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MAR - 8 2016

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 8 2016

OFFICE OF
AIR AND RADIATION

Mr. Todd Shrader
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

Dear Mr. Shrader:

During the week of April 7, 2015, the U.S. Environmental Protection Agency performed an inspection of the Waste Isolation Pilot Plant (WIPP) as part of its continuing oversight program. These inspections were performed under the authorities of 40 CFR 194.21 and 40 CFR Part 191, Subpart A. During this April 2015 inspection, the facility was still undergoing active recovery resulting from the February 2014 unplanned radiological release and not emplacing waste. Therefore, although the inspection followed the format of a typical annual inspection, inspection activities were tailored to the current operational state of the facility. The EPA initially sent the 2015 Subpart A inspection report to you on February 17, 2016; this letter transmits the remaining Emplacement and Monitoring reports resulting from the April 2015 inspection.

Based on the inspection activities documented in the accompanying inspection reports (E-docket #: EPA-HQ-OAR-2001-0012-0458), the EPA concludes that the monitoring program appropriately covers the ten monitoring parameters required by the Agency's 1998 Certification Decision. The Department of Energy/Carlsbad Field Office has maintained adequate parameter monitoring at the WIPP site during the past year and has the procedures and requirements in place to sustain its program into 2016. The EPA also determined that waste emplacement activities and records continue to be adequate.

Copies of these inspection reports are enclosed with this letter and will be placed in the EPA's public dockets on http://www.regulations.gov. If you have any questions regarding the enclosed reports, please contact Jonathan Walsh at (202) 343-9238.

Sincerely,

Jonathan D. Edwards
Director
Radiation Protection Division

160309

Enclosures

cc: Russ Patterson, DOE/CBFO
George Basabilvaso, DOE/WIPP
Alton Harris, DOE/HQ
Tim Hall, NMED
Tom Kesterson, NMED Carlsbad
EPA WIPP Team
EPA Docket

E-DOCKET: EPA-HQ-OAR-2001-0012-0458

2015 – Emplacement Inspection Report

EPA INSPECTION No. EPA-WIPP-10.13-22c
OF THE
WASTE ISOLATION PILOT PLANT
April 7-9, 2015

U. S. ENVIRONMENTAL PROTECTION AGENCY
Office of Radiation and Indoor Air
Center for Waste Management and Regulations
1200 Pennsylvania Avenue, NW
Washington, DC 20460

March 2016

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1.0 Executive Summary

The U.S. Environmental Protection Agency (EPA or the Agency) conducted an inspection of the U.S. Department of Energy's (DOE) Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, from April 7 through April 9, 2015, in accordance with 40 CFR 194.21. The WIPP is a disposal facility for defense-related transuranic (TRU) waste as defined by the WIPP Land Withdrawal Act. EPA first certified that WIPP complies with the Agency's radioactive waste disposal regulations (Subparts B and C of 40 CFR Part 191) on May 18, 1998.

WIPP experienced two events in February 2014 that suspended waste emplacement and required implementation of recovery operations in the underground. The salt haul vehicle fire of February 5 and the radiation release of February 14, 2014 closed the underground for several weeks. Limited access was restored in late April of that year. EPA inspected air sampling and surface facilities at the site in April 2014, in response to the radiological release.

During the April 2015 inspection, the facility was undergoing active recovery and not emplacing waste. The emplacement inspection was used to document recovery progress and confirm information DOE has submitted to EPA regarding recovery. For the Emplacement Report, EPA confirmed Waste Data System (WDS) records for waste currently stored in the Waste Handling Building, toured the underground, and confirmed recovery activities to decontaminate and restore the underground.

EPA did not identify any findings or concerns during the Emplacement portion of the inspection.

2.0 Inspection Purpose and Scope

The purpose of this annual inspection is to verify that contact-handled (CH) and remote-handled (RH) transuranic (TRU) waste sent to WIPP during the past year has been emplaced in the underground facility in the manner specified in DOE's Compliance Certification Application (EPA Air Docket A-93-02, Item II-G-01) and other approvals. EPA performed this inspection under the authority of 40 CFR 194.21, which authorizes the Agency to inspect WIPP during its operational period to verify continued compliance with EPA's WIPP Compliance Criteria and the certification decision of May 18, 1998. Emplacement of waste and backfill, in particular, is relevant to compliance because the emplacement method supports the models that DOE uses in the WIPP performance assessment.

Due to the recovery process, EPA's purpose and scope is unique for this inspection. The Agency confirmed adequate record keeping for the waste stored on site and adequate training records for personnel associated with the recovery. EPA observed the equipment used to maintain the underground (bolting unit) as well as photographic records of the decontamination unit.

3.0 Inspection Team, Observers and Participants

The inspection team consisted of two EPA staff. Numerous DOE staff and contractors participated in the inspection; below is a partial list.

Inspection Team Member	Position and Inspection Focus	Affiliation
Jonathan Walsh	Inspection Leader	EPA – ORIA
Nick Stone	Inspector	EPA – Region 6

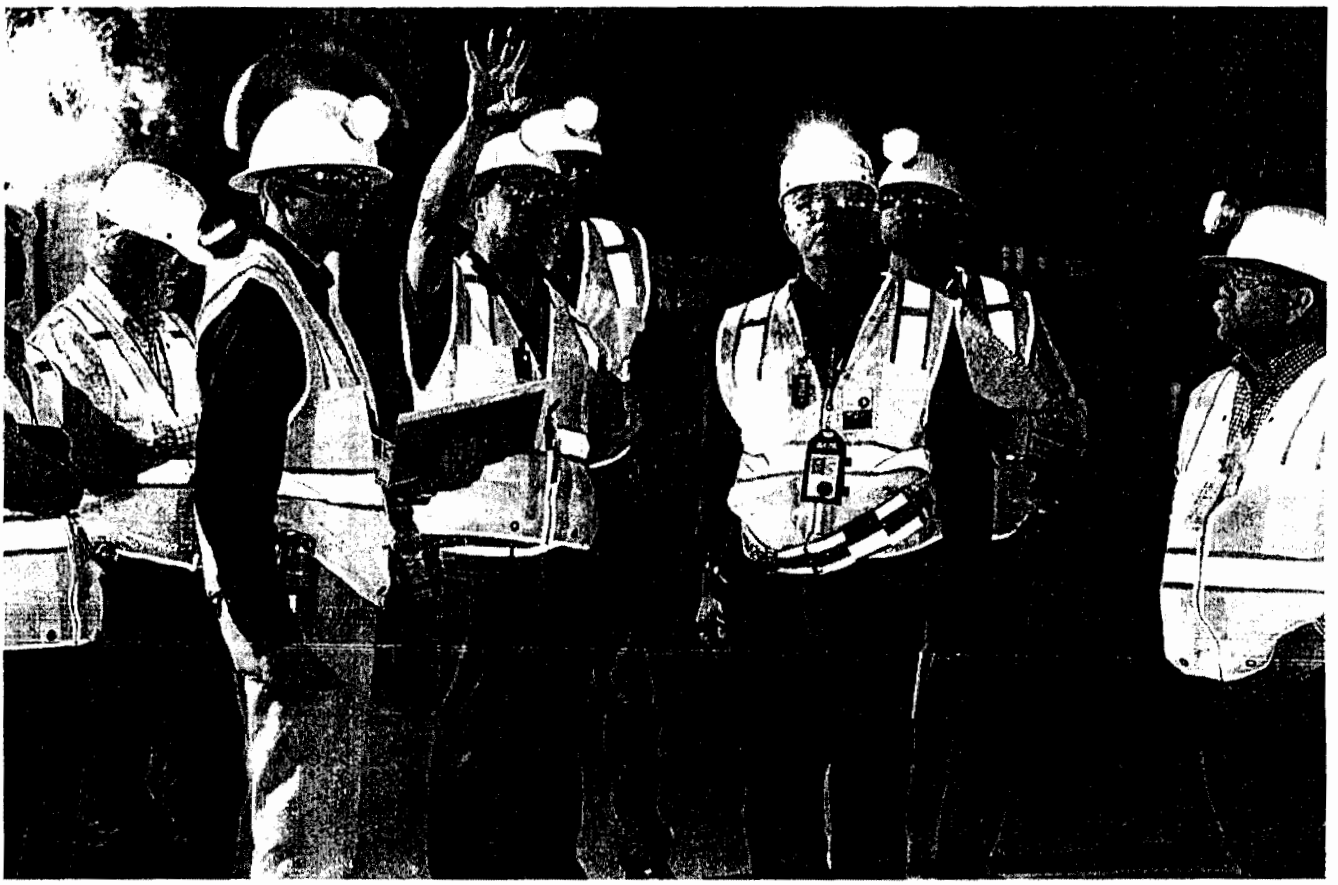
Observer	Position	Affiliation
Mansour Akbarzadeh	Manager, Carlsbad Environmental Monitoring and Research Center	NWP
John Callicoat	Delaware Basin Monitoring Lead	URS-Professional Solutions
Rey Carrasco	Manager Geotechnical Engineering	NWP
Jennifer Hendrickson	Manager, Air Monitoring	NWP
Jaci Davis	Air Monitoring	NWP
Larry Madl	Senior Scientist, EPA Compliance Group	URS-Professional Solutions
Rick Salness	Manager, Environmental and Hydrologic Monitoring	NWP
David Squires	Engineering and Technical Services	NWP
Kris Kuhlman	Sandia PA Team Member - Hydrology	SNL
JohnVandeKraats	Manager WIPP Mine Operations	NWP
Steve Wagner	Sandia PA Team Member - FEPs	J Hart & Assts/SNL
Mike Walentine	Waste Data Monitoring	NWP
Ty Zimmerly	Geotechnical Engineering	NWP

ORIA – Office of Radiation and Indoor Air

NWP – Nuclear Waste Partnership

SNL – Sandia National Laboratories

Figure 1
Inspection Team in the Underground



4.0 Performance of the Inspection

The inspection took place from April 7 to April 9, 2015, at DOE's Carlsbad Field Office (CBFO) and at the Waste Isolation Pilot Plant (WIPP) facility, which is located approximately 26 miles southeast of Carlsbad, New Mexico. The opening meeting with CBFO and NWP personnel was held on the morning of April 7, 2015 at the WIPP site. Facility staff presented information addressing safety, recovery status, updates and changes since the last EPA inspection which took place from April 7-29, 2014.

EPA inspectors accompanied CBFO and NWP personnel into the underground repository on the morning of April 9, in order to examine restoration of the underground including soot removal, decontamination methods, safety upgrades, and the transition zone to the potentially contaminated area of the underground. The inspectors observed the salt hauler vehicle and examined how the fire's location spread soot throughout the underground. EPA inspectors did not enter the potentially contaminated zone because EPA determined after the inspection of 2014 that the WIPP's ability to contain waste was not compromised by the salt hauler fire or the drum breach.

Figure 2
Inspection Team Observes
Test Section of Drift Rad Isolation

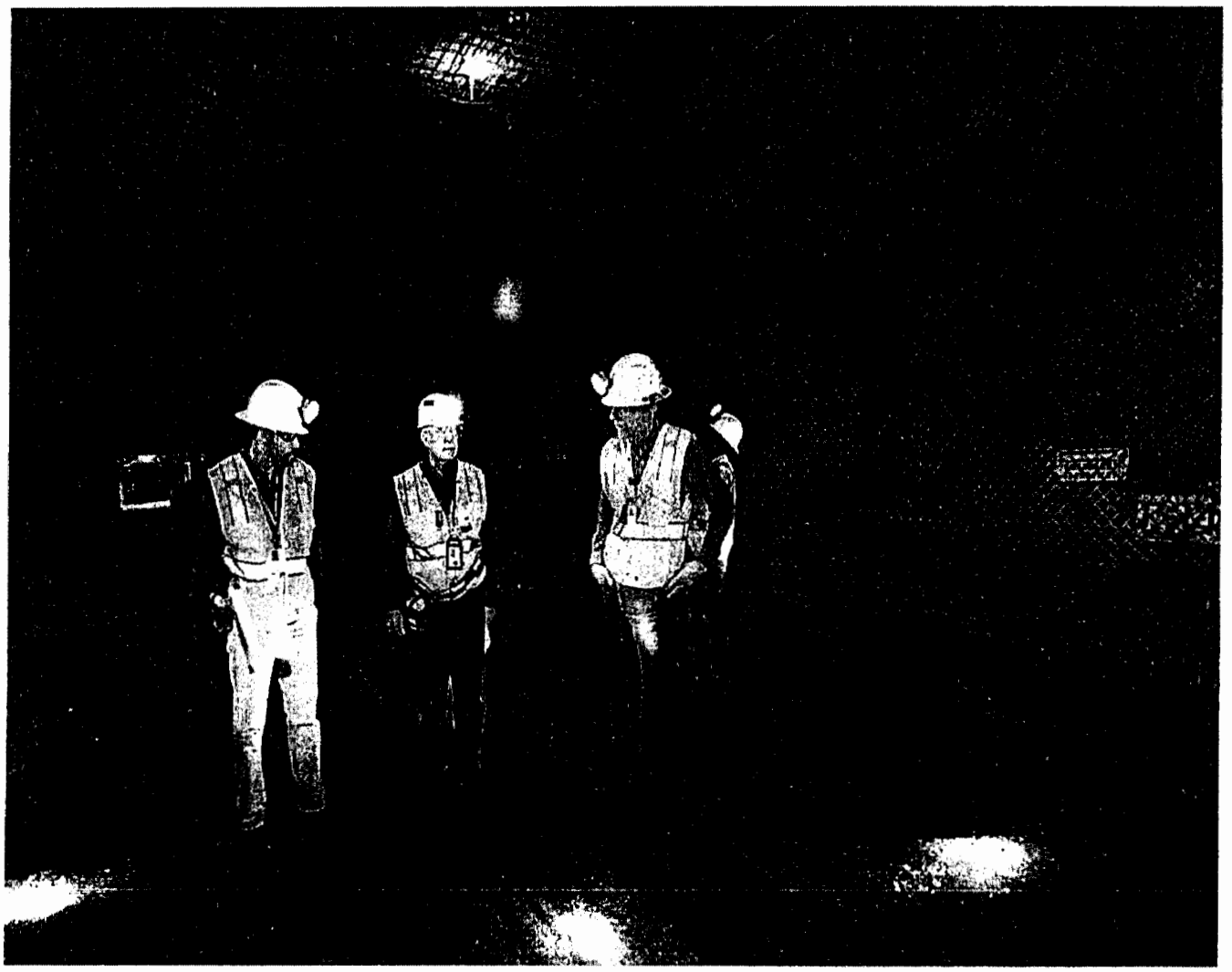


Figure 3
Recovery Operations in the Underground

Figure 4
Inspection Team Follows Safety Procedures

5.0 Waste Emplacement/WDS

Wastes received at the repository include contact-handled (CH) transuranic wastes from Argonne National Laboratory-East (ANL-E), Bettis Atomic Power Laboratory, GE Vallecitos Nuclear Center, Lawrence Livermore National Laboratory, Sandia National Laboratory, Los Alamos National Laboratory (LANL), Idaho National Laboratory (INEEL), Hanford Site, Rocky Flats Environmental Technology Site (RFETS), Savannah River Site (SRS), the Nevada National Security Site (NNSS, formerly the Nevada Test Site), and the Oak Ridge National Laboratory (ORNL). These wastes are received and emplaced in several configurations: Standard Waste Boxes (SWBs), 55-gallon drums assembled in groups of seven called a Seven Pack, 100-gallon drums for super compacted waste, Ten Drum Overpacks (TDOP), SLB2 containers, and Shielded Containers. RH wastes from INL, ORNL, ANL-E, and SRS have been emplaced in the WIPP, using the 72-B canister.

The repository is subdivided into panels, each panel consisting of seven rooms. At the time of the inspection, all waste emplacement had been suspended since February 5, 2014. CH waste containers are stacked in columns (waste stacks) combining SWBs, drum packs, and TDOPs (see Figures 5 and 6). TDOPs are always placed on the floor of the room, occupying the bottom and middle position of a waste column. SWBs and drums may be emplaced in any order, with most wastes emplaced as received. The waste columns are in a series of staggered rows, with a row consisting of three columns that span the distance of a disposal room from left to right (Figure 5). RH waste is placed in the walls on eight foot centers (Figure 7).

Figure 5
Arrangement of Disposed Waste in a Room

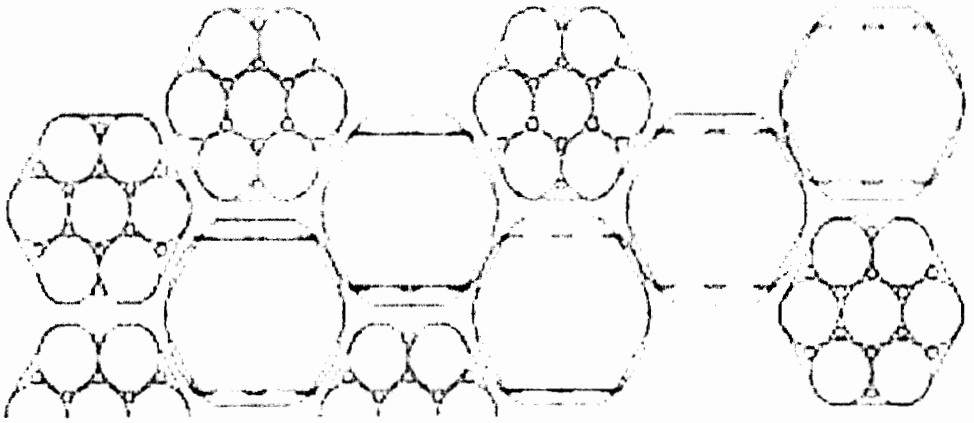


Figure 6
Typical Emplaced Waste Face

Figure 7
Typical RH Waste Emplacement

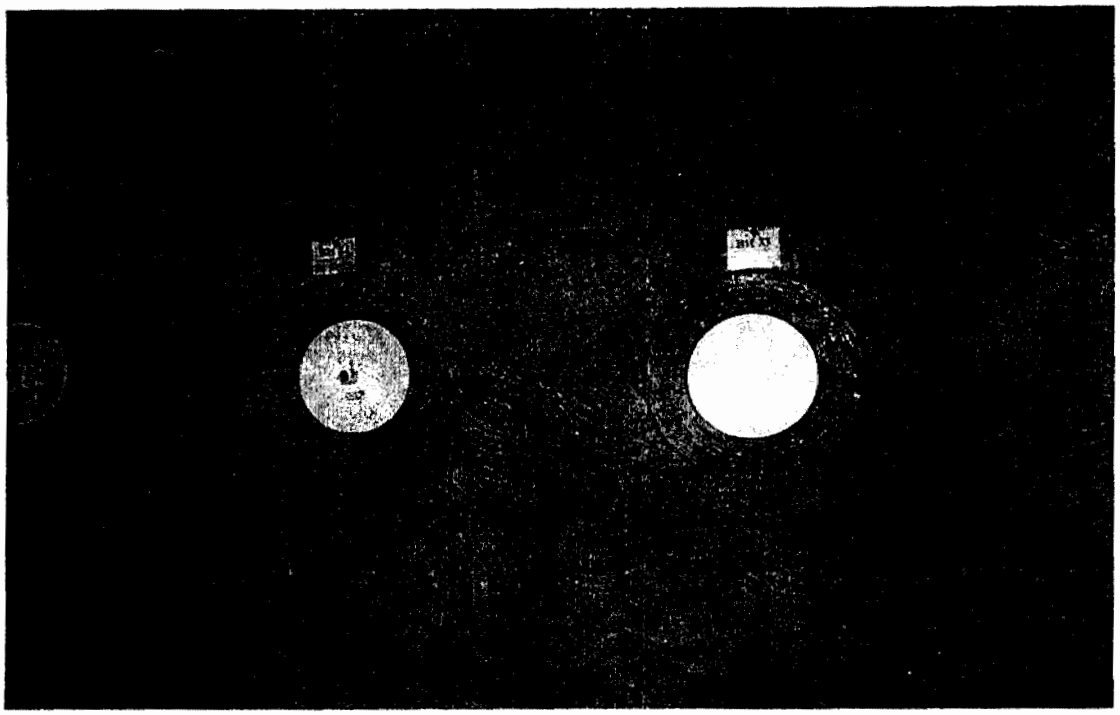
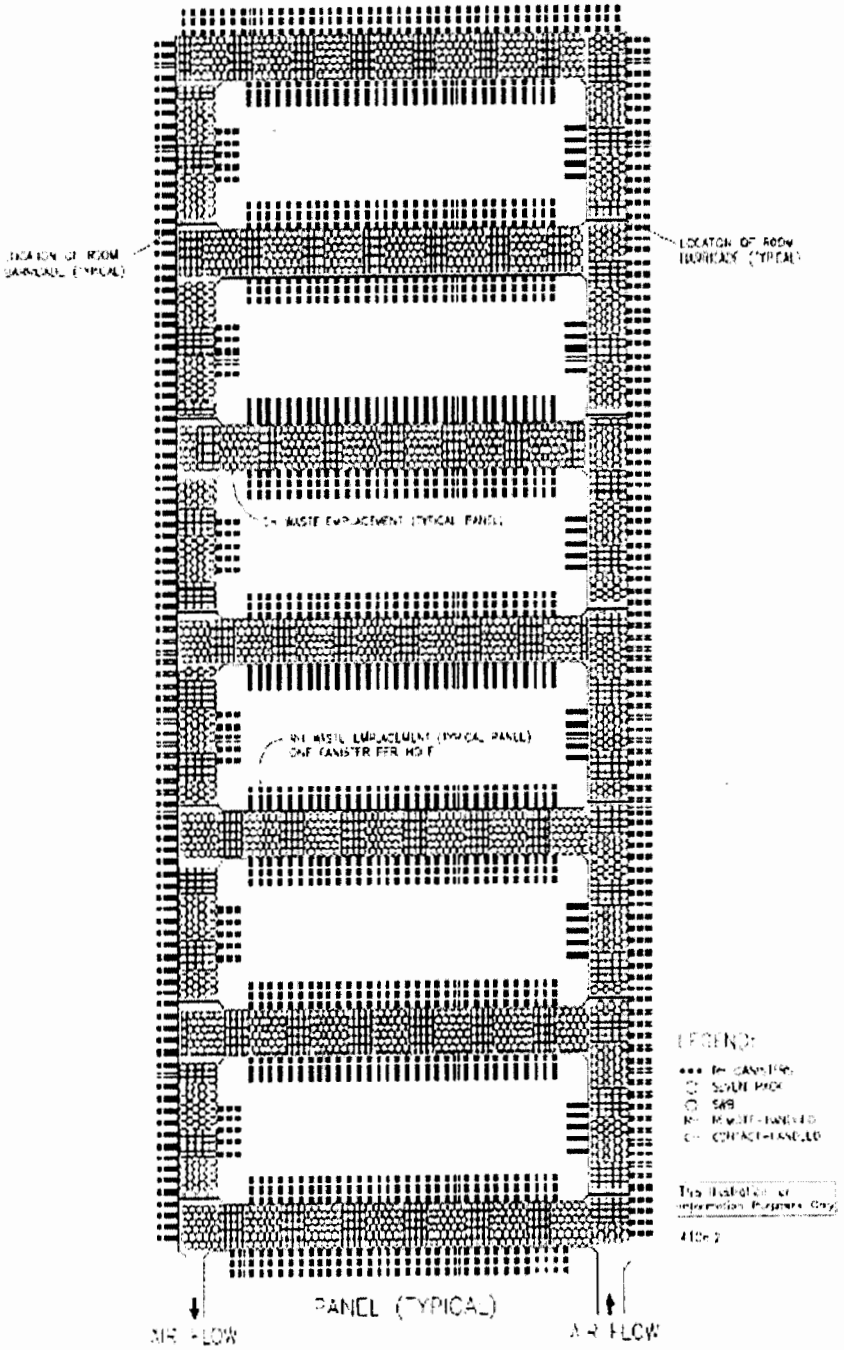


Figure 8
Typical RH and CH TRU Mixed Waste Disposal Configuration



The inspectors identified three containers in temporary storage in the Waste Handling Building for review. The inspector noted the shipment identification numbers directly off the emplaced containers. The containers selected are identified in Table B below.

Table A: Waste Containers Reviewed During Inspection

CH Waste Containers Reviewed During Inspection (Waste Handling Building)	Container Number	Container Type
	HBL 110175	Pipe Overpack Drum
	HBL 120315	Pipe Overpack Drum
	LASB 02156	Standard Waste Box (SWB)

On the afternoon of April 9 at CBFO, inspectors met with NWP personnel, who answered questions and retrieved Waste Disposal System (WDS) data. All electronic records were found to contain required waste stream, container, and emplacement information.

6.0 Magnesium Oxide Backfill

Magnesium oxide (MgO) is the engineered barrier used in the repository as backfill, specified in DOE's Compliance Certification Application (CCA). EPA requires DOE to maintain an MgO excess factor (safety factor) to ensure that adequate MgO is chemically available to control the chemistry of each room after closure. The Agency approved lowering the required excess factor to 1.2 from 1.67 in a letter dated February 11, 2008, requiring the emplacement of sufficient MgO to react with 1.2 times the amount of carbon present in the repository. Conditions of EPA's agreement stipulate that DOE must ensure a minimum reactivity of 96% for the MgO emplaced, and maintain the excess factor on a room-by-room basis. The Department instituted this change in March 2009, and it was a focus of EPA's 2009 inspection.

DOE maintains an excess factor of 1.2 on a room-by-room basis. The MgO records were not reviewed because emplacement has been suspended since February 5, 2014.

Process steps guiding MgO placement and documentation in the underground are found in WP 05-WH1025, CH Waste Downloading and Emplacement, and WP-05-WH.02, WIPP Waste Handling Operations WDS User's Manual. Waste Handling Engineers (WHE) may record the quantity and placement of MgO electronically using a WDS bar code reader, or manually via paper forms if a bar code reader is unavailable.

7.0 Comparison with Inventory Limits

EPA establishes limits for certain waste components at WIPP by approving performance assessment inventory estimates. The limit for ferrous metals is a minimum limit of 20 million kilograms. This limit was achieved in 2010. The amount of ferrous metal currently emplaced is 27,561,627 kg, which is 138% of the minimum. The other established performance limit is for cellulosic, plastic, and rubber (CPR) materials. In the original CCA, DOE calculated 2.2×10^7 kg of CPR, establishing EPA's limit. In the

subsequent performance assessment baseline calculations, DOE added packaging materials to the calculations, and now the CPR limit for WIPP is 2.4 x 10^7 kg (see Table C). The CPR values are tracked per container and the total CPR has remained constant since operations were suspended on February 5, 2014. The CPR total remains at 37% of the maximum limit.

The Summary of Waste Emplacement Inventory Report provided data for emplaced waste, including total activities of the ten EPA-tracked radionuclides, total weights of ferrous and non-ferrous metals, and the CPR/MgO balance by room, as of June 24, 2015.

Table B: Emplaced CPR, Ferrous, & Materials as of June 24, 2015

Material Type	Weight (kg)	Limiting Value	2015	2014	2013	2012	2011	2010	2009
Cellulosic, Plastic, Rubber[1] (CPR)	8,914,542	24,000,000 max kg	37.1%	37.1%	36.3%	34.3%	32.3%	29.9%	26.3%
Ferrous Metal	27,561,627	20,000,000 min kg	138%	138%	132%	123%	113%	101%	87.5%
Non-Ferrous Metal	438,100	N/A							
Other Material[2]	13,357,139	N/A							

[1] EPA has asked for additional information related to CPR, including organic kitty litter, and the MgO safety factor a part of the review of the Compliance Recertification submitted by DOE in March 2014.

[2] Other Material reflects inorganic material and metal alloys.

The WIPP Land Withdrawal Act of 1992 limits the total waste to no more than 176,000 cubic meters (6.1 million cubic feet) and the total activity of the RH waste to 5.1 million curies. The emplaced waste as of April 9, 2015 has not changed since suspension of emplacement in February, 2014. The emplaced waste prior to suspension was 90,983 cubic meters or 3,213,034 cubic feet. The emplaced waste is 52.7% of the maximum allowed. The RH activity is shown in Attachment B as 24,050 curies, which is 0.47% of the maximum allowed.

8.0 Summary of Results

The inspectors reviewed recovery operations, NWP procedures, and records associated with selected stored containers. The procedures for processing CH and RH waste were reviewed and found to be adequate, according to specified plans documented in the CCA. EPA concludes that DOE's emplacement activities and records are adequate, and that CPR and MgO are appropriately tracked. The Agency identified no findings or concerns with the emplacement portion of the inspection. EPA will, however, follow-up on reporting and tracking of the CPR

as part of the WIPP recovery process and the review of the 2014 Compliance Recertification Application.

Attachment A: Inspection Plan

WIPP FY 2015 Inspection Plan for Emplaced Waste, Specified in DOE's Compliance Certification Application and per 40 CFR 194.21

Purpose:

The purpose of this inspection is to verify that waste sent to WIPP during the past year has been emplaced in the underground facility in the manner specified in DOE's Compliance Certification Application (EPA Air Docket A-93-02, Item II-G-01) and other approvals.

EPA is performing this inspection under the authority of 40 CFR 194.21, which authorizes the Agency to inspect the WIPP during its operational period to verify continued compliance with EPA's WIPP Compliance Criteria and the certification decision of May 18, 1998.

Scope:

The scope of this inspection includes: demonstration of the site's ability to receive, process, and emplace contact-handled and remote-handled TRU wastes within the repository; the use of magnesium oxide (MgO) backfill in appropriate amounts to fulfill DOE commitments and requirements; maintenance of relevant waste packaging records, including the electronic WIPP Waste Data System (WDS) and the verification of appropriately implemented quality assurance practices. The availability of documentation of these processes and activities will be a major source of review.

Focal Areas for this Year's Inspection:

As a result of the 2014 incidents, waste emplacement is not taking place. EPA will inspect waste that is being stored aboveground in the Waste Handling Building, and waste tracking in the WDS. EPA will additionally use the underground portion of the inspection to observe facility recovery activities and document DOE's progress towards its recovery milestones.

Location:

The inspection will be held at DOE's WIPP facility located twenty-six miles southeast of Carlsbad, New Mexico and the Carlsbad Field Office (CBFO) in Carlsbad. Inspection activities will include examination of the underground facilities, records related to waste emplacement, and other information as needed.

Duration:

The EPA expects to complete its inspection in three days. Each full day will begin with an opening meeting at 8:00 a.m. and end no later than 5:00 p.m. with a closeout session.

Dates: April 7-9, 2015

Documents for Review:

EPA has received and is reviewing relevant documentation and will request additional documentation if needed.

Attachment B: Summary Totals WDS Nuclide Report through April 9, 2015

Panel: ALL Room: ALL

Radionuclide	Repository CH Activity (Ci)	Repository RH Activity (Ci)	Total Repository Activity (Ci)
AM-241 Americium 241	2.581E5	6.208E2	2.587E5
CS-137 Cesium 137	1.421E1	1.444E4	1.444E4
PU-238 Plutonium 238	4.828E5	7.289E2	4.835E5
PU-239 Plutonium 239	3.333E5	3.839E2	3.337E5
PU-240 Plutonium 240	8.239E4	2.802E2	8.267E4
PU-242 Plutonium 242	2.72E1	3.821E-1	2.759E1
SR-90 Strontium 90	1.595E1	7.599E3	7.615E3
U-233 Uranium 233	6.536E0	3.848E-1	6.921E0
U-234 Uranium 234	8.669E1	1.14E0	8.783E1
U-238 Uranium 238	1.758E1	3.915E-2	1.762E1
Totals:	**1.157E6**	**2.405E4**	**1.181E6**

Attachment C: EPA Emplacement Inspection Checklist, April 7-9, 2015

	Questions: Waste Emplacement	Comments and Objective Evidence	Results
1	Is waste being emplaced in the underground facility in the manner specified in DOE's Compliance Certification/ Re-Certification or other relevant documentation?	N/A. No waste emplaced since February 5, 2014.	N/A
2	Are CH waste containers stacked in columns appropriately given the type of container?	N/A. No waste emplaced since February 5, 2014.	N/A
3	Are records adequate? Randomly select 3-4 CH and 2-3 RH waste containers to verify records for waste approval, shipment, and receipt. NOTE: Because waste handling has been suspended, three stored CH waste containers were selected in the Waste Handling Building to confirm the records.	Yes. TRU Waste Receipt WP 08-NT3020, describes the process. Records produced are Uniform Hazardous Waste Manifest, TRU Waste Receipt Checklist, Shipment Summary Report, and Radiological Survey Report. EPA reviewed records and found records to be adequate. Selected Containers: **CH Waste** (Waste Handling Building) - Pipe Overpack Drum - HBL 110175 - Pipe Overpack Drum - HBL 120315 - Standard Waste Box (SWB) – LASB 02156	Satisfactory
4	Is DOE properly emplacing backfill material (magnesium oxide [MgO]) with the waste packages? Are super sacks placed on top of waste stacks according to procedure?	N/A. No waste emplaced since February 5, 2014.	N/A

5	Verify documentation for the containers listed in item 3 - waste generator site transmittal of waste to WIPP, WIPP approval, shipment certification for transport to WIPP, shipment initiation documentation, shipment received at WIPP records, waste emplaced in the underground, and placement of engineered barrier [MgO].	Inspectors examined electronic records kept aboveground for the selected containers. Documentation was determined to be adequate.	Satisfactory
	Questions: RH Waste Emplacement	**Comments and Objective Evidence**	**Results**
6	Are RH containers approved for receipt, received, processed, and emplaced properly?	N/A. No waste emplaced since February 5, 2014.	N/A
7	Are RH containers appropriately tracked? Where is the information? --In the WDS, what report --During the receipt/transfer process where is it recorded? --In the underground?	N/A. No waste emplaced since February 5, 2014.	N/A
8	Content of RH canisters No RH in storage, access to emplaced RH restricted.	N/A. No waste emplaced since February 5, 2014.	N/A
9	Volume and mass and/or concentration of important waste components and radionuclides (RH and CH)? Are they within statutory and regulatory limits?	Detailed description of nuclide information is included in the Waste Emplacement Report. Yes.	Satisfactory
10	Are RH boreholes closed properly? (Note: also see #9 for tracking of RH in the U/G)	N/A. No waste emplaced since February 5, 2014.	N/A

11	Is a photographic record made of the RH canister number during emplacement and retained in the permanent record?	N/A. No waste emplaced since February 5, 2014.	N/A
	Questions: Procedures	**Comments and Objective Evidence**	**Results**
12	Do DOE procedures reflect an MgO safety factor to 1.2?	Yes. WP 05-WH1025, CH Waste Downloading and Emplacement, Rev. 12, Section 3.0, Backfill, establishes procedures to maintain a safety factor of 1.2 or greater per room on a daily basis. Procedures in the WDS User's Manual, WP-05-WH.02, Sections 6.2.5, 9.5.3, and Attachment 1 reflect the 1.2 safety factor and the use of 3,000-lb. super sacks as necessary. Review of the Summary of Waste Emplacement Inventory Report (April 9, 2015) documents an MgO Safety Factor in excess of 1.2 for all rooms in each panel.	Satisfactory
13	Are both CPR and MgO calculated and tracked on a room- by-room basis?	N/A. No waste emplaced since February 5, 2014.	N/A
14	Are sampling and analytical procedures in place to ascertain that emplaced MgO maintains a minimum of 96% reactivity?	Yes. Specification D-0101, Prepackaged MgO Backfill, and WP 05-WH1105, MgO Sample Records Management, set forth analytical and document management procedures to verifying that each shipment of MgO maintains a 96 +/- 2% reactivity.	Satisfactory
15	Is the acceptance of the MgO backfill material from the supplier documented?	Yes. WP 05-WH1105, MgO Sample Records Management, Sec. 2.0 requires each shipment to be numbered, and the MgO supplier to provide an Analysis of Shipment and a sample under Chain of Custody for each shipment.	Satisfactory

16	For the MgO needed for high CPR, are there procedures or documentation for the WHE or WHM (or other appropriate personnel) identifying when and where additional MgO is needed?	Yes. General procedures are found in the WIPP WH Operation WDS User's Manual, WP 05–WH.02, Attachment 1, Special Requirements for Additional MgO. Section 3 of WP 05-WH1025 calls for notification of the WHM if daily reports show the MgO safety factor of a room to be less than 1.2.	Satisfactory
17	Is there documentation that identifies how MgO should be placed with high CPR waste?	Yes. WP 05-WH1025, CH Waste Downloading and Emplacement, Attachment 3, Super sack/BRT Emplacement Data Sheet; and WP 05-WH1058, CH Waste Handling Abnormal Operations, Sec. 4.0, BRT Emplacement	Satisfactory
18	Verify documentation of procedures for abnormal operating conditions, and documentation of training for contingencies.	Abnormal operating and emergency procedures were reviewed, including but not limited to those listed below. WP 02-EC3506 Rev 9, Environmental Incident Reporting, is the Management Control Procedure for reporting releases, and includes statutory requirement charts for notifications and decision flowcharts. WP 05-WH1058 Rev 15, CH Waste Handling Abnormal Operations, includes instructions for recovering from a torn slip sheet, moving emplaced waste, returning waste to surface, and emplacing BRTs. Specifies that "Abnormal operations of a large scope (e.g. overpack and retrieval) will have specific plans developed." WP 05-WH1758 Rev 15, RH Waste Handling Abnormal Operations, includes instructions for operating the Hot Cell Crane in response to a hoist, trolley, bridge or grapple failure, installing and removing the Waste Transfer Machine Assembly (WTMA) wheels, retrieving a loaded RH –TRU 72-B Cask from the Transfer Cell, returning a loaded 10-160B Cask to a generator site and resetting the Transfer Cell Light Curtain. WP 12-9 Rev 41, WIPP Emergency Management Plan, is the top-level document outlining emergency response procedures and responsibilities, includes training requirements for response roles. WP 05-WH4401 Rev 3, Waste Handler Operator Event Response, includes alarm, alert, and exit procedures. WP 12-ER3906 Rev 14, Categorization and Classification of Operational Emergencies	Satisfactory

18 Con't	Verify documentation of procedures for abnormal operating conditions, and documentation of training for contingencies.	WP 12-HP4000 Rev 9, Emergency Radiological Control Responses, provides guidance for responding to an actual or suspected breach of a TRU container, contamination found outside controlled areas, radiation levels exceeding the limits set in WP 12-5.	Satisfactory

	Questions: Records/WDS	Comments and Objective Evidence	Results
	Does Waste Data System (WDS) adequately record required information?	Reports available through the EPA Dashboard contain the container number, shipment number, emplacement data and underground location. EPA staff queried the WDS to verify that this information is recorded correctly.	Satisfactory
19	Does the WDS adequately document waste shipment and emplacements information for waste containers selected? (Item 3 above) CH, RH	Yes. The Container Query was generated, which correctly reflected container number and shipment number.	Satisfactory
20	Do records verify that contact handled waste container surface doses fall within statutory requirements? Where are CH surface dose records maintained?	Yes. CH surface dose measurements are recorded in the Container Query. Dose limits for each of the containers examined by EPA inspectors (listed in Item 3) were below statutory limits.	Satisfactory
21	Review a Container Query. Does this report adequately record the Waste Stream Profile information?	Yes. For all containers inspected, inspectors found the information in the Container Query and Certification Data Values.	Satisfactory
22	Review the Container Query. Does the report correctly record the containers shipped? CH, RH	Yes, under the Transportation Data Report. By querying the Shipment number, the Shipment Data report may be generated. Inspectors verified that the report reflects the containers shipped.	Satisfactory
23	Review the Waste Emplacement Report. Does this report adequately record the date of receipt, and disposal locations of containers? CH, RH	Yes. See Item 21.	Satisfactory
24	Is DOE assuring that the 1.2 safety factor being maintained on a room basis? Does the WDS accurately calculate the excess factor and recommend the proper amount of MgO to emplace?	Yes. See questions 12-17. EPA inspectors reviewed ISL Matrix Requirements WWIS2-REQ-2126 and -2127 to verify that the WDS software calculates MgO excess appropriately.	Satisfactory

E-DOCKET: EPA-HQ-OAR-2001-0012-0458

2015 - Monitoring Inspection Report

INSPECTION No. EPA-WIPP-4.07-09b
OF THE
WASTE ISOLATION PILOT PLANT
April 7-9, 2015

U. S. ENVIRONMENTAL PROTECTION AGENCY
Office of Radiation and Indoor Air
Center for Waste Management and Regulations
1200 Pennsylvania Avenue, NW
Washington, DC 20460

March 2016

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1.0 Executive Summary

The U.S. Environmental Protection Agency (EPA) conducted an inspection of the Department of Energy's (DOE) Waste Isolation Pilot Plant (WIPP) from April 7 to April 9, 2015 as part of EPA's continuing WIPP oversight program. The purpose of this inspection was to verify that DOE continues to adequately monitor ten parameters listed in the Compliance Certification Application (CCA), Volume 1, Section 7.0, in particular Table 7-7. Attachments A and B contain the inspection plan and the checklist used by the EPA inspectors, and Attachment C lists documents reviewed by the EPA. The monitoring inspection examines the monitoring of geomechanical, hydrological, waste activity, drilling-related, and subsidence parameters.

During this April 2015 inspection, the facility was undergoing active recovery and not emplacing waste. In February of 2014, two separate incidents – a salt haul truck fire and a radiological release – took place, which halted facility operations and continues to restrict access to many areas of the underground. In April 2014, EPA conducted an inspection under 40 CFR Part 191, Subpart A in response to the radiological release, but did not address the monitoring of parameters; the most recent EPA monitoring inspection took place in October 2013. Therefore, this inspection focused on changes in the monitoring program as a result of the 2014 incidents, gaps in monitoring data and their significance, and changes to documentation or procedures. The EPA inspectors toured locations where measurements are taken, examined data, and reviewed documents and procedures directing these monitoring activities. The inspection checklist in Attachment A provides details of these inspection activities.

The EPA found that the site continues to effectively implement the monitoring programs at WIPP for all areas reviewed, including those impacted by the incidents. The inspectors also confirmed that the results of DOE monitoring programs are reported annually, and did not have any findings or concerns.

2.0 Inspection Scope

The EPA WIPP Compliance Criteria [40 CFR 194.42(a)] require DOE to "conduct an analysis of the effects of disposal system parameters on the containment of waste in the disposal system." The results of these analyses were included in the 1996 Compliance Certification Application (CCA), confirmed in the 2010 Compliance Recertification Application (CRA), and were used to develop pre-closure and post-closure monitoring requirements.

Volume 1, Section 7.0, of the CCA documents DOE's analysis of monitoring parameters. Table 7-7 of the CCA lists the ten parameters that DOE determined may affect the disposal system. These parameters are grouped into major categories and listed in Table 1. EPA accepted these ten monitoring parameters in the 1998 Certification Decision and confirmed them in the 2010 Recertification Decision.

Table 1: Monitored Parameters	
Parameter Category	**Parameters**
Geomechanical	Creep closure Extent of deformation Initiation of brittle deformation Displacement of deformation features
Hydrological	Culebra groundwater composition Change in Culebra groundwater flow direction
Subsidence	Subsidence measurements
Drilling-Related	Drilling rate Probability of encountering a Castile brine reservoir
Waste Activity	Waste Activity

This inspection was performed under authority of 40 CFR Part 194.21, which authorizes EPA to verify the continued effectiveness of the parameter monitoring program at WIPP. Inspection activities included an examination of monitoring and sampling equipment both on and off site, and in the underground. EPA also reviewed sampling procedures and measurement techniques and verified implementation of an effective quality assurance program (see the document list in Attachment C of this report).

3.0 Inspection Team, Observers, and Participants

The inspection team consisted of two EPA staff. Numerous DOE staff and contractors participated in the inspection; below is a partial list.

Inspection Team Member	Position	Affiliation
Jonathan Walsh	Inspector	EPA ORIA
Nick Stone	Inspector	EPA Region 6

Participant	Affiliation
Larry Madl	RES, Inspection Coordinator
Yen Kiang	RES, Observer
Robert Boyko	CTAC, Observer
Anderson Ward	CBFO, Observer
Ty Zimmerly	NWP, Geotechnical Engineering
Ed Lewis	NWP, Geotechnical Engineering
Rick Salness	RES, Environmental and Hydrologic Monitoring
Jonathan Callicoat	RES, Delaware Basin Surveillance
Rob Watson	RES, Delaware Basin Surveillance
Mike Walentine	NWP, Waste Data System
Steve Offner	NWP, Waste Data System

ORIA – Office of Radiation and Indoor Air

CBFO – Carlsbad Field Office (DOE)

CTAC – CBFO Technical Assistance Contractor

NWP – Nuclear Waste Partnership

RES – Regulatory Environmental Services

The inspection began on Tuesday morning, April 7, with an opening meeting at the WIPP site. Later that morning, EPA inspectors interviewed geotechnical staff responsible for surface subsidence monitoring. That afternoon, EPA inspectors met with staff responsible for monitoring geotechnical parameters in the WIPP underground. Hydrological monitoring was discussed on the morning of April 8, and Delaware Basin surveillance on the afternoon of April 8. On the morning of April 9, EPA Inspectors toured uncontaminated areas of the underground repository. In the afternoon the EPA Inspectors returned to the Skeen-Whitlock Building in

Carlsbad to review and query the WIPP Waste Data System database. The inspection closeout meeting was held during the afternoon of April 9 at the Skeen-Whitlock Building.

EPA inspectors reviewed three fundamental areas to verify continued implementation of the DOE parameter monitoring program during the pre-closure phase: 1) written plans and procedures, 2) quality assurance procedures and records, and 3) results of the monitoring program in the form of raw data, intermediate reports, and final annual reports.

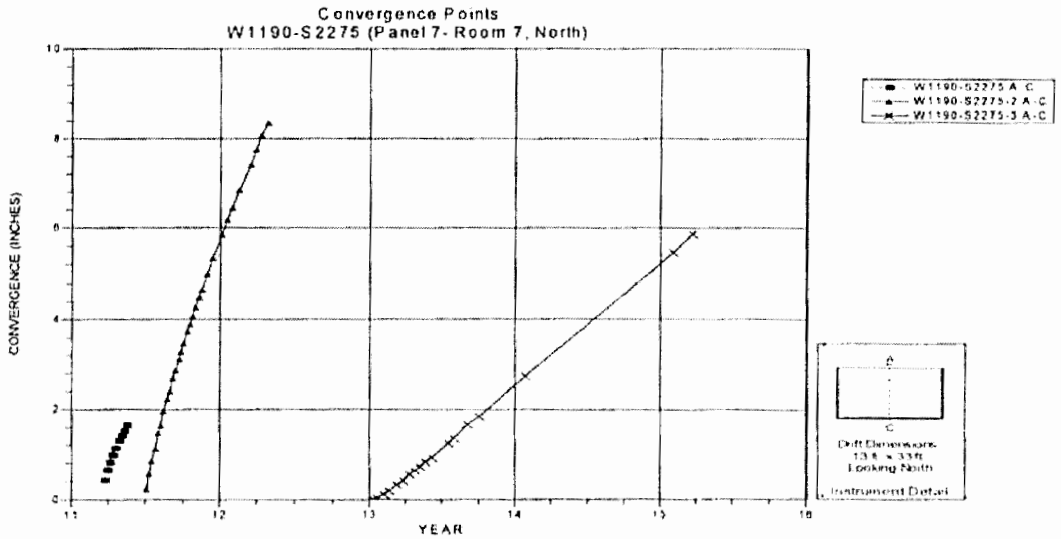
3.1 Monitoring of Geomechanical Parameters

DOE committed to measure four geomechanical parameters in the CCA: creep closure, extent of deformation, initiation of brittle deformation, and displacement of deformation features. These parameters are monitored through convergence monitoring, deformation monitoring, fracture mapping and stratigraphic and fracture mapping, respectively. WIPP has four programs that supply information for these four parameters: the geomechanical monitoring program, the geosciences program, the ground control program, and the rock mechanics program.

Geomechanical monitoring was a major concern of EPA during this inspection. The radiological release prevented personnel access to the underground between February and April of 2014, and continues to greatly restrict access to many areas of the repository. This interrupted routine roof bolting and manual geotechnical measurements, and EPA needed to better understand the long-term impact to geomechanical monitoring. The inspection team met with Ed Lewis on the afternoon of April 7. He reported that the geotechnical program has adapted to the restrictions by training its engineers to enter contaminated areas using personal protective equipment (PPE) and then perform their routine functions. He was able to provide a photograph of this activity, included as Figure 1, below. At the time of the inspection, the program had successfully resumed all underground measurements, with the exception of the convergence points located in the exhaust drift of Panel 7 (S-2180), where the incident took place. Contamination levels in that drift still exceeded the limits on the current Radiological Work Permit. The E-300 exhaust drift had been measured the week prior to the inspection. The inspection team requested copies of extensometer and convergence point data from Panel 7, Room 7 (see Figure 2). An accelerated closure rate was observed in some areas, but not to a degree that would indicate instability of the drift. Prior to the inspection, DOE had reported a roof fall in one of the access drifts to Panel 3. This localized area had been identified as problematic, and was scheduled for ground control work at the time of the fire, when the mine was evacuated and typical operations stopped.

Figure 1: Geomechanical engineers in PPE, taking convergence measurements in a contaminated drift

Figure 2: Convergence point data from Panel 7, Room 7



NOTES:
1. Excavation date February 2011.

3.2 Monitoring of Hydrological Parameters

DOE committed to measure two hydrological parameters in the CCA: 1) Culebra groundwater composition, and 2) changes in the Culebra groundwater flow direction. Culebra flow direction is determined by using annual measurements of Culebra fresh water heads as inputs to a calibrated potentiometric map. Programmatic functions and responsibilities are outlined in the WIPP Groundwater Monitoring Program Plan, WP 02-1, Revision 13, effective 2/23/15. Results of this program are published in the WIPP Annual Site Environmental Report (ASER).

On the morning of April 8, Rick Salness gave a brief presentation reviewing the WIPP hydrology program. Updates continue to the Culebra potentiometric monitoring well network, including the installation of new wells and replacement of older wells. Routine water quality testing was taking place during the inspection. The only noteworthy change was the installation of a production well by the owner of Mills Ranch, which was permitted for the Dewey Lake aquifer, but completed to the Culebra. A Sandia report is available on the impact of this well on the potentiometric surface of the Culebra. Based on the presentation and a review of the Waste Isolation Pilot Plant Annual Site Environmental Report for 2013 (DOE/WIPP-14-3532, September 2014), EPA inspectors did not identify any concerns or findings related to the monitoring of hydrological parameters.

3.3 Monitoring of Waste Activity Parameters

In the CCA, DOE committed to monitor the total radioactivity of waste emplaced in WIPP. Waste activity is collected for each container shipped to WIPP and stored in the WIPP Waste Data System (WDS). The WDS is a database which tracks total radioactivity as well as other waste components emplaced in WIPP (e.g., ferrous and non-ferrous metals, organic materials and magnesium oxide (MgO) as well as radionuclide activity). Requirements for the WDS are discussed in the *WIPP Waste Data System Program and Data Management Plan*, WP 08-NT.01 Revision 29.

On the afternoon of April 9, inspectors met with WDS personnel, who answered questions and generated reports, including the current total activities of the ten EPA-tracked radionuclides emplaced in the repository. The results are included in Table 2.

Table 2: Summary Totals WDS Nuclide Report through April 9, 2015 Panel: ALL Room: ALL			
Radionuclide	**Repository CH Activity (Ci)**	**Repository RH Activity (Ci)**	**Total Repository Activity (Ci)**
AM-241 Americium 241	2.581E5	6.208E2	2.587E5
CS-137 Cesium 137	1.421E1	1.444E4	1.444E4
PU-238 Plutonium 238	4.828E5	7.289E2	4.835E5
PU-239 Plutonium 239	3.333E5	3.839E2	3.337E5
PU-240 Plutonium 240	8.239E4	2.802E2	8.267E4
PU-242 Plutonium 242	2.72E1	3.821E-1	2.759E1
SR-90 Strontium 90	1.595E1	7.599E3	7.615E3
U-233 Uranium 233	6.536E0	3.848E-1	6.921E0
U-234 Uranium 234	8.669E1	1.14E0	8.783E1
U-238 Uranium 238	1.758E1	3.915E-2	1.762E1
Totals:	**1.157E6**	**2.405E4**	**1.181E6**

EPA inspectors did not identify any concerns or findings related to the monitoring of waste activity.

3.4 Monitoring of Drilling Related Parameters

DOE committed to measure two drilling related parameters in the CCA: the drilling rate and the probability of encountering a Castile brine reservoir. Data are collected through a program that is described in the *Delaware Basin Drilling Surveillance Plan*, WP 02-PC.02 Rev 6 (12/3/14). The results of the surveillance program are documented quarterly and reported annually. The most recent Delaware Basin Monitoring Annual Report (DOE/WIPP-14-2308, September 2014) was provided in the inspection documentation.

On the afternoon of April 8, inspection staff met with Jonathan Callicoat and Rob Watson of the Delaware Basin Surveillance Program. They reported no major changes to the program. Of note

was the permitting of a deep injection well near the Land Withdrawal boundary at the Mills Ranch site.

3.5 Monitoring of Subsidence Parameters

In the CCA, DOE committed to measure ground subsidence at the WIPP site. This parameter is measured using procedures documented as part of the *WIPP Underground and Surface Surveying Program* WP 09-ES.01, Rev. 6. DOE performs subsidence surveys at the site annually during pre-closure operations. The results of this program are reported annually. The most recent survey results are provided in *WIPP Subsidence Monument Leveling Survey 2014*, DOE/WIPP 14-3541. The report shows that survey loop vertical closures and accuracies meet the standards set by the National Geodetic Survey for Second Order Class II surveys, and fulfills the requirement that the subsidence parameter is measured and reported on a yearly basis.

On the morning of April 7, the inspection team met with Ty Zimmerly to discuss changes to the surface subsidence program. There was no interruption to the surveying schedule due to the operational incidents at WIPP. Since the most recent inspection in 2013, the only major change to the program was that the site purchased a new instrument, as planned, due to the difficulty of finding replacement memory cards for the older Leica NA3003. The instrument was replaced by the updated Leica DNA03, which is also an optical instrument, and the WILDsoft processing software was replaced by GeoOffice. Procedure WP 09-ES4001 was updated to reflect these changes, and the inspection team observed the processing of raw field data from Loop 6, beginning at step 1.31 of the procedure. The results of the data processing showed a loop closure of .0009 feet (Loop 6 data to control, DnaXn15 format). The inspection team reviewed the documentation for the use of the updated software, including the Software screening checklist EA16-2-1-0, Rev 6, signed 3/1/11, and the Software Installation and checkout form, EA16-2-3-0, Rev 4, signed 8/11/14.

Figure 3 shows use of a surveying rod to measure subsidence parameters. The updated Leica DNA03 instrument is fully compatible with the bar-coded survey rods currently in use.

Figure 3. Surveying Rod on Monument S-24, taken during 2013 inspection.

4.0 Summary of Findings

Based on program documents, interviews, and field demonstrations during the inspection, EPA concludes that the monitoring program covers the ten monitoring parameters required by EPA's 1998 Certification Decision. This inspection determined that monitoring sample collection, and sample/data analysis procedures were complete and appropriate; that staff were adequately trained and implemented the procedures adequately; and that appropriate quality assurance measures are applied. EPA continues to find that DOE has maintained adequate parameter monitoring during the past year and has the procedures and requirements in place to sustain its program into the next year. EPA has no findings or concerns.

Attachment A: Inspection Plan

WIPP Monitoring Inspection Plan 40 CFR 194.42, CY 2015

Purpose:

Verify that the Department of Energy (DOE) can demonstrate that the Waste Isolation Pilot Plant (WIPP) is monitoring the parameter commitments made in the documentation to support the EPA's certification decision, in particular CCA, Volume 1, Section 7.2, Table 7.7 and Appendix MON. This inspection is conducted under the authority of 40 CFR Part 194, Section 21.

This inspection is part of EPA's continued oversight to ensure that DOE appropriately and accurately monitors the performance of significant parameters of the disposal system.

Scope:

Inspection activities will include an examination of monitoring and sampling equipment both on and off site, and in the underground. A review of sampling procedures and measurement techniques may be conducted. Quality assurance procedures and documentation for each of these activities will also be reviewed.

EPA will meet with staff from the WIPP Geotechnical Engineering Program, the WIPP Groundwater Monitoring Program, the WIPP Underground and Surface Surveying Program, the Delaware Basin Drilling Surveillance Program, and WDS database administrators. EPA will review procedures used and data and reports produced by each of these groups, as they relate to monitored parameters at WIPP.

Focal Areas of This Year's Inspection:

- What has changed in the monitoring program as a result of the 2014 incidents and restricted access to the underground?
- Have gaps in monitoring data resulted from the incidents, and how significant are these data gaps?
- What documentation and procedures have changed?

Location: This inspection will be held at the WIPP facility location twenty-six miles south east of Carlsbad, New Mexico and the surrounding vicinity as needed.

Duration: The EPA expects to complete its inspection in three days. Each day will begin with an opening meeting at 8:00 a.m. and end before 5:00 p.m. with a closeout session.

Date: April 7 - 9, 2015

Documents for Review: EPA has received and is reviewing relevant documentation and procedures, and will request additional documentation if needed.

Attachment B: 2015 Monitoring Inspection Checklist

Checklist for Geotechnical Monitoring Commitments - April 2015			
	Monitoring Commitments	Geotechnical Parameters	
#	Question	Comment (Objective Evidence)	Result (Sat = Satisfactory)
1	Does DOE demonstrate that they have implemented plans/programs/procedures to measure - a) Creep Closure; b) Extent of Deformation; c) Initiation of Brittle Deformation and d) Displacement of Deformation Features during the pre-closure phase of operations as specified in the CCA part of the geomechanical monitoring system? (CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)	*WIPP Geotechnical Engineering Program Plan*, WP 07-01 Rev 7, documents plans to measure, report, and the QA requirements related to these activities. Section 3.0 of WP 07-01 documents the geomechanical monitoring program and records the activities associated with this program. Section 4.0 of WP 07-01 documents the quality assurance requirements for these activities. The program has recovered from disruptions due to the 2014 radiological contamination of the underground. Geotechnical staff demonstrated the adequacy of the program. Inspectors reviewed their methods and data and verified that the geomechanical parameters continued to be appropriately monitored by DOE. Results of this program are documented annually in the Geotechnical Analysis Report for each reporting period (DOE/WIPP-14-3516, Vol 1 and 2).	SAT
2	Does DOE demonstrate that they have implemented an effective quality assurance program for item 1 above? 40 CFR 194.22	Yes. Details of the program are found in the Nuclear Waste Partnership, LLC Quality Assurance Program Description, WP 13-1, Rev. 35, effective 11/12/2014.	SAT
3	Does DOE demonstrate that the results of the geotechnical investigations are reported annually? (CCA, App. MON,	WP 07-01 Rev 7, Section 3.2 requires that analysis be performed annually and results are published in the annual	SAT

	Page MON-10)	geotechnical analysis report. The report for calendar year 2013 was provided and reviewed by inspectors (DOE/WIPP-14-3516, Vol. 1 and 2).	
Checklist for Hydrologic Monitoring Commitments – April 2015			
	Monitoring Commitments	**Hydrological Parameters**	
#	**Question**	**Comment (Objective Evidence)**	**Result** (Sat = Satisfactory)
1	Does DOE demonstrate that they have implemented plans/programs/procedures to measure ... a) Culebra Groundwater Composition; (CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)	Yes. See WIPP Groundwater Monitoring Program Plan, WP 02-1, Rev. 13, effective 02/23/2015.	SAT
	b) Change in Culebra Groundwater Flow Direction during the pre-closure phase of operations as specified in the CCA part of WIPP's groundwater monitoring plan? (CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)	Yes. See: See WIPP Groundwater Monitoring Program Plan, WP 02-1, Rev. 13, effective 02/23/2015; Waste Isolation Pilot Plant Annual Site Environmental Report for 2013, DOE/WIPP-14-3532, September 2014.	
2	Does DOE demonstrate that they have implemented an effective quality assurance program for item 1 above? (CCA, App MON, Page MON-22) 40 CFR 194.22	Yes. See WIPP Groundwater Monitoring Program Plan, WP 02-1, Rev. 13, Sections 5 and 9.	SAT
3	Does DOE demonstrate that the results of the groundwater monitoring program are reported annually? (CCA, App. MON, Page MON-22)	Yes. See Waste Isolation Pilot Plant Annual Site Environmental Report for 2013, DOE/WIPP-14-3532, September 2014.	SAT

Checklist for Waste Activity Monitoring Commitments – April 2015			
	Monitoring Commitments	Waste Activity Parameters	
#	Question	Comment (Objective Evidence)	Result (Sat = Satisfactory)
1	Does DOE demonstrate that they have implemented plans/programs/procedures to measure - a) Waste Activity? (CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)	*WIPP Waste Data System Program and Data Management Plan*, WP 08-NT.01 Revision 29 describes the programmatic plan used to monitor and store waste activity information.	SAT
2	Does DOE demonstrate that they have implemented an effective quality assurance program for item 1? (CCA, App WAP, page C-30) 40 CFR 194.22	Yes. See Nuclear Waste Partnership, LLC Quality Assurance Program Description, WP 13-1, Rev. 35, and Waste Data System Software Quality Assurance Plan, WP 08-NT.04, Rev. 22.	SAT
3	Does DOE demonstrate that the results of the waste activity parameters are reported annually? (CCA Volume, Section 7.2.4 Reporting)	Results are updated and reported in the Annual Transuranic Waste Inventory Report and Annual Change Report.	SAT

Checklist for Drilling Rate Monitoring Commitments – April 2015			
	Monitoring Commitments	Drilling Related Parameters	
#	Question	Comment (Objective Evidence)	Result (Sat = Satisfactory)
1	Does DOE demonstrate that they have implemented plans/programs/procedures to measure - a) Drilling Rate; and b) Probability of Encountering a Castile Brine Reservoir? (CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)	The *Delaware Basin Drilling Surveillance Plan*, WP 02-PC.02 Rev 6, documents the program to measure, record, report, and the QA requirements for these activities. The *Delaware Basin Drilling Database Upgrade Process* WP 02-EC3002 Rev 7 documents the process used to update databases with information from various commercial and state sources.	SAT
2	Does DOE demonstrate that they have implemented an effective quality	Quality assurance requirements are documented in Section 7.0 of WP 02-	SAT

	assurance program for item 1 above? (CCA, App DMP, page DMP-9) 40 CFR 194.22	PC.02 Rev 6.	
3	Does DOE demonstrate that the results of the drilling related parameters are reported annually? (CCA Volume, Section 7.2.4 Reporting; App DMP, page DMP-9)	Yes. Parameter updates are reported in the Delaware Basin Monitoring Annual Report, DOE/WIPP-14-2308, September 2014.	SAT
Checklist for Subsidence Monitoring Commitments – April 2015			
	Monitoring Commitments	**Subsidence Measurements**	
#	**Question**	**Comment (Objective Evidence)**	**Result**
	Does DOE demonstrate that they have implemented plans/programs/procedures to measure - a) Subsidence Measurement? (CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)	Yes, See *WIPP Underground and Surface Surveying Program* WP 09-ES.01, Rev. 7, effective 12/17/14.	SAT
	Does DOE demonstrate that they have implemented an effective quality assurance program for item 1 above? (CCA, App DMP, page DMP-9) 40 CFR 194.22	Yes, See *WIPP Underground and Surface Surveying Program* WP 09-ES.01, Rev. 7, Section 4.	SAT
	Does DOE demonstrate that the results of the subsidence measurements are reported annually? (CCA Volume, Section 7.2.4 Reporting;)	The results of this program are reported annually in the *WIPP Subsidence Monument Leveling Survey – 2014*, DOE/WIPP 14-3541.	SAT

Attachment C: Documents Reviewed

Monitoring of Geomechanical Parameters	ID	Source
Geotechnical Analysis Report for July 2012 – June 2013, Vol 1-3	DOE/WIPP-14-3516	DOE/WIPP
Geologic and Fracture Mapping of Facility Horizon Drifts	WP 07-EU1001 Rev 6	DOE/WIPP
Rev 1 Geologic Core Logging	WP 07-EU1002 Rev 1	DOE/WIPP
Manually Acquired Geomechanical Instrument Data	WP 07-EU1301 Rev 9	DOE/WIPP
Geomechanical Instrument Data Processing	WP 07-EU1303 Rev 6	DOE/WIPP
Installing Convergence Reference Points	WP 07-EU1304 Rev 6	DOE/WIPP
Installing Multiposition Borehole Rod Extensometers	WP 07-EU1305 Rev 3	DOE/WIPP
Installing Rock Bolt Load Cells	WP 07-EU1306 Rev 5	DOE/WIPP
Installing Wire Convergence Meters	WP 07-EU1307 Rev 4	DOE/WIPP
Installing Wire Extensometers	WP 07-EU1308 Rev 3	DOE/WIPP
WIPP Core Storage Handling and Distribution	WP 07-EU3504 Rev 4	DOE/WIPP
Software Screening and Control	WP 16-2 Rev 14	

Monitoring of Hydrological Parameters	ID	Source
WIPP Groundwater Monitoring Program Plan	WP 02-1, Rev. 13	DOE/WIPP
Waste Isolation Pilot Plant Environmental Monitoring Plan	DOE/WIPP-99-2194 Rev.8	DOE/WIPP
Field Parameter Measurements and Final Sample Collection	WP 02-EM1010 Rev 2	DOE/WIPP
Administrative Processes for Environmental Monitoring and Hydrology Programs	WP 02-EM3001 Rev 23	DOE/WIPP
Pressure Density Survey	WP 02-EM1021 Rev 9	DOE/WIPP
Groundwater Level Measurement	WP 02-EM1014 Rev 7	DOE/WIPP
Data Review for the Annual Culebra Groundwater Report	WP 02-EM1025 Rev 6	DOE/WIPP
Water Level Data Handling and Reporting	WP 02-EM1026 Rev 5	DOE/WIPP
Integrated Sample Control Plan	WP 02-EM.02 Rev 4	DOE/WIPP
Electric Submersible Pump Operation	WP 02-EM1002 Rev 6	DOE/WIPP

Monitoring of Delaware Basin Parameters	ID	Source
Delaware Basin Surveillance Plan	WP 02-PC.02 Rev 6	DOE/WIPP
Delaware Basin Drilling Database Upgrade Process	WP 02-EC3002 Rev 7	DOE/WIPP
Delaware Basin Monitoring Annual Report	DOE WIPP 14-2308	DOE/WIPP

Monitoring of Subsidence Parameters	ID	Source
WIPP Underground and Surface Surveying Program	WP 09-ES.01, Rev 7	DOE/WIPP
Subsidence Survey Data Acquisition Report	WP 09-ES4001, Rev 3	DOE/WIPP
WIPP Panel Closure Plan	WP 09-ES.02, Rev 4	DOE/WIPP
WIPP Subsidence Monument Leveling Survey 2014	DOE/WIPP 14-3541	DOE/WIPP

Monitoring of Waste Activities	ID	Source
WIPP Waste Data System Program and Data Management Plan	WP 08-NT.01 Rev 29	DOE/WIPP
Waste Stream Profile Form Review and Approval Program	WP 08-NT.03 Rev 15	DOE/WIPP
Waste Data System User's Manual	DOE/WIPP-09-3427 Rev 10	DOE/WIPP
TRU Waste Receipt	WP 08-NT3020 Rev 25	DOE/WIPP
Waste Data System Configuration Management and Software Quality Assurance Plan	WP 08-NT.04 Rev 22	DOE/WIPP