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

OCT 1 2014

OFFICE OF
AIR AND RADIATION

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

Dear Mr. Franco:

During the week of October 22, 2013, the U.S. Environmental Protection Agency performed inspections of the Waste Isolation Pilot Plant (WIPP) waste management and storage operations, emplacement activities, and the monitoring program (Docket: A-98-49, II-B3-127). These inspections were performed under the authorities of 40 CFR 194.21 and 40 CFR Part 191, Subpart A.

As a result of these inspections, the Agency determined that the activities related to emissions monitoring during waste management and storage complied with the requirements of 40 CFR Part 191, Subpart A. We also determined that the U.S. Department of Energy adequately monitored the ten parameters that are important to the long-term containment of waste, as identified in the EPA's 1998 Certification Decision. The EPA also determined that waste was properly emplaced.

Please note that these inspections were conducted prior to the radiological incident at the WIPP in February. In the next inspection, the Agency expects to review affected aspects of DOE's program (40 CFR 194.21 and 40 CFR Part 191, Subpart A) that were involved in this incident.

Copies of these inspection reports are enclosed with this letter and will be placed in the EPA's public dockets. 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

Enclosures
1. Inspection No. EPA-WIPP-10.13-22a (10/22-24/2013)
2. Inspection No. EPA-WIPP-10.13-22b (10/22-24/2013)
3. Inspection No. EPA-WIPP-10.13-22c (10/22-24/2013)

DOCKET NO: A-98-49
Item: II-B3-127

2013 – Emplacement Inspection Report

EPA INSPECTION No. EPA-WIPP-10.13-22c
OF THE
WASTE ISOLATION PILOT PLANT
October 22 – 24, 2013

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

January 2014

Table of Contents

Attachments

Tables

Figures

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 October 22 through October 24, 2013, 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.[1] 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.

The purpose of this annual inspection is to determine 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 and other approvals. The inspection reviews the site's ability to receive, process, and emplace contact-handled and remote-handled TRU wastes within the repository, the emplacement of magnesium oxide (MgO) backfill in appropriate amounts to fulfill DOE commitments and requirements, and the maintenance of records pertaining to waste shipping, packaging, and emplacement, including the electronic Waste Data System (WDS). EPA examined selected activities, such as RH and CH waste processing, waste emplacement activities, and record keeping.

EPA concluded that DOE's emplacement activities are adequate, that cellulosic, plastic and rubber material (CPR) is appropriately tracked and recorded, that MgO balances are calculated properly, and that MgO is emplaced properly. The Agency observed the use of the proper waste emplacement procedures in the underground. EPA did not identify any findings or concerns during this inspection.

[1]WIPP Land Withdrawal Act, Public Law 102-579, Section 2(18), as amended by the 1996 WIPP LWA Amendments, Public Law 104-201.

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.

Activities within the scope of this inspection included: demonstration of the WIPP site's ability to receive, process, and emplace remote-handled (RH) and contact-handled (CH) TRU wastes within the repository, the use of magnesium oxide (MgO) backfill in amounts to fulfill certification requirements and other approvals, maintenance of relevant waste packaging records, including the electronic Waste Data System (WDS) and the verification of appropriately implemented quality assurance practices. The review and examination of documents related to these activities is an important part of the inspection process. The WIPP site is operated by Nuclear Waste Partnership (NWP) under contract to DOE, and the majority of waste related activities onsite are described by or controlled through NWP procedures. A list of NWP procedures examined during this inspection is provided in Attachment D.

3.0 Inspection Team, Observers and Participants

The inspection team consisted of three EPA staff. Trais Kliphaus of the New Mexico Environment Department observed the inspection activities. A partial list of inspection participants is provided in Table A.

Table A
Inspection Participants

Inspection Team Member	Position and Inspection Focus	Affiliation
Nick Stone	Inspection Leader	EPA – Region 6
Jonathan Walsh	Inspector	EPA - ORIA
Kathleen Economy	Inspector	EPA - ORIA
Observer	**Position**	Affiliation
Mansour Akbarzadeh	Manager Carlsbad Environmental Monitoring and Research Center	NWP
Terry Batchelder	Waste Operations	NWP
John Callicoat	Delaware Basin Monitoring Lead	URS-Professional Solutions
Randy Britain	Manager Waste Operations	NWP
Rey Carrasco	Manager Geotechnical Engineering	NWP
Art Chavez	Senior Scientist – EPA Compliance Grou	NWP
Jennifer Hendrickson	Manager - Air Monitoring	NWP
Jaci Davis	Air Monitoring	NWP
Larry Madl	Senior Scientist - Scientist – EPA Compliance Group	URS-Professional Solutions
Rick Salness	Manager - Environmental and Hydrologic Monitoring	NWP

Tom Klein	Scientist – EPA Compliance Group	URS-Professional Solutions
Trais Kliphuis	WIPP Group Manager	New Mexico Environment Department, Hazardous Waste
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 & Associates/ SNL
Mike Walentine	Waste Data Monitoring	NWP
Ty Zimmerly	Geotechnical Engineering	NWP
NWP - Nuclear Waste Partnership SNL – Sandia National Laboratories		

4.0 Performance of the Inspection

The inspection took place from October 22 to October 24, 2013, 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 October 22, 2013. Facility staff presented information addressing program status, updates and changes since the last EPA emplacement inspection which took place from July 17 to July 19, 2012. The primary focus of the emplacement inspection was to determine the nature and extent of changes that had taken place in the areas of emplacement activities and documentation since last year's inspection.

EPA inspectors accompanied CBFO and NWP personnel into the underground repository on the morning of October 23, in order to examine waste packages and MgO that had been emplaced in Panel 6. Inspectors reviewed records documenting that waste emplacement and MgO tracking were conducted in accordance with procedures. Inspectors selected several containers and recorded their numbers (see Figure 3), the records for these containers were examined both in the repository and later using the WDS computer database, to verify correct waste information is recorded by DOE. NWP personnel answered EPA questions about how waste is handled and emplaced. The inspectors also examined air monitoring locations and observed the measurement of geotechnical parameters.

During the afternoon of October 23, EPA inspectors observed operations in the CH and RH bay areas of the waste handling building above ground. On October 24, inspectors accessed the WDS, and were able to generate Container and Canister Data Reports for the RH boreholes and CH waste containers observed in the underground. Inspectors discussed record-keeping procedures with WDS data administrators at the Carlsbad Field Office, and NWP personnel generated additional reports and queries related to the emplacement of shielded containers in Room 2 of Panel 6 for the inspectors. EPA presented its preliminary observations at a close-out meeting on the afternoon of October 24.

5.0 Waste Emplacement/WDS

Wastes received at the repository include contact-handled (CH) transuranic wastes from Argonne National Laboratory-East (ANL-E) in Illinois, Bettis Atomic Power Laboratory, GE Vallecitos Nuclear Center, Lawrence Livermore National Laboratory, Sandia National Laboratory, Los Alamos National Laboratory (LANL), Idaho National Laboratory (INL), Hanford Site in Washington, Rocky Flats Environmental Technology Site (RFETS), Savannah River Site (SRS), the Nevada Test Site (NTS), and the Oak Ridge National Laboratory (ORNL) in Tennessee. 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, CH waste was being emplaced in Panel 6, Room 1 and RH waste in the walls of Panel 7, Room 7. CH waste containers are stacked in columns (waste stacks) combining SWBs, drum packs, and TDOPs (see Figures 2 and 3). 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 2). RH waste is placed in the walls on eight foot centers (Figure 5).

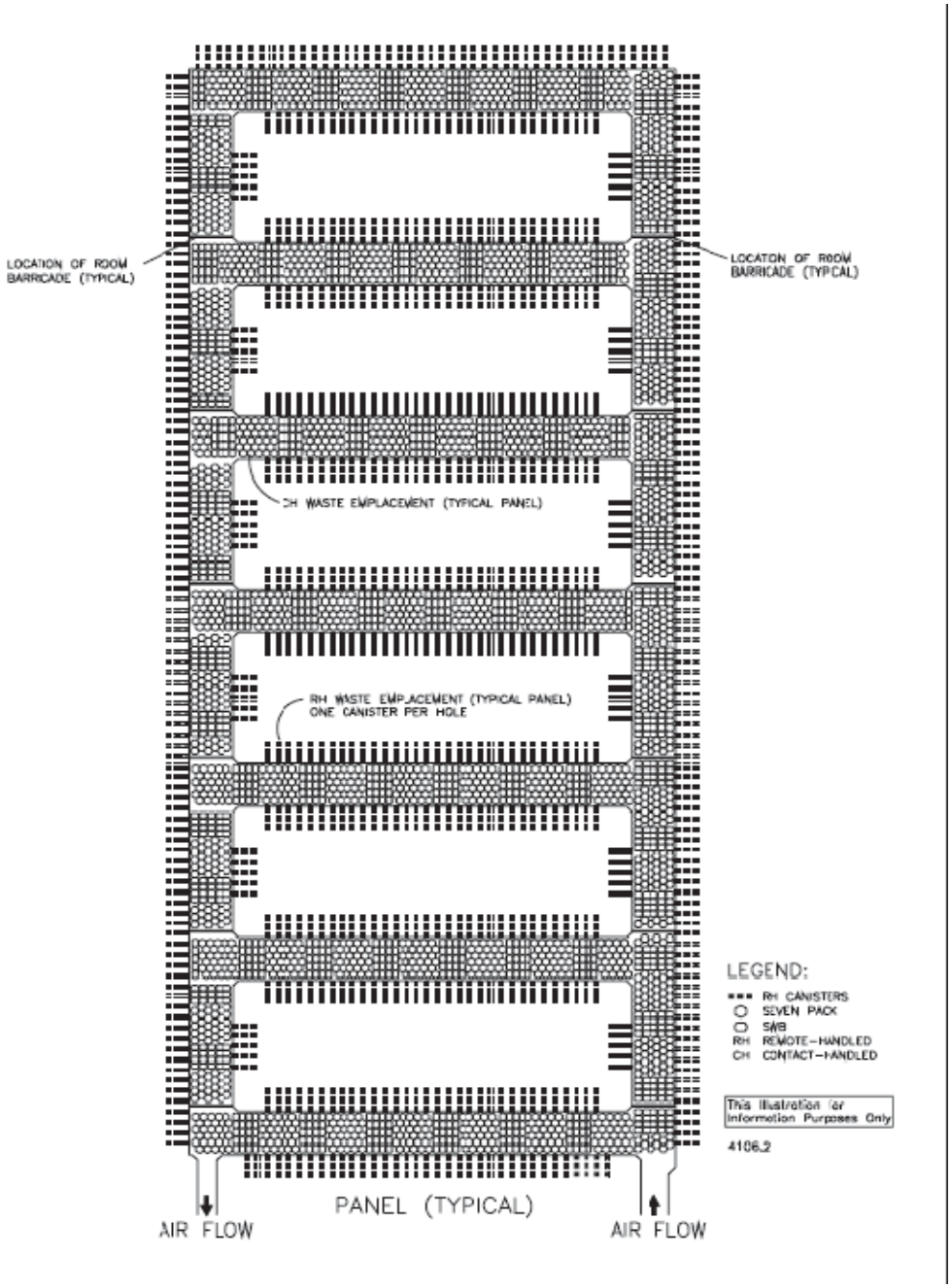

Figure 1
Typical RH and CH TRU mixed waste disposal configuration

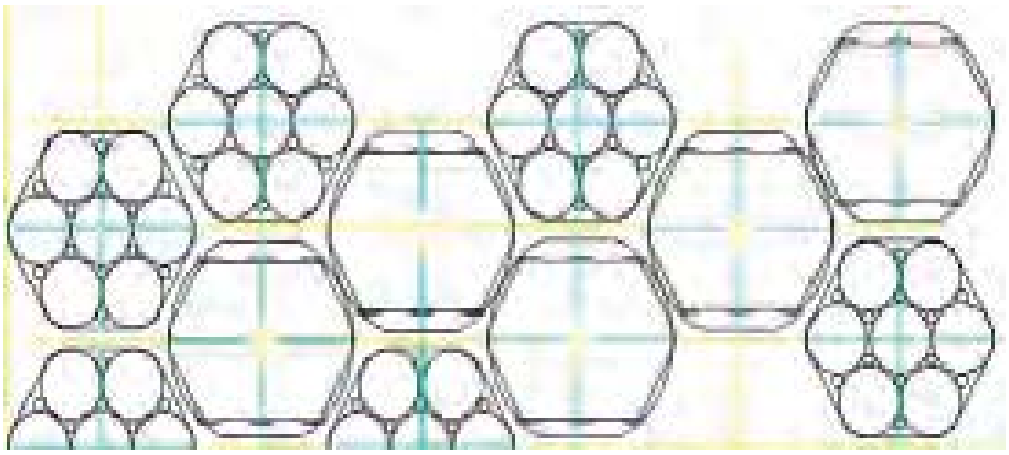

Figure 2
Arrangement of Disposed Waste in a Room

Figure 2 illustrates the arrangement of disposed contact-handled waste in underground. Represented are stacks of seven-packs of drums and standard waste boxes. Figure 3 shows the waste face in Panel 6 Room 1. The waste face shows three packs of 100-gallon drums, standard waste boxes, and an SLB2. In Panel 7, Room 7 inspectors observed boreholes drilled to emplace RH containers. The Horizontal Emplacement/Retrieval Equipment set up to emplace a RH canister is shown in Figure 4. Figure 5 shows the RH waste boreholes selected for records review. Figure 6 shows emplacement of a SLB2 waste container in Panel 6 Room 1. The SLB2 is a container approved for WIPP designed for oversized material.

While underground in Panel 6, Room 1, EPA inspectors selected recently emplaced CH waste packages for review. The inspector noted the shipment identification numbers directly off the emplaced containers. The containers selected are identified in Table B below.

Table B:
Waste Containers Reviewed During Inspection

CH Waste Containers Reviewed During Inspection (Panel 6, Room 1)	**Container Number**	**Container Type**
	WMAPSLB037	SLB2
	BN10500159	100-Gallon Drum
	BN10495381	Standard Waste Box (SWB)
	BN10498135	Ten Drum Overpack (TDOP)
	BN10498132	Ten Drum Overpack (TDOP)
RH Waste in Selected Boreholes (Panel 7, Room 7)	**Container Number**	**Borehole**
	ID	03
	A	03

On the morning of October 24 at CBFO, inspectors met with NWP personnel, who answered questions and generated the Nuclide Report, Materials Emplacement Report and

the MgO safety factor calculations. All electronic records were found to contain required waste stream, container, and emplacement information.

Figure 3
Emplaced waste in Panel 6, Room 1

Figure 4
Equipment prepared for RH waste emplacement

Figure 5
Emplaced RH Waste selected for review

Figure 6
SLB2 in Panel 6 Room 1

6.0 Magnesium Oxide Backfill

Magnesium oxide (MgO) is the engineered barrier used in the repository as backfill, as specified in DOE's Compliance Certification Application (CCA). EPA requires DOE to maintain an MgO safety factor (excess factor) to ensure that adequate MgO is chemically available to control the chemistry of each room after closure. The Agency approved lowering the required safety 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 safety 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 a safety factor of 1.2 on a room-by-room basis. The average reactivity from the supplier measured for the 2013 period was 97.4. The average reactivity for the 2012 emplacement period was 97.6. Both of these manufacturer reactivity's are above the required 96%.

Process steps guiding MgO placement and documentation in the underground continue to be 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.

While in the underground repository, EPA inspectors verified that the proper procedures were used to track MgO emplacement in Panel 6, Room 1 and that MgO was emplaced on top of the CH waste stacks as stipulated. At the conclusion of each shift, the WHE must electronically verify the safety factor of 1.2 using the WDS. MgO safety factor calculations made using the WDS allowed inspectors to verify that the MgO safety factor was maintained in Panel 6, Room 1.

Checklist items 12-24 specifically relate to MgO management and demonstrate that DOE has appropriate processes in place to ensure that MgO is properly emplaced.

DOE is emplacing waste stacked 2-3 containers high topped with 3000 lb MgO supersacks. Figure 3 shows the container types visible during the inspection. Visible on the waste face are black 100-gallon drums in 3-packs, smaller white containers are standard waste boxes, and a larger white container that is an SLB2. 3000 lb MgO supersacks are visible on top of certain waste columns to insure a safety factor above 1.2.

7.0 Comparison With Inventory Limits

The Nuclide Report and the Emplaced Materials 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 October 24, 2013. More detailed data on the total amounts of specific materials emplaced was provided by WDS staff.

EPA establishes limits for certain waste components at WIPP by approving performance assessment inventory estimates. The limit for ferrous metals is a minimum limit. The amount of ferrous metal is now 27,083,534 kg. The minimum limit of 20,000,000 kg iron was met for the repository in 2011. Other waste component limits are maximum limits. Of special concern is the maximum limit on the total amount of 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 2.4×10^7 kg (see Table C). CPR values are tracked on a per container basis and the current CPR values as of September 30, 2013 are listed in Table C.

As of this inspection the WIPP contained 6,375,437 kg of CPR in waste and 1,706,567 kg of CPR in packaging material. In addition, emplacement CPR, such as the slip sheets used to aid the emplacement of the containers, accounts for another 525,682 kg of CPR. This is a total of 8,738,265 kg of cellulosic, plastic and rubber material. The mass of rubber materials currently accounts for approximately 4.2% of the total mass of CPR, compared to 4.2% in 2012, 4.7% in 2011, 4.3% in 2010, 3.4% in 2009, 5% in 2008, 4.7% in 2007, and 7% in 2006. The WIPP currently contains approximately 36% of its maximum limit for CPR. The repository held 34% in 2012, 30% in 2011, 29% in 2009, 24% in 2008, and 21% in 2007.

Table C: Emplaced CPR Quantities as of September 30, 2013

Waste CPR:

Type	Weight (kg)
Cellulosic	2,725,574.91
Plastic	3,286,267.57
Rubber	363,594.44
Total	6,375,436.92 (kg)

Emplacement CPR:

Type	Weight (kg)
Cellulosic	68,598.43
Plastic	457,083.70
	525,682.13 (kg)

Packaging CPR:

Type	Weight (kg)
Cellulosic	906,260.79
Plastic	800,306.39
Total	1,706,567.18 (kg)

MgO CPR:

Type	Weight (kg)
Cellulosic	62,465.70
Plastic	68,113.20
	130,578.90 (kg)

Grand Totals:

Cellulosic + Plastic = 8,374,670.69
Rubber = 363,594.44
Total CPR = 8,738,265.13 (kg)

The Land Withdrawal Act of 1992 limits the total waste to no more than 6.1 million cubic feet and the total activity of the RH waste to 5.1 million curies. The emplaced waste as of October 27, 2013 is 89,359 cubic meters or 3,155,684 cubic feet. The emplaced waste is 52% of the maximum allowed. The RH activity is shown in Attachment B as 23,020 curies, which is 0.45% of the maximum allowed.

The Inspection Team reviewed the WDS data for the recently emplaced shielded containers in Panel 6 Room 2. The dose and alpha activity data for these nine containers is shown in Table D. The shielded containers allow WIPP to emplace TRU waste that has higher activity than regular CH waste because the lead shielding limits the surface dose on the container to less than the CH standard of 200 mrem/hr.

Table D: WDS Record of Shielded Container Waste

Container	Alpha Activity (Ci)	Neutron Dose (mrem/hr)	Beta/Gamma Dose (mrem/hr)	Total Dose (mrem/hr)
AE1241SC	1.86E-02	0.5	15.5	16.0
AE1242SC	1.0E-01	0.5	89.8	90.3
AE1243SC	5.41E-02	0.17	58.5	58.67
AE1245SC	4.47E-02	0.11	10.7	10.81
AE1246SC	6.34E-03	0.082	49.3	49.38
AE1247SC	1.12E-01	0.091	120.5	120.59
AE1248SC	1.05E-01	0.15	120.9	121.05
AE1249SC	3.59E-02	0.15	69.1	69.25
AE1250SC	6.12E-03	0.05	4.5	4.55

8.0 Summary of Results

The inspectors reviewed emplacement operations, NWP procedures, and records associated with selected containers. The surface processing of CH and RH waste as well as underground operations 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. EPA identified no findings or concerns with the emplacement portion of the inspection.

Attachment A

WIPP 2013 Inspection Plan for Emplaced Waste As Specified in DOE's Compliance Certification Application and per Requirements Specified in 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 an important part of this review.

Focal Areas of the 2013 Inspection:

What changes have taken place to emplacement activities and documentation since last year's inspection, particularly with regard to the handling and DOE's modifications since the 2012 inspection.

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, review of 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.

Date: October 22-24, 2013

Documents for Review:

Provide to EPA the latest version of pertinent documentation and/or procedures related to CH and RH waste handling and emplacement, MgO emplacement and tracking, and record keeping using DOE's WDS.

Attachment B

Summary Totals WDS Nuclide Report through October 24, 2013

Panel: ALL Room: ALL

Radionuclide	Repository CH Activity (Ci)	Repository RH Activity (Ci)	Total Repository Activity (Ci)
AM-241 Americium 241	2.532E5	6.083E2	2.538E5
CS-137 Cesium 137	1.411E1	1.389E4	1.39E4
PU-238 Plutonium 238	4.794E5	6.956E2	4.801E5
PU-239 Plutonium 239	3.297E5	3.701E2	3.301E5
PU-240 Plutonium 240	8.146E4	2.719E2	8.173E4
PU-242 Plutonium 242	2.683E1	3.724E-1	2.72E1
SR-90 Strontium 90	1.58E1	7.181E3	7.197E3
U-233 Uranium 233	6.505E0	3.842E-1	6.889E0
U-234 Uranium 234	8.623E1	1.082E0	8.731E1
U-238 Uranium 238	1.741E1	3.817E-2	1.744E1
Totals:	**1.144E6**	**2.302E4**	**1.167E6**

Attachment C

Materials Emplaced in WIPP as of September 30, 2013

Hand Code	MP	Material Type	Material Description	Material Weight (kg)	Packaging CPR (kg)	Emplacement CPR (kg)	MgO CPR (kg)	Total CPR (kg)
CH	1	Waste	IRON BASE METAL ALLOYS	10,696,778.53				
	2	Waste	ALUMINUM BASE METAL/ALLOYS	59,300.51				
	3	Waste	OTHER METAL/ALLOYS	354,312.32				
	4	Waste	OTHER INORGANIC MATERIALS	1,752,818.10				
	6	Waste	CELLULOSICS	2,725,574.91				2,444,259.42
	7	Waste	RUBBER	363,594.44				350,661.13
	8	Waste	PLASTICS	3,286,267.57				3,150,687.26
	9	Waste	SOLIDIFIED INORGANIC MATERIAL	7,891,393.37				
	10	Waste	SOLIDIFIED ORGANIC MATERIAL	2,691,696.71				
	12	Waste	SOILS	656,923.42				
	13	Steel Packaging	STEEL CONTAINER MATERIALS	15,803,195.73				
	14	Plastic Packaging	PLASTIC/LINERS CONTAINER MATERIALS	800,306.39	762,828.30			762,828.30
	15	Cellulosic Packaging	CELLULOSICS PACKAGING MATERIALS	906,260.79	881,508.36			881,508.36
	18	Emplacement	CELLULOSIC EMPLACEMENT MATERIAL	68,598.43		63,301.83		63,301.83
	20	Emplacement	PLASTIC EMPLACEMENT MATERIAL	457,083.70		431,716.00		431,716.00
	21	Steel Liners	STEEL LINER MATERIALS	582.70				
	22	Non-Ferrous Packaging	LEAD PACKAGING MATERIAL	13,150.10				
	99	Emplaced Dunnage	STEEL DUNNAGE CONTAINERS	170,737.50				
RH	1	Waste	IRON BASE METAL ALLOYS	80,344.89				
	2	Waste	ALUMINUM BASE METAL/ALLOYS	29.20				
	3	Waste	OTHER METAL/ALLOYS	9.72				
	4	Waste	OTHER INORGANIC MATERIALS	13.06				
	6	Waste	CELLULOSICS	360.22				274.62
	7	Waste	RUBBER	7.30				7.30
	8	Waste	PLASTICS	68,004.23				59,711.22
	9	Waste	SOLIDIFIED INORGANIC MATERIAL	194.67				
	10	Waste	SOLIDIFIED ORGANIC MATERIAL	15.06				
	13	Steel Packaging	STEEL CONTAINER MATERIALS	380,690.96				
	14	Plastic Packaging	PLASTIC/LINERS CONTAINER MATERIALS	770.40				403.86
	15	Cellulosic Packaging	CELLULOSICS PACKAGING MATERIALS	16.86				4.26
	21	Steel Liners	STEEL LINER MATERIALS	147.60				
MgO	16	Emplacement	MAGNESIUM OXIDE	32,349,740.38				
	18	Emplacement	CELLULOSIC EMPLACEMENT MATERIAL	62,465.70			59,464.20	59,464.20
	20	Emplacement	PLASTIC EMPLACEMENT MATERIAL	68,113.20			65,111.70	65,111.70
			Totals:	**81,709,498.67**		**495,017.83**	**124,575.90**	**8,269,939.46**

Attachment D

Procedures Examined

05-WH.02 Rev.2 WIPP Waste Handling Operations WD User's Manual

D-0101 Rev 8 Specification for Prepackaged MgO Backfill

WP 05-WH1010 Rev.8 Container Overpacking

WP 05-WH1705 Rev.10 RH Canister Transfer System

WP 05-WH1709 Rev.15 RU TRU 72-B Trailer Unloading

WP 05-WH1710 Rev 24 72-B RH Processing

WP 05-WH1716 Rev 4 CNS 10-160B Cask Operation

WP 05WH1717 Rev 8 Cask Unloading Room Shield Door Operation

WP 05-WH1725 Rev 10 RH Waste Downloading and Emplacement

WP 05-WH1758 Rev 15 RH Waste Handling Abnormal Operations

WP 08-NT 01 Rev 27 Waste Data System Program and Data Management Plan

WP 08-NT 03 Rev14 Waste Stream Profile Form Review and Approval Program

WP 08-NT 04 Rev 21 Waste Data System Configuration Management and Software Quality Assurance Program

WP 12-HP1314 Rev 7 Remote Handled Waste Service Room

Attachment E

EPA Emplacement Inspection Checklist
October 22 – 24, 2013

	Questions:	Comments and Objective Evidence	Results
	Waste Emplacement		**Sat = Satisfactory**
1	Is waste being emplaced in the underground facility in the manner specified in DOE's Compliance Certification/ Re-Certification or other relevant documentation?	Yes. Procedure WP 05-WH1025, CH Waste Downloading and Emplacement, Section 2, describes the CH emplacement procedures. Visual verification of the emplaced waste in Rows 7 through 8 of Panel 6, Room 1 confirmed waste emplacement in accordance with facility procedure and CCA documentation . RH processing procedures for 72-B (WP 05-WH1710, WP 05-WH1725) and 10-160-B (WP 05-WH1722) containers are consistent with the approach discussed in the CCA documentation. Emplacement in the repository walls with borehole plugs was verified during inspection of the underground.	Sat
2	Are CH waste containers stacked in columns appropriately given the type of container?	Yes. In WP 05-WH1025, CH Downloading and Emplacement, a note at step 2.25 specifies appropriate stacking of CH container types. Attachment 2 of the same procedure specifies payload assembly positioning. Visual verification confirmed adherence to procedure (e.g. TDOPs placed in bottom position of waste columns.)	Sat

3	Are records adequate? Randomly select 3-4 CH and 2-3 RH waste containers to verify records for waste approval, shipment, and receipt.	Yes. TRU Waste Receipt WP 08-NT3020, describes the process. Records produced are Uniform Hazardous Waste Manifest, TRU Waste Receipt Checklist, Shipment Summary Report, RH waste Processing Data Sheet, Radiological Survey Report, and Waste Emplacement Report. CH waste produces comparable records. EPA reviewed records and found the records to be adequate and traceable. Selected Containers: **CH Waste** (Panel 6, Room 1, Rows 7 – 8) - SLB2 - WMAPSLB037 - 100-Gallon Drum - BN10500159 - Standard Waste Box (SWB) - BN10495381 - Ten Drum Overpack (TDOP) - BN10498132 - Ten Drum Overpack (TDOP) - BN10498135 **RH Waste** (Panel 7, Room 7) - Borehole 033, ID0362 (RH CANISTER WITH REMOVABLE LID-OVERPACK – 1, 55-gallon drum) **RH Waste** (Panel 7, Room 7) - Borehole 034, AE0168 (RH CANISTER WITH REMOVABLE LID-OVERPACK – 3, 30-gallon drums)	Sat
4	Is DOE properly emplacing backfill material (magnesium oxide [MgO]) with the waste packages? Are supersacks placed on top of waste stacks according to procedure?	Yes. 3000-pound supersacks were observed to be emplaced on top of each waste assembly at the active waste face in Panel 6 Room 1, Rows 7-8. WP 05-WH1025, CH Waste Downloading and Emplacement, Section 3.0, establishes procedure for emplacement of MgO.	Sat
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 paper records maintained underground and electronic records kept aboveground for the selected containers. Documentation was determined to be adequate.	Sat

	RH Waste Emplacement Questions		
6	Are RH containers approved for receipt, received, processed, and emplaced properly?	Yes. Inspection of the underground and RH handling area showed procedures to be in agreement with WP 05-WH1710, 72-B RH Processing, and WP 05-WH1725, RH Waste Downloading and Emplacement.	Sat
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?	Yes. Appropriate information is found in the WDS Canister Data Report, and on the underground facility map maintained by the Waste Handling Engineers in the underground.	Sat
8	Content of RH canisters --pick 1 to 3 canisters	See Item 3 above. The Canister Data Report was generated and reviewed for each canister.	Sat
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 Container Data Reports and Canister Data Reports generated. Yes.	Sat
10	Are RH boreholes closed properly? (Note: also see #9 for tracking of RH in the U/G)	Recently emplaced borehole plugs, and plugs prepared for emplacement, were observed by inspectors in the underground to be in accordance with WP 05-WH1725, RH Waste Downloading and Emplacement.	Sat
11	Is a photographic record made of the RH canister number during emplacement and retained in the permanent record?	No. The canister ID number is verified by two operators during cask transfer, via closed-circuit television in accordance with procedure 05-WH1710, 72-B RH Processing, Section 8.24. Tapes are maintained for one year, and WP 05-WH1710 Att. 1, RH Waste Processing Data Sheet, then becomes the permanent record. EPA finds this to be adequate.	Sat
	Question: Procedures		

12	Do DOE procedures reflect an MgO safety factor to 1.2?	Yes. WP 05-WH1025, CH Waste Downloading and Emplacement, Rev. 1, 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. supersacks as necessary. WHEs were observed to be using current procedures and the WDS bar code reader to record MgO emplacement in the underground.	Sat
13	Are both CPR and MgO calculated and tracked on a room- by-room basis?	Yes. Calculations are performed by the Waste Handling Engineer at the conclusion of each shift, through the WDS, using the MgO Balance Report or Daily Report, as required by WP 05-WH1025, CH Waste Downloading and Emplacement, Rev. 1, Section 3.0, Backfill.	Sat
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. Average reactivity from the Supplier for 2012 was 97.6% and currently for 2013 is 97.4%	Sat
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. Supersacks in the underground were observed by inspectors to be marked with unique ID numbers, traceable to their original shipments.	Sat
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 Waste Handling 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	Sat

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, Supersack/BRT Emplacement Data Sheet; and WP 05-WH1058, CH Waste Handling Abnormal Operations, Sec. 4.0, BRT Emplacement	Sat

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 04-CO, Conduct of Operations, identifies notification policies, supervision and training procedures, and required reading (Management Policy 1.30). WP 02-EC3506, Environmental Incident Reporting, is the Management Control Procedure for reporting releases, and includes statutory requirement charts for notifications and decision flowcharts. WP 05-WH1058, 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, 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, WIPP Emergency Management Program, is the top-level document outlining emergency response procedures and responsibilities, includes training requirements for response roles. WP 05-WH4401, Waste Handler Operator Event Response, includes alarm, alert, and exit procedures. WP 12-ER3906, Categorization and Classification of Operational Emergencies includes tables of procedures for emergency notifications and classification of events. WP 12-HP4000, 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.	Sat
	Question: Records/WDS		

	Do the characterization module, certification module, shipping module, and inventory module 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.	Sat
19	Does the WDS adequately document waste shipment and emplacements information for waste containers selected? (Item 3 above) CH, RH	Yes. Canister, Overpack, and Container Data Reports were retrieved, all of which correctly reflected container number, shipment number, and emplacement information in the underground.	Sat
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 Data Report. Dose limits for each of the containers examined by EPA inspectors (listed in Item 3) were below statutory limits.	Sat
21	Review a Waste Container Data Report. Does this report adequately record the Waste Stream Profile Form information?	Yes. For all containers inspected, inspectors found Container and Canister Data Reports to contain Waste Stream IDs, as well as all necessary radiological and chemical profile information.	Sat
22	Review the Shipment Summary Report. Does the report correctly record the containers shipped? CH, RH	By querying the Shipment number, the Shipment Data report may be generated. Inspectors verified that the report reflects the containers shipped.	Sat
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.	Sat
24	Is DOE assuring that the 1.2 safety factor being maintained on a room basis? Does the WDS accurately calculate the safety factor and recommend the proper amount of MgO to emplace?	Yes. See questions 12-17. EPA inspectors reviewed InSEI Matrix Requirements WWIS2-REQ-2126 and -2127 to verify that the WDS software calculates MgO excess appropriately.	Sat

DOCKET NO: A-98-49
Item: II-B3-127

2013 - Monitoring Inspection Report

INSPECTION No. EPA-WIPP-10.13-22b
OF THE
WASTE ISOLATION PILOT PLANT
October 22 – 24, 2013

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

January 2014

Table of Contents

Figures

Tables

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 October 22 to October 24, 2013 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 contains the inspection plan and the checklist used by the EPA inspectors, and Attachment C lists documents reviewed by the EPA.

The inspection examined the implementation of monitoring for geomechanical, hydrological, waste activity, drilling related, and subsidence parameters. The EPA inspectors toured locations where measurements are taken, reviewed parameter databases, and reviewed documents and procedures directing these monitoring activities.

The Agency found that DOE continues to effectively implement the monitoring programs at WIPP for all areas reviewed. EPA did not identify any findings or concerns during this inspection. The inspectors also confirmed that the results of DOE monitoring programs are reported annually.

2.0 Scope

The EPA WIPP Compliance Criteria (40 CFR Part 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 most recent Compliance Recertification Application (CRA), and were used to develop pre-closure and post-closure monitoring requirements.

Volume 1, Section 7.0, of the CCA documented 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 Categories	Parameter
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 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 numerous sampling procedures and measurement techniques and verified implementation of an effective quality assurance program (see the document list in Attachment B of this report).

3.0 Inspection Team, Observers, and Participants

The inspection team consisted of three EPA staff listed in Table 2. Observing the inspection was Thomas Kesterson of the State of New Mexico Environment Department.

Table 2 WIPP Inspection Team and Observers

Inspection Team Member	Position and Inspection Focus	Affiliation
Nick Stone	Inspection Leader	EPA – Region 6
Jonathan Walsh	Inspector	EPA - ORIA
Kathleen Economy	Inspector	EPA - ORIA
Observer	**Position**	Affiliation
Mansour Akbarzadeh	Manager Carlsbad Environmental Monitoring and Research Center	NWP
Terry Batchelder	Waste Operations	NWP
John Callicoat	Delaware Basin Monitoring Lead	URS-Professional Solutions
Randy Britain	Manager Waste Operations	NWP
Rey Carrasco	Manager Geotechnical Engineering	NWP
Art Chavez	Senior Scientist – EPA Compliance Group	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
Tom Klein	Scientist – EPA Compliance Group	URS-Professional Solutions
Trais Kliphuis	WIPP Group Manager	New Mexico Environmental Department, Hazardous Waste Division

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 & Associates/ SNL
Mike Walentine	Waste Data Monitoring	NWP
Ty Zimmerly	Geotechnical Engineering	NWP
NWP - Nuclear Waste Partnership SNL – Sandia National Laboratories		

4.0 Inspection Schedule

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, if appropriate. The inspection checklist in Attachment A provides details of these inspection activities.

The inspection began on Tuesday morning, October 22, 2013, with an opening meeting at DOE's Skeen-Whitlock Building in Carlsbad, New Mexico. Site staff presented changes to the monitoring programs that occurred since the previous inspection. The last half of the morning EPA inspectors interviewed Delaware Basin staff. In the afternoon the EPA inspectors visited the Carlsbad Area Environmental Monitoring and Research Center.

The morning of October 23 EPA inspectors were escorted down into the repository in order to review and observe monitored parameters related to waste packages, MgO emplacement, and geomechanical activities. During the afternoon EPA inspectors remained at the WIPP site and continued with interviews and inspections related to waste handling and operations, geomechanical database capabilities and managment and database, and air monitoring.

The morning of October 24th EPA inspectors traveled to the WIPP site to review activities related to the subsidence and hydrogeologic monitored parameters and see the WIPP core storage facility and view cores stored there. 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 on October 24, 2013, at the Skeen-Whitlock Building.

4.1 Monitoring of Geomechanical Parameters

DOE committed to measuring 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. These programs are described in *WIPP Geotechnical Engineering Program Plan*, WP07-1 Revision 7; the program plan has not been modified since March 19, 2008. The monitored geomechanical parameters are reported annually in two volumes spanning a 12- month period.

The 2011 – 2012 monitored parameters are documented in *Geotechnical Analysis Report for July 2011 – June 2012 Vol 1,* DOE/WIPP-13-3501, Vol. 1 and *Geotechnical Analysis Report for July 2011 – June 2012 Vol 2.* Data are collected as deemed necessary by the Geotechnical Engineer or Geotechnical Cognizant Individual. Overviews of activities or changes that have occurred within the Geotechnical program were presented at the October 22 Opening session (EPA Inspection ID: KME-M2013-GT014). These are summarized below:

- Non-editorial and minor modifications in two of the ten Geotechnical procedures
    - WP 07-EU1001, Geologic and Fracture Mapping of Facility Horizon Drifts
    - WP 07-EU1303, Geomechanical Instrument Data Processing
- Latest Published Reports
    - Ground Control Annual Plan (DOE/WIPP 02-3212, Rev. 12, May 2013)
    - Geotechnical Analysis Report, Volumes 1 & 2 (DOE/WIPP 13-3501, May 2013)
- Excavation Deformation
    - no observable changes
- Mining Effects on Existing Openings
    - Disposal Rooms and RH Boreholes Deformation
    - In line with predicted values
- Monitoring of Excavation Effects
    - Separation at anhydrite stringers in Panel 6 are controlled by roof bolting
    - Effects of RH boreholes in Panel 6 are consistent with numerical modeling results and Panel 5 observations
    - The response to excavation in the SDI area has been predictable, that is, a modestly high initial strain followed by a gradual reduction in closure rate over time
    - Deformation rates are consistent and predictable

Table 3 lists Geotechnical Documents related to this program. Procedures used to measures these parameters are also given in the same table. As indicated in Table 3 six procedures have been modified since the 2012 inspection.

Table 3. DOE Documents Reporting Monitored Geomechanical Parameters and Relevant Procedures

Geomechanical Monitored Parameter Documents and Procedures		
Document Title	**DOE Document ID #**	**Last Modification**
WIPP Geotechnical Engineering Program Plan.	WP 07-1 Rev 7	11/19/2012
Rev 1 Geologic Core Logging	WP 07-EU1002 Rev 1	11/27/2012 Editorial
Geomechanical Instrument Data Processing	WP 07-EU1303 Rev 5	05/13/2013 Some editorial, some procedural (related to checker)
Installing Multiposition Borehole Rod Extensometers	WP 07-EU1305 Rev 2	No modification since last inspection
Installing Wire Convergence Meters	WP 07-EU1307 Rev 4	08/13/2013 Editorial
WIPP Core Storage Handling and Distribution	WP 07-EU3504 Rev 4	11/30/2012 Editorial
Geologic and Fracture Mapping of Facility Horizon Drifts	WP 07-EU1001 Rev 5	11/16/2012 Two revisions since last inspection 1. Measurements recorded in 1/10th feet from floor to back. 2. New step – complete BH inspection data sheet.

Geomechanical Monitored Parameter Documents and Procedures		
Manually Acquired Geomechanical Instrument Data	WP 07-EU1301 Rev 8	06/25/2013 Editorial
Installing Convergence Reference Points	WP 07-EU1304 Rev 6	None Since Last Inspection
Installing Rock Bolt Load Cells	WP 07-EU1306 Rev 4	None Since Last Inspection
Installing Wire Extensometers	WP 07-EU1308 Rev 2	None Since Last Inspection

Geomechanical Monitored Parameter Annual Report, July 2010 – June 2011	
Document Title	**DOE Document ID #**
Geotechnical Analysis Report for July 2011 – June 2012 *Vol 1,*	DOE/WIPP-13-3501, Vol. 1
Geotechnical Analysis Report for July 2011 – June 2012 Vol 2	DOE/WIPP-13-3501,, Vol. 2

Procedures Used to Install Geomechanical Monitoring Instruments and Take Parameter Measurements		
Document Title	**DOE Document ID #**	**Date of Last Modification**
Geologic and Fracture Mapping of Facility Horizon Drifts	WP 07-EU1001 Rev 5	11/16/2012 Two revisions since last inspection
Rev 1 Geologic Core Logging	WP 07-EU1002 Rev 1	11/27/2012 Editorial

Geomechanical Monitored Parameter Documents and Procedures		
Manually Acquired Geomechanical Instrument Data	WP 07-EU1301 Rev 8	06/25/2013 Editorial
Geomechanical Instrument Data Processing	WP 07-EU1303 Rev 5	05/13/2013 Some editorial, some procedural
Installing Convergence Reference Points	WP 07-EU1304 Rev 6	None Since Last Inspection
Installing Multiposition Borehole Rod Extensometers	WP 07-EU1305 Rev 2	None Since Last Inspection
Installing Rock Bolt Load Cells	WP 07-EU1306 Rev 4	None Since Last Inspection
Installing Wire Convergence Meters	WP 07-EU1307 Rev 4	08/13/2013 Editorial
Installing Wire Extensometers	WP 07-EU1308 Rev 2	None Since Last Inspection
WIPP Core Storage Handling and Distribution	WP 07-EU3504 Rev 4	11/30/2012 Editorial
Sample Data Submittal Sheet		
FieldDataSheetBoreholeOH1018_FractureMapsPane7Room1Oct2012_May2013	Per Procedure WP 07-EU1001 Rev 7	N/A
Relevant QA for Software		
Software Screening and Control	WP 16-2 Rev 11	01/05/2012

Changes to these procedures were reviewed by the EPA inspection and are deemed adequate for their intended purpose.

Geomechanical data are collected, at a minimum, quarterly but more frequent readings may be taken. During the morning of October 23, 2013, EPA inspectors went down into the WIPP mine for observations. Inspectors observed fracture measurements being collected in borehole OH1018 located in Panel 6 Room 1. This borehole is drilled 3-inches in diameter and 20-feet deep into the back of the room. Borehole fractures are measured using procedure *Geologic and Fracture Mapping of Facility Horizon Drifts*, Rev 5, WP07EU1001. The inspectors noted during the measurements the Geotechnical Engineers were following procedure WP07EU1001. Figure 1 is a photograph of a borehole where the fracture measurement took place. These measurements are then entered into the database following procedure given in *Manually Acquired Geomechanical Instrument Dat*a (WP 07-EU1301 Rev 8, EPA Inspection ID: KME-M2013-GT03).

Figure 1. Taking Fracture Measurement at Observation Hole OH1018

During the afternoon of October 23, 2013, EPA inspectors interviewed Wayne Stensrud, a designated geotechnical cognizant individual (CI) within the geotechnical program. Mr. Stenstrud and staff demonstrated data processing of fracture measurements and borehole data that had been mapped using procedure *Geologic and Fracture Mapping of Facility Horizon Drifts* WP, Rev 5, 07-EU1001. The measurements are entered on a borehole data entry sheet that includes an updated map of the fractures measured in the room. The collected data are entered on a field data sheet then put into the database using procedure *Manually Acquired Geomechanical Instrument Data* EU1301. A copy of the Field Data Sheet and fracture maps (FieldDataSheetBoreholeOH1018_FractureMapsPane7Room1Oct2012_May2013: EPA Inspection ID: KME-M2013- GT04) was given to EPA inspectors to confirm fracture data was recorded per procedure EU1301 and submitted to the Geotechnical database.

The EPA inspectors asked Mr. Stensrud about procedures and the documentation used to collect and store repository borehole core information. To assure older core sample records are readily available the inspector specifically requested looking at records for a core drilled several years ago that intersected an anhydrite/halite interface layer and where potential fractures are likely to take place. Mr. Stensrud was able to bring up the pictorial record for borehole OH572. Core coordinates, measurement units, direction (top/bottom), sample depth, and date drilled were part of the picture composition as indicated in Figure 2 per an older version of procedure *Geologic Core Logging*, Rev. 1 WP 07-EU1002. The EPA inspector's review of the pictorial record against the current procedure verified that DOE is adequately monitoring, recording, and archiving core sample information.

Figure 2. Picture of Core taken from OH572

On October 24th the EPA team visited the locked shipping containers that store WIPP core samples extracted from the repository. The EPA inspector verified cores are stored, marked and handled per procedure *WIPP Core Storage Handling and Distribution,* WP 07-EU3504 Rev 4. Cores are located in a secure area, access to the area is limited, and core samples have a Chain of Custody sheet as specified in Step 1.1.1 (of WP 07-EU3504). Cores are labeled with indelible ink, stored in marked containers with Sample ID, sample collection date, depth and interval where samples were taken per Step 1.1.2 (of WP 07-EU3504). The inspectors verified borehole cores are stored in locked facility, labeled and marked according per procedure *WIPP Core Storage Handling and Distribution,* WP 07-EU3504.

In summary, EPA inspectors observed fracture measurements being taken, interviewed cognizant individuals related to data processing and storage of this data, visited the core sample storage facility, and spot checked retrieval of data processing. Data measurement, retrievablilty of data, and storage of core samples was verified during this inspection. Based on these inspection observations and activities EPA concluded that the DOE Geotechnical monitoring activities and procedures are adequate. EPA inspectors did not identify any concerns or findings for the Geotechnical program.

4.1 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 groundwater chemistry monitored parameters are collected by DOE's Ground Water Monitoring Program contractors. 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 12*. Results of this program are published in the annual *WIPP Site Environmental Report for 2011, September 2012,* DOE/WIPP-12-3849 denoted herein as the ASER 2011. The ASER 2011 describes and presents environmental data which includes the groundwater monitoring program. The groundwater chemistry monitoring results and the groundwater particle travel path length, travel time, and average groundwater velocity from the WIPP waste handling shaft to the WIPP land withdrawal boundary (LWB) are given in the Section 6.2 of the ASER 2011 report.

During the October 22nd opening presentation, Rick Salness, lead staff of WIPP's Groundwater Monitoring Program, described ongoing activities within the program that are used to collect data reported in ASER (EPA Pres 2013_GW Program, EPA Inspection ID: KME-M2013-GW14). An update of well networks maintained by the Groundwater Monitoring Program was provided. A summary of these activities updates is given below:

- 1 replacement well, AEC-7R, drilled in August 2013 (screened in the Culebra and replaces AEC-7)
- A 17-day long pump test performed on H-9bR (extracted a total of 968,290 gallons). The purpose was to test the hydrologic characteristic of the Culebra
- PVC tubing in wells SNL-10 and SN-18 was blocking the well screen. This tubing was cleared from the wells.
- Brushed and bailed well SNL-1 to removed scale built-up

The current well network, as of June 30, 2013, is as follows:

- 48 Culebra Monitoring Wells
- 12 Magenta Monitoring Wells
- 1 Dual Completion Culebra/Magenta Well
- 1 Dewey Lake Well
- 2 Bell Canyon Wells
- 20 Shallow Santa Rosa/Dewey Lake Contact Wells

Basic water quality chemistry measurements continue at the six groundwater monitoring wells screened in the Culebra Dolomite, located up- and down-gradient from the repository, and one well screened in the Dewey Lake Redbeds. Basic water chemistry testing was also performed at

three wells screened in the Magenta Dolomite—H-2b1, H-4c, and H-9c—and one additional well screened in the Culebra Dolomite—well H9bR.

Table 4 lists the current Groundwater Monitoring Program procedures and indicates those modified since the last inspection.

Table 4. DOE Documents Reporting Monitored Hydrological Parameters and Relevant Procedures

Procedures Used to Monitor Hydrological Parameters		
Document Title	**DOE Document ID #**	**Last Modification**
WIPP Groundwater Monitoring Program Plan	WP 02-1, Rev. 12	11/30/2012
WIPP Environmental Monitoring Plan	DOE/WIPP-99-2194 Rev.8	Jan 2013
Field Parameter Measurements and Final Sample Collection	WP 02-EM1010 Rev 1	2/25/2013
Administrative Processes for Environmental Monitoring and Hydrology Programs	WP 02-EM3001 Rev 19	5/08/2013
Pressure Density Survey	WP 02-EM1021 Rev 8	6/6/2011 No Change
Groundwater Level Measurement	WP 02-EM1014 Rev 6	No Change
Data Review – Annual Culebra Groundwater Report	WP 02-EM1025 Rev 4	2/27/2012
EM&H Field Work and Implementation of the Land Use Request	WP 02-EM1024 Rev 5	No Change
Water Level Data Handling and Reporting	WP 02-EM1026 Rev 4	2/22/2012

Integrated Sample Control Plan	WP 02-EM.02 Rev 3	4/26/2012
Electric Submersible Pump Operation	WP 02-EM1002 Rev 5	2/28/2012
Analysis Report for Preparation of 2011 Culebra Potentiometric Surface Contour Map	ERMS 557633	5/17/2012
October 22 Presentation for Environmental Monitoring and Hydrology	DOE Presentation	10/22/2013

On October 24th, EPA staff visited well pad WQSP-6A, located downgradient from the WIPP site, to observe a demonstration of groundwater field measurements and sample collection per DOE procedure *Field Parameter Measurements and Final Sample* WP 02-EM1010. This procedure prescribes the steps used to collect well water and take samples used to measure basic groundwater constituents (indicator parameters) and test for any radiological and non-radiological contaminants. The indicator parameters are pH, specific conductance, temperature, and specific gravity. The waster samples are collected using a single-step in-line flow-through cell instrument, new to the program. Use of the single-step instrument replaces the two-step bench chemistry analysis described in procedures *Serial and Final Sample Collection* and *Anion and Cation Analysis* (WP 02-EM1005 and WP 02-EM1006, respectively). The two-step methodology is now retired. EPA's October 24th visit was the first time the inspector had observed the in-line flow through cell sample collection. A picture of the in-line flow through cell is given in Figure 3.

Figure 3. In-line Flow Sampling Cell Used To Measure the Field Parameter pH, Specific Conductance, and Temperature

The field staff demonstrated the calibration of the pH probe and conductivity probes per Sections 1 and 2 of procedure WP 02-EM1010. The inspector observed calibration of the Orion 93 VersaStar pH and conductivity meter (Figure 4) and reviewed the calibration output sheet. The inspector deemed groundwater sample collection, instrument calibration and data recording per procedure WP 02—EM1010 and performed by the environmental field staff were adequate.

Figure 4. Calibration of pH Probe Using Orion 93 VersaStar Meter.

EPA inspectors reviewed the Culebra groundwater chemistry results reported in the ASER 2011 Report (DOE/WIPP-12-3489 and EPA Inspection ID: KME_M2013_CBF01), Sections 6.2.4 and

Appendices E and F. Culebra groundwater quality components are evaluated annually as part of the groundwater monitoring programs. Groundwater samples from seven monitoring wells are taken and analyzed against the baseline values reported in 2000. Constituents are compared against the 95th upper tolerance levels for data considered nonparametric (i.e., having neither a normal nor a lognormal distribution with 16 –95 percent non-detects) or the 95th percentile value as calculated for baseline values reported in the *Waste Isolation Pilot Plant RCRA Background Groundwater Quality Baseline Update Report* (IT Corporation, 2000). Table 5 lists the groundwater indicator parameter constituents monitored. All Culebra general chemistry indicator parameters were within the relevant accepted tolerance limits or percentile values. None of the constituents of interest exceeded baseline concentrations.

Table 5. General Culebra Groundwater Chemistry Constituents Measured

Groundwater Constituent Parameters	
Common Cations (calcium, magnesium, potassium, sodium)	Common Anions (choride, sulfate, nitrate, NO_3^-).
Divalent cations	Dissolved magnesium and potassium
Eh potential	Temperature
Specific Gravity	Total Suspended Solids
pH (Acidity, Alkalinity)	Total Dissolved Solids
Total Organic Carbon	

Culebra potentiometric head measurements are performed by members of the WIPP environmental monitoring program. Changes in Culebra flow direction are modeled by using an ensemble average of distributed aquifer parameters and calibrating modeled heads to those annually measured in the field. The analysis to determine Culebra groundwater flow direction is performed by scientists at Sandia National Laboratories. The EPA inspector examined Culebra potentiometric head data and resulting travel paths and times given in Sections 6.2.5 of the 2012 ASER report and compared this to the 2011 ASER report. Table 6 presents predicted travel time values given in the two reports.

Table 6. Estimated Culebra Travel Times, Travel Distance, and Average Groundwater Velocity Reported in the ASER for 2010 and 2011.

Culebra Travel Times, Travel Distance, and Average Groundwater Velocity		
Particle Track Travel Time Originating Waste Handling Shaft to LW Boundary	**ASER June 2010[1]**	**ASER February 2011[2]**
Estimated Advective Travel Time (years)	6283	5826
Travel Distance (kM)	4.089	4.092
Average Groundwater Travel Velocity (m/yr)	0.65	0.70

[1] *WIPP Site Environmental Report for 2010, Issued September 2011,* DOE/WIPP-11-2225

[2] *WIPP Site Environmental Report for 2011, Issued September 2012,* DOE/WIPP-12-3489

Based on seasonal and annual fluctuation of heads used as input to the calibration it is expected that potentiometric surfaces will slightly vary from year to year. This is indicated in the slight differences between the estimated June 2011 and February 2012 travel time results and velocity. These differences are reasonable. The map development process has not changed since last year and continues to be adequate for this monitoring requirement.

In summary, EPA inspectors found the groundwater monitoring parameters, groundwater chemistry constituents and potentiometric heads and predicted travel times collected by DOE's Groundwater Monitoring Program to be adequate. EPA inspectors did not identify any concerns or findings for the groundwater monitoring program.

4.2 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 web-based database which tracks total radioactivity as well as other waste components emplaced in WIPP (e.g., ferrous and non-ferrous metals, organic materials and MgO as well as radionuclide activity). The overarching requirements for the WDS are discussed in the *WIPP Waste Data System Program and Data Management Plan*, WP 08-NT.01 Revision 22. Specific requirements and criteria for implementation of the program are described in *Waste Stream Profile Form Review and Approval Program*.

On the morning of October 24, inspectors met with WWDS personnel, who answered questions and generated a Nuclide Report, a Materials Emplacement Report, several query reports and the MgO safety factor calculations. All electronic records were found to contain required waste stream, container and emplacement information. The Summary of Waste Emplacement Inventory Report generated the current activity of repository emplaced waste as of October 24, 2013, and included the current total activities of the ten EPA-tracked radionuclides emplaced in the repository.

The Land Withdrawal Act of 1992 limits the total waste to no more than 6.1 million cubic feet and the total activity of the RH waste to 5.1 million curies. The emplaced waste as of October 27, 2013, shown in Table 7 is 89,359 cubic meters or 3,155,684 cubic feet. The emplaced waste is 52% of the maximum allowed. The RH activity is 23,020 curies, which is 0.45% of the maximum allowed.

Table 7. Summary Totals WDS Nuclide Report through October 24, 2013

Panel: ALL Room: ALL

Radionuclide	Repository CH Activity (Ci)	Repository RH Activity (Ci)	Total Repository Activity (Ci)
AM-241 Americium 241	2.532E+05	6.083E+02	2.538E+05
CS-137 Cesium 137	1.411E+01	1.389E+04	1.390E+04
PU-238 Plutonium 238	4.794E+05	6.956E+02	4.801E+05
PU-239 Plutonium 239	3.297E+05	3.701E+02	3.301E+05
PU-240 Plutonium 240	8.146E+04	2.719E+02	8.173E+04
PU-242 Plutonium 242	2.683E+01	3.724E-01	2.720E+01
SR-90 Strontium 90	1.580E+01	7.181E+03	7.197E+03
U-233 Uranium 233	6.505E+00	3.842E-01	6.889E+00
U-234 Uranium 234	8.623E+01	1.082E+00	8.731E+01
U-238 Uranium 238	1.741E+01	3.817E-02	1.744E+01
Totals	**1.144E+06**	**2.302E+04**	**1.167E+06**

In summary, EPA inspectors did not identify any concerns or findings in the waste activity.

4.3 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. The overarching protocol for measuring these parameters is documented the *Delaware Basin Drilling Surveillance Plan*, WP 02-PC.02 Rev 5. Drilling data is collected using procedure *Delaware Basin Drilling Database Upgrade Process* WP 02-EC3002 Rev 6. The surveillance program measures and records many parameters related to drilling activities around the WIPP site. The surveillance results documented quarterly and combined drilling activity in the annual report *Delaware Basin Monitoring Annual Report, September 2012,* and DOE/WIPP-12-2308. The annual report provides drilling data within the basin that occurred between September 1, 2011 and August 31, 2012.

During the October 22nd opening presentation Jonathan Callicoat, the lead staff member of WIPP's Delaware Basin Surveillance Program, presented ongoing and changes in drilling activities within the program (EPA Inspection ID: KME-M2013-DB10). These are given below:

Current Well Network as of October, 2013

- June 1, 2012 to August 31, 2013: 1,312 new deep wells drilled in the Delaware Basin, Texas and New Mexico
- Update to deep borehole drilling rate as of August 31, 2013: 72 boreholes/kilometer
    - Increased from the May 31, 2012 drilling rate of 66.3 boreholes/kilometer
- There are 35 new deep wells drilled in WIPP 'Nine-Township' area as of June 1, 2012
- Of the 35 new wells, 10 are within in the WIPP '1 mile radius'
- These deep wells did not report any encounters with Castile Brine

The morning of October 22nd EPA inspectors met with Delaware Basin monitoring staff and viewed how the database is updated weekly to track drilling activities in the basin. The procedure followed is given in *Delaware Basin Drilling Database Upgrade Process* WP 02-EC3002 Rev 6 and used to step through the process to update databases with information from various commercial and state sources. Drilling results and brine encounters are presented in the annual and quarterly reports.

EPA reviewed the drilling surveillance database and examined changes in drilling rates and permitted wells. The functional components of the database were provided with Delaware Basin personnel running EPA requested queries. Delaware Basin staff demonstrated how the Delaware Basin database maps are produced. A file was produced of all the new Mexican hydrocarbon wells drilled in Delaware Basin as of October 7, 2013 *(New Mexico Hydrocarbon 201.* xlsx; EPA Inspection ID: KME-M2013-DB04). WIPP staff created a data file and map of hydrocarbon wells within the one mile buffer surrounding the WIPP site (*Well Status Table-One Mile Buffer 10-7-2013*, EPA ID: KME-M2012-DB08 and *Well Status Map-One Mile Buffer 10-7-2013*, EPA ID: KME-M2012-DB07). The map was compared to Figure 2 in the DOE June-2013 Quarterly Report (Delaware Basin Monitoring Quarterly Report, June 2013, EPA ID: KME-M2012-DB11). The two maps were in agreement and corroborate that the map generation process is reproducible and traceable.

For this year's inspection EPA inspectors focused on seismic events documented in the database. This is a relatively new monitored activity, initiated within the last 2 – 3 years. Seismic activities in the Delaware basin region are primarily due to oil and gas exploration and drilling and reported in Section 2.8 of *Delaware Basin Annual Monitoring Report.* The EPA inspector asked to query the database of the number of Delaware Basin seismic events, plus the year and min/max magnitude time, detected in Texas and New Mexico before and after December 31, 2011. The results of the query are given in *Seismic Table 10222013*.pdf (KME-M2013–DB05). A map from this query (Figure 5) is provided in *Seismic Activity in the WIPP Vicinity 10/22/2012* (EPA Inspection ID: KME-M2013–DB06). The query table and map results corroborate the reported values given in and demonstrate the functionality of the Delaware Basin Monitoring program.

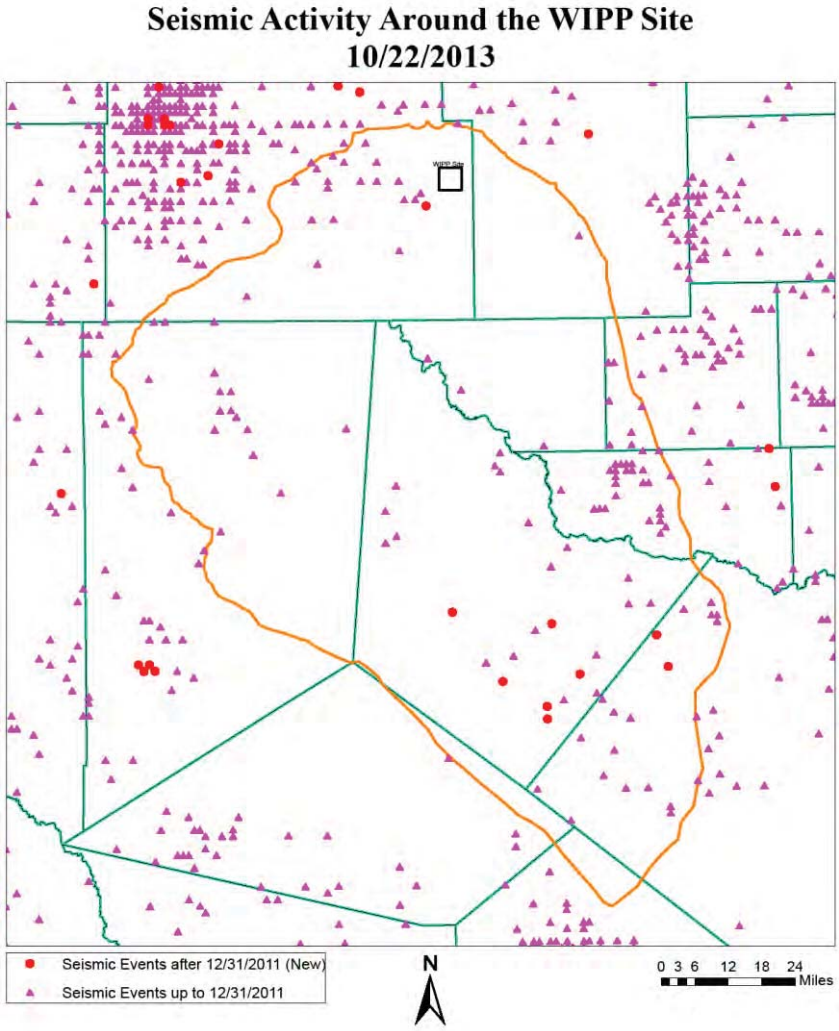

Figure 5. Delaware Basin Seismic Activities Recorded Within the WIPP Vicinity

EPA inspectors reviewed the information provided in the *Delaware Basin Annual Monitoring Report* (DOE-WIPP-13-2308, EPA Inspection ID: KME-M2012-DB03). EPA inspectors did a spot check of Texas and New Mexico drilling reports, well database listings and maps of wells drilled within the Delaware basin and WIPP vicinity. Based on EPA's reviews of the Delaware Basin database, the map creation process and interviews with the monitoring staff, EPA inspectors concluded that DOE adequately tracks Delaware Basin drilling rates and encounters with Castile brine within the WIPP vicinity. EPA inspectors did not identify any concerns or findings for the Delaware basin drilling and monitoring program adequate.

Table 8: Delaware Basin Documents Reviewed

Document Title	**DOE Document ID #**	**Last Modification**
Delaware Basin Drilling Database Upgrade Process	WP 02-EC3002 Rev. 6	12/18/2012
Delaware Basin Surveillance Plan	WP 02-PC.02 Rev 5	11/27/2012
Delaware Basin Monitoring Annual Report	DOE WIPP 12-2308	September 2012
New Mexico Hydrocarbon 2013.xlsx	(Inspection query)	7/19/2012
Seismic Table	(Inspection query)	7/22/2013
Seismic Activity (Map)	(Inspection query)	7/22/2013
DBM-55-2013.pdf	(Inspection query)	10/31/2013
WIPP Delaware Basin Monitoring Quarterly Report June 2013	N/A	June 2013
Delaware Basin EPA Presentation October 17, 2012	N/A	10/22/2013

4.4 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 2012*, DOE/WIPP 12-3497. 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. The report fulfills the requirement that the subsidence parameter is measured and reported on a yearly basis.

In the opening presentation, WIPP staff reported that there have been no major changes to the subsidence surveying program in the past year, with the exception of new computer hardware that will be used to process 2013 data. The relevant procedures, listed in Table 9, have not changed. Because of the difficulty of finding replacement memory cards for the Lyca NA3003 surveying instrument that is currently used, staff anticipate purchasing a new instrument and revising these procedures in 2014.

During the last annual inspection in July 2012, EPA inspectors observed the performance of the office procedure included in Section 2.0 of *Subsidence Survey Data Acquisition Report*, WP 09-ES4001, Rev. 2. The procedure identifies the steps used to process the raw field data in order to calculate the final surface evelations. On the morning of October 24, an EPA inspector joined the surveying team in the field and observed the surveying of part of Loop 7, which is roughly above the footprint of Panel 8. The survey trace is documented in 'pdf' file labeled *JPW-20131022-04_Loop_7_map.* The procedure 09-ES4001, Rev. 2 was followed correctly as the team surveyed from monument K-349 to S-24. EPA inspectors did not identify any concerns or findings.

Figure 6. Surveying Rod on Monument S-24

Table 9. WIPP Subsidence Procedures and Documents Reviewed		
Document Title	**DOE Document ID #**	**Last Modification**
WIPP Underground and Surface Surveying Program	WP 09-ES.01, Rev. 6	11/30/12
Subsidence Survey Data Acquisition Report	WP 09-ES4001, Rev 2	12/14/2011
WIPP Panel Closure Plan	WP 09-ES.02, Rev 2	11/30/2012
WIPP Subsidence Monument Leveling Survey 2012	DOE/WIPP 12-3497	12/27/2011

Attachments

Attachment A

Inspection Plan

WIPP Monitoring Inspection Plan 40 CFR 194.42 for the year 2013

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 194, Section 21.

This inspection is part of EPA's continued oversight to ensure that WIPP can, in fact, monitor 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.

Focal Areas of This Year's Inspection:

- What has changed in the monitoring program this past year?
- What documentation and procedures have changes?
- Update the monitoring program and results for the past year.
- Have any monitoring parameters changed (e.g., have the monitored parameters changed beyond the expected range of values adopted with the most recent PA model)?

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. The First day will begin with an opening meeting at 8:00 a.m. The Last day will end with a closeout session in the afternoon.

Inspection Date: Week of October 21, 2013.

Documents For Review: The latest versions of any documentation and/or procedures related to the DOE monitoring program.

Attachment B

2013 Monitoring Inspection Checklist

Checklist for Geotechnical Monitoring Commitments– October 2013			
	Monitoring Commitments	**Geotechnical Parameters**	**Sat = Satisfactory**
#	**Question**	**Comment (Objective Evidence)**	**Result**
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. WIPP site staff discussed changes to the program during the past year (EPA Inspection ID: KME-M2013-GT014). Staff demonstrated the adequacy of the program and that the program produces satisfactory results. Geotechnical staff demonstrated fracture measurements, how they area recorded, core samples, core parameters, and core sample storage facility. The inspector toured the underground and reviewed the databases used to collect and process recorded data. Results of this program are documented annually in the *Geotechnical Analysis Report Volumes 1 and 2* for each reporting period (DOE/WIPP-13-3501, Vol 1 and DOE/WIPP -13-3501, Vol 2; respectively). The inspector verified that the geomechanical parameters continued to be appropriately monitored by DOE.	Sat

2	Does DOE demonstrate that they have implemented an effective qualityassurance program for item 1 above? 40 CFR 194.22	The overarching QA program has not been modified since the 2012 inspection. All current components are found to be adequate in 2012.	Sat
3	Does DOE demonstrate that the results of the geotechnical investigations are reported annually? (CCA, App. MON, Page MON-10)	WP 07-01 Rev 7, Section 3.2 requires that analysis be performed annually and results are published in the annual geotechnical analysis report (DOE/WIPP-13-3501, Vol 1 and DOE/WIPP-13-3501, Vol 2.	Sat
Checklist for Hydrologic Monitoring Commitments – October 2013			
	Monitoring Commitments	**Hydrological Parameters**	
#	**Question**	**Comment (Objective Evidence)**	**Result**
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)	Objective evidence given reviewing the following procedures and reports: *Field Parameter Measurements and Final Sample* WP 02-EM1010)	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)	Objective evidence given reviewing the following procedures and reports – *WIPP Groundwater Monitoring Program Plan* WP 02-1, Rev. 12; *Waste Isolation Pilot Plant Annual Site Environmental Report* for 2011 Report (DOE/WIPP-12-3489) Section 6.2.5, Figures 6.11 and Figure 6.12	
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	During the 2013 inspection the EPA inspector evaluated the quality assurance program and found it to be adequate.	Sat
3	Does DOE demonstrate that the results	Objective evidence given in *Waste*	Sat

	of the groundwater monitoring program are reported annually? (CCA, App. MON, Page MON-22)	*Isolation Pilot Plant Annual Site Environmental Report* for 2011 DOE/WIPP-12-3489, (ASER). The document provides annual groundwater elevations for wells completed in the Culebra and used data from 47 of these wells to create the Culebra regional and local potentiometric maps around the WIPP LWB.	
Checklist for Waste Activity Monitoring Commitments – October 2013			
	Monitoring Commitments	**Waste Activity Parameters**	
#	**Question**	**Comment (Objective Evidence)**	**Result**
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 22 describes the programmatic plan used to monitor and store waste activity information. The protocol sued to collect, process and store the waste activity is described in . Yearly reporting of waste activity is provided in *Annual Change Repor*t 2009/2010, Table 3 (DOE/WTS November 15, 2010).	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	During the 2012 inspection the EPA inspector evaluated the quality assurance program and found it to be adequate.	Sat
3	Does DOE demonstrate that the results of the waste activity parameters are reported annually? (CCA Volume, Section 7.2.4 Reporting)	*Annual Transuranic Waste Inventory Repor*t -(EPA Inspection ID: KME-M2012-WACT02) verifies that these parameters are updated and reported annually.	Sat
Checklist for Drilling Rate Monitoring Commitments – October 2013			
	Monitoring Commitments	**Drilling Related Parameters**	
#	**Question**	**Comment (Objective Evidence)**	**Result**
1	Does DOE demonstrate that they have implemented	The *Delaware Basin Drilling Surveillance Plan,* WP 02-PC.02 Rev	Sat

	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)	5, documents the program to measure, record, report, and the QA requirements for these activities. Quality assurance requirements are documented in Section 7.0 of WP 02-PC.02 Rev 5. The *Delaware Basin Drilling Database Upgrade Process* WP 02-EC3002 Rev 5 documents the process used to update databases with information from various commercial and state sources. Drilling rate and Castile brine encounter data are reported annually in the *Delaware Basin Monitoring Annual Report, September 2012,* DOE/WIPP-12-2308 in Sections 2.5 and 2.6. WIPP staff discussed changes during the past year. Delaware Basin staff reported on brine encounters, drilling rate calculations, seismic activity, and provided maps of drilling activities near WIPP). Staff also provided the latest listing of the New Mexico well databases and one mile buffer zone (KME-M2013-DB04, KME-M2013-DB08, respectively). Delaware Basin staff demonstrated that DOE is adequately monitoring these parameters through the monitoring program.	
2	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	During this inspection the EPA inspector evaluated the quality assurance program and found it to be adequate.	Sat
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)	*Delaware Basin Monitoring Annual Report, December 2012,* DOE/WIPP-12-2308 Section 6.0 documents that results are reported annually. DOE WIPP 12-2308 verifies that these parameters are updated and reported annually.	Sat

Checklist for Subsidence Monitoring Commitments – October 2013			
	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)	Demonstration is provided via the implementation of the subsidence survey program as given in *WIPP Underground and Surface Surveying Program* WP 09-ES.01, Rev. 6	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	During this inspection the EPA inspector evaluated the quality assurance program and found it to be adequate.	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 – 2012*, DOE/WIPP 12-3497	Sat

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Attachment C

Documents Reviewed

Monitoring of Geomechanical Parameters	ID	Source
Geotechnical Analysis Report for July 2011 – June 2012 *Vol 1,*	DOE/WIPP-13-3501, Vol. 1	DOE/WIPP
Geotechnical Analysis Report for July 2011 – June 2012 Vol 2	DOE/WIPP-13-3501,, Vol. 2	DOE/WIPP
Geologic and Fracture Mapping of Facility Horizon Drifts	WP 07-EU1001 Rev 5	DOE/WIPP
Rev 1 Geologic Core Logging	WP 07-EU1002 Rev 1	DOE/WIPP
Manually Acquired Geomechanical Instrument Data	WP 07-EU1301 Rev 8	DOE/WIPP
Geomechanical Instrument Data Processing	WP 07-EU1303 Rev 5	DOE/WIPP

Installing Convergence Reference Points	WP 07-EU1304 Rev 6	DOE/WIPP
Installing Multiposition Borehole Rod Extensometers	WP 07-EU1305 Rev 2	DOE/WIPP
Installing Rock Bolt Load Cells	WP 07-EU1306 Rev 4	DOE/WIPP
Installing Wire Convergence Meters	WP 07-EU1307 Rev 4	DOE/WIPP
Installing Wire Extensometers	WP 07-EU1308 Rev 2	DOE/WIPP
WIPP Core Storage Handling and Distribution	WP 07-EU3504 Rev 4	DOE/WIPP
Sample Data Submittal Sheet		
FieldDataSheetBoreholeOH1018_FractureMapsPane7Room1Oct2012_May2013	Per Procedure WP 07-EU1001 Rev 7	DOE/WIPP
Relevant QA for Software		
Software Screening and Control	WP 16-2 Rev 11	

Monitoring of Hydrological Parameters	ID	Source
WIPP Groundwater Monitoring Program Plan	WP 02-1, Rev. 12	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 1	DOE/WIPP
Administrative Processes for Environmental Monitoring and Hydrology Programs	WP 02-EM3001 Rev 19	DOE/WIPP
Pressure Density Survey	WP 02-EM1021 Rev 8	DOE/WIPP
Groundwater Level Measurement	WP 02-EM1014 Rev 6	DOE/WIPP
Data Review for the Annual Culebra Groundwater Report	WP 02-EM1025 Rev 4	DOE/WIPP
EM&H Field Work and Implementation of the Land Use Request	WP 02-EM1024 Rev 5	DOE/WIPP
Water Level Data Handling and Reporting	WP 02-EM1026 Rev 4	DOE/WIPP
Integrated Sample Control Plan	WP 02-EM.02 Rev 3	DOE/WIPP
Electric Submersible Pump Operation	WP 02-EM1002 Rev 5	DOE/WIPP
Analysis Report for Preparation of 2011 Culebra Potentiometric Surface Contour Map	ERMS 557633	SNL
October 22 Presentation for Environmental Monitoring and Hydrology	N/A	DOE/WIPP

	(DOE October 22, 2013)	

Monitoring of Delaware Basin Parameters	ID	Source
Delaware Basin Surveillance Plan	WP 02-PC.02 Rev 5	DOE/WIPP
Delaware Basin Drilling Database Upgrade Process	WP 02-EC3002 Rev. 6	DOE/WIPP
Delaware Basin Monitoring Annual Report	DOE WIPP 12-2308	DOE/WIPP
New Mexico Hydrocarbon 2013.xlsx	(Inspection query) KME-M2013-DB04	(Inspection query)
Seismic Table	(Inspection query) KME-M2013-DB05	(Inspection query)
Seismic Activity (Map)	(Inspection query) KME-M2013-DB06	(Inspection query)
DBM-55-2013.pdf	(Inspection query) KME-M2013-DB08	(Inspection query)
WIPP Delaware Basin Monitoring Quarterly Report June 2013	NONE	DOE/WIPP
October 22 Delaware Basin EPA Presentation	N/A (DOE October 22, 2013)	DOE/WIPP

Monitoring of Subsidence Parameters	ID	Source
WIPP Underground and Surface Surveying Program	WP 09-ES.01, Rev. 6	DOE/WIPP
Subsidence Survey Data Acquisition Report	WP 09-ES4001, Rev 2	DOE/WIPP
WIPP Panel Closure Plan	WP 09-ES.02, Rev 2	DOE/WIPP
WIPP Subsidence Monument Leveling Survey 2011	DOE/WIPP 12-2293, Rev 2	DOE/WIPP

Monitoring of Waste Activities	ID	Source
WIPP Waste Data System Program and Data Management Plan	WP 08-NT.01 Rev 22	DOE/WIPP
Annual Transuranic Waste Inventory Report – 2012	DOE/TRU-12-3425	DOE/WIPP
Waste Stream Profile Form Review and Approval Program	WP 08-NT.03 Rev 14	DOE/WIPP
Waste Data System User's Manual	DOE/WIPP-09-3427 Rev 7	DOE/WIPP
Waste Data System Software Verification and Validation Plan	WP 08-NT.05 Rev 12	DOE/WIPP
TRU Waste Receipt	WP 08-NT3020 Rev 23	DOE/WIPP
Waste Data System Configuration Management and Software Quality Assurance Program	WP 08-NT.04 Rev 21	DOE/WIPP

DOCKET NO: A-98-49
Item: II-B3-127

2013 - Subpart A Inspection Report

INSPECTION No. EPA-WIPP-10.13-22a
OF THE
WASTE ISOLATION PILOT PLANT
October 22 – 24, 2013

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

January 2014

Table of Contents

Attachments

1.0 Executive Summary

The U.S. Environmental Protection Agency (EPA) conducted an annual inspection of the Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) from October 22 to 24, 2013 as part of its continued oversight program. This inspection was conducted under the authority of 40 CFR 191, Subpart A. The purpose of this inspection was to verify that DOE remains in compliance with the release standard found at 40 CFR 191.03, Subpart A.

EPA reviewed DOE's ability to monitor radioactive releases to the public due to normal waste disposal operations and any unplanned or accidental releases that might occur during disposal operations. EPA inspectors examined WIPP's emission monitoring devices and methods used to estimate radiation doses to the public. In addition, EPA inspected radiation sample locations and equipment, sample processing, and reviewed the computational methods used to estimate dose. EPA verified that site staff is able to calculate both yearly and accidental dose estimates adequately.

EPA found that there have been no major off-normal incidents related to radiation control or air sampling, and that DOE has continued to effectively manage its air sampling program to provide representative samples. DOE's decision to rely exclusively on Skids A-2 and A-3 at Station A will increase the predictability of managing salt occlusion on the probes. DOE continues to have an effective radiation sampling program because of this continued diligence. Inspectors made two observations related to procedure updates, both of which were corrected before this report was completed. EPA did not identify any findings or concerns during this inspection.

2.0 Inspection Scope

The scope of this inspection was to verify that WIPP continues to effectively capture, measure, and calculate radiation doses to members of the public during waste disposal operations. Inspection activities included an examination of monitoring and sampling equipment. EPA also addressed the site's ability to characterize a radiological release during an emergency, the handling of samples, and the generation analytical results by the WIPP laboratory. This inspection was conducted under the authority of 40 CFR 191, Subpart A.

3.0 Inspection Team, Observers, and Participants

The inspection team consisted of three EPA staff. Trais Kliphuis of the State of New Mexico Environmental Department observed the inspection.

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

Numerous DOE staff and contractors participated in the inspection; below is a partial list.

Participant	Participant
Larry Madl	Art Chavez
Jacqueline Davis	Jennifer Hendrickson
Mansour Akbarzadeh	Ginny Jones
Adan Pena	Rob Hayes
David Squires	Randy Britain

4.0 Performance of the Inspection

The inspection began on Tuesday, October 22, 2013, with an opening meeting that included presentations on changes in air monitoring and WIPP laboratory activities. Site staff discussed changes in the program since the last EPA inspection in July 2012. These presentations included the following updates and changes to the program:

- After several years of problems with salt occlusion of the shrouded probe at Station A, Skid A-1, the program will no longer use A-1. This will allow a longer probe pull interval of four weeks in the absence of heavy mining, and make it unnecessary to consider meteorological impacts on salt occlusion of the probe.

- Flow control and backup power upgrades are underway at Station B because the current instrumentation is no longer supported by the manufacturer.

- Underground RADOS CAMs are operating in the exhaust drifts of Panels 6 and 7. CAMS are expected to be moved from Panel 6 to Panel 8, following the conclusion of waste disposal in Panel 6, in early 2014.

- Consequence Assessment Dose Projection procedures have been updated to allow the simultaneous modeling of combinations of container type and breach scenario. Additionally, procedures now allow consequence assessment engineers to perform an initial emergency plume remotely, using either NARAC or a hand calculation.

- WIPP laboratories reported that small but detectable amounts of 239/240 Pu were observed in FAS, Station A, and environmental sampling filters, including blanks, between September and November 2013. Filters were stored in close proximity to Pu check sources. After changing this, and conducting decontamination activities, no activity above background has been detected in 2013 samples.

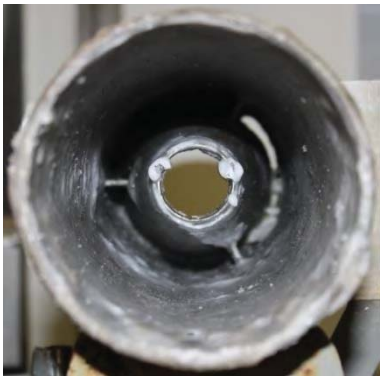
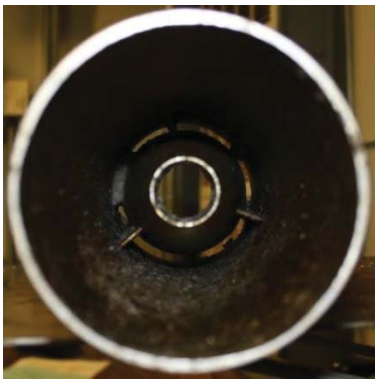
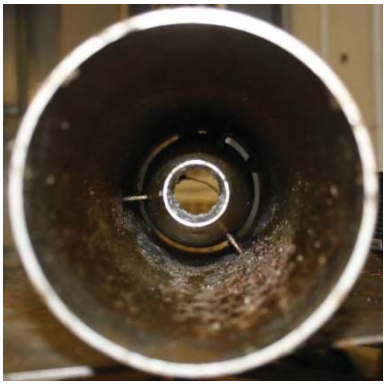
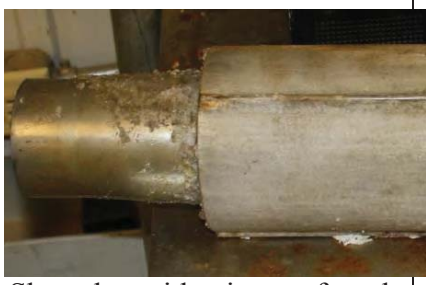
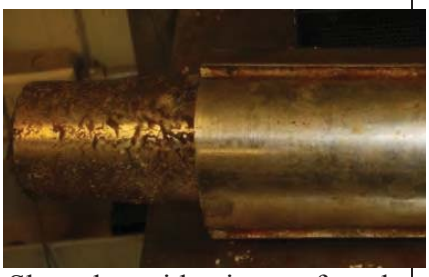
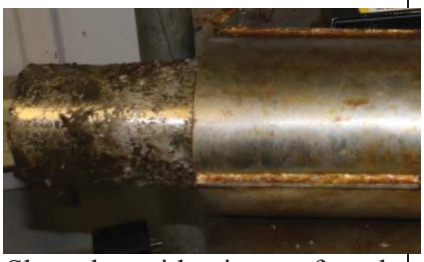
The EPA inspection team reviewed procedures, interviewed site staff, and observed activities to verify the effective implementation of procedures relevant to Subpart A. These activities are described in detail below.

4.1 Stations A, B, and C

Station A, which samples unfiltered air exhausted from the WIPP underground, has been a focus of EPA in several past inspections, due to the tendency of salt to occlude the sampling probes, with the potential to render aerosol samples unrepresentative. Skid A-1, which is nearest to the source of water in the exhaust shaft, has been uniquely problematic, and has created an impetus for DOE to change the probes on a frequent basis, up to biweekly. The decision to not operate Skid A-1 confers several advantages to the program. The most reliable sampling points, Skids A-2 and A-3, are employed interchangeably as the sampler of record and back-up. Probe pulls are reduced to a monthly frequency, reduced only in response to heavy mining in the vicinity of the exhaust. The need to account for meteorology in scheduling probe pulls is obviated. Skid A-1 is essentially on standby as a back-up sampler if it is ever needed.

Site staff has informed EPA of deviations from the typical probe change schedule during the past year. In summer 2013, the probes remained in place for six weeks, due to the unavailability of a crane to perform the change. When they were removed on June 5, probes on A-2 and A-3 passed, confirming that samples taken during that time were valid. A1 failed at the shroud. See Figure 1 for photographs of the probes. In addition, during a probe change on Skid A-2, an exterior weld on the transfer line supporting the probe was observed to have cracked. The transport line has been replaced. Because the crack did not extend to the interior of the transport line, there was no impact to sampling.

Figure 1: Adapted from June 5, 2013 Probe Pull Report

SKID A-1	SKID A-2	SKID A-3
Probe acceptance determinations: Nozzle – passed, Shroud – failed	**Probe acceptance determinations: Nozzle – passed, Shroud – passed**	**Probe acceptance determinations: Nozzle – passed, Shroud – passed**
 Front view as found – focus on nozzle tip	 Front view as found – focus on nozzle tip	 Front view as found – focus on nozzle tip
 Shroud outside view as found	 Shroud outside view as found	 Shroud outside view as found

The inspection team performed a walk-down of Station A on October 23. All flow meters were within calibration. Skid A-1 was switched off, and Skids A-2 and Skid A-3 were both operating within the intended ranges for volumetric flow and pressure differential across the filter.

The inspection team also visited Station B and Station C to verify calibration dates and flow rates. At Station B, Skid B-2 was tagged out and disassembled, and new instrumentation had been installed. Skid B-1 was calibrated and operating correctly.

Site personnel alerted inspectors to the fact that the flow meter at Station C, which samples the exhaust from the waste handling building, had not been recalibrated. During the previous inspection, EPA observed that the flow meter's calibration had expired on May 5, 2012. A new

procedure for calibrating the flow meter, which was a 2011 upgrade, still has not been finalized. There is no reason to believe that Station C would fail to detect a release, and numerous fixed air samplers throughout the waste handling areas provide confirmation that no releases have taken place. EPA recommended resolving the calibration issue as quickly as possible, so that data from Station C could be used without question in the case of an off-normal event. Documentation that Station C's calibration has been verified was provided to EPA on November 27 and Dec 2 (JPW-20131022-05 and Work Orders 1202385C, 1203590C).

4.2 Consequence Analysis

On the afternoon of October 23, EPA inspectors met with Consequence Assessment staff in the Engineering building. The previous two inspections focused on consequence assessment drills and staff turnover. This year, the inspector discussed changes to WP 12-ER4916, Consequence Assessment Dose Projection. The procedure has been revised to be more useable, and to allow initial does estimates to be conducted remotely from the WIPP site in an emergency. The inspector asked whether the procedure had been updated to reflect incidents involving shielded containers, which were approved and emplaced in the repository more recently than the last EPA inspection. A review of WP 12-ER4916, Rev. 19, showed that shielded containers were not reflected in tables showing Material at Risk and Damage Ratios for each container type. Staff immediately submitted an update, and WP 12-ER4916, Rev. 20 became effective on 11/20/13.

4.3 Underground Sampling

During the underground tour on October 23, inspectors observed the continuous air monitors (CAMs) placed at the exhaust of Panel 7, where RH waste emplacement had begun in Room 7. CAM 151 was observed to be within calibration and operating with air flow and pressure differentials within the acceptable range. The inspection team also visited Station D, at the bottom of the exhaust shaft. A calibration sticker on Station D's flow meter indicated that calibration had expired in September, however, the site was able to produce documentation showing that the flow control equipment had been recalibrated (JPW-20131022-02, -03).

4.4 WIPP Laboratory

EPA also inspected the WIPP laboratory, which supports annual NESHAP reporting and emergency response activities at WIPP. Inspectors again toured the laboratory itself and were given a presentation of the laboratory's analytical services. Discussions with laboratory staff focused on the lab's QA program.

5.0 Summary of Findings

During the inspection EPA examined DOE's activities over the past year. The inspection verified that DOE is correctly implementing procedures which allow it to accurately monitor and calculate possible radiation doses to members of the public due to WIPP site operation. The inspection checklist included as Attachment A specifically documents DOE's compliance with

each reporting expectation set forth in EPA's WIPP Subpart A Guidance (402-R-97-001). Based on the inspection activities documented in this report, EPA concludes that DOE continues to adequately implement a radiological monitoring and sampling program for WIPP disposal operations in which it collects representative samples and appropriately performs calculations to estimate potential releases to the public. The results of this program, documented in the Annual Periodic Confirmatory Measurement Compliance Report for Calendar Year 2012 (RES 12-522) show that the calculated annual effective dose equivalent (EDE) value to the maximally exposed individual resulting from normal operations conducted at WIPP is less than $1.00x10^{-05}$ millirem, demonstrating that DOE remains compliant with the dose limits expressed in 40 CFR 191.03(b) and in 40 CFR 61, Subpart H. EPA does not have any findings or concerns.

Attachment A

Inspection Plan and Checklist

Purpose:
EPA will verify that the Department of Energy (DOE) has accurately monitored and calculated possible radiation doses to members of the public, due either to normal operations or to any accidental releases that may have occurred during the last reporting period. This inspection is conducted under the authority of 40 CFR 191, Subpart A. This inspection is part of EPA's continued oversight to ensure that WIPP can, during the operational phase of management and storage of radioactive waste, comply with the limits expressed in 40 CFR 191.03.

Scope:
The scope of this inspection includes all activities performed by DOE at WIPP to measure and calculate any actual or potential radiation dose to members of the public during management and storage of radioactive waste, specifically during the past year of site operation. Inspection activities will include an examination of monitoring procedures and sampling equipment both on and off site, and in the underground.

The purpose of this inspection is to verify and confirm that DOE at WIPP has complied with the "Compliance reporting" expectations of EPA's as specified in *Guidance For the Implementation of EPA's Standards And Storage of Transuranic Waste* (40 CFR Part 191, Subpart A) at the WASTE ISOLATION PILOT PLANT (402-R-97-001), Section 4.2, Page 15.

Focal Areas for the 2013 Inspection:

- What changes have taken place in air sampling since last year's inspection?
- What potential changes to air sampling would result from the development of a new experimental area?
- During past years a number of potential changes were discussed to evaluate and address salt occlusion on Station A probes. What is the status of these activities?
- With continued moisture in the exhaust shaft air flow, what have been the conditions of the sample filters? Have the filters had salt buildup or samples washed off as in the past?
- Verify that the underground CAMs operate as expected.
- How are composite samples handled and processed, measurement accuracy, and implications of laboratory standards used?
- Provide a presentation of the process and procedures used to calculate off-normal potential release during operations. Describe the process used to respond to off-normal situations from start to finish.
- How would DOE prove to independent examiners that samples taken at Station A are representative samples?

Location: This inspection will be held at the WIPP facility located 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.

Inspection Dates: October 22-24, 2013.

Information Requested: DOE will provide documentation and procedures related to Subpart A compliance activities as in past years. Before the inspection, DOE will provide information that describes how measurements are taken, and complete documentation that shows how compliance calculations are performed with an explanation of all input parameters and their derivation. Provide to EPA the 2012 Annual Safety Analysis Report.

Inspection Checklist

#	CHECKLIST QUESTION	November 2013	40 CFR 191.03 Subpart A Sat = Satisfactory NA = Not Applicable	
	40 CFR 191.03 Compliance Standard	**EPA Citation**	**Comment (Objective Evidence)**	**Result**
	Does DOE "...provide reasonable assurance that the combined annual dose equivalent to any member of the public in the general environment resulting from discharges of radioactive material and direct radiation from such management and storage shall not exceed 25 millirems to the whole body and 75 millirems to any other critical organ." 40 CFR 191.03(b)	40 CFR 191.03 Subpart A - Environmental Standards for Management and Storage	DOE has demonstrated that they can capture, measure, and calculate releases to assure that they are and remain below these limits.	Sat
	Scope of activities considered in determining compliance			
1	Does DOE demonstrate that all activities at the WIPP up until the point of disposal are considered in determining compliance? Activities include those at "all WIPP facilities, both at above-ground locations and in the underground disposal system" and those related to "arrival or receipt of waste, inspections of containers, unloading, and waste movement."	EPA 402-R-97-001 Section 2.3, Page 4	The Annual Site Environmental Report for 2011 (DOE/WIPP 12-3489) Executive Summary documents DOE's efforts to consider all activities that impact compliance. The Annual Periodic Confirmatory Measurement Compliance Report for Calendar Year 2012 (RES 12-522, hereafter referred to as the annual NESHAP report) and inspection activities confirm that all waste handling activities are considered in determining compliance.	Sat

2	Does DOE demonstrate that radiation doses to the public due to 1) actual normal operation and 2) any unplanned or accidental releases are examined?	EPA 402-R-97-001 Section 2.3, Page 5	Section 3.0 of the Implementation Plan for Subpart A (DOE/WIPP 00-3121, Rev. 3) documents how this requirement is met, both for normal operation and accidental releases. Annual NESHAP report demonstrates that normal operations are fully examined. CH Waste Documented Safety Analysis (DOE/WIPP 95-2065, Rev. 10) and RH Waste DSA (DOE/WIPP 06-3174, Rev. 0) documents DOE's review of potential accidents at WIPP. Procedure Emergency Radiological Control Response (WP 12-HP4000, Rev. 6) and Consequence Assessment Dose Projection (WP 12-ER4916, Rev 20) document radiological emergency response activities, including an initial assessment of possible dose to the public.	Sat
	Media considered in determining compliance			
3	Does DOE demonstrate that the air pathway is the credible release pathway?	EPA 402-R-97-001 Section 2.4, Page 5	Section 2.1 of the Implementation Plan for Subpart A describes the process by which the air pathway was established as the credible release pathway, and the use of environmental monitoring of other exposure pathways to confirm that this remains the case.(DOE/WIPP-00-3121, Rev. 4, p.8)	Sat
4	Does DOE demonstrate that other exposure mechanisms from an air release could include inhalation of contaminated air, immersion in a plume of radioactive particles, ingestion of soil on which contaminated particles have been deposited, swimming in ponds in which radionuclides have been deposited are considered?	EPA 402-R-97-001 Section 2.4, Page 5	Sections 2.1 and 3.5 of the Implementation Plan for Subpart A documents methods for measuring these potential exposure pathways (DOE/WIPP 00-3121, Rev. 4). Section 4.8.4 of the ASER documents the consideration of dose from these pathways (DOE/WIPP-11-2225). Annual NESHAP report confirms that these exposure mechanisms are included in dose calculations.	Sat

5	Is DOE monitoring the expected air exhaust pathway and performing environmental monitoring of other release points and exposure pathways to confirm air exhaust as the only release pathway?	EPA 402-R-97-001 Section 2.4, Page 5 and page 6.	Yes. Section 2.1 of the Implementation Plan for Subpart A explains DOE's plan to fulfill this requirement(DOE/WIPP-00-3121, Rev. 4). Annual Site Environmental Report Chapter 4 demonstrates that DOE implements groundwater surveillance, biota sampling and off-site air monitoring programs (DOE/WIPP-11-2225).	Sat
	Boundary of compliance			
6	Does DOE demonstrate compliance at the "exclusive use area" boundary? If not, does DOE justify changing this boundary?	EPA 402-R-97-001 Section 2.5, Page 6. EPA 402-R-97-001 Section 2.5, Page 7	Section 3.1 of DOE/WIPP-00-3121 Rev. 4 states that the "Exclusive Use Area" will be used as the boundary for 40 CFR 191 Subpart A compliance.	Sat
	Location of maximally exposed individual			
7	Does DOE examine radiation doses to individuals at any offsite point where there is a residence, school, business, or office? (Such as grazing, mining, or oil drilling in the vicinity.) "The location of the maximally exposed individual is the location where an actual individual lives or works who receives the maximum annual radiation dose from the source."	EPA 402-R-97-001 Section 2.6.1, Page 8	For Subpart A, DOE assumes that the member of the public resides, "… year-round at the fence line in the northwest sector" (DOE/WIPP-11-2225, Section 4.8.4.3). Section 1.3.2 of the ASER demonstrates that DOE considers doses at appropriate offsite points, such as Smith Ranch located 7.5 km away in the WNW sector (DOE/WIPP 11-2225). The Annual Periodic Confirmatory Measurement Compliance Report for the DOE WIPP for Calendar Year 2012, or "2012 NESHAP Report," identifies Smith Ranch as the location of the maximally exposed individual. The nearest farms, dairies, and beef ranching activities are also considered.	Sat
8	Does DOE "analyze potential exposure pathways and examine demographic information and conduct field investigations to identify the location of actual individual who could be exposed via those pathways?"	EPA 402-R-97-001 Section 2.6.1, Page 8	Yes. See checklist Item 7.	Sat

9	Does DOE "conduct separate analyses of potential dose received from each exposure pathway?" Then does DOE "assume that a member of the public resides at the single geographic point on the surface where the maximum dose would be received?"	EPA 402-R-97-001 Section 2.6.1, Page 8	Yes. See checklist Item 7.	Sat
	Personal parameters	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
10	Does DOE assume that the individual exhibits personal characteristics of the "reference man" when evaluating radiation dose to the maximally exposed individual?	EPA 402-R-97-001 Section 2.6.2, Page 8	Section 3.2 of the Implementation Plan for Subpart A describes the "reference man" parameters as described in the CAP88-PC computer code (DOE/WIPP 00-3121, Rev. 4). These parameters are confirmed on page 8) of the CAP-88 output file included in the 2012 NESHAP report.	Sat
	Calculation of dose - Modeling – Parameters			
11	Does DOE provide both whole body radiation dose and critical organ radiation dose for the maximally exposed individual (or a hypothetical individual conservatively located at a point of higher exposure)?	EPA 402-R-97-001 Section 2.7.1, Page 8	Yes. The effective dose equivalent and table of organ dose equivalents is included in the 2012 annual NESHAP report CAP-88 output file.	Sat
12	Does DOE calculate radiation doses including all release points and reflecting evaluation of all exposure pathways?	EPA 402-R-97-001 Section 2.7.1, Page 8	Section 2.1 of DOE/WIPP-00-3121, Rev. 4 states that the air pathway is the most credible, but that other exposure pathways are monitored to confirm the air pathway. Annual NESHAP report demonstrates that all release points are evaluated.	Sat
13	Does DOE use computer modeling to calculate radiation doses for compliance with the Subpart A standard?	EPA 402-R-97-001 Section 2.7.2, Page 9	Section 3.2 of DOE/WIPP-00-3121, Rev. 4 states that computer models will be used to calculate radiation doses during both routine operation and accidental releases.	Sat
14	Does DOE use CAP88-PC to perform dose calculations?	EPA 402-R-97-001 Section 2.7.2, Page 9	CAP88-PC is used for dose calculations for routine operations (DOE/WIPP-00-3121 Rev 4, Section 3.2). Annual NESHAP report demonstrates that DOE is using CAP88-PC.	Sat

15	Does DOE use an alternate model for calculating radiation doses? If so, does DOE justify such usage?	EPA 402-R-97-001 Section 2.7.2, Page 10	DOE uses an atmospheric dispersion code (HOTSPOT) to estimate potential radiation due to accidental releases (DOE/WIPP-00-3121 Rev 4, Section 3.2). WP 12-ER4916 Rev. 20 states that HOTSPOT is used for accidental release calculations. DOE has demonstrated that HOTSPOT is a reasonable choice for emergency dose calculations.	Sat
16	Does DOE adequately support exposure parameters used in dose calculations?	EPA 402-R-97-001 Section 2.7.3, Page 10	Annual NESHAP report includes CAP-88 output file, demonstrating that DOE is using appropriate parameters in dose calculations. Also see checklist items 7-10.	Sat
17	Does DOE document that "conservative simplifying assumptions" are used in the radiation dose calculations?	EPA 402-R-97-001 Section 2.7.3, Page 10	DOE uses conservative assumptions to estimate worst-case dose to a maximally-exposed offsite individual (DOE/WIPP 00-3121, Rev. 4, Section 3.2).	Sat

18	Are DOE's exposure parameters as conservative as the following? For a maximally exposed individual located at a residence, assumed continuous exposure (24 hours per day). For a maximally exposed individual located at a business, office, or school, assume exposure of 8 hours per day. Assume individuals consume 2 liters per day of drinking water from an underground source of drinking water. Assume inhalation rate for air to be $9x10^5$ cm^3/hr. Assume ingestion rate of meat to be 85 kg/yr. Assume ingestion rate of leafy vegetables to be 18 kg/yr. Assume ingestion of milk to be 112 liter/yr. Assume ingestion rate of produce to be 176 kg/yr	EPA 402-R-97-001 Section 2.7.3, Page 10	DOE uses these exact values as exposure parameters (DOE/WIPP 00-3121, Rev. 4, Section 3.2). The Annual NESHAP report CAP-88 output file demonstrates that DOE is using these parameters in dose calculations.	Sat
	Emissions and Environmental Monitoring - Air	**EPA Citation**	**Comments (Objective Evidence)**	**Result**

19	Does DOE demonstrate that effluent flow rate measurements are made using Reference Method 2 of Appendix A to 40 CFR Part 60 to determine velocity and volumetric flow rate for stacks and large vents?	EPA 402-R-97-001 Section 3.1, Page 11, (1(i))	Stations A and B use alternate methods approved by the Administrator, per Section 3.3(3) of this rule (Nichols 1994). See checklist items 25, 27. Station C sampling was designed based on ANSI N.12-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities from which Method 2 was derived (WP 12-RC.01, Rev. 9). DOE/WIPP 89-028, Section 1.3 confirms that "guidance was taken from . . . the CFR Title 40, Part 60, Appendix A, Reference Methods" and describes testing to establish the velocity profile for Station C.	Sat
20	Does DOE demonstrate that effluent flow rate measurements are made using Reference Method 2a of Appendix A to 40 CFR 60 to measure flow rates through pipes and small vents?	EPA 402-R-97-001 Section 3.1, Page 11, (1(ii))	Not applicable at WIPP. Duct diameter associated with WIPP exhaust point exceeds the 40 CFR 60 requirements.	NA
21	Does DOE demonstrate that the frequency of flow rate measurements depend on the variability of the effluent flow rate? **Note:** For variable flow rates, continuous or frequent flow rate measurements are expected to be made. For relatively constant flow rates, only periodic measurements are expected.	EPA 402-R-97-001 Section 3.1, Page 11, (1(iii))	DOE has implemented continuous air monitoring at WIPP, and does not need to consider this requirement. (DOE/WIPP-00-3121, Rev. 4, Section 3.3, 3.3.1)	NA
22	Does DOE demonstrate that radionuclides to be directly monitored or extracted, collected and measured using Reference Method 1 of Appendix A to 40 CFR Part 60 for selected monitoring or sampling sites?	EPA 402-R-97-001 Section 3.1, Page 11, (2(i))	Stations A and B use alternate methods approved by the Administrator, per Section 3.3(3) of this rule (Nichols 1994). See checklist items 25, 27. Station C sampling was designed based on ANSI N.12-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities from which Method 2 was derived (WP 12-RC.01, Rev. 9). DOE/WIPP 89-028, Section 1.3 confirms that "guidance was taken from . . . the CFR Title 40, Part 60, Appendix A, Reference Methods."	Sat
	Emissions and Environmental Monitoring - Air	**EPA Citation**	**Comments (Objective Evidence)**	**Result**

23 a	Does DOE demonstrate that the effluent stream is either "directly monitored continuously with an in-line detector capable of distinguishing relevant radionuclides," or alternately "continuously sampled such that analysis of filters or other collectors will provide an accurate estimate of emissions from a known flow rate during a fixed sampling time?"	EPA 402-R-97-001 Section 3.1, Page 11, (2(ii))	Yes. DOE implemented the latter sampling option, and continually collects samples and flow rate data to demonstrate compliance with 40 CFR 191 Subpart A. All sample filters are screened to determine that alpha and beta activity fall below set action levels, and are then submitted for analysis. As described in Section 3.3.3 of the Implementation Plan for Subpart A, DOE then uses periodic confirmatory measurements to demonstrate compliance with dose standards. Sections 3.5 and 3.3.5 document relevant radionuclides at WIPP. (DOE/WIPP 00-3121, Rev. 4)	Sat
23 b	Does DOE demonstrate that representative samples of the effluent stream are withdrawn from the sampling site? "…The need for continuous sampling is applicable to batch processes when the unit is in operation. Periodic sampling (grab samples) may be used in lieu of continuous sampling only with EPA's prior approval. Such approval may be granted in cases where continuous sampling is not practical and radionuclide emission rates are relatively constant. In such cases, EPA expects grab samples to be collected with sufficient frequency so as to provide a representative sample of the emissions."	EPA 402-R-97-001 Section 3.1, Page 11, (2(ii))	As stated in checklist item 23a, DOE samples continuously. After they are found to be below screening levels, all samples found to be representative are composited for periodic measurements (typically monthly for Station A, and quarterly for Stations B and C). This process is described by DOE/WIPP 97-2238, Rev. 10. The procedure Periodic Confirmatory Analysis, Reporting, and Compliance Activities (WP 12-RE3004, Rev. 5) describes the criteria for confirming that a filter sample is representative, and documents how to report and handle a sample which does not meet these requirements.	Sat
24	Does DOE demonstrate that radionuclides are collected and measured using procedures based on the principles of measurement described in Appendix B, Method 114 of 40 CFR 61? If not, does DOE demonstrate that the Administrator has approved the method used?	EPA 402-R-97-001 Section 3.1, Page 12, (2(iii))	Attachment 1 to the QAPP for Sampling Emissions (WP 12-RC.01, Rev. 10) documents both the requirements of Method 114, and where WIPP documentation reflects these principles.	Sat

25	If DOE is using the "Shrouded Probe", does DOE demonstrate that this alternative method is being used according to the guidance provide in "An Explanation of Particle Sampling in a Moving Gas Stream Within a Duct Using an Unshrouded and Shrouded Probe"?	EPA 402-R-97-001 Section 3.1, Page 12, (2(iii)(a))	An Assessment of the WIPP Shrouded Probe Against EPA Approval Criteria for Use of Single Point Sampling with the Shrouded Probe HA:98:0100 (Included in August 2000 Inspection Report, A-98-49, II-B3-12, EPA's Approval letter (Nichols 1994) documents DOE's evaluation of the Shrouded Probe and its compliance with the EPA criteria. Single Point Representative Sampling with Shrouded Probes (LA-12612-MS) documents how the shrouded probe was qualified for use at WIPP.	Sat
26	Does DOE's quality assurance program meet the performance requirements described in Appendix B, Method 114 of 40 CFR Part 61?	EPA 402-R-97-001 Section 3.1, Page 12, (2(iv))	QAPP for Sampling Emissions (WP 12-RC.01, Rev. 10) Section 1.0 documents DOE quality assurance requirements. These meet the requirements of 40 CFR 61. See Checklist Item 24.	Sat
27	If it is impractical to measure the effluent flow rate in accordance with the method(s) in Section 3.1(1) or to monitor or sample extraction according to methods in Section 3.1(2), has DOE demonstrated that the use of alternative effluent flow rate measurement or site selection and sample extraction are appropriate and that the alternate method are used provided the following: (i) DOE shows that methods in Section 3.1(1) or (2) are impractical; (ii) DOE shows the alternative procedure will not significantly underestimate the emissions; (iii) DOE shows the alternative procedure is fully documented; and (iv) DOE has received prior approval from EPA.	EPA 402-R-97-001 Section 3.1(3)(i) to (3)(iv), Page 12	At Stations A and B, DOE uses alternate methods per Section 3.3(3) of the Subpart A Guidance (402-R-97-001). See checklist items 25 and 27. Single Point Representative Sampling with Shrouded Probes (LA-12612-MS) documents how the shrouded probe was technically qualified for use at WIPP. EPA's Approval letter (Nichols 1994) documents DOE's compliance with these criteria, and EPA's approval.	Sat
28	Does DOE demonstrate that radionuclide emission measurements are in conformance with the methods in Section 3.1(1) and (2) to be made at all release points which have a potential to discharge radionuclides into the air in quantities which could cause a combined annual dose equivalent in excess of 1% of the dose limit in Subpart A?	EPA 402-R-97-001 Section 3.1, Page 12 and page 13, (4(i))	DOE/WIPP 00-3121, Rev. 4., Section 3.2 documents DOE's compliance with this requirement. All areas of a potential discharge are continuously sampled, although even in a worst-case accident scenario, 1% of the Subpart A dose limit is not expected to be reached. This requirement is also discussed in Sections 1.0 and 2.0 of DOE/WIPP 97-2238, Rev. 10.	Sat

29	Does DOE demonstrate that all radionuclides which could contribute greater than 10% of the combined annual dose equivalent for a release point are being measured?	EPA 402-R-97-001 Section 3.1, Page 13, (4(i))	Section 3 of the Periodic Confirmatory Measurement Protocol (DOE/WIPP 97-2238, Rev. 10) states that the selected analytes "constitute approximately 98% of the dose due to the average source term for CH and RH wastes."	Sat
30	If DOE uses alternative procedures to determine emissions, does DOE demonstrate that they have prior EPA approval?	EPA 402-R-97-001 Section 3.1, Page 13, (4(i))	DOE uses the shrouded sampling probe as an alternative method. EPA has formally approved this alternative method (Nichols, 1994).	Sat
31	Does DOE demonstrate that for other release points which have a potential to release radionuclides into the air it has performed periodic confirmatory measurements to verify the low emissions?	EPA 402-R-97-001 Section 3.1, Page 13, (4(i))	This is not applicable. DOE has no other points with a potential to release radionuclides. CH (DOE/WIPP-95-2065, Rev. 10) and RH (DOE/WIPP-06-3174, Rev. 0) Waste Documented Safety Analyses document these conclusions.	NA
32	Does DOE demonstrate that in evaluating whether emissions must be measured for a given release point, estimated radionuclide release rates are based on discharge of effluent stream that would result if all pollution control equipment did not exist, but the facilities operations were otherwise normal?	EPA 402-R-97-001 Section 3.1, Page 13, (4(ii))	Stations B and C use pollution control equipment. However, because DOE has chosen to sample continuously at these locations, this requirement is not applicable.	Sat
	Environmental Measurements	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
33	Does DOE demonstrate that environmental measurements of concentrations of radionuclides in air at the critical receptor locations are used as an alternative to air dispersion calculations in demonstrating compliance with the standard?	EPA 402-R-97-001 Section 3.1, Page 13, (5)	DOE does not use environmental monitoring as an alternative to comply with 40 CFR 191.03 Subpart A. DOE samples at release points.	NA
34	Does DOE demonstrate that air at the point of measurement is continuously sampled for collection of radionuclides if environmental measurements are used?	EPA 402-R-97-001 Section 3.1, Page 13, (5(i))	Section 3.1(5) of EPA 402-R-97-001 is not applicable. See checklist item 34.	NA
35	Does DOE demonstrate that the environmental measurement program is appropriately designed to collect and measure specifically those radionuclides which are major contributors to the annual radiation dose from the facility?	EPA 402-R-97-001 Section 3.1, Page 13, (5(ii))	Section 3.1(5) of EPA 402-R-97-001 is not applicable. See checklist item 34.	NA

36	Does DOE demonstrate that radionuclide concentrations which would cause an annual dose equivalent of 10% of the standard are readily detectable and distinguishable from background?	EPA 402-R-97-001 Section 3.1, Page 13, (5(iii))	Section 3.1(5) of EPA 402-R-97-001 is not applicable. See checklist item 34.	NA
37	Does DOE demonstrate that a quality assurance program that meets the performance requirements described in 40 CFR Part 61, Appendix B, Method 114 is conducted for environmental measurements?	EPA 402-R-97-001 Section 3.1, Page 13, (5(iv))	Section 3.1(5) of EPA 402-R-97-001 is not applicable. See checklist item 34.	NA
38	Does DOE demonstrate that EPA has granted prior approval for the use of environmental measurements to demonstrate compliance with the standard?	EPA 402-R-97-001 Section 3.1, Page 13, (5(v))	DOE has not requested approval to use environmental measurements.	NA
	Emissions and Environmental Monitoring - Other Media			
39	Does DOE demonstrate that environmental monitoring of other release points or critical receptor locations to confirm air exhaust as the only release pathway?	EPA 402-R-97-001 Section 3.2, Page 14.	Implementation Plan for Subpart A, Section 2.1 states; "However, to confirm that the air pathway is the only credible pathway for radiological releases, WIPP implements a radiological ground water surveillance program, biota sampling program and off-site radiological air monitoring program" (DOE/WIPP00-3121, Rev. 4). ASER Chapter 4 demonstrates that DOE's environmental program monitors other release points and critical receptor locations(DOE-WIPP 12-3489).	Sat
	Compliance Reporting	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
40	Does DOE demonstrate compliance with the Subpart A standard by showing that the annual radiation dose to any member of the public in the general environment falls below the regulatory limits?	EPA 402-R-97-001 Section 4.2, Page 15.	The Annual NESHAP report demonstrates that DOE reports results yearly, and that those results fall below regulatory limits. For calendar year 2012, the calculated effective dose equivalent to the maximally exposed individual of the public was less than 1.00×10^{-5} mrem.	Sat

41	Does DOE report results of monitoring and the dose calculations for each reporting period?	EPA 402-R-97-001 Section 4.2, Page 15	Section 5.0 of DOE/WIPP 00-3121 documents that DOE's plans to report annual results. The Annual NESHAP Report demonstrates that DOE reports results of monitoring and dose results yearly – see checklist item 41.	Sat
42	Does DOE demonstrate that monitoring is performed each calendar year of facility operation, and that radiation doses are calculated after the end of each year?	EPA 402-R-97-001 Section 4.2, Page 15	Yes. See checklist item 42.	Sat
	Notification of construction or modification.			
43	Does DOE demonstrate that they have provided the EPA written notification of any planned construction or modification to the WIPP facility, prior to commencing any such activity, if it results in an increase in the rate of emissions of radionuclides during operation?	EPA 402-R-97-001 Section 4.3, Page 16.	The Annual NESHAP Report includes a description of construction and modifications during each reporting period. None requiring advanced notice took place during 2012.	Sat
44	Does DOE demonstrate that advanced notification was not needed for construction and modification if the radiation dose caused by all the emissions from the new construction or modification is less than 1% of the Subpart A dose limits?	EPA 402-R-97-001 Section 4.3, Page 16 and page 17.	Yes, this is accomplished by the Annual NESHAP Report. See checklist item 44.	Sat
	Record Keeping			
45	Does DOE demonstrate documentation is sufficient to allow the Agency to verify the correctness of the determination made concerning the WIPP's compliance with Subpart A?	EPA 402-R-97-001 Section 4.4, Page 17.	Through its various documents, Subpart A implementation plan, its Annual NESHAP Report, and many procedures that support Subpart A activities, DOE demonstrate that documentation is sufficient to allow EPA to verify compliance with Subpart A.	Sat

Attachment B

Table of Documents Reviewed

	Documents Reviewed and Copies Received During Inspection	**191.03 Subpart A Inspection Nov 2013**	
Citation	**Document Title**	**Subject Matter**	**Source**
	Legal and Technical Reference Documents		
EPA 402-R-97-001	Guidance For The Implementation of EPA's Standards For Management And Storage of Transuranic Waste (40 CFR Part 191, Subpart A) at the Waste Isolation Pilot Plant. EPA 402-R-97-001, January 1997	"WIPP Subpart A Guidance,"	EPA
DOCKET A-92-56, Item II-C-2	Memorandum of understanding between EPA and DOE, September 29, 1994	Agreement states that although not required, DOE will implement NESHAPs Subpart H regulations at the WIPP site until closure.	DOE/WIPP
DOE/WIPP 93-043	Effects of Salt Loading and Flow Blockage on the WIPP Shrouded Probe, by Chandra, Ortiz, McFarland, August 1993, DOE/WIPP 93-043	Report discusses the impact of salt loading on shrouded probe performance.	DOE/WIPP
DOE/WIPP 89-027	Evaluation Of The Station B Effluent Monitoring System In The Underground Exhaust Ventilation System At The WIPP, Sept 1990, DOE/WIPP 89-027	Documents testing at WIPP to evaluate the ability of Station B to collect representative samples.	DOE/WIPP
EEG-60	The Influence of Salt Aerosol On Alpha Radiation Detection By WIPP Continuous Air Monitors, by Bartlett and Walker, Jan 1996, EEG-60, DOE/AL/58309-60	Reports impact of salt deposits on monitor efficiency.	DOE/WIPP
DOE/WIPP 89-026	Evaluation Of The Station A Effluent Monitoring System In The Underground Exhaust Ventilation System At The WIPP, DOE/WIPP 89-026, Sept 1990	Documents testing at WIPP to evaluate the ability of Station A to collect representative samples.	DOE/WIPP

Rodgers et al., 1994	Single Point Aerosol Sampling: Evaluation of Mixing and Probe Performance In A Nuclear Stack, by Rodgers, Fairchild, Wood, Ortiz, Muyshondt, McFarland, July 1994	Compares performance of ANSI isokinetic with shrouded probes at DOE faculties.	DOE/WIPP
PNL-10816	Generic Air Sampler Probe Test, by Glissmeyer and Ligotke, Nov 1995, PNL-10816	Test of isokinetic and shrouded probes at Hanford. Tests show that shrouded probes deliver samples with significantly less particle-size bias.	DOE/WIPP
PNL-10148	Functional Requirements Document For Measuring Emissions Of Airborne Radioactive Materials, by Glissmeyer, Alvarez, Hoover, McFarland, Newton, Rodgers, Nov 1994, PNL-10148	States general functional requirements for system and procedures for measuring emissions.	DOE/WIPP
PNL-SA-25532	Changing Methodology For Measuring Airborne Radioactivity Discharges From Nuclear Facilities, by Glissmeyer and Ligotke, May 1995, PNL-SA-25532	Tests show single-point sampling (shrouded) probes are superior to ANSI style multiple-point probes.	DOE/WIPP
Nichols, 1994	EPA Shrouded Probe Approval. Letter from Mary Nichols to Raymond Pelletier, dated November 21, 1994.	Allows DOE to use the shrouded probe as an alternative measuring procedure.	DOE/WIPP
LA-12612-MS	Single-Point Representative Sampling with Shrouded Probes by McFarland and Rodgers, LA-12612-MS, August 1993	Describes shrouded probe testing requirements and test performed to qualify probe for use at WIPP.	DOE OSTI Document website.
McFarland, 1993	Air Sampling With Shrouded Probes At The WIPP Site, by McFarland, Sept 1993	Paper discussing the use of the shrouded probe at WIPP. Benefits of the shrouded probe are discussed.	DOE/WIPP
	DOE Procedural Documents		
WP 12-2, Rev 18	WIPP ALARA Program Manual, WP 12-2, Revision 18, 7/13/13	Describes organization and responsibilities of ALARA committee and coordinator.	DOE/WIPP
12-RL.01, Revision 18	Radiochemistry Quality Assurance Plan, 12-RL.01, Revision 18, 11/12/12	Describes the management policy and organizational structure, and QA requirement for radiochemical analysis.	DOE/WIPP

DOE/WIPP 00-3121, Revision 4	Implementation Plan for 40 CFR 191, Subpart A DOE/WIPP 00-3121, Revision 4, December 17 2012	Outlines program at WIPP to show compliance with 40 CFR 191, Subpart A.	DOE/WIPP
DOE/WIPP 12-3489 (replaces 11-2225)	Waste Isolation Pilot Plant Annual Site Environmental Report for 2011, DOE/WIPP 12-3489, Rev. 0 September 2012	Results of the environmental monitoring program, in particular radiological measurements.	DOE/WIPP
DOE/WIPP 97-2238, Rev. 10	Periodic Confirmatory Measurement Protocol for the Waste Isolation Pilot Plant, DOE/WIPP 97-2238, Revision 10, January 2013	Used to explain the protocol used to perform periodic confirmatory measurements.	DOE/WIPP
DOE/WIPP 99-2194, Rev. 7	Waste Isolation Pilot Plant Environmental Monitoring Plan. DOE/WIPP 99-219, Rev 7, March 2012.	DOE environmental monitoring plans at the WIPP site. Of particular interest: Section 4.0, Dose Calculations, and 5.0, Environmental Monitoring Program.	DOE/WIPP
DOE/WIPP-06-3174 Rev 0, 03/06	WIPP RH Waste Documented Safety Analysis, Section 3.4.1.4. DOE/WIPP-06-3174 Rev 0, 03/06	This selection verifies that the air pathway is the only pathway of concern at the WIPP for RH waste.	DOE/WIPP.
DOE/WIPP-95-2065 Rev. 10, 11/06	WIPP CH Waste Documented Safety Analysis, Section 3.4.1.4. DOE/WIPP-95-2065 Rev. 10, 11/06	This selection verifies that the air pathway is the only pathway of concern at the WIPP for CH waste.	DOE/WIPP.
IC041072, Rev 9	Calibration of Effluent Monitoring Skids A1, A2, A3, B1 and B2 Flow Instrumentation, Maintenance Procedure, IC041072, Revision 9	Instructions for calibration of FAS skids A1, A2, A3, B1 and B2 flow instrumentation.	DOE/WIPP
IC041097, Rev 2	Calibration of Station C Flow Instrumentation, Maintenance Procedure IC041097, Revision 2	Instructions for calibration of Station C flow instrumentation.	DOE/WIPP
IC041098, Revision 5	U/G Exhaust Mass Flow Measurement System for Fans 700A, B & C, Maintenance Procedure, IC041098, Revision 5	Documents calibration verification test and alignment of U/G exhaust.	DOE/WIPP
IC413000, Revision 6	Station B Mass Flow Measurement System, Loop 41A001W2001, Maintenance Procedure, IC413000, Revision 6, 06/02/11	Documents calibration of Station B mass flow measurement system.	DOE/WIPP

PM364001, Revision 1	Predictive Maintenance to Determine Station A Probe Pull Frequency, Maintenance Procedure PM364001, Revision 1	Determine recommended frequency of Station A probe inspections based on meteorological data.	DOE/WIPP
PM364005, Revision 11	Inspection and Cleaning of Station "A" Sample Probes Bldg. 364, Maintenance Procedure, PM364005, Rev. 12,	Documents steps to inspect and clean Station A probes. "Determination of Probe Condition" requires that salt buildup "at the probe inlet should be no more than 2/3 of the area" and "blocking the shroud exhaust should be limited to no more than 1/3 of that area". Now Section 8.6	DOE/WIPP
2012 NESHAP Report	Annual Periodic Confirmatory Measurement Compliance Report for the DOE WIPP for Calendar Year 2012, submitted 6/18/2013	Annual NESHAP report. Includes report, and CAP88-PC Version 3.0 output file. Documents annual results.	DOE/WIPP
WP 12-ER4903, Rev 16	Radiological Event Response, Emergency Response Procedure, WP 12-ER4903, Revision 15, 5/10/11	Procedure documents actions to be taken by CMRO, FSO, and Radcon if a potential or actual radioactive release takes place.	DOE/WIPP
WP 12-ER4916, Rev 1	Consequence Assessment Dose Projection, Technical Procedure, Rev 18, 10/5/12	Procedure for estimating the potential dose consequence from a release or suspected release of radioactive material, using Hotspot, NARAC, or hand calculations.	
WP 12-ER4916. Rev 20	Consequence Assessment Dose Projection, Technical Procedure WP 12-ER4916, Revision 20, 11/26/13	Documents procedure for estimating the potential dose consequence from a release or suspected release of radioactive material. Reviewed for consistency with Rev.16	DOE/WIPP
WP 12-HP1305, Rev 11	Air Sampling Equipment, Technical Procedure WP 12-HP1305, Revision 10, 2/19/13	Instructions for the operation of fixed air monitoring equipment. Attachment 2 documents flow rates and alarm set points.	DOE/WIPP
WP 12-HP1306, Rev 8	Canberra Alpha Sentry Continuous Air Monitor, Technical Procedure WP 12-HP1306, Revision 8, 3/21/10	Instructions for operating the Canberra continuous air monitor equipment at waste revieving bays. Includes daily check sheets.	DOE/WIPP
WP 12-HP1307, Rev 12	Portable Instrument and Portal Monitor Operability Checks, Technical Procedure, WP 12-HP1307, Revision 12, 7/30/12	Instructions for operational checks of portable contamination instruments.	DOE/WIPP

WP 12-HP1308, Revision 4	Portable Alpha-6 Continuous Air Monitors, Technical Procedure WP 12-HP1308, Revision 4, 3/28/11	Instructions for operation of Portable Alpha-6 continuous air monitor.	DOE/WIPP
WP 12-HP3500, Revision 19	Airborne Radioactivity - Technical Procedure WP 12-HP3500, Revision 19, 01/24/12	Technical procedure. Provides instructions for analyzing, reporting, and trending results of air samples. Att. 5 contains Guide for Station A Filter Counting for Re-Entry into the U/G.	DOE/WIPP
WP 12-HP3700, Rev 4	Radiological Event Reporting, Management Control Procedure WP 12-HP3700, Revision 5, 2/7/13	Documents the first estimate of a possible release.	DOE/WIPP
WP 12-HP4000, Revision 7	Emergency Radiological Control Responses, Emergency and Alarm Response Procedure, WP 12-HP4000, Revision 7, 3/27/13	Addresses radiological contamination events which require an immediate stop work order.	DOE/WIPP
WP 12-RC.01, Rev 9	Quality Assurance Program Plan for Sampling Emissions of Radionuclides to the Ambient Air at the Waste Isolation Pilot Plant, WP 12-RC.01, Revision 9, 8/14/13	QA program for sampling air emissions at WIPP. Contains useful background information regarding the design and qualification of sampling systems at Stations A-D.	DOE/WIPP
WP 12-RE3002, Rev 3	Radiological Engineering Off-site Air Sampling - Technical Procedure WP 12-RE3002, Revision 3, 12/13/10	Instructions for collecting and documenting Low-Volume filter retrieval in response to a potential release.	DOE/WIPP
WP 12-RE3003, Revision 6	Radiological Release of Potentially Contaminated Materials, Waste, and Items - Management Control Procedure, WP 12-RE3003, Revision 5, 01/19/12	Instructions for evaluating materials, waste, and items which are to be released from the WIPP as non-radioactive material.	DOE/WIPP
WP 12-RE3004, Rev 5	Periodic Confirmatory Sampling, Reporting, and Compliance Activities, Management Control Procedure, WP 12-RE3004, Rev 5, 02/07/13	This procedure provides instructions for Radiological Engineers of the Radiological Controls Department to fulfill the requirements of NESHAPs.	DOE/WIPP
WP 12-RL1001, Rev 11	Sample Tracking and Custody, Technical Procedure, WP 12-RL1001, Revision 11, 12/17/12	Instructions for documenting receipt and storage of samples in WIPP laboratory.	DOE/WIPP
WP 12-RL1002, Rev 10	Alpha Spectroscopy System Operation, Technical Procedure, WP 12-RL1002, Revision 10, 2/21/12	Direction for calibrating and operating the Canberra Alpha Spectroscopy System as interfaced with the Genie 2000.	DOE/WIPP

WP 12-RL1008, Rev 8	Establishing Gross Alpha and Gross Beta Self-Absorption Curves, Technical Procedure, WP 12-RL1008, Revision 8, 01/04/12	Instructions for preparing samples of known activity and known weight to generate self-absorption curves for each of the gas proportional counters.	DOE/WIPP
WP 12-RL1009, Rev 5	Gross Alpha and Gross Beta Activity in Air Filter, Soil, Water, Sludge, and Biota, Technical Procedure, WP 12-RL1009, Revision 5, 04/26/11	Guidance for rapidly performing a variety of screening matrices for both high and low activity Radionuclides.	DOE/WIPP
WP 12-RL1010, Rev 10	Sample Preparation, Technical Procedure, WP 12-RL1010, Revision 10, 7/22/10	Directions for preparing samples to determine activity of radionuclides.	DOE/WIPP
WP 12-RL1011, Rev 12	Elemental Separation - Strontium 90, Technical Procedure, WP 12-RL1011, Revision 12, 11/07/11	Directions for performing elemental separation of strontium from samples.	DOE/WIPP
WP 12-RL1012, Rev 9	Elemental Separation - Transuranic Products, Technical Procedure, WP 12-RL1012, Revision 9, 05/07/12	Describes method for elemental separation and purification of actinide isotopes in samples.	DOE/WIPP
WP 12-RL1013, Rev 9	Sample Mounting, Technical Procedure, WP 12-RL1013, Revision 9, 09/12/07	Directions for electrodeposition sample mounting and neodymium fluoride coprecipitation sample mounting of actinides in preparation for alpha spectroscopy counting.	DOE/WIPP
WP 12-RL1014, Rev 8	Routine Laboratory Operations, Technical Procedure, WP 12-RL1014, Revision 8, 1/03/13	Instructions for routine laboratory operation.	DOE/WIPP
WP 12-RL1015, Rev 18	Canberra Alpha Analyst System Operation, Technical Procedure, WP 12-RL1015, Revision 18, 12/19/12	Directions for calibrating and operating the Canberra Alpha Analyst 32-chamber alpha spectroscopy system.	DOE/WIPP
WP 12-RL1016, Rev 13	Operation of the Oxford Series 5 Gas Proportional Counter, Technical Procedure, WP 12-RL1016, Revision 13, 12/19/12	Guidance for the operation of the Oxford Series 5 Gas Proportional Counter. Editoial changes and instructions for a power outage made since 2010 inspection	DOE/WIPP
WP 12-RL1200, Revision 1	Plutonium-241 Analysis, Technical Procedure, WP 12-RL1200, Revision 1, 10/13/11	Provides method for the analysis of Pu 241 in any matrix after preparation of the sample in accordance with WP 12-RL1012 and WP 12-RL1015.	DOE/WIPP

WP 12-RL1400, Rev 10	Radiochemistry Laboratory Waste Management, Technical Procedure, WP 12-RL1400, Revision 10, 05/26/11	Instructions for handling, management, and disposal of laboratory waste.	DOE/WIPP
WP 12-RL1550, Revision 12	Control of Radioactive Standards, Technical Procedure, WP 12-RL1550, Revision 12, 11/11/11	Instructions for labeling, maintaining inventory, dilution of standards, completing standard logbook for new standards received, expired standards, depleted standards, and recertification or standards.	DOE/WIPP
WP 12-RL3002, Revision 9	Radiochemistry Laboratory Data Validation and Verification, Technical Procedure, WP 12-RL3002, Revision 9, 11/26/12	Instructions for performing radiochemistry analytical data verification and validation by radiochemistry staff.	DOE/WIPP
WP 12-RL3003, Rev. 12	Data Reduction and Reporting, Technical Procedure, WP 12-RL3003, Revision 10, 6/19/2013	Instructions for processing laboratory data from the time of sample receipt to the reporting of final results.	DOE/WIPP
WP 13-1, Rev 33	Nuclear Waste Partnership LLC Quality Assurance Program Description, WP 13-1, Revision 33, 4/1/13	Identifies Federal and industry quality standards, and sets standards for WIPP QA programs.	DOE/WIPP
DOE/WIPP 99-3119, Rev 7	Compliance Monitoring Implementation Plan for 40 CFR 194.14(b), Assurance Requirement, DOE/WIPP 99-3119, Rev. 7, 04/12	Outlines monitoring activities at WIPP to demonstrate compliance with 40 CFR 191 and 40 CFR 194.	DOE/WIPP
Work Order 1202385C	411-S-105 Calibration Skid Flow Indication. Corrective action package. Provided 12/2/2013.	Used to verify calibration of Kurtz flowmeter on Station C.	DOE/WIPP
Work Order 1203590C	411-S-105 Calibration Station C Skid. Provided 12/2/2013.	Used to perform a calibration check/calibration adjustment of the Station C 411-S-105 Flow Control Valve.	DOE/WIPP
	Documents Generated During Inspection		
JPW-20131022-01	Inspection schedule and opening presentation slides		DOE/WIPP
JPW-20131022-02	Work Order 1300125, Station D Flow meter calibration.2/08/13. 12 pages.		DOE/WIPP
JPW-20131022-03	Work Order 1309099, Station D vacuum pump calibration. 9/17/13. 7 pages		DOE/WIPP
JPW-20131022-04	Surface subsidence survey, Loop 7 map. 10/24/2013.		DOE/WIPP
JPW-20131022-05	Station C calibration labels. Photos received 11/27/2013.		DOE/WIPP