteristics	X	--	--	--
3.2.1.1	Disposal	--	--	X	X
3.2.1.2	Transportation	--	--	X	X
3.2.1.3	Sample Transportation and Disposal	--	--	X	X
3.2.1.4	Facility Operations	--	X	X	--
3.2.1.5	IDF Expansion	--	X	X	--
3.2.2	System Relationships	X	--	--	--
3.2.3	External Interface Requirements	X	--	--	--
3.2.3.1	River Protection Project - Waste Treatment Plant Interface	--	--	X	--
3.2.3.2	Richland Operations Office – Waste Management Interface	--	--	X	--
3.2.3.3	Additional On-site Interfaces	--	--	X	--
3.2.4	Physical Characteristics	X	--	--	--
3.2.4.1	Disposal	--	--	X	X
3.2.4.2	Transportation	--	X	X	--
3.2.4.3	Sample Transportation and Disposal	--	--	X	X
3.2.4.4	Facility Operations		X	X	
3.2.5	System Quality Factors	X	--	--	--
3.2.5.1	Reliability	--	X	X	--
3.2.5.2	Maintainability	--	X	X	--
3.2.5.3	Availability	--	X	X	--
3.2.5.4	Additional Quality Factors	--	X	X	--

Table 4-1. Verification Matrix. (2 sheets)

Section	Title	N/A	T	R	A
3.2.6	Environmental Conditions	--	--	X	--
3.2.6.1	Natural Environments	--	--	X	--
3.2.6.2	Induced Environments	X	--	--	--
3.2.7	Transportability	--	--	X	--
3.2.8	Flexibility and Expansion	--	--	X	--
3.2.9	Portability	X	--	--	--
3.3	**Design and Construction**	X	--	--	--
3.3.1	Materials	--	--	X	X
3.3.1.1	Toxic Products and Formulations	--	--	X	--
3.3.2	Electromagnetic Radiation	X	--	--	--
3.3.3	Nameplates and Product Markings	--	--	X	--
3.3.4	Workmanship	--	--	X	--
3.3.5	Interchangeability	--	--	X	--
3.3.6	Safety	X	--	--	--
3.3.6.1	Personnel Safety	--	--	X	--
3.3.6.2	Equipment Protection	--	--	X	--
3.3.6.3	Environmental Protection	--	--	X	--
3.3.7	Human Engineering	--	--	X	--
3.3.8	Nuclear Control	--	--	X	--
3.3.9	Security	--	--	X	--
3.3.10	Government-Furnished Property	X	--	--	--
3.3.11	Computer Resources Reserve Capacity	--	--	X	--
3.4	**Documentation**	X	--	--	--
3.4.1	System Requirements	--	--	X	--
3.4.2	Operational Requirements	--	--	X	--
3.5	**Logistics**	X	--	--	--
3.5.1	Spare Parts	--	--	X	--
3.5.2	Maintenance	--	--	X	--
3.6	**Personnel and Training**	X	--	--	--
3.6.1	Personnel Requirements	--	--	X	--
3.6.2	Training Requirements	--	--	X	--

Table 4-1. Verification Matrix. (2 sheets)

Section	Title	N/A	T	R	A
3.7	**Characteristics of Subordinate Elements**	X	--	--	--
3.8	**Precedence**	X	--	--	--
3.9	**Qualification**	--	X	X	--

A = verify by analysis/calculation.
ILAW = immobilized low-activity waste.
N/A = not applicable.
R = verify by review of documentation.
T = verify by testing.

5.0 PREPARATION FOR DELIVERY

5.1 VENDOR-SUPPLIED EQUIPMENT

Safety class and safety significant components may require special packaging to protect against corrosion, contamination, physical damage, or any effect that would lower the quality or cause the items to deteriorate during the time they are shipped and handled. Lower-level specifications (*e.g.*, procurement specifications) shall establish the specific packaging requirements.

5.2 PRE-OPERATIONAL AND STARTUP TESTING

Pre-operational and startup testing of the ILAW Disposal System functions shall be planned and conducted to ensure proper performance of components and subsystems individually and as part of the overall facility performance startup of the actual disposal facility according to DOE O 425.1C, as applicable.

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6.0 NOTES

6.1 DEFINITIONS

No system unique definitions are identified for this document.

6.2 REFERENCES

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02-AMPD-119, 2002, *Contract Number DE-AC27-99RL14047 – Request to Self-Perform Design of the Immobilized Low-Activity Waste (ILAW) Disposal Facility*, R. J. Schepens to E. S. Aromi, 9 December 2002, U.S. Department of Energy, Office of River Protection, Richland, Washington.

DE-AC27-99RL14047, 2000, *CH2M HILL Hanford Group, Inc., Contract*, U.S. Department of Energy, Office of River Protection, Richland, Washington.

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HNF-SD-WM-MAR-008, 2002, *Tank Waste Remediation System Mission Analysis Report*, Rev. 4, CH2M HILL Hanford Group, Inc., Richland, Washington.

HNF-SD-WM-SP-012, Rev 4B, 2003, *Tank Farm Contractor Operation and Utilization Plan*, CH2M HILL Hanford Group, Inc. Richland, Washington.

PNNL-13117, 1999, *Hanford Site Climatological Data Summary*, Pacific Northwest National Laboratory, Richland, Washington.

RPP-6227, Rev 0, *Storage and Disposal Program Product Sampling Support*, CH2M HILL Hanford Group, Inc., Richland, Washington.

RPP-MP-618, 2001, *Systems Engineering Management Plan for the Tank Farm Contractor*, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington

WHC-S-045, 1994, *Specification for Radioactive Mixed Waste Disposal Facility*, Rev. 3, Westinghouse Hanford Company, Richland, Washington.

7.0 APPENDIX: REQUIREMENTS CROSS-REFERENCE MATRIX

Table 7-1 provides a cross-reference map that provides the traceability for Section 3.0 paragraph requirements by source document. This cross-reference helps identify the flow down for each specific requirement, as identified. Paragraphs from Section 3.0 that are not listed in this table are assumed to have no significant measurable requirements.

Table 7-1. Requirements Cross-Reference Map. (5 sheets)

Specification paragraph	Source document	Source reference
3.2.1.1 Disposal	HNF-SD-WM-MAR-008	Table 6
3.2.1.2 Transportation	HNF-SD-WM-MAR-008	Par. 5.4.1 and Table 6
	DOE O 460.1A	Par. 4.b
ILAW Shielded Transportation Container	24590-WTP-ICD-MG-01-015 (Constraint)	Par. 3.4.3
	HNF-SD-WM-MAR-008	Par. 8.2 bullet 9
ILAW Transporter	HNF-SD-WM-MAR-008	Par. 8.2 bullet 9 and Table 17
	DOE O 460.1A	Par. 4.b
Failed Melter Transport and Disposal Capacity	24590-WTP-ICD-MG-01-003 (Constraint) IDF, HOLD-001 and HOLD-002	Par. 4.2
3.2.1.3 Sample Transportation and Disposal -- Sample Transport System and Transport Container	DOE O 460.1A	Par. 4.b
Sample Disposition	Not applicable (disposition will be by others as currently identified)	--
3.2.1.4 Facility Operations	RPP-6911, IDF, HOLD-003	--
3.2.1.5 IDF Expansion	HNF-SD-WM-MAR-008	Table 17
Closure System	*Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement)	Article III.14.c and Article VII.27
Design Life	Calculated requirement based on 30-year operation plus 30-year initial monitoring period	--
3.2.3.1 RPP-WTP Interface	Contract DE-AC27-99RL14047	Par. C.2.B (7) and C.4
ILAW Interface	Contract DE-AC27-01RV14136	Par. C.9.a.
Failed Melter Interface	Contract DE-AC27-01RV14136 IDF, HOLD-004 IDF, HOLD-005	Par. C.9.a.
Sample Interface	Contract DE-AC27-01RV14136	Par. C.9.a.

Table 7-1. Requirements Cross-Reference Map. (5 sheets)

Specification paragraph	Source document	Source reference
3.2.3.2 Richland Operations Office – Waste Management Interface	Contract DE-AC27-99RL14047	Par. C.6
3.2.3.3 Additional On-site Interfaces – Hanford Site Utility Services	Contract DE-AC27-99RL14047	Par. C.6
Fluor Hanford	Contract DE-AC27-99RL14047	Par. C.6.A
3.2.4 Physical Characteristics	Contract DE-AC27-99RL14047	Par. C.2.A (2) (d) Par. C.6.A
3.2.4.1 Disposal	DOE Letter 99-DPD-006	3.2.5 --
Capacity	HNF-SD-WM-SP-012	Phase 1 capacity based on Case 3S6E R2.X as a worse-case forecast. Total capacity based on Case 3S6B R2 plus approximately 10% reserve space.
Environmental Protection	HNF-SD-WM-MAR-008 Contract DE-AC27-99RL14047	Table 6 Section H.4
Nonradioactive Air Emissions	HNF-SD-WM-MAR-008 Contract DE-AC27-99RL14047	Table 6 and App.C Section H.4
Radioactive Air Emissions	HNF-SD-WM-MAR-008 Contract DE-AC27-99RL14047	Table 6 Section H.4
Permitting	Contract DE-AC27-99RL14047 24590-WTP-ICD-MG-01-015 (Constraint)	Par.C.2A(2) (e) and C.2.D Par. 4.6
Hazardous Substances and Petroleum Products	HNF-SD-WM-MAR-008	Table 6
Radioactive Materials and Waste Management	Contract DE-AC27-99RL14047	Sections C.3.F and H.4
3.2.4.2 Transportation -- ILAW Transportation Container	Contract DE-AC27-01RV14136	Section C, Par. 2.2.2
Internal Dimensions	Contract DE-AC27-01RV14136	Section C, Par. 2.2.2.3
Weight	Contract DE-AC27-01RV14136	Section C Par. 2.2.2.4 and Table 13.2
	24590-WTP-ICD-MG-01-015 (Constraint)	Par. 3.4.3
Radiation Levels	Contract DE-AC27-01RV14136	Section C Par. 2.2.2.9
	IDF, HOLD-006	

Table 7-1. Requirements Cross-Reference Map. (5 sheets)

Specification paragraph	Source document	Source reference
3.2.4.2 Transportation -- ILAW Transportation System	DOE O 460.1A	Par. 4.b
	RCW-46.44	--
Gross Weight	RCW-46.44	Section 041
Axle Weight	RCW-46.44	Section 041
	24590-WTP-ICD-MG-01-015 (Constraint)	Par. 3.4.3
Height	24590-WTP-ICD-MG-01-015 (Constraint)	Par. 3.4.3
Width	24590-WTP-ICD-MG-01-015 (Constraint)	Par. 3.4.3
Load Locking Devices	DOE O 460.1A	Par. 4.b
Turning Radius	24590-WTP-ICD-MG-01-015 (Constraint)	Par. 3.4.3
3.2.4.2 Failed Melter Transportation System	DOE O 460.1A	Par. 4.b
Transportation Loads	24590-WTP-ICD-MG-01-003 (Constraint)	Par. 4.5
Road Limits	24590-WTP-ICD-MG-01-003 (Constraint)	Par. 4.5
3.2.4.3 Sample Transportation and Disposition	24590-WTP-ICD-MG-01-015	Section 4
3.2.4.4 Facility Operations Water and Wastewater Management	Contract DE-AC27-99RL14047	Par. C.2.D (3)
Sanitary Water	Contract DE-AC27-99RL14047	Par. C.2.D (3)
Domestic Wastewater Disposal	Contract DE-AC27-99RL14047	Par. C.2.D (3)
Non-Potable Water	Contract DE-AC27-99RL14047	Par. C.2.D (3)
Storm Water Drainage	Contract DE-AC27-99RL14047	Par. C.2.D (3)
3.2.5 System Quality Factors	Contract DE-AC27-99RL14047	Par. C.2.D
	24590-WTP-ICD-MG-01-015	Section 3
	24590-WTP-ICD-MG-01-003	Sections 3 & 4
	TBD, IDF-02	--

Table 7-1. Requirements Cross-Reference Map. (5 sheets)

Specification paragraph	Source document	Source reference
3.2.5.1 Reliability	24590-WTP-ICD-MG-01-015	Section 3
	DOE O 420.1A	Section 4.1.1.2
	TBD, IDF-07	--
3.2.5.2 Maintainability	TBD, IDF-08	--
	DOE O 420.1A	Section 4.1.1.2
3.2.5.3 Availability	IDF, HOLD-007	--
	IDF, HOLD-008	--
ILAW Transport and Disposal Availability	24590-WTP-ICD-MG-01-015	Par. 3.2.3
	DOE O 420.1A	Section 4.1.1.2
Failed Melter Transport and Disposal Availability	24590-WTP-ICD-MG-01-003	Par. 4.2
	TBD, IDF-09	
	DOE O 420.1A	Section 4.1.1.2
Sample Transport Availability	TBD, IDF-10	--
	DOE O 420.1A	Section 4.1.1.2
3.2.5.4 Additional Quality Factors-Mechanical Equipment	Contract DE-AC27-99RL14047	Par. C.1
Materials	Contract DE-AC27-99RL14047	Par. C.1
3.2.6 Environmental Conditions	Contract DE-AC27-99RL14047	Par. C.3.J
3.2.7 Transportability	DOE O 460.1A	Par. 4.b
3.2.8 Flexibility and Expansion	HNF-SD-WM-MAR-008	Par. 8.2
3.2.9 Portability	Not applicable	--
3.3 Design and Construction	Contract DE-AC27-99RL14047	Par. C.2.A (2) (d)
3.3.1.1 Toxic Products and Formulations	Contract DE-AC27-99RL14047	Section I.37
3.3.2 Electromagnetic Radiation	47 CFR 15, Subpart B	--
3.3.3 Nameplates and Product Markings	DOE O 5480.19	Chapter XVIII
3.3.4 Workmanship	--	--
3.3.5 Interchangeability	--	--
3.3.6 Safety	Contract DE-AC27-99RL14047	Par. C.2.D
3.3.6.1 Personnel Safety	Contract DE-AC27-99RL14047	Par. C2.D (2)
3.3.6.2 Equipment Protection	DOE O 440.1A	Full document

Table 7-1. Requirements Cross-Reference Map. (5 sheets)

Specification paragraph		Source document	Source reference
3.3.6.3	Environmental Protection	Contract DE-AC27-99RL14047	
3.3.7	Human Engineering	DOE O 430.1A	GPG-FM-027
3.3.8	Nuclear Control	DOE O 420.1A	Full document
3.3.9	Security	HNF-SD-WM-MAR-008	Table 6
3.3.10	Government - Furnished Equipment	Not applicable	--
3.3.11	Computer Resource Reserve Capacity	Contract DE-AC27-99RL14047	Par. C.3.J.
		TBD, IDF-11	--
3.4	Documentation	Not applicable	--
3.5	Logistics	--	--
3.5.1	Spare Parts	TBD, IDF-12	--
3.5.2	Maintenance	TBD, IDF-13	--
3.6	Personnel and Training	DOE Order 5480.20A	Full document
3.6.1	Personnel Requirements	TBD, IDF-14	--
3.6.2	Training Requirements	HNF-IP-0842	Vol. III
3.7	Characteristics of Subordinate Elements	Not applicable	--
3.8	Precedence	HNF-IP-0841, Vol. IV, Section 3.2	Attach. B
3.9	Qualification	(See Section 4.0)	--

ILAW = immobilized low-activity waste.
NEPA = *National Environmental Policy Act of 1969*, et seq.
RCRA = *Resource Conservation and Recovery Act of 1976*, et seq.
RPP-WTP = River Protection Project - Waste Treatment Plant
TFC = Tank Farm Contractor.

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8.0 TO BE DETERMINED AND HOLD LISTING

Table 8-1. To Be Determined Number Listing.

TBD Number	Section/Paragraph	Description
IDF-01	3.2.3.2	Memorandum of Understanding with Richland Operations Office Waste Management Division.
IDF-02	3.2.3.3 and 3.2.5	ICD between CH2M HILL and FH for the IDF
IDF-03	3.2.4.2	Maximum design constraint for the weight of the empty transportation container
IDF-04	Table 3.2	Transporter – Bounding Physical Parameters Height
IDF-05	Table 3.2	Transporter – Bounding Physical Parameters Width
IDF-06	3.2.4.3	Sample package description
IDF-07	3.2.5.1	IDF Disposal System reliability goals
IDF-08	3.2.5.2	IDF Disposal System maintainability goal
IDF-09	3.2.5.3	Failed Melter Transport and Disposal Availability
IDF-10	3.2.5.3	Sample transport availability goal
IDF-11	3.3.11	Computer resource reserve requirements
IDF-12	3.5.1	Spare Parts
IDF-13	3.5.2	Maintenance
IDF-14	3.6.1	Personnel Requirements

Table 8-2. Hold Number Listing.

Hold Number	Section/Paragraph	Description
HOLD-001	3.2.1.2	Failed melter transporter throughput
HOLD-002	3.2.1.2	Failed melter transporter and disposal capacity
HOLD-003	3.2.1.4	RPP-6911, *Preliminary Closure Plan for the Immobilized Low-Activity Waste Disposal Facility*
HOLD-004	Table 3-1	Failed melter radiological content
HOLD-005	Table 3-1	Failed melter radiation level
HOLD-006	3.2.4.2	ILAW package maximum radiation level at the exterior surface
HOLD-007	3.2.5.3	Availability
HOLD-008	3.2.5.3	Availability

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