Waste Isolation Pilot Plant

Annual Change Report 2021/2022

Revision 1

July 1, 2021, to June 30, 2022

Effective Date: November 30, 2023

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Acronyms and Abbreviations

AMWTP	Advanced Mixed Waste Treatment Project
BATS	Brine Availability Test in Salt
CBFO	Carlsbad Field Office
CCP	Central Characterization Program
CFR	Code of Federal Regulations
CH	contact-handled
CPR	cellulose, plastic, and rubber
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FWS	Fish and Wildlife Service
FY	fiscal year
HPC	High Performance Computing
HWFP	Hazardous Waste Facility Permit
INL	Idaho National Laboratory
JHA	Job Hazard Analysis
kg	kilogram
LANL	Los Alamos National Laboratory
LBRE	Low Background Radiation Experiment
LWA	Land Withdrawal Act
m^3	cubic meters
MgO	magnesium oxide
NDA	Nondestructive Assay
NMSU	New Mexico State University
NWP	Nuclear Waste Partnership
PDP	Performance Demonstration Program
QA	Quality Assurance
QAPD	Quality Assurance Program Document
RCDM	Radiological Control and Dosimetry Manager
RH	remote-handled
RK&M	Records, Knowledge and Memory
SNL	Sandia National Laboratory
SRS	Savannah River Site
TOC-L CPH	Total Organic Carbon Analyzer
TRU	transuranic
UPS	uninterruptible power supply
WIPP	Waste Isolation Pilot Plant
WP	WIPP Procedure

1.0 INTRODUCTION

Title 40 of the Code of Federal Regulations (CFR) of the U.S. Environmental Protection Agency Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with Disposal Regulations (EPA 1996) requires the U.S. Department of Energy (DOE) to provide information on changes in conditions or activities pertaining to the disposal system since the most recent compliance application. Specifically, 40 §194.4(b)(4) states:

> "Not later than six months after the Administrator issues a certification, and at least annually thereafter, the Department shall report to the Administrator, in writing, any changes in conditions or activities pertaining to the disposal system that were not required to be reported by paragraph (b)(3) of this section and that differ from information contained in the most recent compliance application."

Significant planned changes are reported by the DOE to the EPA prior to implementation. Significant changes include those that would result in crucial information contained in the Compliance Certification/Recertification no longer being valid or would result in noncompliance with the requirements in 40 CFR 191 and the criteria in 40 CFR 194. Planned changes are submitted on an individual basis. Significant unplanned changes are reported to the EPA within 24 hours, or 10 days, in accordance with Title 40 CFR §194.4(b)(3) (EPA 1996).

In a June 17, 2002, letter to the DOE, the EPA provided examples of routine operations and maintenance activities for the Waste Isolation Pilot Plant (WIPP) facility that are considered to be non-significant to the Compliance Certification/Recertification. Examples of these activities include mining a ventilation overcast, installation of equipment/instruments related to geo-mechanical and groundwater monitoring as required by the EPA, and installation of ground-control monitoring devices.

Proposed changes in activities or conditions are reviewed to determine if 40 CFR §194.4(b)(3) reporting is necessary. The annual report summarizes the items identified as requiring reporting under 40 CFR §194.4(b)(4) (EPA 1996). The majority of the items reported are inspections, reports, and modifications to written plans and procedures for WIPP facility operations.

Each November, the DOE provides to the EPA the required annual report of applicable changes at the WIPP facility. Applicable changes include non-significant changes to information in the most recent compliance application, i.e., the 2019 *Compliance Recertification Application* (DOE 2019). The reporting period for the annual report is July 1, 2021 to June 30, 2022.

This report captures the description of each change during the reporting period of July 1, 2021, through June 30, 2022, as well as extra-regulatory information requested by the EPA, in seven tables described below:

Conditions, activities, or information reportable per 40 CFR §194.4(b)(4):

> **Table 1: Changes in WIPP Conditions or Activities Reportable Under Title 40 CFR §194.4(b)(4) During the Reporting Period**
>
> Documents EPA and DOE interactions during the reporting period, with a high-level summary of each correspondence.

Table 2: Procedure/Plan Revision During the Reporting Period

Documents changes to relevant plans and procedures during the reporting period.

Table 3: Waste Emplacement Summary Report During the Reporting Period

Documents the transuranic (TRU) waste disposed inventory for the waste parameters. The summary provides the total emplaced inventory in the repository as of June 30, 2022.

Table 4: Performance Assessment, Software, and Hardware Changes During the Reporting Period

Documents the changes to relevant codes, software, and hardware that have occurred during the reporting period.

Extra-regulatory information requested by the EPA:

Table 5: Passive Institutional Controls Activity During the Reporting Period

Documents activities applicable to the development of Passive Institutional Controls. This table was added at the request of the EPA (Reyes to Moody, 2008a).

Table 6: EPA Waste Characterization Inspections During the Reporting Period

Documents inspections performed by the EPA pertaining to Tier 1 changes to the baseline approvals at generator and storage sites for TRU waste. This table was added to the Annual Change Report at the request of the EPA during the EPA/DOE management meeting held July 29, 2010.

Table 7: EPA Quality Assurance Audits by Site During the Reporting Period

Documents audits performed by the EPA at generator and storage sites for TRU waste. This table was added to the Annual Change Report at the request of the EPA during the EPA/DOE management meeting held July 29, 2010.

In accordance with the EPA's requests[1] and feedback, this report incorporates suggestions and guidance for capturing the appropriate level of detail and the layout of information with respect to the WIPP certification criteria. This report does not include administrative changes to procedures such as editorial changes, reformatting, correcting references, correcting inconsistency within a procedure, and other changes that do not alter the substance or intent of the document.

The changes reported in this WIPP Annual Change Report are non-significant changes pertaining to the disposal system.

2.0 Conditions, activities or information reportable per 40 CFR §194.4(b)(4):

Table 1*:* Changes in WIPP Conditions or Activities Reportable Under 40 CFR §194.4(b)(4) During the Reporting Period

Regulatory Requirements	Implementing Document or Activity that Changed	Description of the Change
40 CFR §194.4(b)(3), Conditions of Compliance Certification	Planned Change Notices and Planned Change Requests	DOE to EPA, September 13, 2021 Response to the EPA's August 31, 2021, letter regarding comments on the DOE's June 23, 2021, Planned Changed Notice to excavate the West Mains Access Drifts.
40 CFR §194.4(b)(4), Conditions of Compliance Certification	2020/2021 Annual Change Report	DOE to EPA, November 10, 2021 Transmittal of 2020/2021 Annual Change Report.
40 CFR §194.8, Approval Process for Waste Shipment from Waste Generator Sites for Disposal at the WIPP Facility.	Advanced Mixed Waste Treatment Project (AMWTP)	DOE to EPA, April 20, 2022 Carlsbad Field Office (CBFO) Tier 1 Request for the Dual Utilization of Certified Radiological Characterization Approach in Contact-handled and Remote-handled at the AMWTP.
40 CFR §194.8, Approval Process for Waste Shipment from Waste Generator Sites for Disposal at the WIPP Facility.	Idaho National Laboratory (INL)	EPA to DOE, March 10, 2022 Approval of Tier 1 change to add containers from waste streams ID-BEN-S5100-R; ID-MISC-RH; and ID-ANLE-S5000, consisting of remote-handled (RH) TRU waste, to the approved RH waste characterization program at the INL. DOE to EPA, April28, 2022 Request for Concurrence of the Recertification for INL Central Characterization Program (CCP) adding the RH EPA Tier 1 Approvals.

Regulatory Requirements	Implementing Document or Activity that Changed	Description of the Change
40 CFR §194.8, Approval Process for Waste Shipment from Waste Generator Sites for Disposal at the WIPP Facility.	Savannah River Site (SRS)	DOE to EPA, September 15, 2021 CBFO Tier 1 Request for new Nondestructive Assay (NDA) equipment at the SRS K-Area. DOE to EPA, September 22, 2021 Revised CBFO Tier 1 Request for new NDA equipment and relocation of Real-time Radiography unit #8 at the SRS K-Area.
40 CFR §194.8, Approval Process for Waste Shipment from Waste Generator Sites for Disposal at the WIPP Facility.	Tier 2 Reports	DOE to EPA, June 2, 2022 CBFO Notification of Tier 2 Changes for AMWTP and CCP Activities for fiscal year (FY) 2022 2nd Quarter.
40 CFR §194.14(b), Design of the Disposal System	Status of Experiments in the WIPP Underground	Low Background Radiation Experiment (LBRE) The research consists of growing, handling, culturing, and testing organisms in a low background radiation environment. July 1, 2021, to September 30, 2021 The New Mexico State University (NMSU) LBRE conducted research at WIPP (surface and underground) from June through September 2021. NMSU completed their Summer 2021 research on September 30, 2021. October 1, 2021, to December 31,2021 NMSU did not complete any testing in quarter 2 and is scheduled to resume testing in May 2022. January 1, 2022, to March 31, 2022 NMSU did not complete any testing in quarter 3 and is

Regulatory Requirements	Implementing Document or Activity that Changed	Description of the Change
		scheduled to resume testing in May 2022. <u>April 1, 2022, to June 30, 2022</u> NMSU LBRE started this summer's research at the WIPP facility with an experiment to study the biological effects of low background radiation on male individuals of *Aedes aegypti* and this phase of the experiment was completed in June. Salt Disposal Investigations /Salt Defense Disposal Investigations <u>July 1, 2020, to September 30, 2021</u> Borehole Heater Test monitoring equipment was powered off on September 22, 2021, ending phase 1 testing. For the July through September 22, 2021, time period there have been multiple heating periods followed by cool down periods, and brine tracer tests. Currently the borehole heater test is shut down and the drilling and coring of a new borehole array is expected to start in late October 2021 for phase 2 testing. <u>October 1, 2021, to December 31, 2021</u> Currently the borehole heater test is shut down and the drilling and coring of a new borehole array is ongoing for phase 2 testing. As of December 31, 2021, 8 of 16 boreholes had been completed. <u>January 1, 2022, to March 31, 2022</u> The drilling and coring of a new Brine Availability Test in Salt (BATS) 2 borehole array were completed on 2/18/2022.

Regulatory Requirements	Implementing Document or Activity that Changed	Description of the Change
		Pre-test characterization, brine sampling, video logging, and permeability testing were performed and heater installation initiated. April 1, 2022, to June 30, 2022 Completed instrumentation installation of the BATS 2 borehole array and background/ambient conditions data collection was initiated. BATS 2 equipment currently operating includes Electrical Resistivity Tomography, Fiber Optic, Linear Variable Differential Transformer, Acoustic Emission, Gas Analyzer, Picarro Isotopic Water Analyzer, Thermocouples, Resistance Temperature Detectors, Temperature and Relative Humidity (probes, Strain gages, mass flow controllers, pressure transducers, Drierite™ brine outflow measurement canisters, and environmental monitoring instrumentation). Brine sampling, of the Sample borehole is conducted 1 to 2 times per month. Permeability testing of the heated deuterium borehole is ongoing.
40 CFR §194.22, Quality Assurance (QA)	Quality Assurance Audit	See Table 7: EPA Quality Assurance Audits by Site During the Reporting Period.
40 CFR §194.23, Models and Computer Codes	Performance Assessment, Software, and Hardware Changes	See Table 4: Performance Assessment, Software, and Hardware Changes During the Reporting Period.

Regulatory Requirements	Implementing Document or Activity that Changed	Description of the Change
40 CFR §194.24(a)	Waste Characterization	DOE, December 2021 Issuance of DOE/TRU-21-3425, Rev. 0, *Annual Transuranic Waste Inventory Report.*
40 CFR §194.24(c)	Waste Characterization	See Table 3: Waste Emplacement Summary Also see: DOE/TRU-21-3425, Annual Transuranic Waste Inventory Report – 2021 Report During the Reporting Period.
40 CFR §194.33	Consideration of Drilling Events in Performance Assessments	DOE, September 27, 2021 Issuance of DOE/WIPP-21-2308, Rev. 0, *Delaware Basin Monitoring Annual Report.*
40 CFR §194.42(a) - (c)	Monitoring	DOE, September 29, 2021 Issuance of DOE/WIPP-21-3591, Rev. 0, *Waste Isolation Pilot Plant Annual Site Environmental Report for 2020.* DOE to NMED, November 2021 *Annual Culebra Groundwater Report.* DOE, October 18, 2021 Issuance of DOE/WIPP-21-3557, Rev. 0, *Mine Ventilation Monitoring Annual Report.* DOE, October 27, 2021 Issuance of DOE/WIPP-21-3610 Volumes 1 and 2, Rev. 0, *Geotechnical Analysis Report for July 2019 – June 2020.* DOE, September 27, 2021 Issuance of DOE/WIPP-21-2308, Rev. 0, *Delaware Basin Monitoring Annual Report.* DOE, February 16, 2022 Issuance of DOE/WIPP-22-3613 *WIPP Subsidence Monument*

Regulatory Requirements	Implementing Document or Activity that Changed	Description of the Change
		Leveling Survey 2021.
40 CFR §194.43	Passive Institutional Controls	See Table 5: Passive Institutional Controls Activity During the Reporting Period.
40 CFR §194.51-55	Individual and Groundwater Protection Requirements.	DOE, 2022 Issuance of ERMS 576731, *Compliance Monitoring Parameter Assessment for 2021.*

Table 2: Procedure/Plan Revision During the Reporting Period

Procedure / Plan	Revision Effective Date	Description of Change
WIPP Procedure (WP) 02-1, *WIPP Groundwater Monitoring Program Plan*	Revision 17 July 19, 2021	Changed the number of wells in Section 3.3.
DOE/CBFO-21-3630, *Performance Demonstration Program Plan for Nondestructive Assay of Criticality Control Overpacks for the TRU Waste Characterization Program*	Revision 0 July 27, 2021	Initial issue.
WP 02-EM.04, *Low-Volume Air Particulate Sampler Maintenance Guide*	Revision 1 August 10, 2021	Removed reference to an obsolete procedure (02-EM1031).
DOE/WIPP-17-3573, *Waste Isolation Pilot Plant Emergency Management Plan*	Revision 2 August 16, 2021	Combined Advanced Planning Unit, Documentation Unit Leader, and Support Unit Leader into Support in Table 4.6 and revised Figure 4.4 to match. Editorial changes throughout Section 6.1. Revised Section 11.
DOE/WIPP-17-3573, *Waste Isolation Pilot Plant Emergency Management Plan*	Revision 3 April 20,2022	Major organizational changes. Removed the Deputy Crisis Manager, CBFO Representative, and Finance and Admin. Chief positions throughout the plan. Removed Incident/Accident Response Team from the EM Plan. Changed Lea Regional Medical Center name to Covenant Health Hobbs Hospital. Replaced Fire Department/FD with Emergency Services/ES. Defined Minimum Staffing throughout. Changed DOE Spokesperson to Joint Information Center Spokesperson.

Procedure / Plan	Revision Effective Date	Description of Change
WP 12-HP3000, *Radiological Control Administration*	Revision 26-FR1 August 17, 2021	Removed WP 12-HP3400 Attachments 3 & 4 from Emergency Locker Supply Inventory List and Locations. Added EA12HP3401-1-0 and EA12HP3401-2-0 to Emergency Locker Supply Inventory List and Locations.
WP 12-HP3000, *Radiological Control Administration*	Revision 27 January 10, 2022	Update Manager. Change 5.9 *Annual Decon Trailer Inventory* section title to Quarterly Decon Trailer Inventory. 2.0 References, added WP12-HP3401, *Potentially Contaminated Personnel or Areas*. Update 2.1 *Abbreviations and Acronyms*. Add 5.12 *Annual Decon Trailer Inspection and Testing* section. Update Attachment 1-*Emergency Locker Supply Inventory List and Locations*. Update Attachment 2-*Emergency Response Kit Inventory List and Locations*. Remove Attachment 3-*Decon Trailer Supply Inventory List.* Various editorial changes and corrections. Added Station H.
WP 12-HP3000, *Radiological Control Administration*	Revision 28 January 13, 2022	Incorporate changes missed in rev. 27.
DOE/WIPP-21-3627, Rev. 0, *CBFO Guidance for Sharing New Information with the National Transuranic Waste Program*	Revision 0 August 25, 2021	Initial issue.

Procedure / Plan	Revision Effective Date	Description of Change
DOE/WIPP-93-004, Revision H, *Waste Isolation Pilot Plant Land Management Plan*	Revision H August 27, 2021	Updated Table 3-2. In Chapter 3, actions added for protection of birds and pollinators. Updated Figure 8.1. In Chapter 11, changed WP 12-9 to DOE/WIPP-17-3573. In Chapter 12, changed WP 12-ES3918 to WP 15-CA1010. Other minor clarifications.
DOE/WIPP-99-2194 Revision 12, *Waste Isolation Pilot Plant Environmental Monitoring Plan*	Revision 12 September 1, 2021	Updated Acronym and Reference Lists. Updated Tables and Figures. Clarifications made throughout document.
WP 09-ES4001, *Subsidence Survey Data Acquisition Report*	Revision 6 September 2, 2021	Additional detail added to clarify steps in Section 5.2, *Office Procedure*.
DOE/CBFO-12-3491, Rev. 3, *National TRU Waste Management Plan*	Revision 3 September 8, 2021	Complete re-write Added Appendix 1 – *Roles, Responsibilities, Authorities and Accountabilities*. Added Figure 4-1 - *Site Certification Process*, Figure 4-2 – *Certification Documentation Process*, and Figure 4- 3 - *Physical Characterization Process*. Updated shipping information through 2030.
WP 05-WH1704, *Facility Cask Transfer Car (41-H-003) Operation*	Revision 10 October 5, 2021	Major rewrite: New format. Updated references. Updated Precautions and Limitations. Removed inspection requirement steps for handling TRU mixed waste.
WP 05-WH1603, *CH Underground Transporter 52-H-008A*	Revision 22 October 25, 2021	*Documented Safety Analysis* Revision 7 page change 002a/003.

Procedure / Plan	Revision Effective Date	Description of Change
WP 05-WH1603, *CH Underground Transporter 52-H-008A*	Revision 23 May 19, 2022	Incorporated WP 05-WH1604, *CH U/G Transporter* 52-H-008D and 52-H-008E. Identified which Waste Handling personnel are assigned to conduct inspection in Scope. Updated references. Removed unnecessary information from Limitations. Changed use of equipment logbook to turnover checklist; moved step as first step in Prerequisite Actions. Added Step 5.1.1[A] to address equipment leaking. Added step to document and corrective or compensatory actions in the comments section of EA. Revised the sequences of preoperational checks. Moved requirements for Hazardous Waste Facility Permit (HWFP) delinquent/failed/unsatisfactory inspections and leak categorization to new procedure WP 05-WH1801, *Waste Handling Preoperational Requirements*, and pointed to procedure. Added section on completion of preoperational check. Created new electronic attachment (EA05WH1603-1-0) removing the requirement for use of equipment logbook and moving preoperational checks to checklist.
WP 05-WH1701, *Road Cask Transfer Car Operation*	Revision 14 October 25, 2021	Major rewrite: Updated format. Updated references. Removed inspection requirement steps for handling TRU Mixed Waste.

Procedure / Plan	Revision Effective Date	Description of Change
WP 05-WH1714, *RH Cask Preparation Station 41-Z-076*	Revision 6 October 25, 2021	Major rewrite: Format changes. Updated Reference documents. Editorial corrections throughout. Added Attachment 1. Added lower-level steps.
WP 05-WH1714, *RH Cask Preparation Station 41-Z-076*	Revision 7 March 8, 2022	Updated Precautions and Limitations section. Added note on power supply. Editorial changes.
WP 12-RL.01, *Radiochemistry Quality Assurance Plan*	Revision 25 October 28, 2021	Updated language throughout per revision to WP 15-GM1002. Updated Section 4.6, *Training Requirements for Qualification Programs.* Added analytical balance to Attachment 2. Added Tabletop centrifuge to Attachment 3. Deleted Ball Mill from Attachment 3. Deleted Gamma Spectrometers from Attachment 3. In Section 4.0, *Personnel Training*: Added information about the Training Coordinator role. Deleted sentence regarding current qualification training programs. Added sentence regarding personnel demonstrating proficiency on an annual basis.

Procedure / Plan	Revision Effective Date	Description of Change
WP 12-RL.01, *Radiochemistry Quality Assurance Plan*	Revision 26 June 29, 2022	Added clarifying information about recording data in several sections. Removed gamma from list in Section 5.0, Laboratory Facilities. Removed expiration date from list regarding inventory documentation in Section 6.5, *Storing and Controlling Radioactive Materials*. Moved information regarding balances being under a service contract. Removed ball mill from list of support equipment. Removed information regarding Inductively Coupled Plasma Mass Spectrometer (ICP MS) analyses throughout procedure. Updated Attachment 1, *Radiochemistry Laboratory Procedures*. Updated Attachment 2, *Laboratory Equipment List*. Clarified in procedure that only equipment in this attachment may be used. Updated Attachment 3, *Supplemental Equipment List*. Clarified in procedure that only equipment in this attachment may be used. Editorial changes throughout.
WP 05-WH1712, *RH-TRU 72-B Cask Operations*	Revision 4 November 8, 2021	Major rewrite: New format. Updated Precautions. Updated references. Removed inspection requirement steps for handling TRU Mixed Waste.
WP 12-RC.01, *Quality Assurance Program Plan for Sampling Emissions of Radionuclides to Ambient Air at WIPP*	Revision 13 November 22, 2021	Added Station A back into the procedure as a compliance skid. Added Station H. Editorial Changes.

Procedure / Plan	Revision Effective Date	Description of Change
WP 05-WH1025, CH Waste Downloading and Emplacement	Revision 30 November 29, 2021	SBS-2021-01 implementation.
WP 12-HP1500, *Radiological Posting and Access and Control*	Revision 26-FR2 December 29, 2021	Removed (POST Radiation Work Permit if waste handling activities are to be conducted within Radioactive Materials Areas) from Section 5.2.3.
SP 12-42, *Calibration, Use and Maintenance of the Shimadzu Total Organic Carbon Analyzer (TOC-L CPH)*	Revision 0 February 8, 2022	The purpose of this procedure is to establish a method for measuring the carbon content of a sample in water utilizing the Shimadzu Total Organic Carbon Analyzer (TOC-L CPH). The scope of this procedure is to direct standard operating procedures for the Shimadzu TOC-L CPH in the laboratory at the Carlsbad Programs Group.
SP 12-47, *Meteorological Instrumentation Installation and Maintenance*	Revision 0 March 9, 2022	This procedure prescribes the process for the collection of meteorological data in the vicinity of the WIPP facility using a suite of sensors installed on a folding 10-meter meteorological tower. The objectives of the procedure are to describe how data are generated from the sensors and how the sensors are field checked, installed, and maintained.
DOE/CBFO-01-3107, *Performance Demonstration Program Management Plan*	Revision 11 March 31, 2022	Updates to the Carlsbad Field Office organizational structure were incorporated. References to DOE/CBFO-21-3630, *Performance Demonstration Program (PDP) Plan for Nondestructive Assay of Criticality Control Overpacks for the TRU Waste Characterization Program*, were incorporated. Editorial and formatting changes were made for technical clarity and consistency.
DOE/CBFO-01-1005, *Performance Demonstration Program Plan for Nondestructive Assay of Drummed Wastes for the TRU Waste Characterization Program*	Revision 8 March 31, 2022	Incorporate updates to the Carlsbad Field Office organizational structure. Remove non-interfering matrix drum and the associated scoring criteria. Incorporate reference to PDP Plan for criticality control overpacks.

Procedure / Plan	Revision Effective Date	Description of Change
		Incorporate editorial and formatting changes to improve technical clarity and consistency.
SP 12-46, *NanoBrook ZetaPALS Zeta Potential Analyzer*	Revision 0 April 11, 2022	This new procedure prescribes the Sandia National Laboratory (SNL) WIPP process for the calibration, operation, and maintenance of the NanoBrook ZetaPALS Zeta Potential Analyzer as part of the laboratory geochemistry research activities to determine the zeta potential of aqueous colloidal suspensions in support of the WIPP Project.
SP 12-48, *Malvern Zetasizer Operation*	Revision 0 May 31, 2022	This new procedure prescribes the process for utilizing dynamic light scattering via the Malvern Zetasizer Ultrared for determination of particle size, concentration, and zeta potential of sample suspensions. Determination of these parameters using the Malvern Zetasizer may be applied in the context of work for the WIPP and work for other outside organizations.
WP 05-WH4401, *Waste Handling Operator Event Response*	Revision 7 May 5, 2022	Changes to sections 1.3, 1.4, 2.4, 2.41, 3.0 and 3.6.
WP 05-WH1603, *CH Underground Transporter*	Revision 23 May 19, 2022	Major rewrite, therefore, changes are not tracked: Incorporated WP 05-WH1604, *CH U/G Transporter* 52-H-008D and 52-H-008E. Identified which Waste Handling personnel are assigned to conduct inspection in Scope. Updated references. Removed unnecessary information. from Limitations. Changed use of equipment logbook to turnover checklist; moved step as first step in Prerequisite Actions. Added Step 5.1.1[A] to address equipment leaking.

Procedure / Plan	Revision Effective Date	Description of Change
		Added step to document and corrective or compensatory actions in the comments section of EA. Revised the sequences of preoperational checks. Moved requirements for HWFP delinquent/failed/unsatisfactory inspections and leak categorization to new procedure WP 05-WH1801, *Waste Handling Preoperational Requirements*, and pointed to procedure. Added section on completion of preoperational check. Created new electronic attachment (EA05WH1603-1-0) removing the requirement for use of equipment logbook and moving preoperational checks to checklist.
WP 05-WH1011, *CH Waste Processing*	Revision 67 May 31, 2022	Align with DOE/WIPP-02-3184 hold points (CAR 22-016)
WP 12-2, *WIPP ALARA Program Manual*	Revision 23 April 4, 2022	Changes to Radiological Control and Dosimetry Manager (RCDM) Title and added Radiological Control Program Manager Title.
WP 12-5, *Waste Isolation Pilot Plant Radiation Safety Manual*	Revision 23 April 4, 2022	Editorial corrections: Table 2.3, Sections 323, 412, and 512.
WP 12-HP1306, *Canberra Alpha Sentry Continuous Air Monitor*	Revision 14 June 30, 2022	Change title positions throughout procedure. Add Radiological Control Supervisor and Radiological Control Manager in Section 2.1 *Abbreviations and Acronyms*.
WP 12-HP3200, *Radioactive Material Control*	Revision 24 June 30, 2022	Complete rewrite. Changed procedure type from management control to technical. Added 12-HP3200-*JHA and Precautions*. Removed Attachment 3, *Determination of Release Status of Materials* and Attachment 6, *Material Release*

Procedure / Plan	Revision Effective Date	Description of Change
		Restrictions. Moved Attachment 5, *Radioactive Material Control Guidelines, Precautions*. Revised EA12HP3200-1-0, *Radiological Release Log*; EA12HP3200-2-0, *Radioactive Material Receipt Log*; and EA12HP3200-3-0, *Sample Transfer Form.* Cancelled EA12HP3200-4-0, *Property/Material Release Evaluation* and EA12HP3200-5-0, *Property/Material Release Evaluation Log*.
WP 12-RE3003, *Radiological Release of Potentially Contaminated Materials, Waste, and Items*	Revision 11 June 29, 2022	Major Rewrite Updated format. Removed attachments: *Determination of Release Status of Materials* and *Criteria for Release of Materials Free of Radiological Controls.*
WP 12-RL1014, *Routine Laboratory Operation*	Revision 12 June 20, 2022	Added Step 5.5.1[B] and Step 5.5.1[C] regarding obtaining appropriate labels and labeling reagents and chemicals with the date received. Added information for maintaining the chart recorder in Section 5.7.4. Defined safe configuration on Precaution section. Removed $CA(PO_4)_2$ Precipitation from Precaution section regarding witness requirements. Added situational awareness to precaution regarding eye, foot, head, and hand hazards. Removed Density Chart and Scintillation Vial from list of equipment. Added HNO_3 1% and 5% to reagent list. Removed references to outdated balance models.

Procedure / Plan	Revision Effective Date	Description of Change
		Deleted Balance Calibration Check station. Identified differences between small balances and big balance weights for Reference Checks. Other minor distinctions regarding current processes. Updated Section 5.6 and Attachment 1 regarding General Laboratory Housekeeping. Editorial changes throughout.
WP 12-RL1010, *Sample Preparation*	Revision 19 June 20, 2022	Major rewrite. Changes primarily format-related rather than process-related. Changes mostly affecting the following: Section 5.7, *Water Samples* Section 5.8, *Urine Samples* Section 5.9, *Fecal Samples* Section 5.10, *Animal Tissue Samples* Section 5.11, *Air Filter Samples* Section 5.12, *Sediment, Soil, Vegetation and Other Solid Samples* Updated Table 1 item from no to yes to correct previous error; now aligned with WP 12-RL.01.
WP 12-RL1016, *Operation of the Canberra Series 5 Gas Proportional Counter*	Revision 17 June 22, 2022	Put document into procedure template. Added Step 5.8.1 regarding plugging power source cables into uninterruptible power supply (UPS). Minor editorial changes throughout.
WP 12-RL.01, *Radiochemistry Quality Assurance Plan*	Revision 26 June 29, 2022	Added clarifying information about recording data in several sections. Removed gamma from list in Section 5.0 *Laboratory Facilities.* Removed expiration date from list regarding inventory documentation in Section 6.5,

Procedure / Plan	Revision Effective Date	Description of Change
		Storing and Controlling Radioactive Materials. Moved information regarding balances being under a service contract. Removed ball mill from list of support equipment. Removed information regarding ICP MS analyses throughout procedure. Updated Attachment 1, *Radiochemistry Laboratory Procedures.* Updated Attachment 2, *Laboratory Equipment List.* Clarified in procedure that only equipment in this attachment may be used. Updated attachment 3, *Supplemental Equipment List*. Clarified in procedure that only equipment in this attachment may be used. Other editorial changes throughout.
WP 02-EM1002, *Electric Submersible Pump Operation & Maintenance Purging*	Revision 9 March 29, 2022	Deleted Step 5.1.6
WP 02-EM1009, *Soil and Vegetation Sampling*	Revision 9 November 8, 2021	Complete rewrite to incorporate WP 02-EM1019, WP 02-EM1029, and WP 02-EM1030, making these three procedure obsolete. Attachment 3 deleted.
WP 02-EM1012, *Airborne Particulate Sampling*	Revision 23 April 12, 2022	Minor changes and edits from periodic review.
WP 02-EM3001, *Administrative Processes for Environmental Monitoring and Hydrology Programs*	Revision 27 March 17, 2022	Title for reference WP 02-2 updated. Added to Precautions and Limitations a prohibition on eating, drinking, smoking, and chewing within fenced perimeter of the Sewage Lagoon. Added some clarification to Precautions and Limitations and Prerequisite Actions

Procedure / Plan	Revision Effective Date	Description of Change
		sections. Added pre-operational mobile equipment inspections requirement to section 5.11. Added allowance for texting for communicating fieldwork, but with stipulations. Other minor corrections and clarifications throughout the procedure.
WP 02-EM3004, *Radiological Data Verification and Validation*	Revision 12 March 10, 2022	Removed Attachment 2, comparison with previous year's data. Clarified in NOTE about gamma ID confidence and detection.
WP 07-EU1001, *Geologic and Fracture Mapping of Facility Horizon Drifts*	Revision 9 March 16, 2022	Updated Precautions and Limitations. Changed "aerial" lift to "scissor" lift.
WP 08-NT3020, *TRU Waste Receipt*	Revision 30 January 19, 2022	Added instruction to identify new waste stream profiles that will need Land Disposal Restriction (LDR) forms with shipments and checking to ensure the LDR form is for the expected profile. Moved step for checking the marking of empty packages to the appropriate part of the procedure.
WP 09-CN3007, *Engineering Change Notice*	Revision 53 May 11, 2022	Updated to align with EA09CN3007-1-0, *Engineering Change Notice*.
WP 12-ER4926, *CMR Expanded Staffing Operations*	Revision 10 August 8, 2021	Changes to Sections 1.0, 2.1, 2.2, 2.3, 2.4, and 2.5.
WP 12-HP3500, *Airborne Radioactivity*	Revision 27 January 10, 2022	Added Station H.
WP 12-HP4000, *Emergency Radiological Control Responses*	Revision 12 January 10, 2022	Changes to Section 1.4.14.
WP 12.IH.02-11, *WIPP Industrial Hygiene Program – Polychlorinated Biphenyls (PCBs)*	Revision 2 October 21, 2021	Deleted obsolete references and corrected nomenclature for other references.

Procedure / Plan	Revision Effective Date	Description of Change
IC041096, *Calibration of Station C Mass Flow*	Revision 6T3 July 14, 2021	Reverse order of Sections 5.4 and 5.5. Add Steps 5.4.8 – 5.4.12. Remove Steps 5.4.13 – 5.4.17. Add Steps 5.5.3 – 5.5.7. Remove Steps 5.5.8 – 5.5.16. Remove Traverse I – L on data blocks.
PM365001, *Inspection and Maintenance of Station B Radiological Sample Probes*	Revision 5T5 March 15, 2022	Perform Two Year Fish and Wildlife Service (FWS) Review and Job Hazard Analysis (JHA) Review. Update to Current Template Format R0.V1.3. Replace Lockout/Tagout Statements with Caution Tag Process.

Table 3: Waste Emplacement Summary Report During the Reporting Period

TRU Waste Inventory				
	Reporting Period[1] Emplaced Volume (m^3)		**Cumulative[3] Emplaced Volume (m^3)**	
RH TRU	0 (LWA TRU Waste Volume)[2]		361.73 (LWA TRU Waste Volume)[2]	
CH TRU	982.51 (LWA TRU Waste Volume)[2]		71,127.52 (LWA TRU Waste Volume)[2]	
Waste Components Inventory				
	Reporting Period[1] Emplaced Mass (kg)	**Cumulative[3] Emplaced Mass (kg)**	**Maximum Emplaced Limiting Value[4] (kg)**	**Percent of Limiting Value[4] Emplaced**
Cellulose, Plastic, Rubber Materials[5]	155,249	9,457,547	22,000,000	42.78%
Fe-Metals[6]	572,575	30,834,064	20,000,000	Minimum met
Non-Fe Metals	9,213	468,077	2,000	Minimum met
Emplaced Radiological Activity Inventory (curies)				
Radionuclide	**Cumulative Activity in FY 2021/2022 in Reporting Period**	**CH Repository Reporting Period Activity[7]**	**RH Repository Reporting Period Activity[7]**	**Total Activity as of June 30, 2022[7]**
^{241}Am	4.538E+03	4.538E+03	.000E+00	2.758E+05
^{137}Cs	9.709E-01	9.709E-01	.000E+00	1.449E+04
^{238}Pu	1.823E+04	1.823E+04	.000E+00	5.220E+05
^{239}Pu	5.085E+03	5.085E+03	.000E+00	3.494E+05
^{240}Pu	1.237E+03	1.237E+03	.000E+00	8.655E+04
^{242}Pu	5.305E-01	5.305E-01	.000E+00	2.946E+01
^{90}Sr	6.529E+00	6.529E+00	.000E+00	7.731E+03

^{233}U	4.476E-01	4.476E-01	.000E+00	8.119E+00
^{234}U	3.075E+00	3.075E+00	.000E+00	9.445E+01
^{238}U	1.888E-01	1.888E-01	.000E+00	1.871E+01
Total	2.910E+04	2.910E+04	.000E+00	1.256E+06

Magnesium Oxide (MgO)[8] and Cellulose, Plastic, and Rubber (CPR) Mass Emplaced Per Waste Panel

Panel	Room	MgO (kg)	CPR* (kg)	Excess Factor
1	All	4,482,356	1,237,685	1.87[9]
2	2-7	5,972,300	1,242,279	2.26[9]
2	1	691,515	186,469	1.71
3	7	960,120	109,685	3.83
3	6	954,405	229,646	1.93
3	5	1,022,985	284,651	1.70
3	4	960,120	255,172	1.79
3	3	931,545	243,860	1.89
3	2	942,975	228,067	2.02
3	1	662,940	183,088	1.76
4	7	942,975	248,903	1.90
4	6	925,830	267,494	1.71
4	5	948,690	265,302	1.71
4	4	1,049,655	290,739	1.76
4	3	1,015,365	285,755	1.70
4	2	931,545	374,327	1.22[8]
4	1	668,655	265,884	1.23
5	7	937,260	353,286	1.28
5	6	875,477	140,033	2.85

5	5	782,346	298,832	1.24
5	4	737,167	225,449	1.64
5	3	714,286	215,961	1.61
5	2	730,612	194,069	1.84
5	1	485,714	135,766	1.75
6	7	744,218	167,605	2.11
6	6	666,667	189,775	1.74
6	5	474,294	203,497	1.24
6	4	471,586	202,434	1.25
6	3	406,533	171,330	1.25
6	2	291,716	121,710	1.22
6	1	235,107	80,223	1.46
7	7	57,692	15,900	1.76
7	6	99,320	28,832	1.83
7	5	315,646	76,186	1.80
7	4	161,905	32,351	2.10
7	3	321,088	110,790	1.30
7	2	555,112	218,582	1.26
7	1	182,053[1]	75,662[1]	1.25[1]

Footnotes

1. Reporting Period is July 1, 2021, through June 30, 2022.
2. Pursuant to the January 16, 2019, CBFO memorandum entitled Tracking and Reporting the Defense-Related Transuranic Waste Volume Against the Waste Isolation Pilot Plant Land Withdrawal Act Total Capacity Limit for Defense-Related Transuranic Waste, Land Withdrawal Act (LWA) volumes will now be reported.
3. Cumulative period includes from the beginning of emplacement until June 30, 2022.
4. Limiting Value—Values from CRA 2019 Section 24. These values are based on inventory assumptions.
5. CPR materials include the waste, container materials, emplacement materials, and non-containerized waste.
6. Fe-Metals include both materials in the waste and containers in total.
7. There is no decay correction for the listed isotope activities. Isotopic activities reported are from the time of the original assay. It is understood that some isotopes may have reached secular equilibrium after disposal.
8. New minimum value for excess factor of MgO to be implemented as approved by EPA (Reyes, J 2008b) reduces excess factor from 1.67 to 1.20 and ensures minimum reactivity of 94%.
9. MgO, CPR, and excess factor results for panel 1 and rooms 2-7 of panel 2 have been recalculated to replace averaged data with actual emplaced data.

Table 4: Performance Assessment, Software, and Hardware Changes During the Reporting Period

WIPP Codes/Software and Code Version	Version Date	Date of Change	Description of Change
PFLOTRAN 3.0.1	7/30/21	7/30/21	New code.
ICSET 2.23	8/16/21	8/16/21	This code was migrated from the Oracle Solaris computer cluster to the new High Performance Computing (HPC) Linux cluster running CentOS 7.
SUMMARIZE 3.02	8/16/21	8/16/21	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
DTRKMF 1.01	8/16/21	8/16/21	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
BLOTCDB 1.38	8/24/21	8/24/21	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
MODFLOW2000 1.07	8/24/21	8/24/21	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
RELATE 1.45	9/2/21	9/2/21	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
PEST 9.12	10/25/2021	10/25/2021	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
POSTLHS 4.11	11/9/2021	11/9/2021	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
CCDFVECTORSTATS 1.02	3/15/2022	3/15/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.

STEPWISE 2.23	1/06/2022	1/06/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
NONLIN 2.03	2/22/2022	2/22/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
NUTS 2.08	2/01/2022	2/01/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
PANEL 5.01	1/20/2022	1/20/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
PRELHS 2.45	1/11/2022	1/11/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
LHS 3.00	2/07/2022	2/07/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
PRECCDFGF 2.02	6/01/2022	6/1/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
CCDFGF 7.05	6/16/2022	6/16/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
POSTSECOTP2D 1.05	4/18/2022	4/18/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
PRESECOTP2D 1.23	4/18/2022	4/18/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.
SECOTP2D 1.43	4/18/2022	4/18/2022	This code was migrated from the Oracle Solaris computer cluster to the new HPC Linux cluster running CentOS 7.

3.0 EXTRA-REGULATORY INFORMATION REQUESTED BY THE U.S. EPA

Table 5: Passive Institutional Controls Activity During the Reporting Period

Date	Description of Activity
3/8/2022	An Oral Session on Global Experience of Records, Knowledge and Memory (RK&M): Global Marker Systems, was held at the 2022 Waste Management Symposium. Presentations given included: *Nuclear Energy Agency Work in the Area of Records, Knowledge and Long-term Memory Keeping* – Rebecca Tadesse (Nuclear Energy Agency) *Blockchain Technology Applications for the Waste Isolation Pilot Plant* – Jeremy Standiford (NWP, author), Rob Watson (NWP, Presenter, Session Chair) *Creatively Closing the Data Management Loop at Los Alamos National Laboratory: Verifying Waste Compliance & Tracking System* – Oral Saulters (LANL)

Table 6: EPA Waste Characterization Inspections During the Reporting Period

Generator Site	Date of Inspection	EPA Inspection No./ Tier 1 Evaluation	Docket Number/Approval Date
Advanced Mixed Waste Treatment Project/ Accelerated Retrieval Project			None to report.
Argonne National Laboratory-Illinois			None to report.
Hanford			None to report.
Idaho National Laboratory	March 2022	A-98-49: II-A4-239; II-A4-240; II-A4-241	EPA-HQ-OAR-2001-0012-0504; EPA-HQ-OAR-2001-0012-0505; EPA-HQ-OAR-2001-0012-0506
Lawrence Livermore National Laboratory			None to report.
Los Alamos National Laboratory			None to report.
Oak Ridge National Laboratory			None to report.
Sandia National Laboratory			None to report.
Savannah River Site			None to report.

Table 7: EPA Quality Assurance Audits by Site During the Reporting Period

Site	Audit Date	Purpose
Advanced Mixed Waste Treatment Project	October 18 – 21, 2021	Recertification Audit Audit # A-22-04
Argonne National Laboratory - East-CCP	July 20 – 22, 2021	Recertification Audit Audit # A-21-24
CCP (All Sites)	March 17 – 17, 2022	CCP QA Audit (All sites) Audit # A-22-08
Carlsbad Field Office	March 7 – 17, 2022	Carlsbad Field Office (CBFO) Surveillance of Nuclear Waste Partnership LLC (NWP) iCAS System Surveillance # S-22-14
Hanford-CCP		None to report
Idaho National Laboratory - CCP	February 15 – 17, 2022	INL/CCP Recertification Audit (CH & RH) Audit # A-22-07
Lawrence Livermore National Laboratory	August 10 – 12, 2021	Recertification Audit Audit # A-21-25
Los Alamos National Laboratory-CCP	May 18 – 20, 2021	LANL/CCP Recertification Audit Audit # A-21-17
	June 28 – 30, 2022	LANL/CCP Recertification Audit Audit # A-22-12
Los Alamos National Laboratory-Carlsbad Operations (LANL-CO)	March 1 – 3, 2022	LANL-CO Quality Assurance Program Document (QAPD) Implementation Audit Audit # A-22-07
Nuclear Waste Partnership LLC	August 17 – 19, 2021	10 CFR Part 71 Subpart H Audit Audit # A-21-16
	September 14 – 16, 2021	QAPD Implementation Audit (Criteria 10-18) Audit # A-21-21
	November 16 – 18, 2021	Environmental Sampling Surveillance (National Emission Standards for Hazardous Air Pollutants) Audit # S-22-07

Site	Audit Date	Purpose
	January 4 – 10, 2022	NWP Surface Waste Handling Audit Audit # A-22-06
	January 10 – 11, 2022	Evaluation of the effectiveness of the NWP QA Audit of Premier Technology Inc. (E33-03) for Retention on the NWP Qualified Supplier List Surveillance # S-22-03
	February 1 – 3, 2022	NWP QAPD Implementation Audit (Criteria 1-9) Audit # A-22-03
Oak Ridge National Laboratory- CCP	April 26 – 28, 2022	ORNL/CCP Recertification Audit Audit # A-22-10
Savannah River Site-CCP	December 6 – 9, 2021	Certification of K Area and Recertification Audit (including E Area) Audit # A-22-02
Sandia National Laboratory- CCP	June 22 – 24, 2021	Recertification Audit Audit # A-21-19
Sandia National Laboratory-Carlsbad Office		None to report.

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