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Annual Status Report (FY 2024): Performance Assessment for the Integrated Disposal Facility

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

P.O. Box 550
Richland, Washington 99352

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Executive Summary

The purpose of this Annual Summary Report (ASR) for Fiscal Year (FY) 2024 is to evaluate the continued adequacy of the Integrated Disposal Facility (IDF) Performance Assessment (PA) and Disposal Authorization Statement (DAS). This report consolidates relevant monitoring data, modeling analyses, and regulatory reviews to demonstrate a reasonable expectation that the PA objectives and performance measures will be met, as required under DOE O 435.1. The ASR follows the guidance in DOE-STD-5002-2017, which provides a framework for maintaining the validity of the DAS through periodic assessment of facility performance and compliance with waste disposal requirements.

The IDF is a near-surface disposal facility designed to receive and permanently dispose of low-level waste (LLW) and mixed low-level waste (MLLW) generated from Hanford Site operations. The facility consists of two double-lined disposal cells equipped with leak detection and leachates recovery systems to ensure environmental protection. Waste planned for disposal includes vitrified low-activity waste (LAW) and solid secondary waste (SSW) from the Hanford Waste Treatment and Immobilization Plant (WTP).

At the end of FY 2024, the IDF had not yet received any waste, as it remains in a pre-operational state. Disposal activities will begin with the hot commissioning of the WTP LAW Vitrification Facility using the Direct-Feed Low-Activity Waste (DFLAW) approach in Calendar Year (CY) 2025.

This ASR justifies the continued adequacy of the PA and DAS by reviewing key documents and data sources. these sources are listed in Table A-2 in Appendix A.4):

The Operating Disposal Authorization Statement (ODAS) for the IDF (DOE-EM, 2021) remains in effect, with no outstanding conditions or key issues affecting its implementation. Based on the comprehensive review of PA analyses, monitoring data, and regulatory compliance activities, this ASR concludes that the IDF remains in compliance with DOE O 435.1, and there is reasonable assurance that the PA performance objectives will be met once disposal operations commence in CY 2025.

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Table of Contents

List of Appendices

List of Figures

List of Tables

Terms

ASR	Annual Summary Report
CY	calendar year
DAS	Disposal Authorization Statement
DFLAW	Direct-Feed Low-Activity Waste
DOE	U.S. Department of Energy
Ecology	State of Washington Department of Ecology
EDA	Environmental Dashboard Application (https://ehs.hanford.gov/eda)
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
EWG	Enhanced Waste Glass
FY	fiscal year
HEPA	high-efficiency particulate air (filter)
IDF	Hanford Integrated Disposal Facility
ILAW	Immobilized Low-Activity Waste
LAW	Low-Activity Waste
LCRS	leachate collection and recovery system
LDS	leak detection system
LFRG	Low-Level Waste Disposal Facility Federal Review Group
LLW	Low-Level Waste
MLLW	Mixed Low-Level Waste
ODAS	Operating Disposal Authorization Statement
P2R	Plateau-to-River
PA	Performance Assessment
PCT	Product Consistency Test
RCRA	*Resource Conservation and Recovery Act*

Terms

RWMB	Radioactive Waste Management Basis
S/V	surface-to-volume
SA	Special Analysis
SME	subject matter expert
SSW	solid secondary waste
TER	Technical Evaluation Report
UCAQE	Unreviewed Composite Analysis Question Evaluation
UDQ	Unreviewed Waste Disposal Question
UDQE	Unreviewed Disposal Question Evaluation (also UDQ-E)
UDQ-S	Unreviewed Disposal Question Screening
UDQ-SA	Unreviewed Disposal Question Special Analysis
UHPG	ultra-high-performance grout
VLAW	vitrified/immobilized low-activity waste
WAC	waste acceptance criteria
WDOH	Washington State Department of Health
WIR	Waste Incidental to Reprocessing
WTP	Hanford Tank Waste Treatment and Immobilization Plant

1 Changes Potentially Affecting the Performance Assessment for the Disposal Authorization Statement

This chapter outlines all potential or actual changes, discoveries, proposed actions, and new information identified during the reporting period of fiscal year (FY) 2024 (October 1, 2023, through September 30, 2024) for the Integrated Disposal Facility (IDF) Performance Assessment (PA)

The IDF PA change control process (IDF-PRO-EN-54165, *Change Control Process*) is the process used to evaluate whether new information discovered through the performance of PA maintenance activities or otherwise acquired could cause releases from the IDF to not comply with performance objectives specified in DOE M 435.1-1 and other Federal, State, and local regulatory requirements. A listing of all UDQs and UDQ-SAs is provided in Appendix A.

In FY 2024, two UDQs were screened under the Change Control Process:

- **IDF-UDQ-2024-001**, MLLW soil and debris waste streams generated during DFLAW operations at Hanford's tank farms currently disposed at the Environmental Restoration Disposal Facility (ERDF) that are being considered for disposal at the IDF. This UDQ-S evaluated the potential disposal of mixed low-level MLLW soil and debris from DFLAW operations at the IDF. The analysis confirmed that the waste streams do not exceed established PA performance objectives and will have a negligible impact on the overall PA conclusions.
- **IDF-UDQ-2024-002**, Update of the Plateau-to-River (P2R) groundwater flow and transport model. This UDQ-S assessed updates to the P2R groundwater model version 9.1 which introduced new parameter values for saturated zone flow and transport near the IDF. A full UDQ evaluation will be completed in FY 2025 to determine if the changes affect RPP-CALC-64672, the most recent special analysis for IDF PA groundwater modeling.

The UDQ evaluation was completed in FY 2024 for IDF-UDQ-2024-001. A UDQ evaluation will be completed in FY 2025 for IDF-UDQ-2024-002. The screening and evaluation of these two FY 2024 UDQs is summarized below.

During FY 2024, there were no formal decisions that result in divergences from the expected or planned conditions simulated in the IDF PA and there were no changes to IDF operations or design from that described in the IDF PA.

Table 1. Potential Changes Affecting the Performance Assessment, Composite Analysis, Disposal Authorization Statement or Radioactive Waste Management Basis

Disposal Facility / Unit	UDQE/UCAQE or Change Control Process Identification Number	Change, Discovery, Proposed Action, New Information Description	Evaluation Results	Special Analysis Number	PA, CA, DAS or RWMB Impacts
IDF	UDQ-IDF-2024-001	Mixed Low-Level Waste debris (concrete blocks, steel plates, and soil), that will be generated during Direct-Feed Low-Activity Waste operations are being considered for disposal at the IDF as ungrouted, packaged drums or boxes.	Impact on groundwater was found to be negligible.	Not required.	None
IDF	UDQ-IDF-2024-002	Assessed updates to the P2R groundwater model version 9.1 which introduced new parameter values for saturated zone flow and transport near the IDF.	Evaluation Required	TBD	TBD

CA = Composite Analysis
DAS = Disposal Authorization Statement
IDF = Hanford Integrated Disposal Facility
RWMB = Radioactive Waste Management Basis
UCAQE = Unreviewed Composite Analysis Question Evaluation
UDQE = Unreviewed Disposal Question Evaluation
PA = Performance Assessment

2 Cumulative Effects Of Changes

In accordance with DOE M 435.1-1, *Radioactive Waste Management Manual*, and DOE-STD-5002-2017, *Disposal Authorization Statement and Tank Closure Documentation*, the purpose of this chapter is to identify any cumulative effects of changes in facility operations, waste receipts, waste form behavior, monitoring data, research and development (R&D) data, or land-use decisions during the reporting period that have affected PA assumptions and conclusions, collectively representing the radioactive waste management basis (RWMB).

The RWMB for IDF is provided in CPCC-MP-WM-52872, *Waste Management Basis*. Appendix F of CPCC-MP-WM-52872 provides the facility-specific information and documents.

No programmatic decisions were made in FY 2024 and no substantive changes have occurred in disposal facility operations, disposal facility performance, and PA assumptions or results (Table 1), therefore resulting in no additional cumulative effects.

3 Waste Receipts

The IDF had not received any waste through the end of FY 2024. No waste receipts are anticipated until the WTP LAW Vitrification Facility hot commissioning period begins in 2025.

4 Monitoring

Although no waste has been disposed of in the IDF, monitoring activities are conducted to establish baseline environmental conditions and to meet the requirements of the Hanford Resource Conservation and Recovery Act (RCRA) Permit. These activities provide a foundation for future compliance assessments by defining pre-disposal conditions for air and groundwater quality. The monitoring data collected also contributes to performance monitoring, ensuring that IDF infrastructure, such as the liner system and leak detection sumps, functions as expected prior to waste disposal. Performance monitoring is limited to reviewing the volume of water collected in the leak detection sumps to evaluate the performance of the liner system and monitoring for model validation, which is addressed through PA maintenance activities described in Chapter 6.

This chapter describes IDF relevant monitoring results for FY 2024. Monitoring results are maintained in an online database (https://ehs.hanford.gov/eda) referred to as the Environmental Dashboard Application (EDA). All monitoring results discussed in the annual reports are available through the EDA and are taken from the latest available monitoring report.

- The most recent sitewide environmental monitoring report is DOE/RL-2024-10, *Hanford Annual Site Environmental Report for Calendar Year 2023*. This document is available online at: https://hmis.hanford.gov/files.cfm/DOE-RL-2024-10_-_Rev_00_FULLREPORT.pdf
- The most recent groundwater monitoring report is DOE/RL-2023-54, *Hanford Site Groundwater Monitoring Report for 2023*. This document is available online at: https://www.hanford.gov/files.cfm/DOE-RL-2023-54_-_Rev_00.pdf

4.1 Ambient Air Monitoring

Air monitoring requirements for the IDF are specified in the air operating permit #00-05-006 Renewal 3[1]. In the permit, radionuclide emission monitoring at the IDF is governed by the Site-Wide Radioactive Air Emissions License (#FF-01) issued by the State of Washington Department of Health (WDOH), Office of Radiation Protection. In the license, the IDF is emission unit #1464.

Air monitoring results for FY 2024 are summarized in Table 2, which presents ambient air concentrations measured at the IDF monitoring stations (N532 and N559). Although no waste has been disposed of at the IDF, ambient concentrations of radionuclides are not expected to be zero due to background levels of airborne particulates from regional sources, including historical Hanford Site operation, natural environmental sources, and atmospheric transport from other areas. The data in Table 2 establish baseline conditions for air quality in the IDF vicinity before waste disposal begins. These values will serve as point of comparison for future monitoring to assess potential air emissions.

None of the air monitoring stations had a radionuclide concentration results above the respective reporting threshold value (i.e., 10%) of Title 40, *Code of Federal Regulations*, Part 61 “National

[1] https://fortress.wa.gov/ecy/nwp/permitting/AIR/AOP/renewal/three/index.html

Emission Standards for Hazardous Air Pollutants" (40 CFR 61), Appendix E, Table 2 concentration values.

Postclosure monitoring for iodine-129 in the ambient air samplers is required by the monitoring plan (CHPRC-03347). Iodine-129 is the only radionuclide in the IDF monitoring plan that is not part of the sitewide ambient monitoring plan in the vicinity of the IDF. At the end of FY 2024, the additional sampling equipment needed to sample iodine-129 in the ambient air had not been installed because the IDF will not be in postclosure monitoring for several decades.

Table 2. Average and Maximum Ambient Air Monitoring Results for the Integrated Disposal Facility in Fiscal Year 2024

Radionuclide	Number of Samples	Average[a] (pCi/m^3)	Maximum[b] (pCi/m^3)	EPA Air Conc Limit[c,d] (pCi/m^3)
gross α	52	1.73E-03	3.98E-03	2.00E-02
gross β	52	1.80E-02	5.25E-02	9.00E+00
^{3}H	Not Available in the Environmental Dashboard Application			1.5E+03
^{60}Co	4	<0	3.85E-05	1.7E-02
^{90}Sr	4	<0	1.11E-04	1.9E-02
^{137}Cs	4	5.03E-05	1.60E-04	1.9E-02
^{238}Pu	4	2.66E-06	1.16E-05	2.1E-03
$^{239/240}Pu$	4	<0	1.63E-06	2.0E-03
$^{233/234}U$	4	4.08E-06	8.47E-06	7.7E-03
^{235}U	4	3.89E-06	1.11E-05	7.1E-03
^{238}U	4	4.21E-06	8.28E-06	8.3E-03
^{241}Am	Not Available in the Environmental Dashboard Application			1.9E-03
^{241}Pu	Not Available in the Environmental Dashboard Application			1.9E-01

Source: Environmental Dashboard Application (https://ehs.hanford.gov/eda) queried on November 18, 2024.
NOTE: "<0" indicates that measurement error resulted in negative concentrations for one or more samples that contributed to a negative average value.
NOTE: Ambient Air Monitoring Results for prior fiscal years are summarized in the FY 2023 Annual Summary Report. They have been removed from the FY 2024 ASR based on a LFRG review comment on the FY 2023 ASR.
[a] Average of all samples analyzed.
[b] Maximum of all samples analyzed.
[c] The site air monitoring program applies Pu-239/240 standards for gross α | Sr-90 standards for gross β.
[d] U.S. Environmental Protection Agency (EPA) values are based on an effective dose equivalent of 10 mrem/yr (40 CFR 61, "National Emission Standards for Hazardous Air Pollutants," Appendix E, Table 2).

4.2 Groundwater Monitoring

Groundwater at the Hanford Site is monitored under various sampling and analysis plans that are reviewed and/or approved by the DOE, State of Washington Department of Ecology (Ecology), and EPA. The IDF has a specific groundwater monitoring plan, DOE/RL-2019-29,

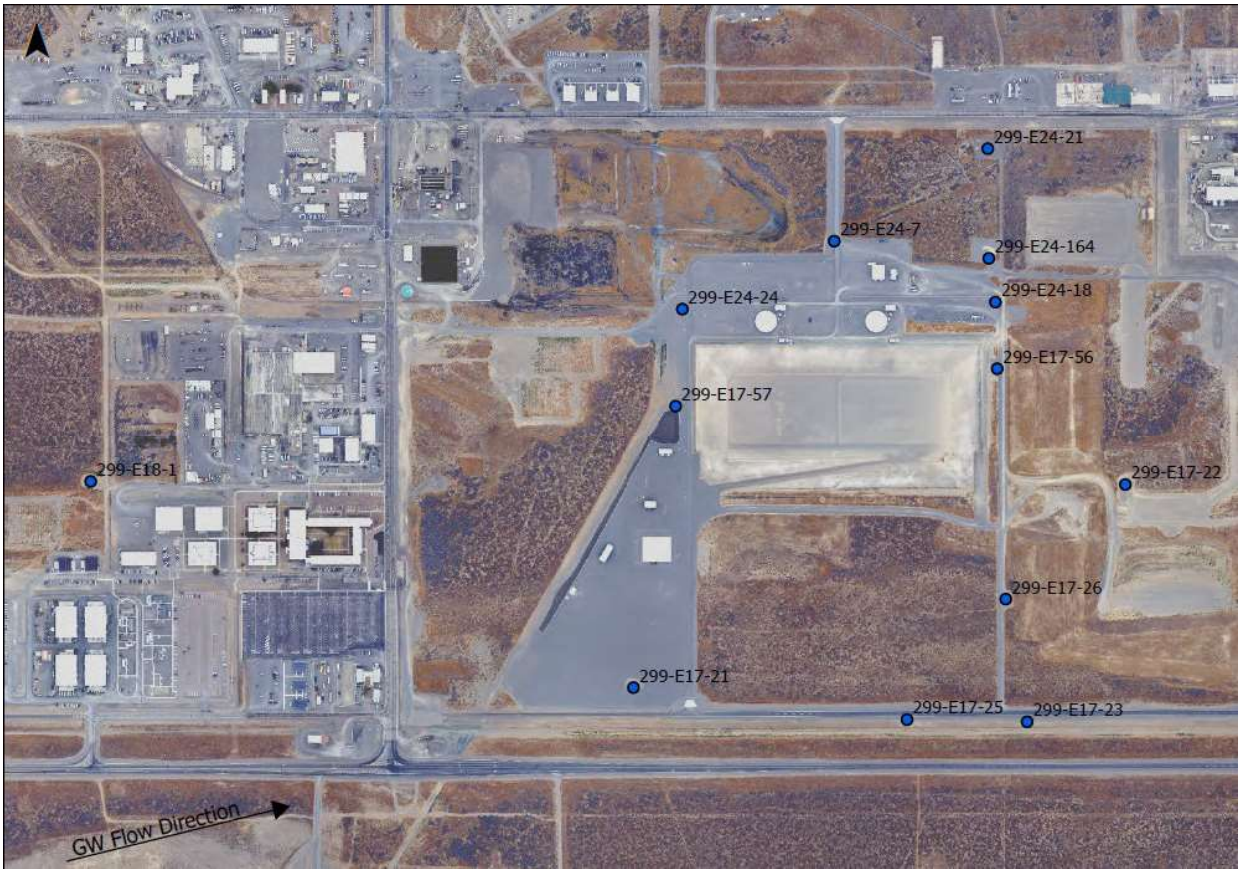
Groundwater Monitoring Plan for the Integrated Disposal Facility. Ecology approved DOE's request to begin baseline sampling under the revised monitoring program in 2020 and the revised program is in the process of being incorporated into the *Resource Conservation and Recovery Act of 1976* (RCRA) Permit (WA7890008967, *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion Revision 8C for the Treatment, Storage, and Disposal of Dangerous Waste*). Due to the reporting cycle for the groundwater monitoring program, the results presented in Table 4 reflect sampling and analyses completed in CY 2023 that were reported in DOE/RL-2023-54 (September 2024). Figure 10-30 and Table B-30 in DOE/RL-2023-54 present the IDF monitoring networks in 2023.

The current monitoring objective is to collect baseline groundwater information prior to waste disposal at the IDF. DOE monitors groundwater beneath IDF in accordance with Title 40, *Code of Federal Regulations*, Part 264, "Standards for Owners and operators of Hazardous Waste Treatment, Storage, and Disposal Facilities", Subpart F, "Releases from Solid Waste Management Units." Although no waste has been disposed of at the IDF, monitoring is required under the Hanford RCRA Permit to establish pre-disposal conditions and detect any pre-existing contamination in groundwater. During FY 2024, IDF was sampled in compliance to the requirements specified in the Hanford RCRA Permit (annual sampling schedule), as well as in the revised monitoring plan (semiannual sampling).

The IDF groundwater monitoring network as defined collectively under the Hanford RCRA Permit (WA7890008967) and DOE/RL-2019-29 consists of three upgradient wells and eight downgradient wells (Figure 1 and Table 4). However, due to changes in the flow direction since the Hanford RCRA Permit was issued, three of the wells (299-E17-23, 299-E17-25, and 299-E17-26) are currently cross-gradient and well 299-E17-22 is cross-gradient or downgradient. Well 299-E24-21 is designated as upgradient in Part III, OUG-11, Chapter 5.0 of the Hanford RCRA Permit but is downgradient in the revised groundwater monitoring plan (DOE/RL-2019-29). Under current groundwater flow conditions, well 299-E24-21 is downgradient.

Groundwater monitoring data (Table 5) indicates the presence of contaminants such as nitrate, iodine-129, technetium-99, and gross beta radiation in some wells. This contamination is not associated with IDF operations but originates from historical releases in the 200 East Area of Hanford. Groundwater flow transport pre-existing contamination beneath the IDF, making ongoing monitoring essential for establishing baseline conditions before waste disposal begins.

Figure 1. Groundwater Monitoring Wells in the Vicinity of the Integrated Disposal Facility



Note: Well 299-E24-7 was decommissioned in 2001. Upgradient well 299-E17-21 is not part of the monitoring network established in DOE/RL-2019-29, *Groundwater Monitoring Plan for the Integrated Disposal Facility*, REV. 1. In the figure, North is at the top of the figure and the groundwater flow direction moves to the right in a generally easterly direction.

Table 3. Hanford Integrated Disposal Facility Groundwater Monitoring Network

Well Name	Location	Year Installed	Hydraulic Head (m)	Hydraulic Head Date	Elevation Top of Screen (m)	Elevation Bottom of Screen (m)
299-E17-22	DG	2002	121.489	3/24/2023	122.6	111.9
299-E17-23	DG	2002	121.458	3/24/2023	122.3	111.6
299-E17-25	DG	2002	121.497	3/24/2023	122.4	111.8
299-E17-26	DG	2005	121.56	7/7/2022	121.4	110.7
299-E17-56	DG	2019	121.46	7/7/2022	122.1	116
299-E17-57	UG	2019	120.87	7/11/2022	121.1	115
299-E18-1	UG	1988	121.490	3/24/2023	125.5	119.2
299-E24-164	DG	2019	121.39	7/7/2022	121.8	114.1
299-E24-18	DG	1988	121.456	3/28/2023	126	119.6
299-E24-21	CG	2001	121.468	3/28/2023	122.7	116.6
299-E24-24	UG	2005	121.489	3/28/2023	122.5	111.9

Source: DOE/RL-2023-54, *Hanford Site Groundwater Monitoring Report for 2023*, Table A-3. DOE/RL-2023-54 was published in September 2024. NR = Not reported for CY 2023 in DOE/RL-2023-54.

Note: Hydraulic head values reported to the nearest mm in DOE/RL-2023-54.
CG = cross gradient
DG = downgradient
UG = upgradient

Table 4. Fiscal Year 2024 Maximum Groundwater Concentrations for Samples in the Integrated Disposal Facility Groundwater Monitoring Network

Well	Fiscal Year	Nitrate (mg/L)	Iron (unfiltered) (µg/L)	Gross α (pCi/L)	Gross β (pCi/L)	Tritium (pCi/L)	Iodine-129 (pCi/L)	Technetium-99 (pCi/L)
299-E17-22	2024	87.2 (D)	97.5 (B)	5.37	201	9830	0.402 (U)	276
299-E17-23	2024	52.7 (D)	30 (U)	3.9 (N)	25.5	14000	0.259 (U)	31.6 (U)
299-E17-25	2024	56.2 (D)	39.2 (U)	3.7 (N)	29.6	28900	0.616 (U)	49.9
299-E17-26	2024	NR	NR	5.45	36.9	NR	0.472 (U)	47.9
299-E17-56	2024	66 (D)	30 (U)	NR	NR	NR	NR	NR
299-E17-57	2024	86.3 (D)	229	NR	NR	NR	NR	NR
299-E18-1	2024	11.1 (D)	658	3.27	7.86	375	0.312 (U)	-0.28 (U)
299-E24-18	2024	73 (D)	203	5.35	103	4210	0.366 (U)	145
299-E24-21	2024	57.1 (D)	42.9 (B)	6.11	139	NR	0.343 (U)	210
299-E24-24	2024	66.4 (D)	39.2 (U)	2.73	52.6	NR	0.0113 (U)	64.4
299-E24-164	2024	79.7 (D)	NR	NR	NR	NR	NR	NR

Source: Hanford Site Environmental Dashboard Application queried for the Integrated Disposal Facility monitoring well network on December 9, 2024.
B = Below contract required detection limit
C = The analyte was detected in both the sample and the associated quality control blank.
D = reported at a secondary dilution factor
N = spike and/or spike duplicate sample recovery is outside control limits
NR = Not Reported
U /UY = Below detection limit
X = False positive

4.3 Leak Detection Monitoring

Washington Administrative Code 173-303-665, "Landfills" and the IDF RCRA permit conditions for the IDF require leakage rate monitoring and an approved Response Action Plan. Leakage from each disposal cell is monitored in accordance with procedure IDF-PRO-PM-53955, *Data Collection Process* and documented in the IDF Operating Record.

During Pre-Active Life, monitoring for the presence of liquid in the secondary leak detection system sumps is performed quarterly and monitoring the action leakage rate for the primary leak detection system is performed quarterly and after storms (WA7890008967 Table 6-2). A storm is defined as any atmospheric disturbance with either wind gust of 56.3 kilometers per hour or greater, or precipitation exceeding 0.5 inches in a 24-hour period. During Active Life,

monitoring the action leakage rate for the primary leak detection system will be performed weekly and after storms and monitoring for the presence of liquids in the secondary leak detection system sumps will be performed monthly.

In December 2023, March 2024, June 2024, and September 2024, water removed from the leachate collection and recovery system (LCRS) and water levels in the leak detection system (LDS) sumps of Cell 1 and Cell 2 were monitored in accordance with IDF-PRO-PM-53955.

- The volumes of water removed from the LCRS for Cell 1 for the four reporting periods was 2,347 gal, 1,433 gal, 627 gal and 1,275 gal, respectively.
- The volumes of water removed from the LCRS for Cell 2 for the four reporting periods was 3,570 gal, 2,465 gal, 268 gal and 666 gal, respectively.
- The leakage rate from the LDS in each cell during these monitoring periods was 0 gallons/day, which is less than the approved Action Leakage Rate of 206 gallons/acre/day established in the Response Action Plan in the IDF RCRA Permit.

5 Research and Development

The research and development section of this ASR focuses on work conducted and documented in FY 2024. Generally, work completed in FY 2024 was performed in FY 2023 or FY 2024. The research is aligned with the PA Maintenance activities presented in Table 6-1 of the PA Maintenance Plan (CHPRC-03348, *Performance Assessment Maintenance Plan for the Integrated Disposal Facility*). Research and development activities focus on collecting data that pertain to PA key assumptions. Current research and development activities are focused on performance of the waste forms that will be relied upon to immobilize the waste that will be disposed of in the IDF. Future decisions regarding the potential adoption of enhanced or modified waste forms is discussed in Chapter 6.

Table 5 summarizes the research and development activities that are discussed in this section. Discussion of earlier research and development activities is summarized in previous year ASRs and discussion of plans for research and development that are expected to provide results in FY 2025 that may impact contemplated changes are discussed in Chapter 6.

Table 5. Fiscal Year 2024 Research and Development Activities for Critical Assumptions

Document Number	Results	PA, CA, DAS or RWMB Impacts
PNNL-36443 *Field-Scale Lysimeter Studies of Low Activity Waste Forms Degradation - Implementation and Status*.	Results to date indicate that the rate at which contaminants leach out of grout waste forms has stabilized (i.e., reached a near-constant release rate) within approximately three years. This trend was observed primarily in lysimeters that experienced the highest infiltrations rates, meaning those exposed to more water infiltration. Higher infiltration rates accelerate the initial leaching of contaminants, but over time, the release rate stabilizes as dissolution and diffusion process reach equilibrium.	None
PNNL-35638 *EWG Glass Corrosion Program Summary Report*	Results of property-composition modeling and benchmarking against glass dissolution test data for other glasses, including baseline waste glass analyzed in the IDF PA indicate the models can cover the wider glass composition space. Additionally, glass dissolution rates derived from the models indicate predicted contaminant release rates will be one to two orders-of-magnitude lower than the representative rates calculated for the 2018 IDF PA analysis.	None
VSL-24S5500-1 *Compilation of VSL Long-Term PCT Data for LAW Glasses, 2010-2024,*	The long-term performance of ILAW glasses is influenced by their composition, particularly the presence of Zr, Sn, and Ca. The formation of secondary phases, such as zeolites and phyllosilicates, plays a critical role in the alteration process. The findings provide valuable insights for optimizing glass formulations to enhance their durability.	None
SRNL-STI-2024-00003 *Full Scale HEPA Filter Encapsulation in Ultra-High-Performance Grout - Proof of Concept*	The results of the proof-of-concept indicate that the Ultra High Performing Grout was observed to completely encapsulate the filters and bonded to the external surfaces of materials comprising the filters. No cracks were observed in the sectioned waste forms	None

CA = Composite Analysis
DAS = Disposal Authorization Statement
FY = Fiscal Year
IDF = Hanford Integrated Disposal Facility
ILAW = immobilized low-activity waste
PA = Performance Assessment
RWMB = Radioactive Waste Management Basis

References:

PNNL-35638, 2024, *EWG Glass Corrosion Program Summary Report*, Rev. 0
PNNL-36443, 2024, *Field-Scale Lysimeter Studies of Low-Activity Waste Forms Degradation*, Rev. 0
SRNL-STI-2024-00003, 2024, *Full Scale HEPA Filter Encapsulation in Ultra-High-Performance Grout - Proof of Concept*.
VSL-24S5500-1, 2024, *Compilation of VSL Long-Term PCT Data for LAW Glasses, 2010-2024*, Rev. 0

5.1 Waste Form Lysimeters

Research and development activities related to use of a lysimeter to collect waste form performance data in a simulated disposal environment are identified in the IDF PA Maintenance Plan in Section 4.9. The waste form studies include baseline glass formulations evaluated in the IDF PA (LAWA44), Enforced Waste Glass (EWG) formulations (ORLEC28 or IDF18-A161), solidified liquid secondary waste, and LAW cast stone.

The status of the field-scale lysimeter study conducted at the Hanford Site to investigate the durability of glass and grout waste forms is summarized in PNNL-36443, *Field-Scale Lysimeter Studies of Low-Activity Waste Forms Degradation*. The study provides data on waste form stability, contaminant release, and transport in a near-field environment relevant to the IDF. The findings will enhance process models for future IDF performance assessments. Key findings to date include:

- **Lysimeter Setup**: The study utilizes 14 large cylindrical drainage lysimeters and an underground sample gallery. Eight lysimeters have been completed, with various cementitious and glass waste forms installed. Glass waste forms are spiked with Re and Mo tracers while grout waste forms are spiked with technetium-99 and iodine-127 tracers.
- **Controlled Conditions**: Soil moisture conditions are controlled to reduce variability and facilitate modeling. Different irrigation rates are applied (i.e. 5, 20, & 50 cm/yr) which are accelerated compared to IDF conditions (0.9 to 3.5 mm/yr).
- **Sampling and Analysis**: Water and gas samples are collected quarterly. Results show observable effects of waste forms on water quality in terms of contaminant release, with differences noted between waste form types and irrigation rates. Notably, glass release rates are much lower than grout, as expected. Different grout formulations show different release rates providing insight into preferred grout formulations and improved knowledge of grout release mechanisms.
- **Modeling and Observations**: Initial modeling efforts have been informative but require further refinement to accurately predict waste form behavior and contaminant transport.

5.2 Glass Corrosion Testing

The Immobilized Low Activity Waste (ILAW) Glass Testing Program work to date is summarized in PNNL-35638, *EWG Glass Corrosion Program Summary Report*. It focuses on information related to the corrosion of EWGs for disposal in the IDF. It describes improvements to the ILAW glass corrosion model since the 2018 IDF PA was issued based on extensive glass corrosion testing and statistical analysis of experimental data.

The report describes Composition Parameter Correlation models that have been developed to link glass durability/performance to glass composition. The primary goal is to use these property-composition models to project the performance of ILAW glasses based on their composition. This creates process flexibility by removing constraints on glass production to only select compositions that have undergone rigorous prior testing.

Results of property-composition modeling and benchmarking against glass dissolution test data for other glasses, including baseline waste glass analyzed in the IDF PA indicate the models can cover the wider glass composition space. Additionally, glass dissolution rates derived from the models indicate predicted contaminant release rates will be one to two orders-of-magnitude lower than the representative rates calculated for the 2018 IDF PA analysis.

5.3 Product Consistency Tests of ILAW Glass

The results of on-going Long-Term Product Consistency Tests (PCTs) of ILAW glasses are presented in VSL-24S5500, *Compilation of VSL Long-Term PCT Data for LAW Glasses, 2010-2024*. The primary objective of the study is to collect data on long-term performance of ILAW glasses that will be used to immobilize low-activity waste at the Hanford site.

The study involves long-term PCTs on 27 ILAW glasses, divided into three phases:

- **Phase 1**: 10 glasses tested for 14 years.
- **Phase 2**: 10 glasses tested for 9 years.
- **Phase 3**: 7 glasses tested for 6 years.

The tests have been conducted at various temperatures and surface-to-volume (S/V) ratios per ASTM C1285 Method B to simulate different accelerated exposure conditions. The study also included analysis of secondary alteration phases that formed using X-ray diffraction and scanning electron microscopy. The key findings to date include:

1. **Glass Composition and Performance**: The study found that glasses with low zirconia content and high alumina content tend to reach resumption (a sharp increase in dissolution rate) earlier.

2. **Secondary Phase Formation**: Zeolites, such as analcime and phillipsite, were commonly observed in glasses that reached resumption. Phyllosilicates were also identified, indicating the formation of a passivating gel layer that can delay resumption.

3. **Effect of S/V and Temperature**: Higher S/V ratios and temperatures (e.g. 90°C) accelerated glass alteration and secondary phase formation. However, no zeolite formation was observed at 40 °C.

4. **Rhenium as a Surrogate for Technetium**: Rhenium release was generally below congruence with boron in the residual rate region but became congruent after resumption, indicating its potential as a surrogate for technetium in predicting long-term glass performance.

5. **Role of Glass Constituents**: Elements like Zr, Sn, Ca, and K play significant roles in glass durability. Zr and Sn enhance the passivating properties of the gel layer, while Ca and K act as charge compensators.

5.4 Ultra-High Performance Grout Testing

Operation of the WTP will produce SSWs including contaminated HEPA filters. The current disposal method for HEPA filters is encapsulation in metal containers using cementitious material and disposal in the IDF. An alternative method for disposal of contaminated HEPA

filters is encapsulation of the filters in ultra-high-performance grout (UHPG). UHPG is a high density, low-porosity cementitious material with low diffusivity, making it an effective material for encapsulation of solid wastes.

A full-scale proof-of-concept simulated waste form was prepared by encapsulating a HEPA filter in a 110-gallon stainless steel drum using UHPG. After the UHPG was cured both a scaled (1 gal) and the full-scale simulated waste forms were sectioned for visual examination. UHPG was observed to completely encapsulate the filters and bonded to the external surfaces of materials comprising the filters. No cracks were observed in the sectioned waste forms. Changes in the type of Portland cement have resulted in refinements to the UHPG formulation that will be evaluated in FY2025.

6 Planned Or Contemplated Changes

There are no planned changes in disposal facility design, construction, operations, closure, or land use that have not been discussed previously in an ASR. However, there are several contemplated changes in waste forms that may be developed or modified from the base case formulations analyzed in the initial LFRG-approved IDF PA (RPP-RPT-59958, Rev. 01A) and subsequent approved SAs that address UDQ evaluations (i.e., RPP-CALC-64672) that were summarized in previous ASRs. These contemplated changes include:

- the possible use of EWG for LAW waste (see recent testing results presented in PNNL-35638,
- the possible use of grout for LAW waste (see recent testing reported in PNNL-35629, *Nitrate and Nitrite at Hanford – From Tanks to Natural Attenuation*), and
- the possible use of the PermaFix Northwest (PFNW) facility to grout ETF waste the testing of which commenced in FY 2025.

At the end of FY 2024, no decisions have been made regarding these potential alternative waste forms and therefore no UDQ screening or evaluation has been performed. It is expected that a UDQ screening and evaluation of the EWG will be conducted in FY 2025 prior to its potential adoption.

Since the completion of the PA, there has been one change to simplify the construction of the surface barrier that was contemplated in FY 2018. At the end of FY 2024, no decision had been made to pursue this design change and no UDQ evaluation was performed. Surface barrier construction is not planned for several decades.

7 Status of Disposal Authorization Statement Conditions, Key and Secondary Issues

There are no ODAS conditions or open key or secondary issues for the IDF.

8 Certification of the Continued Adequacy of the Performance Assessment

I certify to the best of my knowledge that information in this ASR is true, accurate and complete and that any proposed or implemented changes associated with the PA or other technical basis documents provide a reasonable expectation that the performance objectives/measures identified in DOE O 435.1 will be met.

B.T. Vance, Manager
U.S. Department of Energy, Hanford Field Office

3/26/25
Date

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Appendix A

Historical Knowledge / Documentation

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A.1 Historical Information

The original performance assessment (PA) for the Hanford Integrated Disposal Facility (IDF) and Disposal Authorization Statement (DAS) were issued in 1999 to allow construction of the facility. The DAS had conditions that needed to be resolved. In 2001, the PA was updated to resolve the issues, which also closed the associated DAS conditions. In 2006, construction of the IDF was completed. Since 2006, the IDF has been maintained in a pre-operational condition awaiting authorization to begin waste receipt operations. Annual summaries for the IDF PA were prepared through Fiscal Year (FY) 2012. Preparation of annual summaries was suspended in FY 2013. Following the completion of DOE/EIS-0391, *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington* in 2012, and the associated Record of Decision in 2013 (78 FR 75913, "Record of Decision: Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington"), additional IDF waste streams that were not evaluated in the 2001 PA update were identified, necessitating the need for a new or revised PA.

A revision to the IDF PA, RPP-RPT-59958, *Performance Assessment for the Integrated Disposal Facility, Hanford Site, Washington*, was completed in September 2017. At the beginning of FY 2018, the Low-Level Waste Disposal Facility Federal Review Group (LFRG) review team initiated their review of the IDF PA and related documents in the Radioactive Waste Management Basis. The LFRG review team provided review comments in the second quarter of FY 2018. The review resulted in two key issues and 30 secondary issues against the IDF PA, PA Maintenance Plan (CHPRC-03348, *Performance Assessment Maintenance Plan for the Integrated Disposal Facility*), PA Monitoring Plan (CHPRC-03347, *Performance Assessment Monitoring Plan for the Integrated Disposal Facility*), PA Closure Plan (CHPRC-03407, *Performance Assessment Closure Plan for the Integrated Disposal Facility*), the change control process (IDF-PRO-EN-54165, *Change Control Process*), and the waste acceptance criteria (WAC, IDF-00002, *Waste Acceptance Criteria for the Integrated Disposal Facility*). The Associate Principal Deputy Assistant Secretary for Regulatory and Policy Affairs for the Office on Environmental Management issued a conditional Operating Disposal Authorization Statement (ODAS) on June 29, 2018. Two conditions required resolution of the key issues. A third condition required that activities necessary to resolve each of the secondary issues either be completed or be added to the maintenance program and PA Maintenance Plan.

An update to the PA to address LFRG review team comments was completed in FY 2018. On August 13, 2018, Revision 1 of the IDF PA (RPP-RPT-59958, Rev. 1) was issued with LFRG concurrence to close one key issue and 24 secondary issues related to the PA. Preparation of IDF PA annual summaries resumed in FY 2018.

In FY 2019, resolutions for five open secondary issues were completed, with LFRG co-chair approval in November 2019. The remaining key issue required that a WAC document be prepared to include the findings of the revised PA. Development of the WAC was completed in FY 2019 and was provided to the LFRG co-chairs for closure of the remaining key issue in FY 2020. The remaining secondary issue was addressed in a revision to the composite analysis (CA), which began an LFRG review at the beginning of 2021 and was completed with LFRG approval in 2023 (DOE/RL-2019-52, Rev. 2).

Since the completion of the PA in FY 2018 resulting in the issuance of the ODAS, nine special analyses (SAs) have been conducted to evaluate potential changes to the PA technical basis identified as unreviewed waste disposal questions (UDQs). Based on these UDQ SAs, and the mitigation options and recommendations discussed in them, there is still a reasonable expectation that the IDF will meet the U.S. Department of Energy (DOE)'s performance requirements for the disposal of low-level waste. The SAs indicate that some small-volume waste streams previously identified for disposal in IDF may cause groundwater impacts that exceed groundwater protection metrics. Consequently, DOE has been pursuing alternative disposal options for these potentially problematic waste streams. If the problematic waste streams are not disposed of in the IDF or if quantification of the radionuclide content in the generated waste is lower than estimated from process flowsheets, then the PA and ODAS would still be valid.

Key documents of the Radioactive Waste Management Basis and their revision status at the time of preparation are listed in Table ES-1. A listing of the SAs that have been completed since the last revision of the PA was completed is provided in Table A-1.

In addition, in FY 2020 DOE began a consultative review with the U.S. Nuclear Regulatory Commission (NRC) to review DOE's evaluation concluding that vitrified waste produced during the Direct Feed Low-Activity Waste mission is not high-level waste. The NRC completed the Technical Evaluation Report in 2022 (US NRC, 2022, *NRC Technical Evaluation Report for Vitrified Low Activity Waste Disposed Onsite at Hanford*).

In FY 2023, the LFRG approved the Hanford Composite Analysis, DOE/RL-2019-52, revision 2, that includes the source term to the groundwater from the IDF PA as well as other sources that could interact with the IDF releases. A revision to the WAC 00002 was also started in FY 2023 with a publishing date scheduled for FY2025.

A.2 Unreviewed Waste Disposal Questions

Table A-1 summarizes UDQs that have been reported in the current and previous ASRs.

Table A-1. Unreviewed Waste Disposal Questions Fiscal Years 2019 to 2024. (4 sheets)

UDQ Number and Title	Revision	DOE Approval Date	Comment
FY 2019			
UDQ-IDF-2019-001 Special Analysis to Evaluate Disposal of Secondary Waste Powder in the Integrated Disposal Facility	0	12/18/2019	Evaluates a proposed waste stream that was not evaluated in the PA. New waste stream does not impact PA conclusions.
UDQ-IDF-2019-002 Inadvertent Intruder Dose Calculation Update for the Integrated Disposal Facility Performance Assessment	0	12/19/2019	Evaluates potential increases to radionuclide concentrations in vitrified low-activity waste due to flowsheet changes associated with the Direct-Feed Low-Activity Waste process. Higher concentrations require longer periods of intruder protections.
FY 2020			
UDQ-IDF-2020-001 Special Analysis: Impacts of WESP Daily Deluge from SSW Disposed of at IDF	0	2/10/2021	Evaluates increased loading of technetium-99 onto HEPA filters that will be disposed of as SSW in the IDF due to routine maintenance of the Wet Electrostatic Precipitator at the vitrification plant that was not considered in flowsheet supporting the PA. If realized, higher concentrations could exceed concentration limits in the waste acceptance criteria and result in groundwater concentrations that exceed safe drinking water standards in the Post-Compliance Period.
UDQ-IDF-2020-002 Special Analysis of Used Low Activity Waste Melter Cooling Water in IDF	0	01/13/2021	Evaluates the disposal of used low-activity waste melters in the IDF without fully draining up to 1,200 gallons of cooling water from the cooling system of each melter. Minor impact on groundwater concentrations in the Post-Compliance Period. New condition does not impact PA conclusions.
FY 2021			
UDQ-IDF-2021-001	0	8/29/2022	Evaluates vadose zone hydraulic properties that result in simulated moisture contents that are more consistent with field observations.

Table A-1. Unreviewed Waste Disposal Questions Fiscal Years 2019 to 2024. (4 sheets)

UDQ Number and Title	Revision	DOE Approval Date	Comment
Special Analysis of Vadose Zone Hydraulic Property Uncertainty for the Integrated Disposal Facility Performance Assessment			Vadose zone travel times reduced from more than 1,000 years to under 1,000 years for technetium-99. Incorporation of waste stream-specific inventory limits for groundwater protection need to be added to the waste acceptance criteria.
UDQ-IDF-2021-002 Aquifer Hydraulic Gradient & Hydraulic Properties	NA	NA	Screening and Evaluation Only. Special analysis combined with analysis for UDF-IDF-2021-009
UDQ-IDF-2021-003 Tc-99 & I-129 Sorption in Carbon and Silver Mordenite	NA	NA	Screening and Evaluation Only. Special analysis combined with analysis for UDF-IDF-2021-007 and UDF-IDF-2021-009
UDQ-IDF-2021-004 Impacts of Grouting the Melter Plenum on Waste Disposed of in IDF	0	12/22/2021	Evaluates using grout to void-fill used melters and consequences to the residual waste left in the melters. Groundwater impacts from residual waste in the melters is small. New condition does not impact PA conclusions.
UDQ-IDF-2021-005 New ETF Solidified Condensate (acetonitrile distillate) waste stream from WTP	NA	NA	Screening and Evaluation Only. Not a significant waste stream. No special analysis required.
UDQ-IDF-2021-006 Use of Ultra-High Performance Grout as Alternative Macroencapsulation material for debris	NA	NA	Screening and Evaluation Only. Special analysis combined with analysis for UDF-IDF-2021-007
UDQ-IDF-2021-007 Integrated Disposal Facility Performance Assessment Special Analysis: Updated Secondary Waste Release Calculations	0	8/29/2022	Generated new SSW release rates from the IDF, as well as investigated release rates for UHPG waste forms. Updated release rates were used as input in the updated cumulative analysis performed as the special analysis for UDF-IDF-2021-009.

Table A-1. Unreviewed Waste Disposal Questions Fiscal Years 2019 to 2024. (4 sheets)

UDQ Number and Title	Revision	DOE Approval Date	Comment
UDQ-IDF-2021-008 Integrated Disposal Facility Performance Assessment Special Analysis: Updated Immobilized Low Activity Waste Release Calculations	0	8/29/2022	Updates to parameters in the vitrified waste corrosion model, including consequences from Stage III corrosion. Generated new VLAW release rates from the IDF. Updated release rates were used as input in the updated cumulative analysis performed as the special analysis for UDF-IDF-2021-009.
UDQ-IDF-2021-009 Integrated Disposal Facility Performance Assessment Special Analysis: Updated Vadose Zone/Saturated Zone Flow and Transport Calculations	0	8/29/2022	Cumulative analysis addressing UDQ-IDF-2020-001, UDQ-IDF-2021-001, -002, and -009. Reports cumulative analysis of multiple UDQ changes. Unmitigated changes would cause exceedance of DOE performance objectives. Mitigation options for some SSW streams are necessary to protect the validity of the Disposal Authorization Statement. Incorporation of waste stream-specific inventory limits for groundwater protection need to be added to the waste acceptance criteria. Developed model defines the new PA reference case.
FY 2022			
UDQ-IDF-2022-001 Revised DOE Derived Concentration Technical Standard, DOE-STD-1196-2021	0	9/19/2022	Updated exposure factors. Updated annual All-Pathway doses were computed using the updated exposure factors in the updated cumulative analysis performed as the special analysis for UDQ-IDF-2021-009. Special analyses also use updated inventories from UDQ-IDF-2022-003. Updated Results in updated WAC concentration limits for protection of the inadvertent intruder.
UDQ-IDF-2022-002 2022 Evaluation of Additional Solid Secondary Waste Streams for the Hanford Integrated Disposal Facility Performance Assessment	0	9/19/2022	New Secondary Solid waste streams. Special analysis concluded these are negligible inventories and that these new waste streams are not significant waste streams.
UDQ-IDF-2022-003 Updated Inventory Allocation Due to Revised WTP Process Flowsheet	0	2/9/2023	Updated waste stream inventories. Align with responses to NRC RAIs. Updated annual All-Pathway doses were computed using the updated inventories in the updated cumulative analysis performed as the

Table A-1. Unreviewed Waste Disposal Questions Fiscal Years 2019 to 2024. (4 sheets)

UDQ Number and Title	Revision	DOE Approval Date	Comment
			special analysis for UDQ-IDF-2021-009 that are documented in RPP-CALC-64672. Updated inadvertent intruder scenario doses computed. Results in updated WAC concentration limits for protection of the inadvertent intruder.
UDQ-IDF-2022-004 Evaluate Constraints on Tc-99 Secondary Solid Waste Inventory Based on Special Analysis Data	0	5/4/2023	Cumulative changes from UDQ-IDF-2021-009 used to establish a total inventory limit for Tc-99 in encapsulated debris waste stream. This limit requires tracking inventory in this waste stream disposed of in the IDF. Limit being incorporated into the WAC. Initiated steps to dispose of encapsulated debris containing high amounts of Tc-99 at an off-site location.
FY 2023			
UDQ-IDF-2023-001 Glass Shards	NA	NA	Screening and Evaluation Only. Not a significant waste stream. No special analysis required.
UDQ-IDF-2023-002 SSW Debris with Glass	NA	NA	Screening and Evaluation Only. Not a significant waste stream. No special analysis required.
FY 2024			
UDQ-IDF-2024-001 MLLW Soils and Debris	1	NA	Screening and Evaluation Only. Not a significant waste stream. No special analysis required
UDQ-IDF-2024-002 P2R 9.1 MPR	0	NA	Screening occurred at the end of FY2024. A UDQ evaluation is planned for FY2025.

HEPA = high-efficiency particulate air (filter)
IDF = Hanford Integrated Disposal Facility
PA = Performance Assessment
SSW = solid secondary waste
UDQ = unreviewed waste disposal question
WESP = wet electrostatic precipitator

A.3 Past Cumulative Analyses

No cumulative analyses are necessary based on the updated information acquired in FY 2024. Previous cumulative analyses are summarized in the FY 2021 ASR.

A.4 Status of Key RWMB Documents

Table A-2. Status of Key Radioactive Waste Management Basis Documents Including Disposal Authorization Standard Technical Standard Documents

Document	Revision	Date	Status
Waste Management Basis CPCC-MP-WM-52872	1 Chg. 0	September 14, 2024	Active
Operating Disposal Authorization Statement for the Integrated Disposal Facility Hanford Site, Washington DOE-EM, 2021	1	June 28, 2021	Active
Final Waste Incidental to Reprocessing Evaluation for the Vitrified Low-Activity Waste and Secondary Wastes at the Hanford Site, Washington DOE/ORP-2022-03	0	January 2023	Active
Waste Incidental to Reprocessing Determination for the Vitrified Low-Activity Waste and Secondary Wastes at the Hanford Site, Washington ORP-68704	0	January 25, 2023	Active
Performance Assessment for the Integrated Disposal Facility, Hanford Site, Washington RPP-RPT-59958	1A	July 31, 2019	No open key or secondary issues. Special analyses completed since the completion and acceptance of the IDF PA are summarized in Appendix A. The current compliance case is documented in RPP-CALC-64672.
Composite Analysis for Low-Level Waste Disposal in the Hanford Site Central Plateau (FY 2020) DOE/RL-2019-52	2	Sept. 21, 2023	No open key issues. Two open secondary issues.

Table A-2. Status of Key Radioactive Waste Management Basis Documents Including Disposal Authorization Standard Technical Standard Documents

Document	Revision	Date	Status
Performance Assessment Closure Plan for the Integrated Disposal Facility CHPRC-03407	1	November 4, 2019	No key or secondary issues. IDF closure not anticipated for several decades.
Performance Assessment Monitoring Plan for the Integrated Disposal Facility CHPRC-03347	1	October 30, 2019	No open key or secondary issues. RCRA groundwater monitoring at IDF is also governed by DOE/RL-2019-29, *Groundwater Monitoring Plan for the Integrated Disposal Facility*.
Performance Assessment Maintenance Plan for the Integrated Disposal Facility CHPRC-03348	1	October 24, 2019	No key or secondary issues. Update being planned for FY 2025
Change Control Process IDF-PRO-EN-54165	1 Change 1	May 13, 2021	No open key or secondary issues.
Waste Acceptance Criteria for the Integrated Disposal Facility IDF-00002	0	December 16, 2019	No open key or secondary issues. Revision 1 to change waste disposal limits, add ^{99}Tc inventory limits, and special acceptable grout formulations for secondary wastes was in progress at the end of FY 2024. WAC revision is intentionally being held until issues with IDF RCRA permit condition modifications are resolved. The WAC revision is expected to be completed prior to commencing operations in CY 2025.

Note: A complete list of references is available in Chapter 9.

CY = Calendar Year
FY = Fiscal Year
IDF = Hanford Integrated Disposal Facility
PA = Performance Assessment
RCRA = *Resource Conservation and Recovery Act of 1976*
WAC = Waste Acceptance Criteria

A.5 References

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Appendix B

Crosswalk of Review Criteria to Annual Summary Report Content

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Table B-1. Crosswalk of Review Criteria to Annual Summary Report Content

ID	Review Criteria	Where Criteria are Met
ASR-1	*9.21 Executive Summary*	
1.1	Does the Annual Summary Report (ASR) provide an overview of the documents and data used to make the certification of the continued adequacy of the performance assessment (PA), composite analysis (CA), disposal authorization statement (DAS), other DAS technical basis documents, and the radioactive waste management basis (RWMB) to meet the Department of Energy (DOE) Order (O) 435.1 performance objectives/measures?	Information identified in Executive Summary. Table A-2 in Appendix A also indicates this information.
1.2	If the ASR indicates that these documents need revision, has a corrective action plan been developed and implemented?	WAC 00002 was mentioned in the 2023 ASR and the update to revision 1 is planned to be finished in FY 2025
ASR-2	*Chapter 8 Change Control Process Guide and 9.2.2 Changes Potentially Affecting the PA, CA, DAS or RWMB*	
2.1	Are all change control process evaluations (called Unreviewed Disposal Question Evaluation/Unreviewed Composite Analysis Question Evaluation) or other change control processes (e.g., non-conformances and corrective actions) used to evaluate proposed actions, changes, and new information to determine if these activities are within the boundaries analyzed in the approved PA and CA listed and explained? Specific information for each identified change should include the following: 1) disposal facility/unit name; 2) change control process identification number; 3) change description; 4) evaluation results; 5) special analysis number if appropriate); and 6) PA, CA, DAS, and RWMB impact.	Information presented in Table 1. A full listing of UDQs since LFRG approval of the PA is included in Appendix A.
2.2	Are their potential effect on the continued adequacy of the DAS, PA, CA, and RWMB provided?	Information presented in Table 1.
ASR-3	*9.2.3 Cumulative Effects of Changes*	
3.1	Does the ASR provide an evaluation and discussion of the cumulative effects of all the changes that have been identified in "Changes Potentially Affecting the PA, CA, DAS or RWMB" during the year?	There have been no substantial changes, so an updated cumulative analysis was not performed in FY 2024.
ASR-4	*9.2.4 Waste Receipts*	
4.1	Is the following information regarding waste receipts provided and adequately discussed? 1) disposal facility/unit name; 2) disposed volumes; 3) PA estimated disposal capacity; 4) percent filled – volume; 5) Sum of fractions or total curie vs PA curie limit;	No waste receipts have occurred.

Table B-1. Crosswalk of Review Criteria to Annual Summary Report Content

ID	Review Criteria	Where Criteria are Met
	6) PA/CA impacts	
4.2	Was a discussion regarding waste receipts included?	No waste receipts have occurred.
ASR-5	*9.2.5 Monitoring*	
5.1	Was the following compliance monitoring information provided?) 1) disposal facility/unit name; 2) monitoring type; 3) monitoring results and trends: 4) performance objective, measure, or other regulatory limit; 5) action level; 6) action taken; and 7) PA/CA impacts.	Compliance monitoring has not begun since waste disposal operations have not occurred. Monitoring activities to establish pre-disposal conditions and baseline monitoring results are summarized in Chapter 4.
5.2	Was a discussion regarding monitoring results included?	Monitoring is occurring to establish pre-disposal conditions and establish a baseline.
5.3	Was the following performance monitoring information provided? 1) disposal facility/unit name; 2) monitoring purpose; 3) monitoring results and trends; 4) PA expected behavior; 5) action taken; 6) and PA/CA impacts.	Performance monitoring of the liner system is described in Chapter 4
5.4	Were results differing from expected behavior documented and discussed with any corrective actions?	Results were not different from expected behavior.
ASR-6	*9.2.6 Research and Development*	
6.1	Was the following information for research and development (R&D), field studies, etc. results provided and discussed? 1) document number; 2) results; and 3) PA/CA results.	Much of the work conducted in FY 2024 to address PA Maintenance activities are multi-year efforts that will require UDQs in the future when the information is available.

Table B-1. Crosswalk of Review Criteria to Annual Summary Report Content

ID	Review Criteria	Where Criteria are Met
ASR-7	*9.2.7 Planned or Contemplated Changes*	
7.1	Were planned or contemplated changes (including completion schedules) in disposal facility design, construction, operations, closure, R&D, land use, or in technical basis documents (Maintenance Plan, Closure Plan (CP), Waste Acceptance Criteria, Monitoring Plan (MonP), and change control process) discussed? The following information should be provided: 1) planned or contemplated change; 2) change basis; 3) PA/CA impact; and 4) schedule.	Contemplated changes related to disposal facility operations including alternative waste form configurations are discussed.
ASR-8	*9.2.8 Status of DAS Conditions, Key and Secondary Issues*	
8.1	Did the ASR provide a status update on any DAS conditions and key or secondary issues resulting from a LFRG review of the facility's PA and CA and other technical basis documents (e.g., MonP, CP, etc.)? The following information should be provided: 1) disposal facility/unit name; 2) key/secondary issue or DAS condition number; 3) issue description; initial resolution schedule date; 4) projected resolution scheduled date; 5) disposition documentation and date completed; and 6) PA, CA, and DAS impact.	There are no open key or secondary issues affecting the operation or performance of the IDF.
8.2	Does the ASR adequately address comments or recommendations identified in the prior FY ASR review checklist or EM transmittal memo?	Last year's comments on the ASR were addressed based on the response provided in the ASR RCR. In particular much of the historical information summarized in earlier ASRs has been deleted. Content in all sections has been considerably reduced and summarized as per request from prior year's comments.
ASR-9	*9.2.9 Certifications of the Continued of the Adequacy of the PA, CA, DAS, and RWMB*	
9.1	Does the ASR or transmittal memo contain the following statement signed by the Field Element Manager or designee? *I certify to the best of my knowledge that information in this ASR is true, accurate and complete and that any proposed or implemented changes associated with the PA or other technical basis documents provide a reasonable expectation that the performance objectives/measures identified in DOE O 435.1 will be met.*	Chapter 8 contains the certification.

Notes:

The Terms list in the main text defines terms used in this table.

Chapter 9 in the main text provides the complete reference citations used in this table.

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