

**Support Documentation for DOE/RL-2006-48**

**Table 1; Hanford Site Generated Cleanup Wastes In Storage Acceptable for Disposal in ERDF**

Table 1 provides a summary of anticipated Hanford-only legacy waste streams.

Hanford waste streams identified in Table 1 have been subdivided into preliminary treatment categories based on the type of treatment that may be required for disposal at the ERDF. The four categories include: No Treatment, Macroencapsulation, Stabilization, and Alternative Treatment or Supplemental Decision-Making. Waste streams assigned to these categories are preliminary and may change as a result of additional characterization.

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Table 1. Hanford Site Legacy Waste Streams by Preliminary Treatment Categories.

Category	Description	EDMC Preliminary Characterization	Estimated Volume (m <sup>3</sup> )
<i>No Treatment Required</i>			
Soils retrieved from Hanford Tank Farm drilling operations. Soil samples (cores).	Soil samples	LLW	<10
Facility HEPA filters.	Replacement of contaminated HEPA filters	LLW	60
Facility transition	Miscellaneous waste (metal, wood, paper plastic, tools).	LLW	474
Solid Waste Storage and Disposal	Waste dunnage shipments from generators	LLW	33
Investigation derived waste from pilot digs into burial grounds	Characterization activities associated with Radioactive Solid Waste trenches	LLW	30
Waste from caisson HEPA filter change-outs from operating waste management facilities	Maintenance to replace HEPA filters in the alpha caissons	LLW	0.5
Radiologically contaminated debris (rad smears, decontamination debris, other debris, e.g., contaminated equipment)	Incidental waste from normal operations	LLW	3.9
Tumbleweed disposal	Contaminated tumbleweed collection	LLW	1,690
Wire rope	Crane and equipment maintenance	LLW	36
Electrical power lines and telecommunication lines	Decommissioning and construction activities	LLW	180
Petroleum contaminated soil.	Underground storage tank decommissioning and petroleum spill clean-up	LLW	150
Contaminated Inert and Demolition Debris	Surveillance and Maintenance, deactivation	LLW	10,000

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Table 1. Hanford Site Legacy Waste Streams by Preliminary Treatment Categories.			
Category	Description	Preliminary Characterization	Estimated Volume (m <sup>3</sup> )
<i>Macroencapsulation</i>			
Miscellaneous LLW debris	Secondary waste from soil testing – paper, plastic, rubber, metal, wood, cloth, glass, etc.	LLW	<10
Miscellaneous mixed waste debris	Secondary waste from soil testing – paper, plastic, rubber, metal, wood, cloth, glass, etc.	MLLW	<10
Miscellaneous research and development and analytical LLW debris	Miscellaneous secondary waste from research and development and laboratory testing – paper, plastic, rubber, metal, wood, cloth, glass, etc.	LLW/MLLW	280
MLLW-01 Direct Disposal MLLW.	Various generating processes from around the Hanford Site; mainly soils from tank farms.	LLW/MLLW	200
MLLW-04A/4B MLLW debris	Various generating process from around the Hanford Site.	MLLW	25,600
200 Area Tank Farm S&M activities	Routine and corrective surveillance and maintenance activities	LLW/MLLW	10,000
200/300/400 Area waste site and facility S&M activities	Incidental waste from routine and corrective maintenance activities, deactivation, removal of process equipment, tools, debris	LLW/MLLW	660.1
300 Area waste site/facility S&M activities	Surveillance and maintenance	LLW/MLLW	64.4
<i>Stabilization</i>			
Miscellaneous solid/stabilized, solidified analytical waste	Miscellaneous solid analytical waste	LLW/MLLW	60
MLLW-02 inorganic non-debris	Various generating process from around the Hanford Site.	MLLW	420
MLLW-05 lead solids	Various generating process that contain Radioactive Lead Solids from the Hanford Site.	MLLW	250

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Table 1. Hanford Site Legacy Waste Streams by Preliminary Treatment Categories.			
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MLLW-09 radioactively contaminated batteries	Various generating process from around the Hanford Site.	MLLW	20
200 Area Effluent Treatment Facility waste	Treatment residues, secondary waste, debris, unloading and filtering wastewaters, repair and servicing equipment resulting from treatment of CERCLA or RCRA wastewater at the Effluent Treatment Facility.	LLW/MLLW	5,417.5
<i>Alternative Treatment or Supplemental Decision-Making</i>			
Miscellaneous contaminated equipment	Used miscellaneous laboratory and analytical and equipment; Material and equipment utilized in mission of Hanford clean-up, tank waste contacted	LLW/MLLW	300
Hanford tank waste characterization and treatment process development wastes	Waste Treatment Project simulant development, secondary waste, paper, plastic, wood, metal, rubber	LLW/MLLW	<10
Vitrification low-activity waste, glassified waste residues	Vitrified solids and residues to support tank waste characterization and treatment	LLW/MLLW	25
MLLW-07 high rad and large container MLLW	Various generating process from around the Hanford Site.	MLLW	750
Secondary waste from mixed waste trench leachate management	Mixed waste disposal leachate management	MLLW	0.8

FY = fiscal year  
 HEPA = high-efficiency particulate air  
 LLW = low-level waste

MLLW = mixed low-level waste  
 S&M = surveillance and maintenance

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**Descriptions of Proposed Waste Streams**

A portion of the mixed low-level wastes (MLLW) identified in the Land Disposal Restrictions (LDR) Report presented in accordance with *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 2003) Milestone M-26-01N, is proposed to be disposed at the Environmental Restoration Disposal Facility (ERDF). Tables 4.1 and 4.2 provides a summary of the MLLW current inventory and projected volumes, respectively, proposed for ERDF disposal grouped by treatability group as defined in the LDR Report.

**Table 4.1 – Current MLLW Inventory Proposed for Disposal at ERDF (Volume in cubic meters)**

<b>Container</b>	<b>MLLW-01</b>	<b>MLLW-02</b>	<b>MLLW-04A/B</b>	<b>MLLW-05</b>	<b>MLLW-07</b>	<b>MLLW-09</b>
Concrete Box		9				
Metal Container	6	2	131		221	
Drum	130	184	82	12	4	6
<b>Total</b>	<b>136</b>	<b>195</b>	<b>213</b>	<b>12</b>	<b>225</b>	<b>6</b>

**Table 4.2 – Forecasted MLLW Proposed for Disposal at ERDF (Volume in cubic meters)**

<b>Container</b>	<b>MLLW-01</b>	<b>MLLW-02</b>	<b>MLLW-04A/B</b>	<b>MLLW-05</b>	<b>MLLW-07</b>	<b>MLLW-09</b>
Drums	13733	40	5441	16	6	2
LEC-5	1545					
SWB		129	460			
Box	4952		5247			
MCWB	559					
Other	2743		377			
<b>Total</b>	<b>23532</b>	<b>170</b>	<b>11524</b>	<b>16</b>	<b>6</b>	<b>2</b>

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Major contributing radionuclides in the current waste inventory and forecasted waste are provided in Tables 4.3 and 4.4, respectively. Additional waste package information for the waste inventory is maintained in the Solid Waste Information Tracking System (SWITS). Additional information on the forecasted waste streams is maintained in the Solid Waste Integration Forecasting Tool (SWIFT) Report.

Summary waste descriptions of MLLW inventory and forecasted MLLW, by on-site generators for each LDR Treatability Group, are provided in Table 4.5.

**Table 4.3 – Current MLLW Radionuclide Summary (Concentration in Ci/m<sup>3</sup>)**

Isotope	MLLW-01		MLLW-02		MLLW-04A/B		MLLW-05		MLLW-07		MLLW-09		ERDF WAC
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
Am-241			2.3E-03	6.1E-03	3.2E-03	1.7E-02	1.6E-03	2.0E-03	2.5E-03	5.6E-03	2.3E-03	2.3E-03	5.0E-02
Am-243			8.9E-04	1.0E-03									5.7E-02
C-14			1.3E-01	1.3E-01									5.1E+00
Cm-244					3.4E+00	6.7E+00			4.2E-01	4.2E-01			4.0E+01
Cs-137			1.4E+00	3.9E+00	4.3E+00	1.2E+01	4.9E+00	5.8E+00	5.5E-01	9.0E-01			3.2E+01
I-129					4.5E-02	4.8E-02							8.0E-02
K-40									3.0E-03	3.0E-03			9.5E-02
Nb-94					6.6E-04	6.6E-04			1.4E-04	1.4E-04			1.2E-02
Np-237			3.9E-04	7.9E-04	1.9E-04	1.9E-04	2.2E-04	2.6E-04	6.8E-04	6.8E-04			1.5E-03
Pu-238					2.4E-02	2.5E-02							1.5E+00
Pu-239	2.0E-03	8.4E-03	6.3E-03	2.1E-02	1.7E-03	4.8E-03	3.6E-03	6.9E-03	3.1E-03	1.7E-02	1.5E-03	1.5E-03	2.9E-02
Pu-240	1.3E-03	6.4E-03	2.0E-03	4.2E-03	1.2E-03	2.5E-03	9.9E-04	1.5E-03	1.3E-03	4.0E-03	8.4E-04	8.4E-04	2.9E-02
Pu-241	7.8E-02	7.8E-02	9.4E-02	1.4E-01	1.1E+00	1.3E+00			1.5E-01	1.5E-01			6.2E+00
Ra-226			3.7E-06	6.9E-06	1.2E-05	1.2E-05							1.4E-04
Ra-228			2.5E-06	2.5E-06									2.2E-04
Tc-99			3.1E-01	3.1E-01	3.6E-02	3.6E-02							1.3E+00
Th-228			6.2E-06	1.2E-05	2.5E-05	4.9E-05							1.2E-04
Th-232	2.3E-04	4.8E-04	2.0E-04	2.7E-04			8.7E-05	8.8E-05					6.0E-03
U-234	7.6E-03	7.6E-03	1.2E-02	3.3E-02									7.4E-02
U-235	5.2E-04	6.7E-04	1.3E-04	2.7E-04			4.2E-05	4.3E-05					2.7E-03
U-238	6.5E-03	9.6E-03	4.6E-04	6.7E-03	3.8E-04	1.1E-03	3.0E-04	3.0E-04					1.2E-02

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Table 4.4 – Forecasted MLLW Radionuclide Summary (Concentration in Ci/m<sup>3</sup>)

Isotope	MLLW-01		MLLW-02		MLLW-04A/B		MLLW-05		MLLW-07		MLLW-09		ERDF WAC
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
Am-241	1.5E-03	7.6E-05	9.5E-06	3.6E-05	5.3E-06	1.3E-02	1.7E-05	3.6E-05			8.3E-05	3.2E-04	5.0E-02
Am-243	1.9E-10	1.9E-10											5.7E-02
C-14	1.6E-02	1.5E-03	2.2E-06	1.2E-04	2.6E-04	7.0E-04	2.0E-16	2.0E-16					5.1E+00
Cs-137	6.8E-01	9.0E-02	5.9E-04	2.1E-02	1.5E-03	4.3E-02	3.1E-03	5.1E-03	5.1E-03	5.1E-03			3.2E+01
I-129	2.3E-03	3.1E-04			2.0E-04	2.0E-04							8.0E-02
Np-237	4.8E-06	2.5E-06	3.7E-06	3.7E-06	7.5E-05	1.5E-04	7.7E-09	1.1E-08					1.5E-03
Pu-238	3.2E-05	2.2E-06	8.1E-04	5.2E-03	5.1E-03	2.8E-02	1.1E-05	1.9E-05			1.9E-05	1.9E-05	1.5E+00
Pu-239	6.8E-04	4.0E-05	6.1E-05	2.4E-04	1.8E-05	1.7E-02	8.5E-05	2.4E-04			2.3E-04	2.4E-04	2.9E-02
Pu-240	1.4E-04	8.5E-06	2.0E-05	5.7E-05	2.6E-05	6.4E-03	5.7E-05	5.7E-05			5.7E-05	5.7E-05	2.9E-02
Pu-241	4.1E-01	3.7E-02	3.4E-04	1.3E-03	1.0E-04	2.5E-01	5.6E-04	1.3E-03			1.3E-03	1.3E-03	6.2E+00
Pu-242	1.6E-05	3.3E-06	3.1E-09	3.1E-09	3.6E-09	1.3E-05	3.1E-09	3.1E-09			3.1E-09	3.1E-09	1.1E-01
Ra-226	1.5E-08	8.6E-09											1.4E-04
Se-79	1.1E-09	1.1E-09			1.3E-08	1.3E-08							2.8E+01
Sr-90	6.4E-01	4.1E-02	4.1E-04	5.8E-03	3.1E-03	4.4E-02	8.7E-04	3.1E-03	1.3E-03	1.3E-03			7.0E+03
Tc-99	2.3E-02	1.8E-03	3.0E-04	8.1E-04	3.6E-05	1.0E-04	6.8E-08	6.8E-08					1.3E+00
U-233	1.1E-06	6.2E-07			1.5E-03	1.5E-03	1.1E-10	2.2E-10					7.4E-02
U-234	1.4E-06	5.7E-07	1.9E-06	1.9E-06	1.1E-04	1.1E-04	5.6E-08	1.1E-07					7.4E-02
U-235	4.7E-08	1.1E-08	1.5E-06	1.5E-06	3.6E-06	3.6E-06	1.8E-06	3.5E-06					2.7E-03
U-238	5.7E-03	5.4E-04	1.7E-04	1.7E-04	8.3E-05	8.3E-05	3.2E-05	6.4E-05					1.2E-02

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<b>Table 4.5 – MLLW Waste Description Summary</b>			
<b>LDR Treatability Group</b>	<b>Process</b>	<b>Source of Regulated Constituents</b>	<b>Waste category/ Designation</b>
MLLW-01 Direct Disposal MLLW	200 ETF. Secondary waste (dry powder) from the treatment of wastewater through the ETF. The contaminants are destroyed or removed from the wastewater and dried to powder.	Wastewaters from various generators on the Hanford Site, for example, 242-A Evaporator process condensate, LLBG mixed waste trench leachate, WSCF laboratory wastewater, etc.	Wastewaters are characterized using analytical data and process knowledge in accordance with the RCRA Waste Analysis Plan for LERF/ETF.
	222-S. Waste from general maintenance, analytical procedure operations, hot cell operations and 219-S WHF operations. This waste is LDR compliant because it meets the requirements in WAC 173-303-140.	Hazardous constituents are already contained in samples from Hanford generating locations (e.g. Tank Farms, K-Basins, N-Reactor Fuel, PFP). Unused samples, unused or expired standards or reagents.	Waste Stream Fact Sheet (WSFS), Container Disposal Request (CDR), Request for Sample Analysis.
	CWC. Some of subject waste was generated in the early 1990s through various operation activities at the 200 East and 200 West DST and SST Systems. Other portion of subject waste was put into CWC storage in boxes and drums prior to the implementation of the WSS.	Portions of the waste were incidentally contaminated with tank waste. Other waste is equipment from operations and maintenance of DST/SST systems.	Analytical data, process knowledge.
	LLBG. LEF powder drums, tank farm heel jet pump and large T Plant box.	All waste forms contain LDR compliant levels of dangerous waste constituents.	Analytical data and process knowledge.
	PFP. Spent or expired lab chemicals/reagents.	Intrinsically hazardous.	Analytical data, process knowledge.
	T Plant. Expired/excess chemicals from 221-T canyon cleanout, materials from routine maintenance and operations, and contaminated soil. Federal and state LDR compliant waste that does not require additional treatment.	This waste is a result of cleanout activities from the 221-T Canyon and from routine maintenance and operations.	Analytical data and process knowledge.
	WRAP. Can consist of soils, debris, particulates, etc. with LDR compliant levels of hazardous constituents, and/or state-only dangerous constituents. This waste does not include hazardous debris other than incidental debris material commingled with the non-debris.	The waste was from many onsite locations.	Process knowledge.
MLLW-02 Inorganic Non-Debris MLLW	200 ETF. Secondary waste (dry powder) from the treatment of wastewater through the ETF. The contaminants are destroyed or removed from the wastewater and dried to powder.	Wastewaters from various generators on the Hanford Site, for example, 242-A Evaporator process condensate, LLBG mixed waste trench leachate, WSCF laboratory wastewater, etc.	Wastewaters are characterized using analytical data and process knowledge in accordance with the RCRA Waste Analysis Plan for LERF/ETF.

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<b>Table 4.5 – MLLW Waste Description Summary</b>			
<b>LDR Treatability Group</b>	<b>Process</b>	<b>Source of Regulated Constituents</b>	<b>Waste category/ Designation</b>
	222-S. Liquid and/or solid waste from unused or expired standards and reagents, as unused samples, and from the use of chemicals during analytical procedures.	Hazardous constituents were already in the samples received from Hanford Site generating locations or entered the waste stream during sample analysis, or as unused/expired standards and reagents.	Waste Stream Fact Sheet, Content Inventory Sheet, and Generator knowledge.
	324. Discarded/unused chemical products or waste. Chemical products were used for maintenance or clean-up activities.	In the chemical products.	Process knowledge.
	CWC. This waste stream consists of many different inorganic solids including particulates, absorbed liquids, sludges, labpacks, paint waste, salt waste, etc. This waste does not include hazardous debris other than incidental debris material commingled with the non-debris.	The waste was from many onsite locations and offsite generators.	Analytical data and process knowledge.
	PPF. Spent or expired lab chemicals/reagents.	Intrinsically hazardous.	Analytical data, process knowledge.
	T Plant. Mixed waste solids, sorbed liquids and soils, subcategory - other solids (non-thermal treatment). This waste does not include hazardous debris other than incidental debris material commingled with the non-debris.	The waste was from many onsite locations.	Analytical data and/or process knowledge.
	Tank Farms. Unused sample portions returned from the analytical laboratories derived from secondary waste associated with tank farm activities, including rain water, soil sample, etc.	The sample content, or the method of sampling (e.g. sample preservation).	Process knowledge, analytical data, and MSDS.
	WSCF. The inorganic non-debris waste stream, sodium sulfate, is generated during analytical processes in the laboratory. Additionally, a silver zeolite waste stream will be managed under the same treatability group as the sodium sulfate waste stream.	The hazardous constituents are derived from sample contribution and/or the addition of reagents and lab standards during the analytical process. The reagents and standards may be considered regulated constituents and contribute to the hazardous nature of the waste stream.	Information to characterize these waste streams is obtained from process knowledge and analytical data.
MLLW-04A/4B MLLW Debris	200 ETF. Acid waste, caustic waste and process contact debris is from spill clean-up and debris from maintenance activities.	Hanford Site RCRA wastewaters that are treated through the ETF and used oils/greases from LERF/ETF equipment.	Analytical data, source information, MSDS's, process knowledge.
	202-S. Grease and oils used in maintenance activities on the canyon crane way.	Hazardous constituents resulting from equipment maintenance materials.	Process knowledge.

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	222-S. Debris waste from laboratory operations (e.g. analytical procedures, hot cell, maintenance, etc.). Examples of debris items are paper, plastic, and rubber.	The 222-S Laboratory receives mostly Tank Farms samples resulting in all waste listed as F001-F005. Samples may come from any Hanford Site generating location (e.g. ETF, ERDF, K-Basin, etc.). Laboratory standards and reagents and unused samples may result in contaminated debris.	Waste Contents Inventory Sheets, MSDS, Waste Stream Fact Sheets.
	242-A Evaporator. Process contacted debris from maintenance and clean-up activities. Waste is from operation and maintenance activities at the 242-A Evaporator.	From processing DST Waste.	Analytical, source information, MSDS's, process knowledge.
	2724WB. Facility cleanup waste.	Miscellaneous materials containing lead solder/lead debris	Process knowledge.
	324. Waste from decontamination activities using organic solvent.	In the chemical product.	Process knowledge.
	CWC. The waste consists of hazardous debris containing primarily organic and inorganic debris material (e.g., paper, plastic, rubber, wood, cloth, tumbleweeds, rubble, metals, asbestos, etc.) that is contaminated with hazardous constituents. Debris that is contaminated with PCBs at concentrations greater than 50 ppm is not included in this waste.	Waste is debris contaminated with hazardous materials such as F, P, and U listed constituents, RCRA metals, corrosives, etc. The waste was from many onsite locations.	Analytical data and process knowledge.
	LLBG. The waste consists of hazardous debris containing primarily organic and inorganic debris material (e.g., paper, plastic, rubber, wood, cloth, tumbleweeds, rubble, metals, asbestos, etc.) that is contaminated with hazardous constituents. Non-TRU designated waste containers from the TRUM Waste Retrieval Project. Debris that is contaminated with PCBs at concentrations greater than 50 ppm is not included in this waste. In addition, plywood, tarps, PPE, and soil contaminated by breached containers being retrieved from the covered TRUM retrieval project. It is assumed that breached containers hold material that would be regulated as hazardous waste under today's regulations.	Hazardous materials could potentially be commingled with suspect-TRUM waste. Hazardous constituents were not regulated at the time of disposal but are expected to be present. The waste was from many onsite locations. Per Settlement Agreement (draft TPA Milestone M-91-03-01) between DOE-RL and the Washington State Department of Ecology the Waste Retrieval Project waste stream is suspected of being mixed waste.	Process knowledge, analytical data.
	PPF. Waste from routine facility operations and D&D activities.	Materials/debris contaminated with hazardous constituents from operations, construction and D&D activities.	Analytical data, process knowledge

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<b>LDR Treatability Group</b>	<b>Process</b>	<b>Source of Regulated Constituents</b>	<b>Waste category/ Designation</b>
	T Plant. Organic and inorganic debris as a result of 221-T Canyon cleanout (e.g., plastic, rubber, wood, paper, cloth, metals, asbestos, etc.), maintenance, and operational activities.	Operations activities at the T Plant Complex (e.g., repackaging waste). In addition, waste from various onsite generators in which their waste is sent to the T Plant Complex for waste verification/storage/treatment.	Analytical data and process knowledge.
	Tank Farms. Organic and inorganic debris containing regulated material products (paints and paint related products) and/or organic debris which has contacted tank waste. This waste consists of plastic (sheeting, containment tents, glove bags), rubber, cloth (rags and PPE), filters, paper, wood, concrete, metals, asbestos, etc. The containers may also include shielding material such as rubber or lead when necessary.	Debris from tank farms is considered mixed waste when it contains (as described by RCRA "contained-in policy" provisions) tank waste. Debris may also be hazardous due to regulated chemical products.	MSDS, process knowledge and analytical data. The document "Tank Farms Solid Waste Characterization Guide with Sampling and Analysis Attachment", HNF-SD-WM-PLN-119, Rev.1, describes the basis for historical and process knowledge used for designation.
	WRAP. The waste consists of hazardous debris containing organic and inorganic debris material (e.g., paper plastic, rubber, wood, cloth, tumbleweeds, etc.). Debris that is contaminated with PCBs at concentrations greater than 50 ppm is not included in this waste.	Hazardous constituents most likely entered the waste as chemicals used during analytical processes and operating activities.	Analytical data, process knowledge.
	WSCF. TEVA resins and F001-F005 listed solid debris is from discarded lab materials and analytical processes in the lab. The F001-F005 listed solid debris is a result of handling samples that are F-listed. This waste stream consists of debris (e.g., PPE, paper towels, and plastic pipettes) that have been contacted with F-listed constituents.	The hazardous constituents are derived from sample contribution and or the addition of reagents and standards during the analytical process. The reagents and standards may be considered regulated constituents and contribute to the hazardous nature of the waste stream.	Process knowledge and analytical data.
MLLW-05 Lead Solids CWC Stored Waste	222-S. Radioactive lead solids subcategory waste is from general laboratory operations (e.g. hot cell, analytical procedures, and 219-S WHF operations). Lead solids are bricks, shot, and manipulators that are elemental lead and not debris.	Waste is from laboratory operations (e.g. dangerous mixed waste storage area (DMWSA), hot cell, analytical hoods, and 219-S WHF operations). Normally the lead is used as shielding from radiation during Laboratory activities in high radiological contaminated areas. The source of hazardous constituents is Hanford generating facilities (e.g. Tank Farms, K-Basins, PFP, ETF, ERDF, etc.).	Process knowledge.
	324. Lead blocks, lead bricks, lead blankets, lead sheets, and lead shot.	Lead items were used for shielding or counter balances.	Process knowledge.

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LDR Treatability Group	Process	Source of Regulated Constituents	Waste category/ Designation
	CWC. The waste consists of elemental lead solids (bricks, shot, gloves, shielding, etc.). The lead may be commingled with heterogeneous debris or the lead may be a component of a debris article.	The waste was from many onsite locations.	Analytical data and process knowledge.
	PPF. Elemental lead previously used for shielding.	Intrinsically hazardous.	Analytical data, process knowledge.
	T Plant. Radioactive lead solids.	Light-bulb tips.	Process knowledge.
	Tank Farms. Lead waste includes raw lead, lead shots, lead bricks, lead sheets and lead wool which are used in a variety of applications to shield and reduce radiation exposure dose rates.	The lead itself is hazardous, it can also be contaminated with tank waste.	MSDS and process knowledge. "Tank Farm Solid Waste Characterization Guide with Sampling and Analysis Attachment", HNF-SD-WM-PLN-119, REV. 01, describes the basis for historical and process knowledge; and sampling plan for tank farm solid waste.
MLLW-07 High Rad and Large Container MLLW	222-S. Debris waste from laboratory operations (e.g., analytical procedures, hot cell, maintenance, etc.). This waste is at the 222-S Laboratory from operations including analytical procedures, hot cell, 219-S WHF, etc.	Laboratory standards and reagents and unused samples may result in contaminated debris. The 222-S Laboratory receives mostly tank Farms samples resulting in all waste designating as F001-F005. Samples may come from any Hanford generating facility (e.g., ETF, ERDF, K-Basins, etc.).	Waste Contents Inventory Sheets, MSDSs, Waste Stream Fact Sheets.
	325. Waste is from routine operations at PNNL - Laboratory analysis (physical and chemical) and other testing conducted on SST/DST waste and other high dose-rate substances and wastes.	This waste stream consists of liquid waste and debris contaminated with inorganic and organic regulated dangerous waste constituents.	Wastes are characterized as specified in PNNL Waste Stream Profiles.
	CWC. Subject waste is from various sources, however, the primary waste type is heterogeneous debris from the SST/DST Systems operations. Waste is shielded to meet contact handled dose limits for CWC.	The waste was from many onsite locations.	Analytical data; process knowledge.
	T Plant. Savannah River sample returns.	Waste originally came from Tank Farms.	Process knowledge and analytical data.
	Tank Farms. This waste stream includes equipment removed from the DST System and SST System, which can include jumpers, pumps, instrument trees, sluicers, and water or air lances.	Equipment removed from the tank system have contacted tank waste. The source if hazardous constituents is tank waste.	The process knowledge, and analytical data, and sampling plan are described in "Tank Farm Solid Waste Characterization Guide with Sampling and Analysis Attachment", HNF-SD-WM-PLN-119, Rev. 01.
MLLW-09 Radioactively Contaminated Batteries MLLW	324. Used lead acid and cadmium batteries.	Batteries containing hazardous constituents.	Process knowledge.
	CWC. Used lead acid and cadmium batteries.	Batteries containing hazardous constituents.	Process knowledge.

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**Table 1; Hanford Site Generated Cleanup Wastes In Storage Acceptable for Disposal in ERDF**

<b>Table 4.5 – MLLW Waste Description Summary</b>			
<b>LDR Treatability Group</b>	<b>Process</b>	<b>Source of Regulated Constituents</b>	<b>Waste category/ Designation</b>
	PFP. Batteries that were used in emergency lights and other equipment.	Batteries containing hazardous constituents.	Process knowledge.
	T Plant. Used lead acid and cadmium batteries.	Batteries containing hazardous constituents.	Process knowledge.

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**Table 1; Hanford Site Generated Cleanup Wastes In Storage Acceptable for Disposal in ERDF**

**SUMMARY WASTE DATA FOR LLW PROPOSED FOR DISPOSAL IN ERDF**

Low-Level Waste (LLW) currently staged for disposal plus future forecasted LLW from on-site routine surveillance and maintenance operations is proposed to be disposed at the Environmental Restoration Disposal Facility (ERDF). Tables 4.6 and 4.7 provide a summary for waste volume and major contributing radionuclides, respectively, of the LLW currently staged for disposal. The waste is contact-handled with the majority of the waste being Category I LLW. Waste designation is through a combination of analytical sample analyses and process knowledge. Additional waste package information for the waste is maintained in the Solid Waste Information Tracking System (SWITS).

**Table 4.6 – Summary of Currently Staged LLW for Disposal**

<b>Inventory</b>	<b>CH Cat I Volume (m3)</b>	<b>CH Cat III Volume (m3)</b>
Metal Containers	209	48
Wood Box, Cartons	4	2
Drums	19	3
Dump Truck	28	0
<b>Total</b>	<b>260</b>	<b>53</b>

**Table 4.7 - Current LLW Radionuclide Summary (Concentration in Ci/m3)**

<b>Isotope</b>	<b>Avg Conc (Ci/m3)</b>	<b>Max Conc (Ci/m3)</b>	<b>ERDF WAC</b>
Am-241	2.9E-04	6.3E-03	5.0E-02
Np-237	9.7E-06	1.8E-05	1.5E-03
Pu-239	3.9E-04	1.8E-02	2.9E-02
Pu-240	1.2E-04	5.4E-03	2.9E-02
Pu-241	1.8E-03	2.2E-01	6.2E+00
Ra-226	7.8E-08	7.8E-08	1.4E-04
Ra-228	2.7E-07	2.5E-06	2.2E-04
Cs-137	1.2E-03	2.8E-02	3.2E+01
Sr-90	6.5E-03	7.2E-02	7.0E+03
Tc-99	1.9E-04	5.2E-04	1.3E+00
C-14	0.0E+00	0.0E+00	5.1E+00
Total U	5.5E-06	4.1E-05	*9.6E-03

\* The Total U concentration criteria is taken as the ERDF Trigger Level of 3 Ci divided by the total volume of waste.

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**Table 1; Hanford Site Generated Cleanup Wastes In Storage Acceptable for Disposal in ERDF**

Tables 4.8 and 4.9 provide a summary for waste volume and major contributing radionuclides, respectively, of the LLW forecasted to be generated from on-site routine surveillance and maintenance operations. Forecasted LLW consists of contact and remote handled Category I and III LLW. Waste designation developed for the forecasted waste is based on historical waste generation rates and waste characteristics from inventory records, NDA/NDE data, and sample analysis data. Additional information on the forecasted waste streams is maintained in the Solid Waste Integration Forecasting Tool (SWIFT) Report.

**Table 4.8 – Summary of Forecasted LLW for Disposal**

Forecast	CH Cat I Volume (m3)	CH Cat III Volume (m3)	RH Cat I Volume (m3)	RH Cat III Volume (m3)
Drums	4052	97	0	26
Bulk	2118	0	0	0
Box	9032	592	187	0
Metal Box	49	0	0	0
Plastic Wrap	69	0	0	0
Self Contained, Other	4359	3	0	0
<b>Total</b>	<b>19680</b>	<b>691</b>	<b>187</b>	<b>26</b>

**Table 4.9 - Current LLW Radionuclide Summary (Concentration in Ci/m3)**

Isotope	Avg Conc (Ci/m3)	Max Conc (Ci/m3)	ERDF WAC
Am-241	2.5E-04	4.3E-03	5.0E-02
Am-243	4.5E-08	4.5E-08	5.7E-02
C-14	5.7E-05	7.0E-04	5.1E+00
Cs-137	6.9E-03	1.6E+00	3.2E+01
I-129	8.7E-07	8.7E-07	8.0E-02
Sr-90	6.0E-06	6.0E-06	7.0E+03

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**Table 1; Hanford Site Generated Cleanup Wastes In Storage Acceptable for Disposal in ERDF**

Summary waste descriptions of currently staged LLW and forecasted LLW, by on-site generators, are provided in Table 4.10.

**Table 4.10 – LLW Waste Description Summary**

<b>Generating Process</b>	<b>Source of Radiological Constituents</b>	<b>Waste category/ Designation</b>
200 ETF. Radiologically contaminated waste (debris) from operations and maintenance activities in the ETF.	Debris (PPE, paper, plastic, etc.) from groundwater sampling at the LERF and SALDS monitoring wells.	The waste characteristics are based on knowledge of past operations and the wastes from the 200 Area liquid effluent facilities.
209-E. Waste is from routine radiological zone entries associated with ongoing surveillance and maintenance activities.	Incidental contamination from contact with residual contamination remaining after shutdown of the facility which operated as a critical mass laboratory.	Waste characteristics are based on NDA data, inventory records, and historical data for radionuclides, physical waste forms, and WSRd.
222-S. Waste from general maintenance, analytical procedure operations, hot cell operations and 219-S WHF operations. This waste is LDR compliant because it meets the requirements in WAC 173-303-140.	Hazardous constituents are already contained in samples from Hanford generating locations (e.g. Tank Farms, K-Basins, N-Reactor Fuel, PFP). Unused samples, unused or expired standards or reagents.	Waste Stream Fact Sheet (WSFS), Container Disposal Request (CDR), Request for Sample Analysis.
224-B. Debris waste from routine radiological zone entries associated with ongoing surveillance and maintenance activities.	Incidental contamination from contact with residual contamination remaining after shutdown of the facility. The facility's main function was to further decontaminate recovered plutonium by replacing the bismuth phosphate carrier with more efficient lanthanum fluoride.	Waste characteristics are based on NDA data, inventory records, and historical data for radionuclides, physical waste forms, and WSRd.
224-T. Debris waste from routine radiological zone entries associated with ongoing surveillance and maintenance activities.	Incidental contamination from contact with residual contamination from Pu recovery operations from irradiated fuel remaining after shutdown of the facility.	Waste characteristics are based on NDA data, inventory records, and historical data for radionuclides, physical waste forms, and WSRd.
324. Wastes from routine operations and maintenance activities as well as deactivation of the facility's hot cells, pipe trench, vaults, and laboratories.	Incidental contamination from contact with residual contamination remaining after shutdown of the facility which supported research operations on radioisotopes.	Process knowledge.
300 TEDF. Secondary waste (bulk waste) from the treatment of wastewater through the TEDF.	Wastewaters from various generators in the 300 Area, primarily PNNL facilities.	Wastewaters are characterized using analytical data and process knowledge.
340. Debris waste from routine radiological zone entries associated with ongoing surveillance and maintenance activities.	Radioactive waste from research facilities (i.e., 324, 325, 327, 329, etc.) in the 300 Area.	Waste characteristics are based on inventory records, and historical data.
PFP. LLW is from routine facility operations at PFP. The majority of the LLW consists of step off pad waste, equipment and debris from facility upgrades.	Pu processing activities performed at PFP.	The waste characteristics, hazardous constituents, physical waste form and WSRd selection is based on historical data and the current chemical inventory from the PFP Facility. Radioculide inventory is based on historical data.
B Plant. Debris waste from routine radiological zone entries associated with ongoing surveillance and maintenance activities.	Incidental contamination from High Level Waste processed through the plant for past radionuclide separation processes.	Analytical data and process knowledge.
ERC. Waste from lab analysis and clean up of oil spill.	Existing waste inventory.	Analytical data and process knowledge.
Tank Farms. Construction debris and other bulk waste from routine radiological zone entries associated with ongoing surveillance and maintenance activities.	Incidental contamination from HLW in underground storage tanks.	Analytical data and process knowledge.
FFTF. Waste (PPE, bulk waste, ion exchange filters) from routine radiological zone entries associated with ongoing surveillance and maintenance activities and sodium removal.	Incidental contamination from past reactor operations.	Analytical data and process knowledge.
Site Services. Contaminated tumbleweeds, PPE, soil.	Non-routine contaminated waste found during maintenance or shutdown activities.	Process knowledge.

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**Table 1; Hanford Site Generated Cleanup Wastes In Storage Acceptable for Disposal in ERDF**

**Table 4.10 – LLW Waste Description Summary**

<b>Generating Process</b>	<b>Source of Radiological Constituents</b>	<b>Waste category/ Designation</b>
K-Basins. Debris waste from routine radiological zone entries associated with ongoing surveillance and maintenance activities.	Incidental contamination from spent fuel stored in the K-Basins.	Process knowledge.
LLBG. Debris waste from routine radiological zone entries, bulk waste (dunnage, trailers, soil/graves) from LLBG operations.	The waste was from many onsite locations.	Analytical data, process knowledge.
T Plant. Inorganic and debris secondary wastes from decontamination/verification operations.	The waste was from many onsite locations.	Process knowledge.
WESF. Wastes from routine operations and maintenance activities as well as deactivation of the facility's hot cells.	Incidental contamination from past Cs and Sr encapsulation activities.	Analytical data, process knowledge.
WRAP. Secondary waste from characterization, processing, verification, and certification of Hanford's newly generated and retrieved waste.	The waste was from many onsite locations.	Analytical data, process knowledge.
WSCF. Solidified rad liquid, packaged dirt/soil samples, and miscellaneous LLW from routine operations and maintenance activities.	Environmental media (groundwater and soil samples from onsite locations) and industrial hygiene samples.	Analytical data, process knowledge.
PNNL. Solidified liquids and debris waste.	Research laboratories (325, RTR, etc.) located in the 300 Area.	Process knowledge.
PUREX. Debris waste from routine radiological zone entries associated with ongoing surveillance and maintenance activities.	Incidental contamination from contact with residual contamination from Pu recovery operations from irradiated fuel remaining after shutdown of the facility.	Waste characteristics are based on NDA data, inventory records, and historical data for radionuclides, physical waste forms, and WSRd.
REDOX. Debris waste from routine radiological zone entries associated with ongoing surveillance and maintenance activities.	Incidental contamination from past radionuclide separation processes.	Process knowledge.
U Plant. Debris waste from demolition activities.	Debris waste from demolition activities.	Process knowledge.