NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000   Fax (505) 476-6030
www.nmenv.state.nm.us

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 24, 2012

Jose R. Franco, Manager
Carlsbad Field Office
Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

M. Farok Sharif
Washington TRU Solutions LLC
P.O. Box 2078
Carlsbad, New Mexico 88221-3090

RE: ADMINISTRATIVE COMPLETENESS AND FINAL DETERMINATION, CLASS 1*
MODIFICATION REQUESTS
WIPP HAZARDOUS WASTE FACILITY PERMIT
EPA I.D. NUMBER NM4890139088-TSDF

Dear Messrs. Franco and Sharif:

The New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) acknowledges receipt of a Class 1 permit modification request requiring prior agency approval to the WIPP Hazardous Waste Facility Permit. The specific submittal reviewed for administrative completeness is as follows:

- Request for Class 1* Permit Modification (Change Related to Operational Control of the WIPP Hazardous Waste Facility), Letter Dated June 25, 2012, Received June 27, 2012

NMED has reviewed this document and determined that it is administratively complete. The modification identified in the Request for Class 1* Permit Modification is being processed by NMED in accordance with the requirements specified in 20.4.1.900 NMAC (incorporating 40 §270.42(a)(2)).

The New Mexico Hazardous Waste Fee Regulations require assessment of fees when administrative review of a document is complete, as specified in 20.4.2.301 NMAC. NMED will
issue an invoice to you under a separate letter. Payment is due within sixty (60) calendar days from the date that you receive the invoice.

The New Mexico Environment Department (NMED) hereby approves the permit modification request (PMR) to the WIPP Hazardous Waste Facility Permit as submitted to the Hazardous Waste Bureau. The effective date of the permit modification will be October 1, 2012.

The attachment contains the redline/strikeout pages of the modified permit to help the reader rapidly identify each modification. Language deleted from the permit is strikeout. Language added to the permit is highlighted in redline. Also enclosed is a CD-ROM containing the modified files in Microsoft Word redline/strikeout format as well as files with markings and comments removed. On October 1, 2012 an electronic version of the modified permit with markings removed will be publicly posted on the NMED WIPP Information Page at <http://www.nmenv.state.nm.us/wipp/download.html>.

If you have any questions regarding this matter, please contact Trais Kliphuis of my staff at (505) 476-6051.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: Trais Kliphuis, NMED HWB
File: Red WIPP ‘12
PART 1 - GENERAL PERMIT CONDITIONS

1.1. AUTHORITY

This Permit is issued pursuant to the authority of the Secretary of the New Mexico Environment Department (Secretary) under the New Mexico Hazardous Waste Act (HWA), NMSA 1978, §§74-4-1 through 74-4-14, in accordance with the New Mexico Hazardous Waste Management Regulations (HWMR), 20.4.1 NMAC.

Pursuant to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§6901 to 6992k, and 40 CFR Part 271 and Part 272 Subpart GG, the State of New Mexico, through the Secretary, is authorized to administer and enforce the state hazardous waste management program under the HWA in lieu of the federal program.

This Permit contains terms and conditions that the Secretary has determined are necessary to protect human health and the environment, pursuant to 20.4.1.900 NMAC (incorporating 40 CFR §270.32(b)(2)).

Any violation of a condition in this Permit may subject the Permittees or their officers, employees, successors, and assigns to:

1) A compliance order under §74-4-10 of the HWA or §3008(a) of RCRA (42 U.S.C. §6928(a));

2) An injunction under §74-4-10 of the HWA or §3008(a) of RCRA (42 U.S.C. §6928(a)), or §7002(a) of RCRA (42 U.S.C. §6972(a));

3) Civil penalties under §§74-4-10 and 74-4-10.1 of the HWA or §§3008(a) and (g) of RCRA (42 U.S.C. §§6928(a) and (g)), or §7002(a) of RCRA (42 U.S.C. §6972(a));

4) Criminal penalties under §74-4-11 of the HWA or §§3008(d), (e), and (f) of RCRA (42 U.S.C. §§6928(d), (e), and (f)); or

5) Some combination of the foregoing.

The list of authorities in this paragraph is not exhaustive and the Secretary reserves the right to take any action authorized by law to enforce the requirements of this Permit.

1.2. EFFECT OF PERMIT

The Secretary issues this Permit to the United States Department of Energy (DOE), the owner and co-operator of the Waste Isolation Pilot Plant (WIPP) (EPA I.D. Number NM4890139088), and Nuclear Waste Partnership (MOC), the co-operator of WIPP. This Permit authorizes DOE and MOC (the Permittees) to manage, store, and dispose contact-handled (CH) and remote-handled (RH) transuranic (TRU)
mixed waste at WIPP, and establishes the general and specific standards for these activities, pursuant to the HWA and HWMR.

As to those activities specifically authorized or otherwise specifically addressed under this Permit, compliance with this Permit during its term shall constitute compliance, for purposes of enforcement, with Subtitle C of RCRA and the HWA, and the implementing regulations at 40 CFR Parts 264, 266, and 268 except for those requirements that become effective by statute after the Permit has been issued [20 4.1.900 NMAC (incorporating 40 CFR §270.4)]

Compliance with this Permit shall not constitute a defense to any order issued or any action brought under Sections 74-4-10.E or 74-4-13 of the HWA; Sections 3008(a), 3008(h), 3013, or 7003 of RCRA; the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. §9601 et seq., commonly known as CERCLA) Sections 106(a), 104, or 107; or any other federal, state, or local law providing for protection of public health or the environment. This Permit does not convey any property rights of any sort or any exclusive privilege, nor authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local laws or regulations. [20.4.1.900 NMAC (incorporating 40 CFR §§270.4, 270.30(g), and 270.32(b)(1))]

1.3. PERMIT ACTIONS

1.3.1. Permit Modification, Suspension, and Revocation

This Permit may be modified, suspended, and/or revoked for cause as specified in Section 74-4-4.2 of the HWA and 20.4.1.900 NMAC (incorporating 40 CFR §§270.41, 270.42, and 270.43). The filing of a request by the Permittees for a permit modification, suspension, or revocation, or the notification of planned changes or anticipated noncompliance, shall not stay any permit condition. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(f))]

1.3.2. Permit Renewal

The Permittees may renew this Permit by submitting an application for a new Permit at least 180 calendar days before the expiration date of this Permit. In reviewing any application for a Permit renewal, the Secretary shall consider improvements in the state of control and measurement technology and changes in applicable regulations. [20.4.1.900 NMAC (incorporating 40 CFR §§270.10(h) and 270.30(b))]

1.3.3. Permit Review

The Secretary shall review this Permit no later than five (5) years after the effective date of this Permit, and shall modify this Permit as necessary pursuant to Section 74-4-4.2 of the HWA and 20.4.1.900 NMAC (incorporating 40 CFR §270.41). Such modification(s) shall not extend the effective term of this Permit specified in Permit Section 1.7.2. [20.4.1.900 NMAC (incorporating 40 CFR §§270.41 and 270.50(b) and (d))]

PERMIT PART 1
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1.4. **SEVERABILITY**

The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby. [40 CFR §124.16(a)(1) and (2)]

1.5. **DEFINITIONS**

Unless otherwise expressly provided herein, the terms used in this Permit shall have the meaning set forth in RCRA, HWA, and/or their implementing regulations.

1.5.1. **Contact-handled Transuranic Mixed Waste**

“Contact-handled transuranic mixed waste” means transuranic mixed waste with a surface dose rate not greater than 200 millirem per hour. [Pub. L. 102-579 (1992)]

1.5.2. **Remote-handled Transuranic Mixed Waste**

“Remote-handled transuranic mixed waste” means transuranic mixed waste with a surface dose rate of 200 millirem per hour or greater. For WIPP, the surface dose rate shall not exceed 1,000 rems per hour. [Pub. L. 102-579 (1992)]

1.5.3. **Facility**

“Facility” or “permitted facility” means the Waste Isolation Pilot Plant (WIPP) owned by the DOE and located approximately twenty six (26) miles east of Carlsbad, New Mexico, EPA I.D. Number NM4890139088. The WIPP facility comprises the entire complex within the WIPP Site Boundary as specified in the WIPP Land Withdrawal Act of 1992, Pub. L. 102-579 (1992), including all contiguous land, and structures, other appurtenances, and improvements on the Permittees' land, used for management, storage, or disposal of TRU mixed waste.

1.5.4. **Permittees**

“Permittees” means the United States Department of Energy (DOE), an agency of the Federal government, and the owner and co-operator of the WIPP facility; and Nuclear Waste Partnership, Washington TRU Solutions LLC, Management and Operating Contractor (MOC), the co-operator of the WIPP facility. References to actions taken by “the Permittees” indicate actions that may be taken by either co-Permittee.

1.5.5. **Secretary**

“Secretary” means the Secretary of the New Mexico Environment Department (NMED), or designee.
1.5.6. **TRU Waste**

“TRU Waste” means waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for (A) high-level radioactive waste; (B) waste that the DOE Secretary has determined, with the concurrence of the EPA Administrator, does not need the degree of isolation required by the disposal regulations; or (C) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with part 61 of title 10, Code of Federal Regulations. [Pub. L. 102-579 (1992)]

1.5.7. **TRU Mixed Waste**

“TRU Mixed Waste” means TRU waste that is also a hazardous waste as defined by the HWA and 20.4.1.200 NMAC (incorporating 40 CFR §261.3).

1.5.8. **Contact Handled Packages**

“Contact Handled Packages” means TRUPACT-II, HalfPACT, and TRUPACT-III shipping containers and their contents.

1.5.9. **Remote-Handled Packages**

“Remote-Handled Packages” means both CNS 10-160B and RH-TRU 72-B shipping containers and their contents.

1.5.10. **Containment Pallet**

“Containment pallet” means a device capable of holding a minimum of one 55-gallon drum, or 85-gallon drum, or 100-gallon drum or a standard waste box, or a ten-drum overpack and that has internal containment for up to ten percent of the volume of the containers on the containment pallet.

1.5.11. **Waste Characterization**

“Waste characterization” or “characterization” means the activities performed by or on behalf of the waste generator/storage sites (sites) to obtain information used by the Permittees to satisfy the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.13(a)). Characterization occurs before waste containers have been certified for disposal at WIPP.

1.5.12. **Waste Confirmation**

“Waste confirmation” or “confirmation” means the activities performed by the Permittees or the co-Permittee DOE, pursuant to Permit Attachment C7 (TRU Waste Confirmation), to satisfy the requirements specified in Section 310 of Pub. L. 108-447. Confirmation occurs after waste containers have been certified for disposal at WIPP.
1.5.13. **Substantial Barrier**

“Substantial barrier” means salt or other non-combustible material installed between the waste face and the bulkhead to protect the waste from events such as ground movement or vehicle impacts. The substantial barrier incorporates the chain link and brattice cloth room closure specified in Permit Attachment A2.

1.5.14. **Bulkhead**

“Bulkhead” means a steel structure, with flexible flashing, that is used to block ventilation as specified in Permit Attachment A2 (Geologic Repository).

1.5.15. **Explosion-Isolation Wall**

“Explosion-isolation wall” means the 12-foot wall intended as an explosion isolation device that is part of the approved panel-closure system specified in Permit Attachment G1 (Detailed Design Report for an Operation Phase Panel Closure System).

1.5.16. **Filled Panel**

“Filled panel” means an Underground Hazardous Waste Disposal Unit specified in Permit Part 4 that will no longer receive waste for emplacement.

1.5.17. **Internal Container**

“Internal container” means a container inside the outermost container examined during radiography or visual examination (VE). Drum liners, liner bags, plastic bags used for contamination control, capillary-type labware, and debris not designed to hold liquid at the time of original waste packaging are not internal containers.

1.5.18. **Observable Liquid**

“Observable liquid” means liquid that is observable using radiography or VE as specified in Permit Attachment C (Waste Analysis Plan).

1.5.19. **Filled Room**

“Filled Room” means a room in an Underground Hazardous Waste Disposal Unit as specified in Permit Part 4 that will no longer receive waste for emplacement.

1.5.20. **Active Room**

“Active Room” means a room in an Underground Hazardous Waste Disposal Unit as specified in Permit Part 4 that contains emplaced TRU waste and is not a filled room.
1.6. **EFFECT OF INACCURACIES IN PERMIT APPLICATION**

This Permit is based on the assumption that all information contained in the permit application and the administrative record is accurate and that the Facility will be constructed and operated as specified in the application. The permit application consists of information submitted in September 2009 and supplementary technical documents.

Any inaccuracies found in the submitted information may be grounds for the termination or modification of this Permit in accordance with 20.4.1.900 NMAC (incorporating 40 CFR §270.41, §270.42, and §270.43) and for potential enforcement action.

1.7. **DUTIES AND REQUIREMENTS**

1.7.1. **Duty to Comply**

The Permittees shall comply with all conditions of this Permit, except to the extent and for the duration such noncompliance is authorized in an emergency permit specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.61). Any Permit noncompliance, except under the terms of an emergency permit, constitutes a violation of RCRA and/or HWA and is grounds for enforcement action; for Permit modification, suspension, or revocation; or for denial of a Permit modification or renewal application. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(a))]

1.7.2. **Permit Term**

This Permit shall be effective for a fixed term not to exceed ten years from the effective date. The effective date of this Permit shall be 30 days after notice of the Secretary’s decision has been served on the Permittees or such later time as the Secretary may specify. [20.4.1.900 NMAC (incorporating 40 CFR §270.50(a))]

1.7.3. **Duty to Reapply**

If the Permittees wish to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittees shall apply for and obtain a new Permit. The Permittees shall submit an application for a new Permit at least 180 calendar days before the expiration date of this Permit. [20.4.1.900 NMAC (incorporating 40 CFR §§270.10(h), 270.30(b))]

1.7.4. **Continuation of Expiring Permits**

If the Permittees have submitted a timely and complete application for renewal of this Permit as specified in 20.4.1.900 NMAC (incorporating 40 CFR §§270.10, 270.13 through 270.29), this Permit shall remain in effect until the effective date of the new Permit if, through no fault of the Permittees, the Secretary has not issued a new Permit on or before the expiration date of this Permit. [20.4.1.900 NMAC (incorporating 40 CFR §270.51)]
1.7.5. **Need to Halt or Reduce Activity Not a Defense**

It shall not be a defense for the Permittees in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(c))]

1.7.6. **Duty to Mitigate**

In the event of noncompliance with this Permit, the Permittees shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(d))]

1.7.7. **Proper Operation and Maintenance**

The Permittees shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittees to achieve compliance with the conditions of this Permit. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(e))]

1.7.8. **Duty to Provide Information**

The Permittees shall furnish to the Secretary, within a reasonable time frame as specified by the Secretary, any relevant information which the Secretary may request to determine whether cause exists for modifying, suspending, or revoking this Permit, or to determine compliance with this Permit. The Permittees shall also furnish to the Secretary, upon request, copies of records required to be kept by this Permit. Information and records requested by the Secretary pursuant to this condition shall be provided in a paper or an electronic format acceptable to the Secretary. [20.4.1.500 and .900 NMAC (incorporating 40 CFR §§264.74(a) and 270.30(h))]

1.7.9. **Inspection and Entry**

The Permittees shall allow the Secretary, or authorized representatives, upon the presentation of credentials and other documents as may be required by law and at reasonable times, the following inspection and entry privileges specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.30(i)):

1.7.9.1. **Entrance to Premises**

To enter upon the Permittees' premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;
1.7.9.2. **Access to Records**

To have access to and copy any records that must be kept under the conditions of this Permit;

1.7.9.3. **Inspection**

To have access to, inspect, and obtain photographs of any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

1.7.9.4. **Sampling**

To sample or monitor, for the purposes of assuring Permit compliance or as otherwise authorized by RCRA and/or HWA, any substances or parameters at any location. If the Secretary obtains any sample, prior to leaving the premises the Secretary shall give the Permittees a receipt describing the sample obtained and, if requested, a portion of each sample of equal weight or volume to the portion retained. If any analysis is made of the sample, the Secretary shall promptly furnish a copy of the results of the analysis to the Permittees.

Permit Section 1.7.9 shall not be construed to limit, in any manner, the Secretary's authority under Section 74-4-4.3 of the HWA.

1.7.10. **Monitoring and Records**

1.7.10.1. **Representative Sampling**

For the purposes of monitoring, the Permittees shall take samples and measurements representative of the monitored activity. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(j)(1))]

1.7.10.2. **Record Retention**

Beginning with the effective date of this Permit, the Permittees shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, and copies of all reports and records required by this Permit until closure. If original strip chart recordings are more than three years old, copies are acceptable. The Permittees shall retain the waste minimization certification required by 20.4.1.500 NMAC (incorporating 40 CFR §264.73(b)(9)), and records of all data used to complete the application for this Permit for a period of at least 3 years from the date of certification or application. The Secretary may extend these periods at any time, and these periods shall be automatically extended during the course of any unresolved enforcement action.
regarding this facility. The Permittees shall maintain records from all ground-water monitoring wells and associated ground-water surface elevations, during the active life of the facility and the post-closure period. [20.4.1.500 NMAC (incorporating 40 CFR §264.74(b)), 20.4.1.501 NMAC, and 20.4.1.900 (incorporating §270.30(j)(2))]

1.7.10.3. Monitoring Records Contents

As specified by 20.4.1.900 NMAC (incorporating 40 CFR §270.30(j)(3)), records of monitoring information shall include:

i. The dates, exact place, and times of sampling or measurements;

ii. The individuals who performed the sampling or measurements;

iii. The dates analyses were performed;

iv. The individuals who performed the analyses;

v. The analytical techniques or methods used; and

vi. The results of such analyses.

1.7.11. Reporting Requirements

1.7.11.1. Reporting Planned Changes

The Permittees shall give notice to the Secretary, as soon as possible, of any planned physical alterations or additions to the permitted facility. The Permittees shall post a link to the planned change notice transmittal letter on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(l)(1))]

1.7.11.2. Reporting Anticipated Noncompliance

The Permittees shall give advance notice to the Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The Permittees shall post a link to the planned change notice transmittal letter on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11. The Permittees shall not store or dispose TRU mixed waste in any modified portion of the facility (except as provided in 20.4.1.900 NMAC (incorporating 40 CFR §270.42)) until the following conditions specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.30(l)(2)) are satisfied:
i. The Permittees have submitted to the Secretary, by certified mail or hand delivery, a letter signed by the Permittees and a New Mexico registered professional engineer stating that the facility has been constructed or modified in compliance with this Permit, and:

ii. The Secretary has either inspected the modified portion of the facility and finds it is in compliance with the conditions of this Permit; or waived the inspection or, within 15 calendar days of the date of submission of the letter required above, has not notified the Permittees of his intent to inspect.

1.7.12. Transfer of Permits

The Permittees shall not transfer this Permit to any person, unless the Secretary has approved a permit modification request for such transfer in writing. The Secretary shall require modification or revocation and reissuance of this Permit as specified by 20.4.1.900 NMAC (incorporating 40 CFR §§270.40 and 270.41(b)(2)) to identify the new Permittees and incorporate other applicable requirements under the HWA, RCRA, and their implementing regulations. The prospective new Permittee shall file a disclosure statement with the Secretary, if applicable and as specified at §74-4-4.7 of the HWA, prior to modification or revocation and re-issuance of the Permit.

Before transferring ownership or operation of the facility during its active life or post-closure care period, the Permittees shall notify the new owner or operator in writing as required by 20.4.1.500 and .900 NMAC (incorporating 40 CFR §§264.12(c) and 270.30(l)(3)).

1.7.13. 24 Hour and Subsequent Reporting

1.7.13.1. Oral Report

As required by 20.4.1.900 NMAC (incorporating 40 CFR §270.30(l)(6)(i)), within 24 hours from the time the Permittees become aware of the circumstances, the Permittees shall report orally to the Secretary any noncompliance which may endanger human health or the environment, including:

i. Information concerning release of any TRU mixed or hazardous waste that may cause an endangerment to public drinking water supplies; and

ii. Any information of a release or discharge of TRU mixed or hazardous waste, or of a fire or explosion from the facility, which could threaten the environment or human health outside the facility.
The oral report shall be made by calling the Hazardous Waste Bureau’s main telephone number during regular business hours, or by calling the New Mexico Department of Public Safety dispatch telephone number during non-business hours, and requesting that the report be forwarded to the NMED spill number.

1.7.13.2. Description of Occurrence

The description of the occurrence and its cause shall include:

i. Name, address, and telephone number of the Permittees;

ii. Name, address, and telephone number of the facility;

iii. Date, time, and type of incident;

iv. Name and quantity of materials involved;

v. The extent of injuries, if any;

vi. An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and

vii. Estimated quantity and disposition of recovered material that resulted from the incident. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(l)(6)(ii))]

1.7.13.3. Written Notice

As required by 20.4.1.900 NMAC (incorporating 40 CFR §270.30(l)(6)(iii)), the Permittees shall submit a written notice within five calendar days of the time the Permittees become aware of the circumstances. The written notice shall contain the information required in Permit Section 1.7.13.2 and the following information:

i. A description of the noncompliance and its cause;

ii. The period(s) of the noncompliance including exact dates and times and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and

iii. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

The Secretary may waive the five-day written notice requirement in favor of a written report within 15 calendar days if justifiable cause is provided in advance. The Permittees shall post a link to the written notice or report.
transmittal letter on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11.

1.7.13.4. **Contingency Plan Implementation**

If the Contingency Plan is implemented, the Permittees shall comply with the reporting requirements specified in Permit Attachment D (RCRA Contingency Plan). [20.4.1.500 NMAC (incorporating 40 CFR §264.56(j))]

1.7.14. **Other Noncompliance**

The Permittees shall report to the Secretary all other instances of noncompliance not otherwise required to be reported above, in Permit Sections 1.7.10 through 1.7.13, at the time monitoring reports are submitted annually in October. The reports shall contain the information specified in Permit Section 1.7.13 and 20.4.1.900 NMAC (incorporating 40 CFR §270.30(l)(10)).

1.7.15. **Other Information**

Whenever the Permittees become aware that they failed to submit any relevant facts in the Permit application, or submitted incorrect information in the Permit application or in any report to the Secretary, the Permittees shall promptly submit such facts or information in writing to the Secretary. The Permittees shall post a link to the transmittal letter on the WIPP Home Page and inform those on the e-mail notification list as specified in Permit Section 1.11. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(l)(11))]

1.8. **ADMISSIBILITY OF DATA**

The Permittees waive any objection to the admissibility as evidence of any data required by this Permit in any administrative or judicial action to enforce a condition of this Permit.

1.9. **SIGNATORY REQUIREMENT**

The Permittees shall sign and certify, as specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.11) all applications, reports required by this Permit, or information submitted to or requested by the Secretary. [20.4.1.900 NMAC (incorporating 40 CFR §270.30(k))]

1.10. **SUBMITTAL OF REPORTS, NOTIFICATIONS, AND INFORMATION TO THE SECRETARY**

1.10.1. **Information Submittal**

The Permittees shall submit, by certified mail or hand delivery or by electronic transmittal with a subsequent hard copy, all reports, notifications, or other submissions which are submitted to or requested by the Secretary or required by this Permit, to:
1.10.2. Approval of Submittals

All documents prepared by the Permittees under the terms of this Permit and submitted to the Secretary that are subject to the provisions of 20.4.2 NMAC shall be subject to the procedures set forth therein. Documents requiring the Secretary’s approval that are not subject to the provisions of 20.4.2 NMAC may be reviewed and approved, approved with modifications or directions, disapproved, denied, or rejected by the Secretary.

Submittals and associated schedules, upon the Secretary’s written approval, shall become enforceable as part of this Permit in accordance with the terms of the Secretary’s written approval, and such documents, as approved, shall control over any contrary or conflicting requirements of this Permit. This provision does not affect any public process that is otherwise required by this Permit, the HWA, or its implementing regulations, including 40 CFR §270.42 and 20.4.1.901 NMAC.

1.10.3. Extension of Time

The Permittees may seek an extension of time in which to perform a requirement of this Permit, for good cause, by sending a written request for extension of time and proposed revised schedule to the Secretary. The request shall state the length of the requested extension and describe the basis for the request. The Secretary will respond in writing to any request for extension following receipt of the request. If the Secretary denies the request for extension, reasons for the denial will be stated.

1.11. PUBLIC E-MAIL NOTIFICATION LIST

The Permittees shall develop and maintain an e-mail list to notify members of the public concerning actions identified in this Permit requiring e-mail notification. The Permittees shall send e-mail notifications required by this Permit to the e-mail list within seven days of the submittal date to the Secretary and shall include in the e-mail a direct link to the specific document to which it relates. The Permittees shall provide a link on the WIPP Home Page <http://www.wipp.energy.gov> whereby members of the public may review the actions requiring e-mail notification and submit a request to be placed on this list.

1.12. CONFIDENTIAL INFORMATION

The Permittees may claim confidentiality for any information submitted to or requested by the Secretary or required by this Permit. Any such claim must be asserted at the time of submittal in the manner prescribed on the application form, or in the case of other submittals, by stamping the words
“confidential business information” on each page containing such information. If no claim is made, the Secretary may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information), to the extent authorized by Section 74-4-4.3(D) and (F) of the HWA and 20.4.1.100 and .900 NMAC (incorporating 40 CFR §260.2 and §270.12).

1.13. DOCUMENTS TO BE MAINTAINED AT THE FACILITY

The Permittees shall comply with the recordkeeping and reporting requirements specified in 20.4.1.500 NMAC (incorporating 40 CFR §264.73(a)) and elsewhere in this Permit.

The Permittees shall maintain at the facility, until closed as specified in Part 6, the following documents and all amendments, revisions and modifications to these documents:

1. Waste Analysis Plan, as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.13(b)) and this Permit, and records and results of waste analyses performed as specified in 20.4.1.500 NMAC (incorporating 40 CFR §264.13).

2. Inspection schedules, as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.15(b)(2)) and this Permit, and records and results of inspections as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.15(d)).

3. Personnel training documents and records, as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.16(d)) and this Permit.

4. Contingency Plan, as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.53(a)) and this Permit, including summary reports and details of all incidents that require implementation of the contingency plan as specified in 20.4.1.500 NMAC (incorporating 40 CFR §264.56(j)).

5. Operating record, as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.73) and this Permit.

6. Closure Plan, as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.112(a)) and this Permit.

7. Post-Closure Plan as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.118(a)) and this Permit.

8. Procedures for limiting air emissions, as required by 20.4.1.500 and .900 NMAC (incorporating 40 CFR §§264.601(c) and 270.23(a)(2)) and this Permit.

9. All other documents required by Part 1, Permit Section 1.7.10, and Part 2.
1.14. INFORMATION REPOSITORY

1.14.1. Requirement for Information Repository

The Permittees shall establish and maintain an electronic Information Repository (IR) in accordance with the requirements of 20.4.1.1102 NMAC (incorporating 40 CFR §§124.33(c) through (f)) and 20.4.1.900 NMAC (incorporating 40 §270.30(m)). The documents contained in the IR shall be accessible to the public from the WIPP Home Page.

The Permittees shall establish the IR no later than the effective date of this Permit.

1.14.2. Contents of Information Repository

The Permittees shall ensure that the IR contains the following documents:

1. The Permittees’ Part A and Part B Permit Applications associated with the permit renewal;
2. A complete copy of this Permit, as it may be modified;
3. Permit modification notifications and requests associated with this Permit submitted pursuant to 20.4.1.900 NMAC (incorporating 40 CFR §270.42) and any associated responses from the Secretary;
4. The Waste Minimization Report submitted pursuant to Permit Section 2.4;
5. Requests for extensions of time submitted pursuant to Permit Section 1.10.3;
6. Corrective action documents submitted pursuant to Permit Part 8;
7. Each report submitted pursuant to Permit Sections 1.7.11 and 1.7.13 if such report is required to be submitted in writing;
8. Notices of deficiency or disapproval (NODs), NOD responses, final approval letters, and directives from the Secretary associated with the documents identified in paragraphs 1, 3, and 6 above;
9. Notices of violation, administrative compliance orders, responses to these documents required by the Secretary, and directives from the Secretary associated with the Permit;

1.14.3. Index of Information Repository

The Permittees shall ensure that the IR includes an index of the documents contained in the IR identifying all document titles, publications dates, and authors. This index shall be
accessible on the internet through the WIPP Home Page. The Permittees shall ensure that all documents are searchable and printable.

The Permittees shall add new documents to the IR within ten days after the new documents are submitted to, or received from, the Secretary.

1.14.4. Notification to Public of Information Repository

The Permittees shall inform the public of the existence of the IR and how it may be accessed by the following methods:

1. Written notice to all individuals on the facility mailing list 30 days after the IR becomes operational;

2. Public notice in area newspapers, including the Carlsbad Current-Argus, Albuquerque Journal, and Santa Fe New Mexican, when the IR becomes operational;

3. Continuous notice on the WIPP Home Page of the existence of the IR; and

4. In the public notice related to any permit modification notification or request submitted by the Permittees, including permit renewals.

1.15. COMMUNITY RELATIONS PLAN

1.15.1. Requirement for Community Relations Plan

The Permittees shall establish and implement a Community Relations Plan (CRP) to describe how the Permittees will keep communities and interested members of the public informed of Permit-related activities, including waste management, closure, post-closure, and corrective action, as specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.32(b)(2)). The CRP shall explain how communities and interested members of the public can participate in Permit-related activities.

The Permittees shall implement and post the CRP on the WIPP Home Page within 180 days of the effective date of this Permit. The Permittees shall maintain the CRP until the termination of this Permit.

1.15.2. Contents of Community Relations Plan

The CRP must describe how the Permittees will accomplish the following elements:

1. Identify and establish an open working relationship with communities and interested members of the public;

2. Establish a productive government-to-government relationship between the Permittee DOE and affected tribes and pueblos;
3. Keep communities and interested members of the public informed of permit actions of interest (e.g., implementation of the Contingency Plan, Permit modification requests, Permit compliance issues);

4. Minimize disputes and resolve differences with communities and interested members of the public;

5. Provide a mechanism for the timely dissemination of information in response to individual requests; and

6. Provide a mechanism for communities and interested members of the public to provide feedback and input to the Permittees.

1.15.3. Government to Government Consultation

DOE shall consult on a government-to-government basis with affected tribes and pueblos in New Mexico when developing the CRP in an effort to ensure the program is responsive to their needs. DOE shall document in the operating record of this Permit and post on the WIPP Home Page all consultations, communications, agreements, and disagreements between DOE and affected tribes and pueblos in New Mexico only with the express approval of those entities, regarding the development of the CRP. The CRP shall specify how DOE will consult on a government-to-government basis with affected tribes and pueblos annually concerning how they may be made better informed of the issues related to this Permit.

1.15.4. Initial Consultation on Community Relations Plan

The Permittees shall communicate with and solicit comments from communities and interested members of the public when developing the CRP in an effort to ensure the program is responsive to their needs. The Permittees shall document in the operating record of this Permit all consultations, communications, agreements, and disagreements between the Permittees and all participating entities, with the approval of those entities, regarding the development of the CRP.

1.15.5. Annual Compilation of Comments on Community Relations Plan

The CRP shall specify how the Permittees will solicit comments from communities and interested members of the public annually concerning how they may be made better informed of the issues related to this Permit. The CRP shall specify that the Permittees will annually post on the WIPP Home Page a compilation of all such comments, including any statements of disagreement, with the approval of those entities in a manner set forth in the CRP.
1.16. **DISPUTE RESOLUTION**

1.16.1. **Applicability**

In the event DOE disagrees, in whole or in part, with either an action on a final audit report by NMED (as specified in Permit Section 2.3.2.4) or an evaluation by NMED of DOE’s provisional approval of an AK Sufficiency Determination Request for a particular waste stream (as specified in Permit Attachment C), DOE may seek dispute resolution. The dispute resolution procedure in this Permit Section shall be the exclusive mechanism for resolving disputes related to NMED’s final audit report action or a determination that DOE’s provisional approval for a particular waste stream is inadequate.

1.16.2. **Notice to NMED**

To invoke dispute resolution, DOE shall notify NMED in writing within seven calendar days of receipt of the action or determination in dispute. Such notice shall be sent to the Hazardous Waste Bureau Chief and must set forth the specific matters in dispute, the position DOE asserts should be adopted, a detailed explanation for DOE’s position, and any other matters considered necessary for the dispute resolution. For AK Sufficiency Determination disputes, DOE shall also submit all factual data, analysis, opinion, and other documentation upon which they relied for their provisional approval, and any other information that supports their position. NMED shall acknowledge receipt of notification by e-mail sent to DOE’s representative as designated in their written notification.

1.16.3. **Tier I - Informal Negotiations**

DOE and NMED shall make all reasonable, good faith efforts to informally resolve disputes related to NMED’s determination. DOE and NMED shall meet or teleconference within 15 calendar days from NMED’s receipt of notice to commence negotiations to resolve the dispute. DOE and NMED shall have 30 calendar days from NMED’s receipt of notice to resolve the dispute. If an agreement is reached, NMED shall promptly inform DOE of the terms of the agreement in writing. DOE shall comply with the terms of such agreement or, if appropriate, submit a revised submittal and implement the same in accordance with such agreement. If an agreement is not reached, NMED shall promptly inform DOE in writing that an agreement has not been reached.

1.16.4. **Tier II - Final Decision of the Secretary**

In the event agreement is not reached within the 30 calendar day period, DOE may submit a written Request for Final Decision to the Secretary. The Request must be submitted within seven calendar days after receipt of notification from NMED that an agreement under Tier I was not reached. The Secretary will notify the Permittees in writing of the decision on the dispute, and the Permittees shall comply with the terms and conditions of the decision. Such decision shall be the final resolution of the dispute and shall be enforceable under this Permit.
1.16.5. **Actions Not Affected by Dispute**

With the exception of those matters under dispute, the Permittees shall proceed to take any action required by those portions of the submission and of this Permit that NMED determines are not affected by the dispute.

1.16.6. **E-Mail Notifications**

If DOE submits a notice to NMED pursuant to Permit Section 1.16.2, the Permittees shall post a link to the notice on the WIPP Home Page, and inform those on the e-mail notification list as specified in Permit Section 1.11. After receipt of NMED’s letter concerning the conclusion of any Tier I negotiations, the Permittees shall post a link to the NMED letter on the WIPP Home Page, and shall inform those on the e-mail notification list as specified in Permit Section 1.11. If a Tier I agreement is not reached and DOE submits a Tier II request for final decision to the Secretary, the Permittees shall post a link to the request on the WIPP Home Page, and shall inform those on the e-mail notification list as specified in Permit Section 1.11. After receiving notice of the final action by the Secretary, the Permittees shall post a link to the final action on the WIPP Home Page and shall inform those on the e-mail notification list as specified in Permit Section 1.11.
PERMIT ATTACHMENTS

Permit Attachment A2 (as modified from WIPP Hazardous Waste Facility Permit Amended Renewal Application, “Geologic Repository” - Appendix M2).

Permit Attachment C (as modified from WIPP Hazardous Waste Facility Permit Amended Renewal Application, “Waste Analysis Plan” - Chapter B).

Permit Attachment C7 (as modified from WIPP Hazardous Waste Facility Permit Amended Renewal Application, “Permittee Level TRU Waste Confirmation Processes” - Appendix B7).

Permit Attachment D (as modified from WIPP Hazardous Waste Facility Permit Amended Renewal Application, “RCRA Contingency Plan” - Chapter F).

Permit Attachment G1 (as modified from WIPP Hazardous Waste Facility Permit Amended Renewal Application, “Detailed Design Report for an Operation Phase Panel Closure System” – Appendix I1)
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ATTACHMENT A

GENERAL FACILITY DESCRIPTION AND PROCESS INFORMATION
Waste Isolation Pilot Plant
Hazardous Waste Permit

May 8, October 1, 2012

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# ATTACHMENT A

## GENERAL FACILITY DESCRIPTION AND PROCESS INFORMATION

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ATTACHMENT A

GENERAL FACILITY DESCRIPTION AND PROCESS INFORMATION

A-1 Facility Description

Abstract

NAME OF FACILITY: Waste Isolation Pilot Plant

OWNER and CO-OPERATOR: U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221

CO-OPERATOR: Washington TRU Solutions Nuclear Waste Partnership LLC
P.O. Box 2078
Carlsbad, NM 88221

RESPONSIBLE OFFICIALS: Jose R. Franco
Manager, DOE/Carlsbad Field Office
Farok Sharif, General Project Manager
Washington TRU Solutions LLC

FACILITY MAILING ADDRESS: U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221

FACILITY LOCATION: 30 miles east of Carlsbad on the Jal Highway, in Eddy County.

TELEPHONE NUMBER: 575/234-7300

U.S. EPA I.D. NUMBER: NM4890139088

GEOGRAPHIC LOCATION: 32° 22′ 30″ N
103° 47′ 30″ W

DATE OPERATIONS BEGAN: November 26, 1999
A-2 Description of Activities

The Waste Isolation Pilot Plant (WIPP) is a facility for the management, storage, and disposal of transuranic (TRU) mixed waste subject to regulation under 20.4.1.500 NMAC. Both contact-handled (CH) and remote-handled (RH) TRU mixed wastes are permitted for storage and disposal at the WIPP facility.

A-3 Property Description

The WIPP property has been divided into functional areas. The Property Protection Area (PPA), surrounded by a chain-link security fence, encompasses 34.16 acres and provides security and protection for all major surface structures. The DOE Off Limits Area encloses the PPA, and is approximately 1,454 acres. These areas define the DOE exclusion zone within which certain items and material are prohibited. The final zone is marked by the WIPP Site Boundary (WIPP Land Withdrawal Area), a 16-section Federal land area under the jurisdiction of the DOE.

A-4 Facility Type

There are three basic groups of structures associated with the WIPP facility: surface structures, shafts and underground structures. The surface structures accommodate the personnel, equipment, and support services required for the receipt, preparation, and transfer of TRU mixed waste from the surface to the underground. There are two surface locations where TRU mixed waste is managed and stored. The first area is the Waste Handling Building (WHB) Container Storage Unit (WHB Unit) for TRU mixed waste management and storage. The WHB Unit consists of the WHB contact-handled (CH) Bay and the remote-handled (RH) Complex. The second area designated for managing and storing TRU mixed waste is the Parking Area Container Storage Unit (Parking Area Unit), an outside container storage area which extends south from the WHB to the rail siding. The Parking Area Unit provides storage space for up to 50 loaded Contact-Handled Packages and 14 loaded Remote-Handled Packages on an asphalt and concrete surface. Part 3 of the permit authorizes the storage and management of CH and RH TRU mixed waste containers in these two surface locations. The technical requirements of 20.4.1.500 NMAC (incorporating 40 CFR §§264.170 to 264.178) are applied to the operation of the WHB Unit and the Parking Area Unit. Permit Attachment A1 describes the container storage units, the TRU mixed waste management facilities and operations, and compliance with the technical requirements of 20.4.1.500 NMAC.

Four vertical shafts connect the surface facility to the underground. These are the Waste Shaft, the Salt Handling Shaft, the Exhaust Shaft and the Air Intake Shaft. The Waste Shaft is the only shaft used to transport TRU mixed waste to the underground. The WIPP underground structures are located in a mined salt bed 2,150 feet below the surface.

The WIPP is a geologic repository mined within a bedded salt formation, which is defined in 20.4.1.100 NMAC (incorporating 40 CFR §260.10) as a miscellaneous unit. As such, hazardous waste management units within the repository are subject to permitting according to 20.4.1.900 and .901 NMAC (incorporating 40 CFR §270), and are regulated under 20.4.1.500 NMAC, Miscellaneous Units.

The underground structures include the underground Hazardous Waste Disposal Units (HWUDUs), an area for future underground HWUDUs, the shaft pillar area, interconnecting drifts and other areas unrelated to the Hazardous Waste Facility Permit. The underground HWUDUs
are defined as waste panels, each consisting of seven rooms and two access drifts. The WIPP underground area is designated as Panels 1 through 10, although only Panels 1 through 8 will be used under the terms of this permit. Each of the seven rooms is approximately 300 feet long, 33 feet wide and 13 feet high. Part 4 of the permit authorizes the management and disposal of CH and RH TRU mixed waste containers in underground HWDUs. The Disposal Phase consists of receiving CH and RH TRU mixed waste shipping containers, unloading and transporting the waste containers to the underground HWDUs, emplacing the waste in the underground HWDUs, and subsequently achieving closure of the underground HWDUs in compliance with applicable State and Federal regulations. As required by 20.4.1.500 NMAC (incorporating 40 CFR §264.601), the Permittees shall ensure that the environmental performance standards for a miscellaneous unit, which are applied to the underground HWDUs in the geologic repository, will be met. Permit Attachment A2 describes the underground HWDUs, the TRU mixed waste management facilities and operations, and compliance with the technical requirements of 20.4.1.500 NMAC.

A-5 Waste Description

Wastes destined for WIPP are byproducts of nuclear weapons production and have been identified in terms of waste streams based on the processes that produced them. Each waste stream identified by generators is assigned to a Waste Summary Category to facilitate RCRA waste characterization, and reflect the final waste forms acceptable for WIPP disposal.

These Waste Summary Categories are:

S3000—Homogeneous Solids
Solid process residues defined as solid materials, excluding soil, that do not meet the applicable regulatory criteria for classification as debris [20.4.1.800 NMAC, (incorporating 40 CFR §268.2(g) and (h))]. Solid process residues include inorganic process residues, inorganic sludges, salt waste, and pyrochemical salt waste. Other waste streams are included in this Waste Summary Category based on the specific waste stream types and final waste form. This category includes wastes that are at least 50 percent by volume solid process residues.

S4000—Soils/Gravel
This waste summary category includes waste streams that are at least 50 percent by volume soil. Soils are further categorized by the amount of debris included in the matrix.

S5000—Debris Wastes
This waste summary category includes waste that is at least 50 percent by volume materials that meet the NMAC criteria for classification as debris (20.4.1.800 NMAC (incorporating 40 CFR §268.2)). Debris means solid material exceeding a 2.36 inch (60 millimeter) particle size that is intended for disposal and that is: 1) a manufactured object, 2) plant or animal matter, or 3) natural geologic material.

The S5000 Waste Summary Category includes metal debris, metal debris containing lead, inorganic nonmetal debris, asbestos debris, combustible debris, graphite debris, heterogeneous debris, and composite filters, as well as other minor waste streams. Particles smaller than 2.36 inches in size may be considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material.
If a waste does not include at least 50 percent of any given category by volume, characterization shall be performed using the waste characterization process required for the category constituting the greatest volume of waste for that waste stream.

Wastes may be generated at the WIPP facility as a direct result of managing the TRU and TRU mixed wastes received from the off-site generators. Such waste may be generated in either the WHB or the underground. This waste is referred to as “derived waste.” All such derived waste will be placed in the rooms in HWDUs along with the TRU mixed waste for disposal.

Non-mixed hazardous wastes generated at the WIPP, through activities where contact with TRU mixed waste does not occur, are characterized, placed in containers, and stored (for periods not exceeding the limits specified in 20.4.1.300 NMAC (incorporating 40 CFR §262.34)) until they are transported off site for treatment and/or disposal at a permitted facility. This waste generation and accumulation activity, when performed in compliance with 20.4.1.300 NMAC (incorporating 40 CFR §262), is not subject to RCRA permitting requirements and, as such, is not addressed in the permit.

A-6 Chronology of Events Relevant to Changes in Ownership or Operational Control

December 19, 1997 NMED received notification of a change of name/ownership from Westinghouse Electric Corporation to CBS Corporation. The WIPP Management and Operating Contractor (MOC), Westinghouse Waste Isolation Division (WID), became a division of Westinghouse Electric Company, which in turn was a division of CBS Corporation. Notification to NMED was made by the permit applicant in a letter dated December 18, 1997. The permit application was under review, but a draft permit was not yet issued.

September 22, 1998 NMED received notification of a pending transfer of ownership for the MOC, Westinghouse WID, from CBS Corporation to an as-yet-to-be-named limited liability company owned jointly by British Nuclear Fuels, plc and Morrison-Knudsen Corporation. The transfer of ownership was scheduled to occur on or about December 15, 1998. Notification to NMED was made by the permit applicant in a letter dated September 17, 1998. The draft permit had been issued for public comment, but the final permit was not yet issued.

March 9, 1999 NMED again received notification of the pending divestiture of the MOC, Westinghouse WID, by CBS Corporation to the limited liability company owned jointly by British Nuclear Fuels, plc and Morrison-Knudsen Corporation known as MK/BNFL GESCO LLC. The new MOC would be renamed to Westinghouse Government Environmental Services Company LLC. Notification to NMED was made by the permit applicant in a letter dated March 2, 1999. The public hearing on the permit was underway, but the final permit was not yet issued.

March 26, 1999 NMED received official notification of the divestiture of Westinghouse Electric Company by CBS Corporation to MK/BNFL GESCO LLC effective March 22, 1999. The MOC was renamed Westinghouse Government Environmental Services Company LLC (WGES), of which
Westinghouse Waste Isolation Division was a division. This transaction constituted a change of operational control under 20.4.1.900 NMAC (incorporating 40 CFR §270.40). Notification to NMED was made by the permit applicant in a letter dated March 24, 1999. The public hearing on the permit was nearly concluded, but the final permit was not yet issued.

April 28, 1999

NMED received a revised Part A Permit Application in a letter dated April 21, 1999, reflecting that the Westinghouse Waste Isolation Division, co-operator of the WIPP hazardous waste facility, was now a part of WGES. However, the final permit, issued October 27, 1999, did not reflect the change in ownership.

July 25, 2000

NMED received a Class 1 permit modification in a letter dated July 21, 2000, changing the name in the Permit from Westinghouse Electric Corporation to Westinghouse Government Environmental Services Company LLC (WGES), Waste Isolation Division (WID). However, this notification did not constitute the required permit modification under 20.4.1.900 NMAC (incorporating 40 CFR §270.40) necessary to reflect the transfer of the permit to a new operator.

December 15, 2000

DOE announced that it had awarded a five-year contract for management and operation of WIPP to Westinghouse TRU Solutions LLC, a limited liability company owned jointly by WGES LLC and Roy F. Weston, Inc. The announcement further stated that, following a brief transition period, the new contractor would assume MOC responsibilities on February 1, 2001. This transaction constituted a change of operational control under 20.4.1.900 NMAC (incorporating 40 CFR §270.40) requiring a Class 1 permit modification with prior written approval of NMED.

February 5, 2001

NMED received a Class 1 permit modification in a letter dated February 2, 2001, which notified NMED of an organizational name change of the MOC from Westinghouse Government Environmental Services Company LLC Waste Isolation Division to Westinghouse TRU Solutions LLC. However, this notification did not constitute the required permit modification under 20.4.1.900 NMAC (incorporating 40 CFR §270.40) necessary to reflect the transfer of the permit to a new operator.

December 31, 2002

NMED received a Class 1 permit modification in a letter dated December 27, 2002, which changed the name of the MOC from Westinghouse TRU Solutions LLC to Washington TRU Solutions LLC. Again, this notification did not constitute the required permit modification under 20.4.1.900 NMAC (incorporating 40 CFR §270.40) necessary to reflect the transfer of the permit to a new operator.

February 28, 2003

NMED received a Class 1 permit modification requiring prior agency approval in a letter dated February 28, 2003, to satisfy the requirements specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.40) to reflect the transfer of the permit to a new operator.
September 16, 2004  NMED received a Class 1 permit modification requiring prior agency approval in a letter dated September 16, 2004, describing a change of ownership of Washington TRU Solutions LLC (WTS). WTS is owned jointly by WGES, managing member, and Weston Solutions, Inc. WGES had been owned jointly by Washington Group International, Inc. (WGI), and BNFL Nuclear Services, Inc. However, WGI has acquired BNFL’s prior interest in the former Westinghouse government services businesses, which includes BNFL’s prior interest in WGES.

August 6, 2007  NMED received notification in a letter dated August 2, 2007 of the pending acquisition of WGI by URS Corporation at an unknown future date. This acquisition would be related to operational control, because WGI is the sole owner of WGES, managing member of the joint venture, along with Weston Solutions, Inc., that owns WTS, the WIPP MOC. This notification was submitted to assure compliance with 20.4.1.900 NMAC (incorporating 40 CFR §270.40(b)).

November 26, 2007  NMED received a Class 1 permit modification requiring prior agency approval in a letter dated November 19, 2007, describing a change of ownership of WTS. On November 15, 2007, WGI was acquired by URS Corporation. WTS is owned jointly by WGES, managing member, and Weston Solutions, Inc. WGES, formerly owned by WGI, is now owned by URS Corporation.

October 1, 2012  NMED received a Class 1 permit modification requiring prior agency approval in a letter dated June 25, 2012 describing a change in the MOC for the WIPP facility. The new MOC for the WIPP facility will be Nuclear Waste Partnership LLC. The new MOC is comprised of URS Energy and Construction, Inc. and Babcock and Wilcox Technical Services Group, Inc.
ATTACHMENT B

HAZARDOUS WASTE PERMIT APPLICATION PART A
# ATTACHMENT B

## HAZARDOUS WASTE PERMIT APPLICATION PART A

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</tr>
<tr>
<td>1. Reason for Submittal</td>
<td>Reason for Submittal:</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td></td>
<td>(To provide an Initial Notification (first time submitting site identification information / to obtain an EPA ID number for this location)</td>
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<td></td>
<td>(To provide a Subsequent Notification (to update site identification information for this location)</td>
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<tr>
<td></td>
<td>(As a component of a First RCRA Hazardous Waste Part A Permit Application)</td>
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<td></td>
<td>(As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment # 26)</td>
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<td></td>
<td>(As a component of the Hazardous Waste Report (if marked, see sub-bullet below)</td>
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<td>(Site was a TSD facility and/or generator of &gt;1,000 kg of hazardous waste, &gt;1 kg of acute hazardous waste, or &gt;100 kg of acute hazardous waste spill cleanup in one or more months of the report year (or State equivalent LQG regulations)</td>
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<tr>
<th>2. Site EPA ID Number</th>
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<tr>
<td>County: Eddy</td>
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<tr>
<td>State: NM</td>
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<tr>
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<th>5. NAICS Code(s) for the Site</th>
<th>A. 6 6 2 2 1</th>
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</thead>
<tbody>
<tr>
<td>B.</td>
<td></td>
</tr>
<tr>
<td>C.</td>
<td></td>
</tr>
<tr>
<td>D.</td>
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<table>
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<th>6. Site Mailing Address</th>
<th>Street or P.O. Box: P.O. Box 3090</th>
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</thead>
<tbody>
<tr>
<td>City, Town, or Village: Carlsbad</td>
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<tr>
<td>State: NM</td>
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<td>Country: USA</td>
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<td>Zip Code: 88221</td>
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<table>
<thead>
<tr>
<th>7. Site Contact Person</th>
<th>First Name: Jose</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI: R.</td>
<td>Last: Franco</td>
</tr>
<tr>
<td>Title: Manager, Carlsbad Field Office (CBFO)</td>
<td></td>
</tr>
<tr>
<td>Street or P.O. Box: P.O. Box 3090</td>
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</tr>
<tr>
<td>City, Town, or Village: Carlsbad</td>
<td></td>
</tr>
<tr>
<td>State: NM</td>
<td></td>
</tr>
<tr>
<td>Country: USA</td>
<td></td>
</tr>
<tr>
<td>Zip Code: 88221</td>
<td></td>
</tr>
<tr>
<td>Email: <a href="mailto:jose.franco@wipp.ws">jose.franco@wipp.ws</a></td>
<td></td>
</tr>
<tr>
<td>Phone: (575) 234-7300</td>
<td></td>
</tr>
<tr>
<td>Ext.:</td>
<td></td>
</tr>
<tr>
<td>Fax: (575) 234-7027</td>
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<th>8. Legal Owner and Operator of the Site</th>
<th>A. Name of Site's Legal Owner: U.S. Department of Energy</th>
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<tr>
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<td>County</td>
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<tr>
<td>District</td>
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<tr>
<td>Federal</td>
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<td>Tribal</td>
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<tr>
<td>Municipal</td>
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<tr>
<td>State</td>
<td></td>
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<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Street or P.O. Box: P.O. Box 3090</td>
<td></td>
</tr>
<tr>
<td>City, Town, or Village: Carlsbad</td>
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<td>State: NM</td>
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</tr>
<tr>
<td>Country: USA</td>
<td></td>
</tr>
<tr>
<td>Zip Code: 88221</td>
<td></td>
</tr>
<tr>
<td>B. Name of Site's Operator: U.S. Department of Energy</td>
<td></td>
</tr>
<tr>
<td>Date Became Operator: 05/18/1981</td>
<td></td>
</tr>
<tr>
<td>Operator Type: Private</td>
<td></td>
</tr>
<tr>
<td>County</td>
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<tr>
<td>District</td>
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<td>Federal</td>
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<tr>
<td>Tribal</td>
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<tr>
<td>Municipal</td>
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<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>SEND COMPLETED FORM TO: The Appropriate State or Regional Office</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>

United States Environmental Protection Agency

RCRA SUBTITLE C SITE IDENTIFICATION FORM

1. Reason for Submittal
   - [ ] To provide an Initial Notification (first time submitting site identification information for this location)
   - [ ] To provide a Subsequent Notification (to update site identification information for this location)
   - [ ] As a component of a First RCRA Hazardous Waste Part A Permit Application
   - [ ] As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment #27)
   - [ ] As a component of the Hazardous Waste Report (if marked, see sub-bullet below)
   - [ ] Site was a TSD facility and/or generator of 1,000,000 kg of hazardous waste, >1 kg of acute hazardous waste, or >100 kg of acute hazardous waste spill cleanup in one or more months of the report year (or State equivalent LQS regulations)

2. Site EPA ID Number
   - EPA ID Number: [N M 4 8 9 0 1 3 9 0 8 8]

3. Site Name
   - Name: Waste Isolation Pilot Plant

4. Site Location Information
   - Street Address: 30 miles east of Carlsbad on Jal Highway
   - City, Town, or Village: Carlsbad
   - County: Eddy

5. Site Land Type
   - [ ] Private
   - [ ] County
   - [ ] District
   - [ ] Federal
   - [ ] Tribal
   - [ ] Municipal
   - [ ] State
   - [ ] Other

6. NAICS Code(s) for the Site (at least 5-digit codes)
   - A. [5 6 2 2 1]
   - B. [ ]
   - C. [ ]
   - D. [ ]

7. Site Mailing Address
   - Street or P.O. Box: P.O. Box 3090
   - City, Town, or Village: Carlsbad
   - State: NM
   - Country: USA
   - Zip Code: 88221

8. Site Contact Person
   - First Name: Jose
   - Middle Initial: M
   - Last Name: Franco
   - Title: Manager, Carlsbad Field Office (CBFO)
   - Street or P.O. Box: P.O. Box 3090
   - City, Town, or Village: Carlsbad
   - State: NM
   - Country: USA
   - Zip Code: 88221
   - Email: josefranco@wipp.wm
   - Phone: (575) 234-7300
   - Ext.: [ ]
   - Fax: (575) 234-7027

9. Legal Owner and Operator of the Site
   - A. Name of Site's Legal Owner: U.S. Department of Energy
   - Date Became Owner: 05/15/1981
   - Owner Type: [ ] Private
   - [ ] County
   - [ ] District
   - [ ] Federal
   - [ ] Tribal
   - [ ] Municipal
   - [ ] State
   - [ ] Other
   - Street or P.O. Box: P.O. Box 3090
   - City, Town, or Village: Carlsbad
   - State: NM
   - Country: USA
   - Zip Code: 88221

   - B. Name of Site's Operator: U.S. Department of Energy
   - Date Became Operator: 06/18/1981
   - Operator Type: [ ] Private
   - [ ] County
   - [ ] District
   - [ ] Federal
   - [ ] Tribal
   - [ ] Municipal
   - [ ] State
   - [ ] Other
   - Street or P.O. Box: P.O. Box 3090
   - City, Town, or Village: Carlsbad
   - State: NM
   - Country: USA
   - Zip Code: 88221
### A. Hazardous Waste Activities; Complete all parts 1-10.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Y</td>
<td>Generator of Hazardous Waste</td>
</tr>
<tr>
<td>Y</td>
<td>Short-Term Generator</td>
</tr>
<tr>
<td>Y</td>
<td>United States Importer of Hazardous Waste</td>
</tr>
<tr>
<td>Y</td>
<td>Mixed Waste (hazardous and radioactive) Generator</td>
</tr>
</tbody>
</table>

#### 1. Generator of Hazardous Waste
- LQG: Generates, in any calendar month, 1,000 kg/mo (2,200 lbs./mo.) or more of hazardous waste; or generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lbs./mo) of acute hazardous waste; or generates, in any calendar month, or accumulates at any time, more than 100 kg/mo (220 lbs./mo) of acute hazardous spill cleanup material.
- SQG: 100 to 1,000 kg/mo (220 - 2,200 lbs./mo) of non-acute hazardous waste.
- CESQG: Less than 100 kg/mo (220 lbs./mo) of non-acute hazardous waste.

#### 2. Short-Term Generator
- Provide an explanation in the Comments section.

#### 3. United States Importer of Hazardous Waste

#### 4. Mixed Waste (hazardous and radioactive) Generator

### B. Universal Waste Activities; Complete all parts 1-2.

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<tr>
<th>Option</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Y</td>
<td>Large Quantity Handler of Universal Waste</td>
</tr>
<tr>
<td>Y</td>
<td>Destination Facility for Universal Waste</td>
</tr>
</tbody>
</table>

#### 1. Large Quantity Handler of Universal Waste
- Batteries
- Pesticides
- Mercury containing equipment
- Lamps
- Other (specify)

#### 2. Destination Facility for Universal Waste
- A hazardous waste permit may be required for this activity.

### C. Used Oil Activities; Complete all parts 1-4.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Used Oil Transporter</td>
</tr>
<tr>
<td>Y</td>
<td>Used Oil Processor and/or Re-refiner</td>
</tr>
<tr>
<td>Y</td>
<td>Off-Specification Used Oil Burner</td>
</tr>
<tr>
<td>Y</td>
<td>Used Oil Fuel Marketer</td>
</tr>
</tbody>
</table>

#### 1. Used Oil Transporter
- a. Transporter
- b. Transfer Facility (at your site)

#### 2. Used Oil Processor and/or Re-refiner
- a. Processor
- b. Re-refiner

#### 3. Off-Specification Used Oil Burner
- a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
- b. Marketer Who First Claims the Used Oil Meets the Specifications

EPA Form 8700-12, 8700-13 A/B, 8700-23 (Revised 12/2011)
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes/May Apply</th>
<th>No/No Apply</th>
<th>Other Comments</th>
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<td>1. Generator of Hazardous Waste</td>
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<td></td>
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<tr>
<td>a. LGQ: Generates, in any calendar month, 1,000 kg/mo (2,200 lbs./mo.) or more of hazardous waste; or Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lbs./mo) of acute hazardous waste; or Generates, in any calendar month, or accumulates at any time, more than 100 kg/mo (220 lbs./mo) of acute hazardous spill cleanup material.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>b. SQG: 100-1,000 kg/mo (220-2,200 lbs./mo) of non-acute hazardous waste.</td>
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<td></td>
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<tr>
<td>c. CESQG: Less than 100 kg/mo (220 lbs./mo) of non-acute hazardous waste.</td>
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<td>If “Yes” above, indicate other generator activities in 2-4.</td>
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<tr>
<td>2. Short-Term Generator (generate from a short-term or one-time event and not from ongoing processes). If “Yes”, provide an explanation in the Comments section.</td>
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<td>3. United States Importer of Hazardous Waste</td>
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<tr>
<td>4. Mixed Waste (hazardous and radioactive) Generator</td>
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<td>B. Universal Waste Activities; Complete all parts 1-2.</td>
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<td></td>
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<tr>
<td>1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) [refer to your State regulations to determine what is regulated]. Indicate types of universal waste managed at your site. If “Yes”, mark all that apply.</td>
<td>Y/N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Batteries</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>b. Pesticides</td>
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<td>c. Mercury containing equipment</td>
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<tr>
<td>d. Lamps</td>
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<tr>
<td>e. Other (specify)</td>
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<td>f. Other (specify)</td>
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<td>g. Other (specify)</td>
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<td>2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity.</td>
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<tr>
<td>C. Used Oil Activities; Complete all parts 1-4.</td>
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<td></td>
</tr>
<tr>
<td>1. Used Oil Transporter</td>
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<td></td>
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<tr>
<td>a. Transporter</td>
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<td>b. Transfer Facility (at your site)</td>
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<tr>
<td>2. Used Oil Processor and/or Re-refiner</td>
<td>Y/N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Processor</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>b. Re-refiner</td>
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<tr>
<td>3. Off-Specification Used Oil Burner</td>
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<td>4. Used Oil Fuel Marketeer</td>
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<td>a. Marketeer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner</td>
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<tr>
<td>b. Marketeer Who First Claims the Used Oil Meets the Specifications</td>
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</table>
### D. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262 Subpart K

- You can ONLY Opt into Subpart K if:
  - you are at least one of the following: a college or university; a teaching hospital that is owned by or has a formal affiliation agreement with a college or university; or a non-profit research institute that is owned by or has a formal affiliation agreement with a college or university; AND
  - you have checked with your State to determine if 40 CFR Part 262 Subpart K is effective in your state.

#### 1. Opting into or currently operating under 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories

- See the Item-by-Item Instructions for definitions of types of eligible academic entities. Mark all that apply:
  - College or University
  - Teaching Hospital that is owned by or has a formal written affiliation agreement with a college or university
  - Non-profit Institute that is owned by or has a formal written affiliation agreement with a college or university

#### 2. Withdrawing from 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories

### 11. Description of Hazardous Waste

#### A. Waste Codes for Federally Regulated Hazardous Wastes

Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

<table>
<thead>
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#### B. Waste Codes for State-Regulated (i.e., non-Federal) Hazardous Wastes

Please list the waste codes of the State-Regulated hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.
### D. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262 Subpart K

- You can ONLY Opt into Subpart K if:
  - you are at least one of the following: a college or university; a teaching hospital that is owned by or has a formal affiliation agreement with a college or university; or a non-profit research institute that is owned by or has a formal affiliation agreement with a college or university; AND
  - you have checked with your State to determine if 40 CFR Part 262 Subpart K is effective in your state

**Y ☐ N ☑ 1. Opting into or currently operating under 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories**

- See the item-by-item instructions for definitions of types of eligible academic entities. Mark all that apply:
  - a. College or University
  - b. Teaching Hospital that is owned by or has a formal written affiliation agreement with a college or university
  - c. Non-profit Institute that is owned by or has a formal written affiliation agreement with a college or university

**Y ☐ N ☑ 2. Withdrawing from 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories**

### 11. Description of Hazardous Waste

#### A. Waste Codes for Federally Regulated Hazardous Wastes

Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

<table>
<thead>
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<td>D040</td>
<td>F009</td>
<td>U019</td>
<td>U103</td>
<td>U196</td>
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</table>
| D018   | D032   | D043   | P015   | U037   | U05   | More Codes Attached.

#### B. Waste Codes for State-Regulated (i.e., non-Federal) Hazardous Wastes

Please list the waste codes of the State-Regulated hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.
### Additional Hazardous Waste Numbers from Section 10

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### Additional Hazardous Waste Numbers from Section 10

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</tbody>
</table>

Y ☐ N ☑ Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 261.2(a)(2)(ii), 40 CFR 261.4(a)(23), (24), or (25)?

If "Yes", you must fill out the Addendum to the Site Identification Form: Notification for Managing Hazardous Secondary Material.

13. Comments

14. Certification. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. For the RCRA Hazardous Waste Part A Permit Application, all owner(s) and operator(s) must sign (see 40 CFR 270.10(b) and 270.11).

Signature of legal owner, operator, or an authorized representative  Name and Official Title (type or print)  Date Signed (mm/dd/yyyy)

Original Signature on File  Jose R. Franco, Manager-CBFO  06/25/2012

Original Signature on File  Farok Sharif, Project Manager-NWP  06/25/2012

- Y [ ] N [x] Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 261.2(a)(2)(ii), 40 CFR 261.4(a)(23), (24), or (25)?

  If "Yes", you must fill out the Addendum to the Site Identification Form: Notification for Managing Hazardous Secondary Material.

13. Comments

14. Certification. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. For the RCRA Hazardous Waste Part A Permit Application, all owner(s) and operator(s) must sign (see 40 CFR 270.10(b) and 270.11).

<table>
<thead>
<tr>
<th>Signature of legal owner, operator, or an authorized representative</th>
<th>Name and Official Title (type or print)</th>
<th>Date Signed (mm/dd/yyyy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Signature on File</td>
<td>Jose R. Franco, Manager-CBFO</td>
<td>02/13/2012</td>
</tr>
<tr>
<td>Original Signature on File</td>
<td>Farok Sharif, General Manager-WTS</td>
<td>02/13/2012</td>
</tr>
</tbody>
</table>
**United States Environmental Protection Agency**

**HARDOUS WASTE PERMIT INFORMATION FORM**

<table>
<thead>
<tr>
<th>1. Facility Permit Contact</th>
<th>2. Facility Permit Contact Mailing Address</th>
<th>3. Operator Mailing Address and Telephone Number</th>
<th>4. Facility Existence Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name: Jose</td>
<td>Street or P.O. Box: P.O. Box 3090</td>
<td>Street or P.O. Box: P.O. Box 3090</td>
<td>Facility Existence Date: 05/18/1981</td>
</tr>
<tr>
<td>Mi: R.</td>
<td>City, Town, or Village: Carlsbad</td>
<td>City, Town, or Village: Carlsbad</td>
<td></td>
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<tr>
<td>Last Name: Franco</td>
<td>State: NM</td>
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<td></td>
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<td></td>
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**5. Other Environmental Permits**

<table>
<thead>
<tr>
<th>A. Facility Type (Enter code)</th>
<th>B. Permit Number</th>
<th>C. Description</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>See Permit Attachment B, Appendix B1</td>
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</tbody>
</table>

**6. Nature of Business:**
The Waste Isolation Pilot Plant (WIPP) is a U.S. Department of Energy facility which entails receiving, unloading, and transferring radioactive mixed waste from the surface of the site to the underground hazardous waste management units. Waste will be emplaced in an underground geologic repository horizon located in a deep-beded salt formation approximately 2,150 feet beneath the surface.
### Process Codes and Design Capacities

Enter information in the section on Form Page 3

**A. PROCESS CODE** - Enter the code from the list of process codes below that best describes each process to be used at the facility. If more lines are needed, attach a separate sheet of paper with the additional information. **For other** processes (i.e., D99, S99, T94 and X99), describe the process (including its design capacity) in the space provided in Item 6.

**B. PROCESS DESIGN CAPACITY** - For each code entered in Item 7.1, enter the capacity of the process.

1. **AMOUNT** - Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.

2. **UNIT OF MEASURE** - For each amount entered in Item 7.2(1), enter the code in Item 7.2(2) from the list of unit of measure codes below that describes the unit of measure used. Select only from the units of measure in this list.

**C. PROCESS TOTAL NUMBER OF UNITS** - Enter the total number of units for each corresponding process code.

|--------------|---------|--------------------------------------------------------|--------------|---------|--------------------------------------------------------|
| D09          | Underground Injection | Gallons; Liters; Gallons Per Day; or Liters Per Day | T81          | Cement Kiln | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| D10          | Landfill | Acre-feet; Hectare-meter; Acres; Cubic Meters; Hectare; Cubic Yards | T82          | Lime Kiln | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| D81          | Land Treatment | Acres or Hectares | T83          | Aggregates Kiln | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| D82          | Ocean Disposal | Gallons Per Day or Liters Per Day | T84          | Phosphates Kiln | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| D83          | Surface Impoundment | Gallons; Liters; Cubic Meters; or Cubic Yards | T85          | Coke Oven | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| D90          | Other Disposal | Gallons; Liters; Cubic Meters; or Cubic Yards | T86          | Blast Furnace | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| S01          | Container | Gallons; Liters; Cubic Meters; or Cubic Yards | T87          | Smelting, Melting, or Reeling Furnace | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| S02          | Tank Storage | Gallons; Liters; Cubic Meters; or Cubic Yards | T88          | Titanium Dioxide Chloride Oxidation Reactor | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| S03          | Waste Pile | Cubic Yards or Cubic Meters | T89          | Methane Reforming Furnace | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| S04          | Surface Impoundment | Gallons; Liters; Cubic Meters; or Cubic Yards | T90          | Pulping Liquid Recovery Furnace | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| S05          | Drip Pad | Gallons; Liters; Cubic Meters; Hectare; Cubic Yards | T91          | Combustion Devices Used in the Recovery of Sulfur Values from Sulfuric Acid | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| S06          | Containment Building | Storage | T92          | Halogen Acid Furnaces | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| S08          | Other Storage | Gallons; Liters; Cubic Meters; or Cubic Yards | T93          | Other Industrial Furnaces Listed in 40 CFR 260.10 | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| **Treatment** | **Storage** | **Design Capacity** | **T94** | Containment Building | Cubic Yards; Cubic Meters; Short Tons Per Day; BTU Per Hour; Gallons Per Day; Liters Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| T01          | Tank Treatment | Gallons Per Day; Liters Per Day | **Miscellaneous (Subpart X)** | **Open Burning/Open Deforestation** | Any Unit of Measure Listed Below |}
| T02          | Surface Impoundment | Gallons Per Day; Liters Per Day | | **Mechanical Processing** | Short Tons Per Hour; Metric Tons Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Day; Liters Per Hour; or Gallons Per Day |}
| T03          | Incinerator | Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; BTUs Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Day; Gallons Per Day; Metric Tons Per Hour; or Million BTU Per Hour | | **Thermal Unit** | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Day; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liquid Per Hour; or Million BTU Per Hour |}
| T04          | Other Treatment | Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; BTUs Per Hour; Gallons Per Day; Liters Per Hour; or Million BTU Per Hour | | **Geologic Repository** | Cubic Yards; Cubic Meters; Acre-feet; Gallons or Liters |}
| T09          | Boiler | Gallons; Liters; Liters Per Hour; or Million BTU Per Hour | | **Other Subpart X** | Any Unit of Measure Listed Below |}

### Unit of Measure

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**PERMIT ATTACHMENT B**

Page B-12 of 5752
### 7. Process Codes and Design Capacities (Continued)

**EXAMPLE FOR COMPLETING Item 7 (shown in line number X-1 below):** A facility has a storage tank, which can hold 533.788 gallons.

<table>
<thead>
<tr>
<th>Line Number</th>
<th>A. Process Code (From list above)</th>
<th>B. PROCESS DESIGN CAPACITY</th>
<th>C. Process Total Number of Units</th>
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**Note:** If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the line sequentially, taking into account any lines that will be used for "other" process (i.e., D99, S99, T04, and X99) in Item 8.

### 8. Other Processes (Follow instructions from Item 7 for D99, S99, T04, and X99 process codes)

<table>
<thead>
<tr>
<th>Line Number</th>
<th>A. Process Code (From list above)</th>
<th>B. PROCESS DESIGN CAPACITY</th>
<th>C. Process Total Number of Units</th>
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...
9. Description of Hazardous Wastes - Enter information in the Sections on Form Page 5

A. EPA HAZARDOUS WASTE NUMBER - Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR Part 261, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY - For each listed waste entered in Item 9.A, estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in Item 9.A, estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE - For each quantity entered in Item 9.B, enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

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<th>ENGLISH UNIT OF MEASURE</th>
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<tr>
<td>TONS</td>
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<td>METRIC TONS</td>
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</tr>
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</table>

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure, taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each listed hazardous waste entered in Item 9.A, select the code(s) from the list of process codes contained in Items 7.A and 8.A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all listed hazardous wastes.
   For non-listed waste: For each characteristic or toxic contaminant entered in Item 9.A, select the code(s) from the list of process codes contained in Items 7.A and 8.A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:
1. Enter the first two as described above.
2. Enter "000" in the extreme right box of Item 9.D(1).
3. Use additional sheet, enter line number from previous sheet, and enter additional code(s) in Item 9.E.

2. PROCESS DESCRIPTION: If code is not listed for a process that will be used, describe the process in Item 9.D(2) or in Item 9.E(2).

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in Item 9.A. On the same line complete Items 9.B, 9.C, and 9.D by estimating the total annual quantity of the waste and describing all the processes to be used to store, treat, and/or dispose of the waste.
2. In Item 9.A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In Item 9.D.2 on that line enter “included with above” and make no other entries on that line.
3. Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING Item 9 (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 800 pounds per year of chrome shavings from leather tanning and finishing operations. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

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Page 4 of 6
### 9. Description of Hazardous Wastes (Continued)

Use additional sheet(s) as necessary; number pages as 5a, etc.

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### 10. Map
Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

### 11. Facility Drawing
All existing facilities must include a scale drawing of the facility (see instructions for more detail).

### 12. Photographs
All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas (see instructions for more detail).

### 13. Comments
See attached narrative from previous Part A Form (Section XII)
8. PROCESS—CODES AND DESIGN CAPACITIES (continued)

The Waste Isolation Pilot Plant (WIPP) geologic repository is defined as a “miscellaneous unit” under 40 CFR §260.10. “Miscellaneous unit” means a hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, waste pile, land treatment unit, landfill, incinerator, containment building, boiler, industrial furnace, or underground injection well with appropriate technical standards under 40 CFR Part 146, corrective action management unit, or unit eligible for research, development, and demonstration permit under 40 CFR §270.65. The WIPP is a geologic repository designed for the disposal of defense-generated transuranic (TRU) waste. Some of the TRU wastes disposed of at the WIPP contain hazardous wastes as co-contaminants. More than half the waste to be disposed of at the WIPP also meets the definition of debris waste. The debris categories include manufactured goods, biological materials, and naturally occurring geological materials. Approximately 120,000 cubic meters (m³) of the 175,600 m³ of WIPP wastes is categorized as debris waste. The geologic repository has been divided into ten discrete hazardous waste management units (HWMU) which are being permitted under 40 CFR Part 264, Subpart X.

During the Disposal Phase of the facility, which is expected to last 25 years, the total amount of waste received from off-site generators and any derived waste will be limited to 175,600 m³ of TRU waste of which up to 7,080 m³ may be remote-handled (RH) TRU mixed waste. For purposes of this application, all TRU waste is managed as though it were mixed.

The process design capacity for the miscellaneous unit (composed of ten underground HWMUs in the geologic repository) shown in Section 8 B, is for the maximum amount of waste that may be received from off-site generators plus the maximum expected amount of derived wastes that may be generated at the WIPP facility. In addition, two HWMUs have been designated as container storage units (S01) in Section 8 B. One is inside the Waste Handling Building (WHB) and consists of the contact-handled (CH) bay, waste shaft conveyance loading room, waste shaft conveyance entry room, RH bay, cask unloading room, hot cell, transfer cell, and facility cask loading room. This HWMU will be used for waste receipt, handling, and storage (including storage of derived waste) prior to emplacement in the underground geologic repository. No treatment or disposal will occur in this S01 HWMU. The capacity of this S01 unit for storage is 194.1 m³, based on 36 ten-drum overpacks on 18 facility pallets, four CH Packages at the TRUDOCKs, one standard waste box of derived waste, two loaded casks and one 55-gallon drum of derived waste in the RH Bay, one loaded cask in the Cask Unloading Room, 13 55-gallon drums in the Hot Cell, one canister in the Transfer Cell and one canister in the Facility Cask Unloading Room. The second S01 HWMU is the parking area outside the WHB where the Contact- and Remote-Handled Package trailers and the road cask trailers will be parked awaiting waste handling operations. The capacity of this unit is 50 Contact-Handled Packages and twelve Remote-Handled Packages with a combined volume of 242 m³. The HWMUs are shown in Figures B3-2, B3-3, and B3-4.

During the ten year period of the permit, up to 148,500 m³ of CH TRU mixed waste could be emplaced in Panels 1 to 8 and up to 2,635 m³ of RH TRU mixed waste could be emplaced in Panels 4 to 8. Panels 9 and 10 will be constructed under the initial term of this permit. These latter areas will not receive waste for disposal under this permit.
RCRA PART A APPLICATION CERTIFICATION

The U.S. Department of Energy (DOE), through its Carlsbad Field Office, has signed as “owner and operator,” and Washington TRU Solutions LLC, the Management and Operating Contractor (MOC), has signed this application for the permitted facility as “co-operator.”

The DOE has determined that dual signatures best reflect the actual apportionment of Resource Conservation and Recovery Act (RCRA) responsibilities as follows:

The DOE’s RCRA responsibilities are for policy, programmatic directives, funding and scheduling decisions, Waste Isolation Pilot Plant (WIPP) requirements of DOE generator sites, auditing, and oversight of all other parties engaged in work at the WIPP, as well as general oversight.

The MOC’s RCRA responsibilities are for certain day-to-day operations (in accordance with general directions given by the DOE and in the Management and Operating Contract as part of its general oversight responsibility), including, but not limited to, the following: certain waste handling, monitoring, record keeping, certain data collection, reporting, technical advice, and contingency planning.

For purposes of the certification required by Title 20 of the New Mexico Administrative Code, Chapter 4, Part 1 (20.4.1 NMAC), Subpart IX, §270.11(d), the DOE’s and the MOC’s representatives certify, under penalty of law that this document and all attachments were prepared under their direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on their inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of their knowledge and belief, true, accurate, and complete for their respective areas of responsibility. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner and Operator Signature: 
Original signed by Jose R. Franco
Title: Manager, Carlsbad Field Office
for: U.S. Department of Energy
Date: 6-25-12

Co-Operator Signature: 
Original signed by Farok Sharif
Title: General Project Manager
for: Washington TRU Solutions LLC
Date: 6-25-12
APPENDIX B1
OTHER ENVIRONMENTAL PERMITS
### Active Environmental Permits and Approvals for the Waste Isolation Pilot Plant as of June 25, 2012 March 1, 2010

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<td>Right-of-Way for Water Pipeline</td>
<td>NM053809</td>
<td>08/17/83 Transferred 05/15/06 to City of Carlsbad</td>
<td>In Perpetuity</td>
<td>Inactive (city of Carlsbad Double Eagle is the owner of the pipeline)</td>
</tr>
<tr>
<td>2. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for the North Access Road</td>
<td>NM055676</td>
<td>08/24/83</td>
<td>None</td>
<td>In Perpetuity</td>
</tr>
<tr>
<td>4. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for Dosimetry and Aerosol Sampling Sites</td>
<td>NM063136</td>
<td>07/31/86 07/31/12</td>
<td>12/31/40</td>
<td>Active</td>
</tr>
<tr>
<td>5. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for Seven Subsidence Monuments</td>
<td>NM065801</td>
<td>11/07/86</td>
<td>None</td>
<td>Active</td>
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<tr>
<td>6. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for Aerosol Sampling Site</td>
<td>NM077921</td>
<td>08/18/89</td>
<td>08/18/19</td>
<td>Active</td>
</tr>
<tr>
<td>8. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for telephone cable (Value Telecom of NM LLC)</td>
<td>NM064092</td>
<td>09/04/11</td>
<td>09/04/11</td>
<td>Renewal In Process</td>
</tr>
<tr>
<td>9. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for SPS 115 KV Powerline (Southwestern Public Service)</td>
<td>NM043203</td>
<td>10/19/81</td>
<td>10/19/11 12/31/40</td>
<td>Active</td>
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<td>Granting Agency</td>
<td>Type of Permit</td>
<td>Permit/Right of Way Number</td>
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<tr>
<td>11. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for Duval telephone line</td>
<td>NM060174</td>
<td>11/06/96 03/08/85</td>
<td>03/08/15 03/08/35</td>
<td>Active</td>
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<tr>
<td>12. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for groundwater monitor wells/pads Wells AEC-7 &amp; AEC-8</td>
<td>NM108365</td>
<td>08/30/02</td>
<td>08/30/32</td>
<td>Active</td>
</tr>
<tr>
<td>13. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for ERDA-6</td>
<td>NM108365</td>
<td>08/30/02</td>
<td>08/30/32</td>
<td>Active</td>
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<tr>
<td>14. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for Well C-2756 (P-18)</td>
<td>NM108365</td>
<td>08/30/02</td>
<td>08/30/32</td>
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<tr>
<td>17. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for Wells C-2725 (H-4A), C-2775 (H-4B), &amp; C-2776 (H-4C)</td>
<td>NM-6-5 Cooperative Agreement</td>
<td>04/27/78</td>
<td>None</td>
<td>Active</td>
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<tr>
<td>18. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for Monitoring Wells C-2723 (WIPP-25), C-2724 (WIPP-26), C-2722 (WIPP-27), C-2636 (WIPP-28), C-2743 (WIPP-29), &amp; C-2727 (WIPP-30)</td>
<td>NM-6-5 Cooperative Agreement</td>
<td>076/14/78</td>
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<td>19. Department of the Interior, Bureau of Land Management</td>
<td>Right-of-Way for Aerosol Sampling Sites</td>
<td>NM77924</td>
<td>10/03/89</td>
<td>08/18/19</td>
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<tr>
<td>20. New Mexico State Land Office Commissioner of Public Lands</td>
<td>Right-of-Way easement for accessing state trust lands in Eddy &amp; Lea Counties</td>
<td>RW-25430</td>
<td>09/28/04</td>
<td>09/28/14</td>
<td>Active</td>
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<td>21. Department of Interior, Bureau of Land Management</td>
<td>Right of Way for Valor Telecom</td>
<td>NM113339</td>
<td>08/09/05</td>
<td>(Valor Telecom Inc)</td>
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<tr>
<td>2218. Department of Interior, Bureau of Land Management</td>
<td>Right of Way for South Access Road Fence</td>
<td>NM094304</td>
<td>03/15/95</td>
<td>In Perpetuity</td>
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<td>2319. New Mexico State Land Office Commissioner of Public Lands</td>
<td>Right-of-Way for High Volume Air Sampler</td>
<td>RW-22789</td>
<td>10/03/85</td>
<td>10/03/20</td>
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<td>2420. New Mexico Environment Department Groundwater Quality Bureau</td>
<td>Discharge Permit</td>
<td>DP-831</td>
<td>09/08</td>
<td>09/09/13</td>
<td>Active</td>
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<td>2521. New Mexico Environment Department Air Quality Bureau</td>
<td>Operating Permit for two backup diesel generators</td>
<td>310-M-2</td>
<td>12/07/93</td>
<td>None</td>
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<tr>
<td>2622. New Mexico Environment Department UST Petroleum Storage Tank Bureau</td>
<td>Discharge Permit</td>
<td>NMED11811</td>
<td>07/01/02</td>
<td>06/30/03 (2003 registration submitted 6/18/02)</td>
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<tr>
<td>2723. New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well Exhaust Shaft Exploratory Borehole</td>
<td>C-2801</td>
<td>02/23/01</td>
<td>None</td>
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<tr>
<td>2824. New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well Exhaust Shaft Exploratory Borehole</td>
<td>C-2802</td>
<td>02/23/01</td>
<td>None</td>
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<td>2925. New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well Exhaust Shaft Exploratory Borehole</td>
<td>C-2803</td>
<td>02/23/01</td>
<td>None</td>
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<td>3026. New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well Exhaust Shaft Exploratory Borehole</td>
<td>C-2811</td>
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<td>3127. New Mexico Office of New Mexico State Engineer Office</td>
<td>Appropriation: WQSP-1 Well</td>
<td>C-2413</td>
<td>10/21/96</td>
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<td>3228. New Mexico Office of New Mexico State Engineer Office</td>
<td>Appropriation: WQSP-2 Well</td>
<td>C-2414</td>
<td>10/21/96</td>
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<td>3329. New Mexico Office of New Mexico State Engineer Office</td>
<td>Appropriation: WQSP-3 Well</td>
<td>C-2415</td>
<td>10/21/96</td>
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<td>3430. New Mexico Office of New Mexico State Engineer Office</td>
<td>Appropriation: WQSP-4 Well</td>
<td>C-2416</td>
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<td>3531. New Mexico Office of New Mexico State Engineer Office</td>
<td>Appropriation: WQSP-5 Well</td>
<td>C-2417</td>
<td>10/21/96</td>
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<td>3625 New Mexico Office of New Mexico State Engineer Office</td>
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<td>C-2418</td>
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<td>3834 New Mexico Office of New Mexico State Engineer Office</td>
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<td>3935 New Mexico Office of New Mexico State Engineer Office</td>
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<td>4036 New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well Cabin Baby</td>
<td>C-2664</td>
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<td>4237 New Mexico Office of New Mexico State Engineer Office</td>
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<td>C-2757</td>
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<td>C-2752</td>
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<td>4540 New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well H-1</td>
<td>C-2765</td>
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<td>4641 New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well H-2A</td>
<td>C-2762</td>
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<td>4843 New Mexico Office of New Mexico State Engineer Office</td>
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<td>4944 New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well H-2C</td>
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<td>11/06/00</td>
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<td>5146 New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well H-3B2</td>
<td>C-2760</td>
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<td>52 47. New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well H-3B3</td>
<td>C-2761</td>
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<td>54 49. New Mexico Office of New Mexico State Engineer Office</td>
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<td>56 51. New Mexico Office of New Mexico State Engineer Office</td>
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<td>57 52. New Mexico Office of New Mexico State Engineer Office</td>
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<td>58 53. New Mexico Office of New Mexico State Engineer Office</td>
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<td>63 58. New Mexico Office of New Mexico State Engineer Office</td>
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<td>64 59. New Mexico Office of New Mexico State Engineer Office</td>
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<td>C-2770</td>
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<td>66 61. New Mexico Office of New Mexico State Engineer Office</td>
<td>Monitoring Well H-8A</td>
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*Non DOE grantee is noted
P&A=Plugged and Abandoned
(APPENDIX B2
MAPS
Figure B2-1
General Location of the WIPP Facility
Figure B2-2
Planimetric Map-WIPP Facility Boundaries
**LEGEND**

- WIPP Site Boundary 10,240 Acres.
- U.S. DOE Right of Way Number NM-53809. For Waterline, 50 Feet Wide.
- The DOE had Agreed with the City of Carlsbad to Allow the Individuals to Tap this Line Located within the North Access Road Right of Way.
- Stock Water Tanks and Tap Lines Connected to the Main WIPP Waterline.
- Southwestern Public Service Company Right of Way Number NM-43203 for Power 60 Feet Wide.
- General Telephone of the Southwest Right of Way for Telephone Line, 30 Feet Wide, Located within the North access Road Right of Way.
- General Telephone of the Southwest Right of Way Number NM-60174 for Telephone Line, 30 Feet Wide, Located within the Railroad Right of Way.
- U.S. DOE Right of Way Number NM-55675 for North Access Road, 170 Feet Wide.
- El Paso Natural Gas company Right of Way for Gas Pipeline, 30 Feet Wide in Section 16, 50 Feet Wide Elsewhere.
- U.S. DOE Right of Way Number NM-55699 for Access Railroad, 150 Feet Wide.

**NOTES**

1. The Property Protection Area is a fenced area of approximately 35 acres. It contains all surface facilities with the exception of salt storage piles, parking lot, landfill and waste water stabilization lagoons.

2. Zone II overlies the maximum extent of the Area available for underground development.

3. WIPP site boundary (WSB) provides a one mile buffer area around the area available for underground development.

Figure B2-2a
Legend to Figure B2-2
Replace this page with the Topographic Map from the earlier version of the draft Permit
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Spatial View of the WIPP Facility
Figure B3-2
Repository Horizon
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Waste Handling Building - CH TRU Mixed Waste Container Storage and Surge Areas
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Westward View of CH Bay of the Waste Handling Building
Figure B4-7
Waste Shaft Conveyance - Loading Facility Pallet with CH Waste, Waste Handling Building
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RH Bay (Photo Taken July 2000)
Figure B4-9
Cask Unloading Room and Bridge Crane
Figure B4-10
Hot Cell
Figure B4-11
Transfer Cell
Figure B4-12
Facility Cask Loading Room and Facility Cask Rotating Device
ATTACHMENT G1
APPENDIX G

TECHNICAL SPECIFICATIONS

PANEL CLOSURE SYSTEM
WASTE ISOLATION PILOT PLANT
CARLSBAD, NEW MEXICO
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# ATTACHMENT G1

## APPENDIX G

## TECHNICAL SPECIFICATIONS

### PANEL CLOSURE SYSTEM

**WASTE ISOLATION PILOT PLANT**

**CARLSBAD, NEW MEXICO**

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DIVISION 1 - GENERAL REQUIREMENTS
Section 01010 - Summary of Work

Part 1 - General

1.1 Scope

This section includes:

- Scope of Work
- Definitions and Abbreviations
- Drawings
- Work by Others
- Contractors Use of Site
- Contractors Use of Facilities
- Work Sequence
- Work Plan
- Submittals

1.2 Scope of Work

The Contractor shall furnish all labor, materials, equipment and tools to perform operations in connection with the construction of two (2) panel closure systems for each panel, one of each to be installed in the air intake drift and the air exhaust drift of a waste-emplacement panel, as shown on the drawings and called for in these specifications.

Four (4) possible arrangements of the concrete barrier and isolation walls are shown on the attached Figure G1-1 “Plan Variations.”

- Concrete barrier without disturbed rock zone (DRZ) removal in combination with construction isolation wall (Sketch A).
- Concrete barrier without DRZ removal in combination with an explosion isolation wall (Sketch B).
- Concrete barrier with DRZ removal up through clay seam G and down through marker bed 139 (MB 139) in combination with a construction isolation wall (Sketch C).
- Concrete barrier with DRZ removal in combination with an explosion isolation wall (Sketch D) (This is the only approved configuration in this Permit).

The scope of work shall include but not be limited to the following units of work:

- Develop work plan, health and safety plan (HASP) and contractors quality control plan (CQCP)
- Prepare and submit all plans requiring approval
- Mobilize to site
• Coordinate construction with operations

• Perform the following for the air intake entry and the air exhaust entry.
  - Excavate the surface preparation for the explosion isolation wall
  - Construct the explosion isolation wall
  - Excavate the DRZ
  - Install the form work for the concrete barrier
  - Place concrete for the concrete barrier
  - Grout the interface of concrete barrier/back wall
  - Provide contact grouting along the contact surface (if required by the engineer)

• Clean up construction areas in underground and above ground

• Submit all required record documents

• Demobilize from site

1.3 Definitions and Abbreviations

Definitions

Contact-handled waste—Contact-handled defense transuranic (TRU) waste with a surface dose rate not to exceed 200 millirem per hour.

Concrete barrier—A barrier placed in the access drifts of a panel to restrict the mass flow rate of volatile organic compounds (VOC).

Concrete block—Concrete used for construction of either an explosion-isolation wall or a construction-isolation wall.

Construction-isolation wall—A wall immediately adjacent to the panel waste-emplacement area that is made of concrete block, with mortar or steel frame to isolate construction personnel from coming into contact with the waste.

Creep—Plastic deformation of salt under deviatoric stress.

Design migration limit—A mass flow rate that is at least 1 order of magnitude below the health-based levels for VOCs during the Waste Isolation Pilot Plant (WIPP) operational period.

Disturbed rock zone (DRZ)—A zone surrounding underground excavations where stress redistribution occurs with attendant dilation and fracturing.

Explosion-isolation wall—A concrete-block wall adjacent to the panel waste-emplacement area with mortar that can sustain the pressure and temperature transients of a methane explosion.

Health-based concentration level—The concentration level for a VOC in air that must not be exceeded at the point of compliance during the WIPP operational period.
Health-based migration limit—The mass flow rate of a VOC from all closed panels that results in the health-based concentration level at the point of compliance.

Hydration temperature—The temperature developed by a cementitious material due to the hydration of the cement.

Interface grouting—Grouting performed through grout boxes and pipe lines to fill the void at the concrete barrier/back-wall interface.

Methane explosion—A postulated deflagration caused by the buildup of methane gas to explosive levels.

Partial closure—The process of rendering a part of the underground repository inactive and closed according to approved facility closure plans. The partial-closure process is considered complete after partial-closure activities are performed in accordance with approved Resource Conservation and Recovery Act (RCRA) partial closure plans.

Point of compliance—The operating point of compliance for VOC levels at the WIPP, which is the 16-section land withdrawal boundary.

Remote-handled waste—Any of the various forms of high beta-gamma defense TRU waste requiring remote-handling and with a surface dose rate exceeding 200 millirem per hour.

Standard barrier—A concrete barrier emplaced into the panel-access drifts without major excavation of the surrounding rock.

Volatile Organic Compound (VOC)—Any VOC comprising the land-disposal-restricted indicator VOC constituents in the WIPP waste inventory.

Abbreviations/Acronyms

ACI American Concrete Institute
AISC American Institute for Steel Construction
ANSI American National Standards Institute
ASTM American Society for Testing and Materials
AWS American Welding Society
CFR Code of Federal Regulations
DOE U.S. Department of Energy
DRZ Disturbed rock zone
EPA U.S. Environmental Protection Agency
MB 139 Marker Bed 139
MSHA U.S. Mine Safety and Health Administration
NMAC New Mexico Administrative Code
NMED New Mexico Environment Department
MOC Management and Operating Contractor (Permit Section 1.5.3)
RCRA Resource Conservation and Recovery Act
SMC Salado Mass Concrete
USACE U.S. Army Corps of Engineers
WIPP Waste Isolation Pilot Plant
1.4 List of Drawings

The following drawings are made apart of this specification:

1. 762447-E1 Panel closure system, air intake and exhaust drifts, title sheet
2. 762447-E2 Panel closure system, underground waste-emplacement panel plan
3. 762447-E3 Panel closure system, air intake drift, construction details
4. 762447-E4 Panel closure system, air exhaust drift, construction details
5. 762447-E5 Panel closure system, construction and explosion walls, construction details
6. 762447-E6 Panel closure system, air intake and exhaust drifts, grouting and miscellaneous details

1.5 Work by Others

Survey

All survey work to locate the barriers and walls, control and confirm excavation, and complete the work will be supplied by the Permittees. All survey measurements for record purposes will also be performed/supplied by the Permittees. The Contractor shall be responsible for verifying the excavation dimensions to develop the form work to fit the excavation.

Excavation

The Permittees may elect to perform certain portions of the work, notably the excavation. The work performed by the Permittees will be defined prior to the contract.

1.6 Contractor's Use of Site

Site Conditions

The site is located near Carlsbad, New Mexico, as shown on the site location maps and the title sheet drawing. The underground arrangements and location of the WIPP waste-emplacement panels are shown on the plan view drawing. The work described above is to construct the concrete barriers in the air intake and exhaust drifts of one of the panels upon completion of the disposal phase of that panel. The waste-emplacement panels are located approximately 2,150 feet below the ground surface. The Contractor shall visit the site and become familiar with the site and site conditions prior to preparing his bid proposal.

Contractor's Use of Site

Areas at the ground surface will be designated for the Contractor's use in assembling and storing his equipment and materials. The Contractor shall utilize only those areas designated.

Limited space within the underground area will be designated for the Contractor's use for storage of material and setup of equipment.

Coordination of Contractor's Work

The Contractor is advised that on-going waste emplacement and excavation operations are being conducted throughout the period of construction of the panel barrier system. The
Contractor shall coordinate his construction operations with that of the waste emplacement and mining operations. All coordination shall be through the Engineer.

1.7 Contractor’s Use of Facilities

Existing facilities at the site which are available for use by the Contractor are:

- WIPP roadheader
- Waste shaft conveyance
- Salt skip hoist
- (1) 20 ton forklift
- (1) 40 ton forklift
- 460 volt AC, 3 phase power
- Water (underground, at waste shaft only) (above ground, at location designated by Engineer)

Additional information on these facilities is presented in Section 02010.

1.8 Work Sequence

Work Sequence shall be as shown on the drawings and directed by the Engineer.

1.9 Work Plan

The Contractor shall prepare and submit for approval by the Engineer a Work Plan fully describing his proposed construction operation. The work plan shall define all proposed equipment. The work plan shall also include the method of excavation, grouting, and pumping concrete. The work plan shall also contain such items as control of surface dust emissions. No work shall be performed prior to approval of the Work Plan.

1.10 Submittals

Submittals to the Permittees shall be in accordance with the Permittees’ Submittal Procedures and as required by the individual specifications. Approval by the Permittees shall not constitute approval by NMED. Any submittals that propose a change to the panel closure requirements of this Permit (e.g., changes in grout composition, detailed design, etc.) shall be submitted to NMED as required by 20.4.1.900 NMAC (incorporating 40 CFR §270.42).

Part 2 - Products

Not used.
Part 3 - Execution

Not Used.

End of Section
Section 01090 - Reference Standards

Part 1 - General

1.1 Scope

This section includes:

- Provision of Reference Standards at Site.

1.2 Quality Assurance

For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

Conform to reference by date of issue current on the date of the agreement between the Permittees and the contractor.

The Contractor shall obtain copy of the standards referenced in the individual specification sections. Maintain a copy at jobsite during submittals, planning, and progress of the specific work, until completion of work.

Should specified reference standards conflict with the contract documents, request clarification from the Engineer before proceeding.

1.3 Schedule of References

Various publications are referenced in other sections of the specifications to establish requirements for the work. These referenced are identified by documents number and title. The addresses of the organizations whose publications are referenced are listed below.

ACI
ACI International
P.O. Box 19150
Detroit, MI 48219-0150
Ph: 313-532-2600
Fax: 313-533-4747

AITC
American Institute of Timber Construction
7012 So. Revere Parkway, Suite 140
Englewood, CO 80112
Ph: 303-792-9559
Fax: 303-792-0669

AISC
American Institute of Steel Construction
One E. Wacker Dr., Suite 3100
Chicago, IL 60601-2001
Section 01400 - Contractor Quality Control

Part 1 - General

1.1 Scope

This section includes:

- Contractor Quality Control Plan (CQCP)
- Reference Standards
- Quality Assurance
- Tolerances
- Testing Services
- Inspection Services
- Submittals

1.2 Related Sections

- 01090 - Reference Standards
- 01600 - Material and Equipment
- 02222 - Excavation
- 02722 - Grouting
- 03100 - Concrete Formwork
- 03300 - Cast-in-Place Concrete
- 04100 - Mortar
- 04300 - Unit Masonry System

1.3 Contractor Quality Control Plan

The Contractor shall prepare and submit for approval by the Engineer, a Quality Control Plan, as described in Section 3.2. No work shall be performed prior to approval of the Contractor’s Quality Control Plan.

1.4 References and Standards

Refer to individual specification sections for standards referenced therein, and to Section 01090 - Reference Standards for general listing.

Standards referenced in this section are as follows:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM C1077</td>
<td>Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation</td>
</tr>
<tr>
<td>ASTM C1093</td>
<td>Practice for Accreditation of Testing Agencies for Unit Masonry</td>
</tr>
<tr>
<td>ASTM E329</td>
<td>Practice for Use in the Evaluation of Inspection and Testing Agencies as Used in Construction</td>
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</table>
1.5 Quality Assurance

- Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality
- Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship
- Perform work by persons qualified to produce required and specified quality
- Verify that field measurements are as indicated on shop drawings
- Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.6 Tolerances

Monitor excavation fabrication and installation tolerance control of work and products to produce acceptable work. Do not permit tolerances to accumulate.

Adjust products to appropriate dimensions; position before securing products in place.

1.7 Testing Services

Unless otherwise indicated by the Engineer, the Contractor shall employ an independent firm to perform the testing services and other services specified in the individual specification sections, and as required by the Engineer. Testing and source quality control may occur on or off the project site.

The testing laboratory shall comply with applicable sections of the reference standards and shall be authorized to operate in the state in which the project is located.

Testing equipment shall be calibrated at reasonable intervals with devices of an accuracy traceable to either the National Bureau of Standards or accepted values of natural physical constants.

1.8 Inspection Services

The Contractor shall employ an independent firm to perform inspection services as a supplement to the Contractor’s quality control as specified in the individual specification sections, and as required by the Engineer. Inspection may occur on or off the project site.

The inspection firm shall comply with applicable sections of the reference standards.
1.9 Submittals

The Contractor shall submit a Contractors’ Quality Control Plan as described herein.

Prior to start of work, the Contractor shall submit for approval, the testing laboratory name, address, telephone number and name of responsible officer of the firm. He shall also submit a copy of the testing laboratory compliance with the reference ASTM standards, and a copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards with memorandum of remedies of any deficiencies reported by the inspection.

Prior to start of work, the Contractor shall submit for approval the inspection firm name, address, telephone number and name of responsible officer of the firm. He shall also submit the personnel proposed to perform the required inspection, along with their individual qualifications and certifications (Example: Certified AWS Welding Inspector.)

Part 2 - Products

Not used.

Part 3 - Execution

3.1 General

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both on site and off site, and shall be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work on the job. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production.

3.2 Quality Control Plan

3.2.1 General

The Contractor shall furnish for review and approval by the Engineer, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract. The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. Construction will be permitted to begin only after acceptance of the CQC Plan.
3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both on site and off site, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.

- The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

- Description of the CQC System Manager’s responsibilities and delegation of authority to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities.

- Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, off site fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with the Permittees’ Submittal Procedures.

- Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be subject to approval by the Engineer.)

- Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

- Reporting procedures, including proposed reporting formats.

- A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon by the Engineer.

3.2.3 Acceptance of Plan

Acceptance of the Contractor’s plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Permittees reserve the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.
3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Engineer in writing of any proposed change. Proposed changes are subject to acceptance by the Engineer.

3.3 Quality Control Organization

3.3.1 General

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel supplemented by independent testing and inspection firms as required by the specifications, to ensure contract compliance. The Contractor shall provide a CQC organization which shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Engineer.

3.3.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, with a minimum of five years construction experience on construction similar to this contract. This CQC System Manager shall be on the site at all times during construction and will be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the System Manager’s absence. The requirements for the alternate will be the same as for the designated CQC System Manager.

3.3.3 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel or third party inspectors to assist the CQC System Manager. These individuals shall be employed by the prime Contractor; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience. These individuals shall have no other duties other than quality control.

3.3.4 Organizational Changes

The Contractor shall maintain his CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Engineer for acceptance at the Contractors’ expense.

3.4 Tests

3.4.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Engineer duplicate samples of test specimens for possible testing.
by the Engineer. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of an approved testing laboratory. The Contractor shall perform the following activities and record and provide the following data:

- Verify that testing procedures comply with contract requirements.
- Verify that facilities and testing equipment are available and comply with testing standards.
- Check test instrument calibration data against certified standards.
- Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- Results of all tests taken, both passing and failing tests, will be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. If approved by the Engineer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an off site or commercial test facility will be provided directly to the Engineer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.5 Testing Laboratory

The testing laboratory shall provide qualified personnel to perform specified sampling and testing of products in accordance with specified standards, and ascertain compliance of materials and mixes with requirements of Contract Documents. The testing laboratory shall promptly notify the Engineer and Contractor of any observed irregularities or non-conformance of Work or Products.

Reports indicating results of tests, and compliance (or noncompliance) with the contract documents will be submitted in accordance with the Permittees’ submittal procedures.

The Contractor shall cooperate with the independent testing firm, furnish samples, storage, safe access, and assistance by incidental labor as required. Testing by the independent firm does not relieve the contractor of the responsibility to perform the work to the contract requirements.

The laboratory may not:

- Release, revoke, alter, or enlarge on requirements of the contract
- Approve or accept any portion of the work
- Assume any duties of the Contractor.

The laboratory has no authority to stop the work.

3.6 Inspection Services

The inspection firm shall provide qualified personnel at site to supplement the Contractor’s Quality Control Program to perform specified inspection of Products in accordance with
specified standards. He shall ascertain compliance of materials and mixes with requirements of Contract Documents, and promptly notify the CQC System Manager, the Engineer and the Contractor of observed irregularities or non-conformance of Work or Products. The inspector does not have the authority to stop the work. The inspector shall refer such cases to the CQC System Manager who has the authority to stop work (see Section 3.2.2).

Reports indicating results of the inspection and compliance (or noncompliance) with the contract documents will be submitted in accordance with the Permittees’ submittal procedures.

The Contractor shall cooperate with the independent inspection firm, furnish samples, storage, safe access and assistance by incidental labor, as requested.

Inspection by the independent firm does not relieve the Contractor of the responsibility to perform the work to the contract requirements.

3.7 Completion Inspection

3.7.1 Pre-Final Inspection

At the completion of all work the CQC System Manager shall conduct an inspection of the work and develop a “punch list” of items which do not conform to the approved drawings and specifications. Once this is accomplished the Contractor shall notify the Engineer that the facility is complete and is ready for the “Prefinal” inspection. The Engineer will perform this inspection to verify that the facility is complete. A “Final Punch List” will be developed as a result of this inspection. The Contractor’s CQC System Manager shall ensure that all items on this list have been corrected and notify the Engineer so that a “Final” inspection can be scheduled. Any items noted on the “Final” inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph will be accomplished within the time slated for completion of the entire work.

3.7.2 Final Acceptance Inspection

The final acceptance inspection will be formally scheduled by the Engineer based upon notice from the Contractor. This notice will be given to the Engineer at least 14 days prior to the final acceptance inspection and must include the Contractor’s assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection.

3.8 Documentation

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- Contractor/subcontractor and their area of responsibility.
- Operating plant/equipment with hours worked, idle, or down for repair.
• Work performed each day, giving location, description, and by whom.

• Test and/or quality control activities performed with results and references to specifications/drawings requirements. List deficiencies noted along with corrective action.

• Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

• Submittals reviewed, with contract reference, by whom, and action taken.

• Off-site surveillance activities, including actions taken.

• Instructions given/received and conflicts in plans and/or specifications.

• Contractor’s verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Engineer daily. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.9 Notification of Noncompliance

The Engineer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

End of section.
Section 01600 - Material and Equipment

Part 1 - General

1.1 Scope

This section includes:

- Equipment
- Products
- Transportation and handling
- Storage and protection
- Substitutions

1.2 Related Sections

- 01010 - Summary of Work
- 01400 - Contractor Quality Control
- 02010 - Mobilization and Demobilization
- 02222 - Excavation
- 02722 - Grouting
- 03100 - Concrete Formwork
- 03300 - Cast-in-Place Concrete
- 04100 - Mortar
- 04300 - Unit Masonry System

1.3 Equipment

The Contractor shall specify his proposed equipment in the Work Plan. Power equipment for use underground shall be either electrical or diesel engine driven. All diesel engine equipment shall be certified for use underground.

1.4 Products

The Contractor shall specify in the Work Plan, or in subsequently required submittals the proposed products including, but not limited to the grout mix and its components, concrete mix and its components, mortar mix and its components, formwork, and masonry. The proposed products shall be supported by laboratory test results as required by the specifications. All products shall be subject to approval by the Engineer.

1.5 Transportation and Handling

- Transport and handle products in accordance with manufacturer’s instructions.
- Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
1.6 Storage and Protection

- Store and protect products in accordance with manufacturers’ instructions.
- Store with seals and labels intact and legible.
- Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- For exterior storage of fabricated products, place on sloped supports above ground.
- Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.7 Substitutions

1.7.1 Equipment Substitutions

The Contractor may substitute equipment for that proposed in the Work Plan subject to the Engineer’s approval. The Contractor shall demonstrate the need for the substitution, and the applicability of the proposed substitute equipment.

1.7.2 Product Substitutions

The Contractor may not substitute products after the proposed products have been approved by the Engineer unless he can demonstrate that the supplier/source of that product no longer exists in which case he shall submit alternate products with lab test results to the Engineer for approval. In the case that product is a component in a mix, the Contractor shall perform mix testing using that component and submit laboratory test results.

Part 2 - Products

Not used.

Part 3 - Execution

Not used.

End of section.
DIVISION 2 - SITE WORK
Section 02010 - Mobilization and Demobilization

Part 1 - General

1.1 Scope

This section includes:

- Mobilization of equipment and facilities to site
- Contractor use of site
- Use of existing facilities
- Demobilization of equipment and facilities
- Site cleanup

1.2 Related Sections

- 01010 - Summary of Work
- 01600 - Material and Equipment

Part 2 - Products

Not used.

Part 3 - Execution

3.1 Mobilization of Equipment and Facilities to Site

Upon authorization to proceed, the Contractor shall mobilize his equipment and facilities to the jobsite. Equipment and facilities shall be as specified, and as defined in the Contractor’s Work Plan. The Contractor shall erect the batch plant and assemble his equipment and materials in the areas designated by the Engineer. Facilities shall be located as near as practical to the existing utilities.

The Permittees will provide utilities (460 volt AC, 3 phase, and water) at designated locations. The Contractor shall be responsible for all hookups and tie-ins required for his operations.

The Contractor shall be responsible for providing his own office, storage, and sanitary facilities.

Areas will be designated for the Contractor’s use in the underground area in the vicinity of the panel closure system installation. These areas are limited.

3.2 Use of Site

The Contractor shall use only those areas specifically designated for his use by the Engineer. The Contractor shall limit his on-site travel to the specific routes required for performance of his work, and designated by the Engineer.
3.3 Use of Existing Facilities

Existing facilities at the site which are available for use by the Contractor are:

- WIPP roadheader
- Waste shaft conveyance
- Salt skip hoist
- (1) 20 ton forklift
- (1) 40-ton forklift
- 460 Volt AC, 3 phase power
- Water (in mine, at waste shaft only-above ground at location designated by the Engineer).

The Contractor shall arrange for use of the facilities with the Engineer and coordinate his actions/requirements with that of the ongoing operations.

Use of water in the underground will be restricted. No washout or cleanup will be permitted in the underground. Above ground washout/cleanup or equipment will be allowed in the areas designated by the Engineer.

The Contractor is cautioned to be aware of the physical dimensions of the waste conveyance and the air lock (see Figures G1-2 and G1-3, attached).

The Contractor shall be responsible for any damage incurred by the existing site facilities as a result of his operations. Any damage shall be reported immediately to the Engineer and repaired at the Contractor’s cost.

3.4 Demobilization of Equipment and Facilities

At completion of this work, the Contractor shall demobilize his equipment and facilities from the job site. The batch plant shall be disassembled and removed along with any unused material. All Contractor’s equipment and materials shall be removed from the mine and all disturbed areas restored. Utilities shall be removed to their connection points unless otherwise directed by the Engineer.

3.5 Site Cleanup

At conclusion of the work, the Contractor shall remove all trash, waste, debris, excess construction materials, and restore the affected areas to its prior condition, to the satisfaction of the Engineer. A final inspection of the areas will be conducted by the Engineer and the Contractor before final payment is approved.

End of section.
Section 02222 - Excavation

Part 1 - General

1.1 Scope

This section includes:

- Excavation for main concrete barrier
- Excavation for surface preparation and leveling of base areas for isolation walls
- Disposition of excavated materials.

1.2 Related Sections

- 01010 - Summary of Work
- 01600 - Material and Equipment
- 03100 - Concrete Form Work
- 04300 - Unit Masonry System.

1.3 Reference Documents


1.4 Field Measurements and Survey

All surveys required for performance of the work will be provided by the Permittees. To develop the concrete formwork to fit the excavation, the Contractor shall be responsible for verifying the excavation dimensions.

Part 2 - Products

Not used.

Part 3 - Execution

3.1 Excavating for Concrete Barrier

Excavation for the main concrete barrier shall be performed to the lines and grades shown on the drawings. Excavate the back a minimum of 1 inch to 3 inches beyond clay seam G, and the floor a minimum of 1 inch to 3 inches below the anhydride marker bed 139 (MB-139) to assure removal of the disturbed rock zone (DRZ). Excavation shall be performed utilizing mechanical means such as a cutting head on a suitable boom, by drilling boreholes and using an expansive agent to fragment the rock or other competent equipment or methods submitted to the Engineer for review and approval. The use of explosives is prohibited. The existing WIPP roadheader mining machine may also be available for use. The Contractor is to determine availability and coordinate proposed use of the roadheader with the Engineer. The existing roadheader is capable of excavating the back and the portions of the ribs above the floor level. However, it is not capable of excavating the portion below floor level.
The tolerances for the concrete barrier excavation shall be +6 inches, to 0 inch. In addition, the Contractor is to remove all loose or spalling rock from the excavation surface to provide a sound surface abutting the concrete barrier. The Contractor shall provide and install roof bolts for support as required for personnel protection and approved ground control plans.

3.2 Excavating for Surface Preparation and leveling of Base Areas for Isolation Walls

The Contractor shall excavate a 6-inch surface preparation around the entire perimeter of the isolation walls. The surface preparation in the floor shall be made level to produce a surface for placing the first course of block in the isolation walls. Tolerances for the leveled portion of the surface preparation are ±1 inch. Excavation may be performed by either mechanical or manual means. Use of explosives is prohibited.

3.3 Disposition of Excavated Materials

The Contractor shall remove all excavated materials from the panel-access drift where they are excavated. Excavated materials shall be removed from the mine via the salt skip to the surface, where they will be disposed on site at a location as directed by the Engineer.

3.4 Field Measurements and Survey

All survey required for performance of the work will be provided by the Permittees. The Contractor shall protect all survey control points, bench marks, etc., from damage by his operations. MOC will verify by survey that the Contractor has excavated to the required lines and grades. The Contractor shall be responsible for verifying the excavation dimensions to develop concrete formwork to fit the excavation. No form work or block work is to be erected until this survey is completed. The Contractor is to coordinate the survey work with his operations to assure against lost time. The Contractor shall notify the Engineer at least 24 hours prior to the time surveying is required.

End of section.
Section 02722 - Grouting

Part 1 - General

1.1 Scope

This section includes:

- Grouting of concrete barrier.

1.2 Related Sections

- 01010 - Summary of Work
- 01400 - Contractor Quality Control
- 01600 - Material and Equipment
- 03100 - Concrete Form Work
- 03300 - Cast-in-Place Concrete

1.3 References

- ASTM C1107 Standard Specification for Nonshrink Grout

1.4 Submittals for Review and Approval

Thirty days prior to the initiation of grouting, the Contractor shall submit to the Engineer for review and approval, the following:

- Type of grout proposed

- Product data:
  - Manufacturer’s specification and certified laboratory tests for the manufactured grout, if proposed
  - Certified laboratory tests for the salt-saturated grout, if proposed, using project-specific materials

- Proposed grouting method, including equipment and materials and construction sequence in Work Plan.

1.5 Submittals for Construction

Daily grouting report indicating the day, date, time of mixing and delivery, quantity of grout placed, water used, pressure required, problems encountered, action taken, quality control data, testing results, etc., no later than 24 hours following construction.
Part 2 - Products

2.1 Grout Materials

Grout used for grouting in connection with fresh water/plain cement concrete shall be nonshrink, cement-based grout, Five Star 110 as manufactured by Five Star Products Inc., 425 Stillson Road, Fairfield, Connecticut 06430 or approved equal. Mixing and installation shall be in accordance with the manufacturer’s recommendations.

As an alternate to the above grout, in connection with the Salado Mass concrete mix, the Contractor shall use, subject to the approval of the Engineer, a salt saturated grout. The following formulation is suggested to the Contractor as an initiation point for selection of the grout mix. Salt saturated grout strength shall be 4500 psi at 28 days.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percent of total Mass (wt.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class H Cement</td>
<td>48.3</td>
</tr>
<tr>
<td>Class C Fly Ash</td>
<td>16.2</td>
</tr>
<tr>
<td>Cal Seal (Plaster - from Halliburton)</td>
<td>5.7</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>7.9</td>
</tr>
<tr>
<td>Dispersant</td>
<td>0.78</td>
</tr>
<tr>
<td>Defoamer</td>
<td>0.02</td>
</tr>
<tr>
<td>Water</td>
<td>21.1</td>
</tr>
</tbody>
</table>

Water for mixing shall be of potable quality, free from injurious amounts of oil, acid, alkali, salt, or organic matter, sediments, or other deleterious substances, as specified for concrete, Section 03300-2.3.

2.2 Product Data

If the Contractor proposes to utilize a manufactured nonshrink cement-based grout, he shall submit complete manufacturer’s specifications for the product, along with certified laboratory test results of the material.

If the Contractor proposes to utilize the salt-saturated grout in connection with the Salado Mass concrete mix, he shall submit manufacturer’s/supplier’s specifications for the component materials, and certified laboratory test results for the resultant mix.

Part 3 - Execution

3.1 General

The Contractor shall furnish all labor material, equipment, and tools to perform all operations in connection with the grouting.

Grout delivery and return lines for interface grouting shall be installed in the form work or in the area to be grouted to provide uniform distribution of the grout as shown on the drawings.
exact location of the boxes and lines shall be determined in the field. Additional grout delivery and return lines and boxes may be required by the Engineer.

Pumps shall be positive displacement piston type pump designed for grouting service capable of operating at a discharge pressure of 100 psi. The Contractor shall supply a standby pump to be utilized in the event of a breakdown of the primary unit.

Mixers shall be high velocity “colloidal” type with a rotary speed of 1,200 to 1,500 rpm. Grout shall be mixed to a pumpable mix as per the manufacturer’s recommendations.

Mixing water shall be accurately metered to control the consistency of the grout.

The Contractor shall provide all necessary valves, gages, and pressure hoses.

Water for mixing is available at the waste shaft. The Contractor is cautioned that no free water discharges or spills are permitted in the mine. All cleanup and washout operations shall be performed at the ground surface.

Potential spill areas in the underground shall be identified by the Contractor in the work plan. The Contractor shall provide adequate containment for potential spills. Isolation measures shall include, but are not limited to, lining with a membrane material (PVC, hypalon, HDPE), draped curtains (polyethylene, PVC, etc.), corrugated sheet metal protective walls or a combination of these and other measures.

If salt-saturated grout is selected for use, the Contractor shall make provisions to accurately proportion the components. Proportioning shall be by weighing. Sufficient quantities of dry components shall be developed prior to initiation of the grouting to perform the work so as not to incur delays during the mixing/placing sequence.

3.2 Interface Grouting of Concrete Barrier

After each cell of the concrete barrier has been allowed to cure for a period of seven days, or as directed by the Engineer, the Contractor shall interface grout the remaining space between the back wall and the top surface of the concrete barrier.

Each cell of the concrete barrier shall be grouted before the next adjacent cell is formed and concrete placed. Grout delivery and return lines shall be installed with the form work as shown and called for on the drawings, or as directed by the Engineer.

The placing of grout, unless otherwise directed by the Engineer shall be continuous until completed. Grouting shall progress from lower to higher grout pipes. Grouting shall proceed through a single delivery line until grout escapes from the adjacent return line. The Contractor shall then secure these lines and move to the next adjacent set of delivery and return lines. Pressure shall be adjusted to adequately deliver the grout to the forms, as witnessed by grout in the return line.

The grouting operation shall be conducted in a manner such that it does not affect the stability of the concrete barrier structure.
3.3 Contact Grouting

After completion of interface grouting if directed by the Engineer, the Contractor shall contact grout to fill any remaining voids at the concrete barrier/back wall interface. Contact grouting includes all operations to drill, clean, and grout holes installed in the concrete barrier.

The Contractor shall drill and grout the interface zone to the main concrete barrier as directed by the Engineer.

The location, direction, and depth of each grout hole shall be as directed by the Engineer. The order in which the holes are drilled and the manner in which each hole is drilled and grouted, the proportions of the water used in the grout, the time of grouting, the pressures used in grouting, and all other details of the grouting operations shall be as directed by the Engineer.

Wherever required, contact grouting will entail drilling the hole to a limited depth, installing a packer, and performing grouting.

3.3.1 Drilling

The holes shall be drilled with rotary-type drills. Drilling grout holes with percussion-type drills will not be permitted except as approved by the Engineer.

The requirements as to location, depth, spacing, and direction of the holes shall be as directed by the Engineer.

The minimum diameter shall be approximately 1 1/2 inches.

When the drilling of each hole or stage of has been completed, compressed air will be used to flush out drill cuttings. The hole shall then be temporarily capped or otherwise suitably protected to prevent the hole from becoming clogged or obstructed until it is grouted.

3.3.2 Materials for Contact Grouting

Standard weight black steel pipe conforming to ASTM A-53 shall be set in the concrete in the locations as directed by the Engineer. All pipe and fittings shall be furnished by the Contractor.

The size of the grout pipe for each hole and the depth of the holes for setting pipe for grouting shall be as directed by the Engineer. Care shall be taken to avoid clogging or obstructing the pipes before being grouted, and any pipe that becomes clogged or obstructed from any cause shall be cleaned satisfactorily or replaced.

The packers shall be furnished by the Contractor and shall consist of expansible tubes or rings of rubber, leather, or other suitable material attached to the end of the grout supply pipe. The packers shall be designed so that they can be expanded to seal the drill hole at the specified locations and when expanded shall be capable of withstanding without leakage, for a period of 5 minutes, air pressure equal to the maximum grout pressures to be used.
3.3.3 Grouting Procedures

Different grouting pressures will be required for grouting different sections of the grout holes. Pressures as high as necessary to deliver the grout but which, as determined by trial, are safe against concrete displacement shall be used in the grouting.

If, during the grouting of any hole, grout is found to flow from adjacent grout holes or connections in sufficient quantity to interfere seriously with the grouting operation or to cause appreciable loss of grout, such grout holes and connections shall be capped temporarily. Where such capping is not essential, inaugurated holes shall be left open to facilitate the escape of air as the grout is forced into other holes. Before the grout has set, the grout pump shall be connected to adjacent capped holes and to other holes from which grout flow was observed, and grouting of all holes shall be completed. If during the grouting of any hole, grout is found to flow from points in the barrier, any parts of the concrete structure, or other locations, such flows or leaks shall be plugged or caulked by the Contractor as directed by the Engineer.

As a safeguard against concrete displacement, excessive grout travel, or while grout leaks are being caulked, the Engineer may require the reduction of the pumping pressure, intermittent pumping, or the discontinuance of pumping.

The consistency of the grout mix shall be varied, as directed by the Engineer, depending on the conditions encountered. Where the grout hole or connection continues to take a large amount of grout after the mix has been thickened, the Engineer may require that pumping be done intermittently, waiting up to 8 hours between pumping periods to allow grout in the barrier to set. After the grouting is complete, the pressure shall be maintained by means of stopcocks, or other suitable valve that it will be retained in the holes or connections being grouted.

3.4 Cleanup

No clean-up or washing of equipment with water is allowed in the underground. No free water spills are permitted. All clean out or wash out requiring water will be performed above ground at the location approved by the Engineer. See note above regarding potential spill areas in Section 3.1 - General.

3.5 Quality Control

The Contractor shall provide a third-party quality control inspector at the site throughout the grout placement operations. The inspector shall determine that the grout mix is properly proportioned and properly mixed to the approved consistency. The inspector shall sample and make one set of grout cubes for compression testing for every 50 cubic feet of grout placed, or fraction thereof, for each day of grout placement.

End of section.
DIVISION 3 - CONCRETE
Section 03100 - Concrete Formwork

Part 1 - General

1.1 Scope

This section includes:

1. Formwork for cast-in-place concrete with shoring, bracing, and anchorage
2. Accessory items, grout pipes, concrete delivery pipes.

1.2 Related Sections

- 01010 - Summary of Work
- 01400 - Contractor Quality Control
- 01600 - Material and Equipment
- 02722 - Grouting
- 03300 - Cast-in-Place Concrete
- 04300 - Unit Masonry System

1.3 References

15. ACI 301 Specifications for Structural Concrete for Buildings
16. ACI 318 Building Code Requirements for Reinforced Concrete
17. ACI 347 Recommended Practice for Concrete Formwork
18. ASTM A-36 Standard Specification for Structural Steel
20. ASTM A-325 High Strength, Structural Bolts
21. ASTM A-615 Standard Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcements
23. AWS A3.0 Welding Terms and Definitions
24. AWS A5.1 Specification for Mild Steel Covered Arc Welding Electrodes
25. AWS D1.1 Structural Welding Code-Steel

1.4 Submittals

The Contractor shall submit the following 30 days prior to initiation of work at site.

Shop detail drawings with appropriate calculations to support the adequacy or the formwork.
1. Mill test certification of materials utilized in construction of the forms.

2. Details of installation contained in the Contractor’s Work Plan.

1.5 Quality Assurance

3. Design and detail the formwork under direct supervision of a professional structural Engineer experienced in design of this work and licensed in the state of New Mexico.

4. Perform work in accordance with ACI 301, 318, and 347, AISC and AWS standards. Maintain one copy of all standards at site.

5. Perform all fabrication in accordance with AISC manual of steel construction.

6. Perform all welding in accordance with AWS D1.1 structural welding code.

7. Perform all bolting in accordance with AISC specification for structural joints using ASTM A325 or A490 bolts.

Part 2 - Products

2.1 Form Materials

8. Forms for the concrete barrier shall be constructed of ASTM A-36 steel.


10. Form spacers shall be ASTM A-36 round stock.

11. Bolts shall be ASTM A325 high strength structural bolts.

12. Grout pipes shall be ASTM A-53 standard weight pipe or flex conduit as shown on the drawings.

13. Rock anchors shall develop strength equal to or greater than ASTM A-36 round stock.

14. Welding electrodes shall conform to AWS A5.1.

Part 3 - Execution

3.1 General

15. The Contractor shall furnish all labor material equipment and tools to perform all operations in connection with the design, detail, fabrication and erection of the formwork and the fabrication and installation of grout pipes for the main concrete barrier.

16. The Contractor may, at his option submit an alternate design or modify the design shown on the drawings, subject to the approval of the Engineer. All designs must be supported by design calculations stamped and sealed by a registered professional engineer.
The Contractor shall furnish, fabricate and install all grout pipes and grout boxes for both the concrete barrier and the isolation walls.

3.2 Shop Drawings

The Contractor shall design and detail all formwork for the concrete barrier, complete with any required bracing and shoring for the concrete barrier as shown on the drawings, in accordance with ACI 318 and 347 and the AISC manual of steel construction.

The details shall incorporate provision for adjusting and modifying the formwork to suit the excavation. Excavation tolerances are given in Section 02222 Excavation.

The Contractor shall be responsible for verifying the excavation dimensions to develop the concrete formwork to fit the excavation.

Prior to fabrication, the Contractor shall submit shop drawings complete with supporting calculations for review/approval by the Engineer 30 days prior to initiating work. The contractor shall incorporate all Engineer’s comments, revisions, resolve all questions and resubmit drawings for final approval prior to proceeding with fabrication.

3.3 Fabrication

The Contractor shall fabricate all formwork and ancillary items in accordance with the latest edition of the AISC Manual of Steel Construction and the approved detail drawings.

Formwork shall contain all inserts for grouting and pumping concrete. Sufficient valving shall be provided on inserts to allow shut off of concrete and grout to prevent back flow through the formwork.

All welding shall be in accordance with AWS D1.1 structural welding code including operator and procedure certifications. Elements shall be welded using E-7018 low hydrogen electrodes. Panels shall be piece marked to correspond to the erection drawing(s) and sequence at fabrication.

3.4 Installation

3.4.1 Grout Pipes

The Contractor shall furnish, fabricate, and install all grout pipes and boxes as approved by the Engineer. Grout pipes and boxes shall be attached to the back surface using masonry anchors as shown on the drawings or other approved methods. Grout pipes shall be connected to the inserts installed in the permanent forms and securely fastened to the formwork. All grout pipes will be blown out with compressed air after installation and prior to closure of the formwork to assure they are clean and free from debris or obstructions. Grout pipes shall then be temporarily capped to prevent entry of foreign matter until ready for grouting. The Contractor shall apply masking tape to the grout box openings to prevent concrete infiltration during concrete placement.
3.4.2 Formwork

The steel formwork for the concrete barrier is to remain in place at completion of each segment of the barrier, therefore all formwork shall be free from oil, grease, rust, dirt, mud or other material that would prevent bonding by the concrete. Forms will not be oiled or receive application of release agent.

The Contractor shall install formwork at the locations shown on the drawings to the lines and grades shown. Forms are to be mortar tight. The Contractor shall adjust the formwork to suit the contour of the excavation. Rock may be trimmed or chipped to suit where interferences are encountered. Where overexcavation has occurred in excess of the designed-in adjustability of the formwork, modifications shall be proposed to the Engineer for his approval prior to installation. Installation of the formwork shall be reviewed and approved by the Engineer prior to proceeding with concrete installation.

The Contractor shall provide a sealant or gasket material on mating surfaces to provide mortar-tite joints.

3.5 Quality Control

The Contractor shall arrange for and contract with an approved third party inspector to provide inspection/testing services for the fabrication and installation of the formwork and ancillary items, as required by the QA/QC plan.

The Contractor shall furnish certified mill test reports for all materials utilized in the fabrication. All welding shall be in accordance with AWS D1.1 structural welding code. The Contractor shall furnish welding operator and procedure certifications for all operators and procedures utilized.

Fabricated components shall be inspected for dimension and overall quality. Welds shall be inspected by an AWS certified welding inspector.

The inspector shall visually inspect the installation for fit-up and dimensionally for location.

3.6 Handling, Shipping, Storage

The Contractor shall handle, ship, and store fabricated components with care to avoid damage. Stored components shall be placed on timbers or pallets off the ground to keep the units clean. Components shall be tarped while in outdoor storage. Components that become spattered or contaminated with mud will be thoroughly cleaned before delivering to the mine for installation. Damaged components will be rejected by the inspector and replaced by the contractor at his cost.

End of section.
Section 03300 - Cast-in-Place Concrete

Part 1 - General

1.1 Scope

This section includes:

- Cast-in-place concrete for concrete barrier
- Concrete mix design.

1.2 Related Sections

- 01010 - Summary of Work
- 01400 - Contractor Quality Control
- 01600 - Material and Equipment
- 02222 - Excavation
- 02722 - Grouting
- 03100 - Concrete Formwork

1.3 References

- ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavy Weight, and Mass Concrete
- ACI 318.1 Building Code Requirements for Structural Plain Concrete
- ACI 304R Guide for Measuring, Mixing, Transporting, and Placing Concrete
- ASTM C 33 Standard Specification for Concrete Aggregates
- ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- ASTM C 94 Standard Specification for Ready-Mixed Concrete
- ASTM C 143 Standard Specification for Slump of Portland Cement Concrete
- ASTM C 150 Standard Specification for Portland Cement
- ASTM C 403 Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance
- ASTM C 618 Fly ash and Raw or Calcined Natural Pozzolan for Use as an Admixture in Portland Cement Concrete
1.4 Submittals for Review/Approval

The Contractor shall submit the following for approval 30 days prior to initiating any work at the site.

Specific sources of supply and detailed product information for each component of the concrete mix is specified in Section 2.6 below.

Product Data - Laboratory test data and trial mix data for the proposed concrete to be utilized for the concrete barrier.

Proposed method of installation, including equipment and materials in work plan.

1.5 Submittals at Completion

Laboratory test data developed during the installation of the concrete barrier.

1.6 Quality Assurance

Perform work in accordance with the Contractor’s Quality Control Plan and referenced ACI and ASTM standards.
Acquire cement, aggregate and component materials from the same source throughout the work.

### Part 2 - Products

#### 2.1 Cement

Portland cement shall conform to API 10 Class H oil well cements. The source of the cement to be used shall be indicated and manufacturer’s certification that the cement complies to the applicable standard shall be provided with each shipment.

#### 2.2 Aggregates

Aggregates shall be quartz aggregates conforming to the requirements of ASTM C33.

Fine aggregate shall meet the requirements of ASTM C33 having a fineness modules in the range of 2.80 to 3.00.

Coarse aggregate maximum size shall be 1 ½ inches and shall be clean, cubical, angular, 100 percent crushed aggregate without flat or elongated particles.

The source of the aggregate is to be indicated and test reports certifying that the aggregate complies with the applicable standard are to be submitted for approval with the trial mix data.

#### 2.3 Water

Water used in mixing concrete shall be of potable quality, free of injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.

Water shall conform to the provisions in ASTM C94, and in addition, shall conform to the following:

- pH not less 6.0 or greater than 8.0
- Carbonates and/or bicarbonates of sodium and potassium: 1000 ppm maximum
- Chloride ions (Cl⁻): 250 ppm maximum
- Sulfate ions (SO₄⁻): 1000 ppm maximum
- Iron content: 0.3 ppm maximum
- Total solids: 2000 ppm maximum

When ice is used in concrete mix, the water used for making ice shall meet all of the above requirements.

The source of water is to be indicated and certified copies of test data from an approved laboratory confirming that the water to be used meets the above requirements shall be submitted for approval with the trial mix data.
2.4 Admixtures

Pozzolan shall conform to ASTM C618. Sampling and testing of pozzolans shall conform to ASTM C311. Approximately 5 percent by weight of pozzolan may be used to replace cement in the mixes when approved.

The source of any admixtures proposed are to be indicated and certified copies of test data from an approved laboratory shall be submitted for approval with the trial mix.

2.5 Concrete Mix Properties

The Contractor shall develop and proportion a Salado Mass Concrete mix for use in constructing the concrete barrier. Cement utilized in the mix shall be Class H. The Contractor shall demonstrate by trial mix that the proposed concrete meets the following properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-hr working time</td>
<td>Indicated by 8-inch slump (ASTM C 142) after 3-hr intermittent mixing. Max 10-inch slump at mixing.</td>
</tr>
<tr>
<td>Nonsegregating</td>
<td>Aggregates do not readily separated from cement paste during handling</td>
</tr>
<tr>
<td>Less than 25°F heat rise prior to placement</td>
<td>Difference between initial condition and temperature after 4 hr.</td>
</tr>
<tr>
<td>4,500 psi compressive strength (f’c)</td>
<td>At 28 days after casting (ASTM C39)</td>
</tr>
<tr>
<td>Volume stability</td>
<td>Length change between +0.05 percent and -0.02 percent (ASTM C 490)</td>
</tr>
<tr>
<td>Minimal entrained air</td>
<td>2 percent to 3 percent air</td>
</tr>
</tbody>
</table>

The Contractor shall provide certified copies of test data from an approved laboratory demonstrating compliance with the above target properties.

In addition to the target properties the Contractor shall provide certified test data for the trial mix for the following properties:

- Heat of hydration ASTM C-186
- Concrete Set ASTM C-403
- Thermal Diffusivity USACE CRD-C36
- Water Permeability USACE CRD-C43

2.6 Salado Mass Concrete

The Contractor shall utilize the Salado Mass concrete. The Contractor shall demonstrate that the Salado Mass concrete meets the target properties shown above. Recommended initial proportioning of the Salado Mass concrete is as follows:
Component | Percent of Total Mass
---|---
Class H Cement | 4.93
Chem Comp III | 2.85
Class F fly ash | 6.82
Fine aggregate | 33.58
Coarse aggregate | 43.02
Sodium chloride | 2.18
Defoaming agent | 0.15
Sodium citrate | 0.09
Water | 6.38

The Contractor shall prepare a trial mix and provide certified test data from an approved testing laboratory for slump, compressive strength, heat rise, heat of hydration, concrete set time, thermal diffusivity, and water permeability as indicated above for the plain concrete mix.

### Part 3 - Execution

#### 3.1 General

The Contractor shall provide all labor, material, equipment and tools necessary to develop, supply, mix, transport and place mass concrete in the forms as shown on the drawings and called for in these specifications.

The Contractor will be required to provide and erect on the site a batch plant, suitable to store, handle, weight and deliver the proposed concrete mix. The batch plant shall be certified to NRMCA standards. The batch plant shall be erected on site in the location as directed by the Engineer.

The Contractor shall batch, mix, and deliver to the underground, sufficient quantity of concrete to complete placement of concrete within one form section, as shown on the drawings. Once begun, placement of concrete in a section shall be continuous until completed. The time for concreting one section will not exceed ten hours.

It is expected that addition of water to the dry materials and mixing of the concrete will occur at the ground surface with transport of wet concrete to a pump at the underground level where it will be pumped into the forms.

The Contractor is to provide all transport vehicles or means to transfer the wet concrete from the mixer truck to the pump. It is expected that the Contractor will use the waste conveyance hoist to transfer from the ground surface to the mine level. The Contractor is to familiarize himself with the dimensions of the waste conveyance and the airlock in order to provide suitable transport vehicles. The Contractor is also to familiarize himself with the capacity and speed of the conveyance to allow transfer of sufficient concrete to sustain the continuing placement of concrete. (See Figures G1-2 and G1-3, attached).
The Contractor shall determine the horizontal distance to the entry where placement of the concrete barrier is to occur, and develop a route, with the approval of the Engineer for traffic flow within the underground.

Details of the logistics for handling the concrete shall be included in the Contractors’ Work Plan, and submitted to the Engineer for approval prior to start of work at the site.

Potential spill areas in the underground shall be identified by the Contractor in the Work Plan. The Contractor shall provide measures to contain and isolate any water from contact with the halite in these areas. Suitable containment isolation measures shall include but are not limited to, lining with a membrane material (PVC, hypalon, HDPE), draped curtains (polyethylene, PVC, etc.), corrugated sheet metal protective walls or a combination of these and other measures.

3.2 Pumping Concrete

The Contractor shall provide pumping equipment suitable for placing the concrete into the forms. The Contractor at a minimum, shall provide an operating and a spare pump, to be used in the event of breakdown of the primary unit. After transporting and prior to pumping the concrete shall be remixed to compensate for segregation of aggregate during transport. The Contractor shall indicate the equipment proposed for pumping (manufacturer, model, type, capacity, pressure and remixing at the point of delivery in the Work Plan).

Each batch of concrete shall be checked at the surface at the time of mixing and again at the point of transfer to the pump for slump and temperature, and shall conform to the following:

- Maximum slump at mixing - 10 inches
- Maximum slump at delivery to pump - 8 inches
- Maximum mix temperature at placement = 70F

Note: No water is to be added to the mix after the initial mixing and slump are determined.

The Contractor shall connect to the pipe ports fabricated into the forms for delivery of the concrete, beginning with the lowest ports first. Pumping shall continue until concrete is seen in the adjacent port at which time the delivery hose will be transferred to that port and the first port capped.

Pumping shall continue moving laterally then upward until the entire form is filled and the pour is completed.

3.3 Coordination of Work

The Contractor is to coordinate his work mixing, transporting, and placing the mass concrete with the on-going operations in the underground. Coordination of use of the facilities and existing equipment shall be through the Engineer.

3.4 Clean-Up

No clean up or washing of equipment with water will be allowed in the underground. No free water spills are permitted in the underground. All clean-out or wash-out requiring water will be performed above ground at the location approved by the Engineer.
3.5 Quality Control

The Contractor shall provide a third-party quality control inspector at the site throughout the concrete placement. The inspector shall be responsible for determining that the batch plant is proportioning the mix according to the approved proportions. The batch plant shall provide a print out of batch quantities for each truck delivered to the mine. The inspector shall also determine the slump for each batch as it is mixed and allow additional water to be added until the initial slump is achieved. No additional water is to be added after this time. Temperature will also be recorded at this time.

The inspector shall also determine the slump and temperature following the remixing when concrete is transferred to the pump. Concrete not meeting or exceeding the specification is to be rejected and removed from the underground.

Concrete test cylinders to determine unconfined compression strength shall be taken by the inspection at the delivery from remixer to the pump in the underground. Four (4) cylinders shall be made for each 50 cubic yards of concrete placed. Cylinders shall be sealed with polyethylene and taped and field cured at ambient temperatures in the mine adjacent to the concrete barrier area. Two (2) samples shall be tested at 7 days and the remaining two (2) at 28 days.

End of section.
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DIVISION 4 - MASONRY
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Section 04100 - Mortar

Part 1 - General

1.1 Scope

This section includes:

- Mortar for Isolation Wall Construction.

1.2 Related Sections

- 01010 - Summary of Work
- 01400 - Contractor Quality Control
- 01600 - Material and Equipment
- 04300 - Unit Masonry System

1.3 References

ASTM C91 Standard Specification for Masonry Cement
ASTM C144 Standard Specification for Aggregate for Masonry Mortar
ASTM C150 Standard Specification for Portland Cement
ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes
ASTM C270 Standard Specification for Mortar for Unit Masonry
ASTM C7805 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
ASTM C1142 Ready-Mixed Mortar for Unit Masonry
ASTM E447 Test Methods for Compressive Strength of Masonry Prisms

1.4 Submittals for Review and Approval

The Contractor shall submit for approval the following 30 days prior to the initiation of work at the site:

Design mix.

Certified laboratory tests for the proposed design mix, indicating conformance of mortar to property requirements of ASTM C270, and test and evaluation reports to ASTM C780.

1.5 Submittals at Completion

Certified laboratory test results for the construction testing of mortar mix.
1.6  Quality Assurance

Perform work in accordance with the Contractor’s Quality Control Plan and referenced ASTM standards. Acquire cement, aggregate, and component materials from the same source throughout the work.

1.7  Delivery Storage Handling

Maintain packaged materials clean, dry and protected against dampness, freezing and foreign matter.

Part 2 - Products

2.1  Mortar Mix

The Contractor shall provide mortar for Isolation Walls, which shall be in conformance with ASTM C270 type M, using the property specification (3,000 psi at 28 days).

Sand for mortar shall conform to ASTM C144.

Water used for mixing mortar shall be of potable quality, free of injurious amounts of oil, acid alkali, organic matter, sediments, or other deleterious substances, as specified for Concrete, Section 03300 2.3.

The supply of materials as defined in the design mix shall remain the same throughout the job.

Part 3 - Execution

3.1  General

The Contractor shall furnish all labor material equipment and tools to perform all operations in connection with supplying and mixing mortar for constructing the isolation walls.

The Contractor shall fully describe his proposed mortar mixing operation, including proposed equipment and materials in the Work Plan.

3.2  Mortar Mixing

Mortar shall be machine-mixed with sufficient water to achieve satisfactory workability. Maintain sand uniformly damp immediately before the mixing process. If water is lost by evaporation, retemper only within one and one half hours of mixing. Use mortar within two hours of mixing at ambient temperature of 85° in the mine.

3.3  Installation

The Contractor shall install mortar to the requirements of Section 04300 Unit Masonry System.
3.4 Field Quality Control

The Contractor shall provide a third party Quality Control Inspector to perform all sampling and testing to confirm that the mortar mix conforms to the proposed mix properties developed in the design mix.

Construction testing of mortar mix shall be in accordance with ASTM C780 for compression strength. Four (4) prism specimens shall be taken for each 50 cu. ft. of mortar or fraction thereof placed each day.

End of Section.
(This page intentionally blank)
Section 04300 - Unit Masonry System

Part 1 - General

1.1 Scope

This section includes:

- Concrete Masonry Units

1.2 Related Sections

- 01010 Summary of Work
- 01400 Contractor Quality Control
- 01600 Material and Equipment
- 02722 Grouting
- 03100 Concrete Formwork
- 04100 Mortar

1.3 References

- ASTM C55 Standard Specification for Concrete Building Brick
- ASTM C140 Standard Method of Sampling and Testing Concrete Masonry Units

1.4 Submittals for Revision and Approval

The Contractor shall submit for approval the following 30 days prior to initiation of the work at the site.

- Certified laboratory test results for the proposed solid masonry units.

1.5 Quality Assurance

Perform the work in accordance with the Contractor’s Quality Control Plan.

Part 2 - Products

2.1 Concrete Masonry Units

Concrete masonry units shall be solid (no cavities or cores), load bearing high-strength units having a minimum compressive strength of 3500 psi. Concrete masonry units shall be tested in accordance with ASTM C140. All other aspects of the concrete masonry units shall comply with ASTM C55, Type I Moisture Controlled.

Nominal modular size shall be 8 x 8 x 16 inches, or as otherwise approved by the Engineer.

Concrete brick shall comply with ASTM C55, Grade N, Type I (moisture controlled) having a minimum compressive strength of 3500 psi (Avg. 3 units) or 3000 psi for individual unit.
2.2 Mortar

Mortar shall be as specified in Section 04100 Mortar.

Part 3 - Execution

3.1 General

The Contractor shall furnish all labor, material, equipment and tools to perform all operations of installing Unit Masonry Isolation Walls to the lines and grades shown on the drawings.

The Contractor shall examine the excavation of the entry to affirm that the keys have been properly leveled and cut to the appropriate depths, at the proper locations prior to any work.

3.2 Installation

The Contractor shall install the isolation walls using concrete masonry units as specified above. Masonry units shall be installed with 3/8-inch mortar joints with full mortar bedding and full head joints. Masonry units shall be installed in running bond with headers every third course. Masonry units shall be mortared tight to the ribs and the back wall to provide a seal all around the isolation wall.

Concrete brick may be used as required for fit-up around grout pipes, or minimizing the dimensional fit-up at the top or sides of the isolation walls as approved by the Engineer. The interface between the top of the isolation wall and the back wall shall be completely mortared to provide full contact between the back and the block wall.

3.3 Field Quality Control

The Contractor shall provide a third-party Quality Control Inspector to inspect the installation of the Concrete Masonry Unit Isolation Walls. Inspection and testing of the mortar shall be in accordance with Section 04100 Mortar.
FIGURES

1

2
Figure G1G-1
Plan Variations

A. CONCRETE BARRIER WITHOUT DRZ REMOVED
   AND CONSTRUCTION ISOLATION WALL

B. CONCRETE BARRIER WITHOUT DRZ REMOVED
   AND EXPLOSION ISOLATION WALL

C. CONCRETE BARRIER WITH DRZ REMOVED
   AND CONSTRUCTION ISOLATION WALL

D. CONCRETE BARRIER WITH DRZ REMOVED
   AND EXPLOSION ISOLATION WALL
Figure G1G-2
Waste Handling Shaft Cage Dimensions
Figure G1G-3
Waste Shaft Collar and Airlock Arrangement
(This page intentionally blank)
## ATTACHMENT L

### WIPP GROUNDWATER DETECTION MONITORING PROGRAM PLAN

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<td>cm</td>
<td>centimeter(s)</td>
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<td>DOE</td>
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<td>DQO</td>
<td>data quality objectives</td>
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<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
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<tr>
<td>ft</td>
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<td>g/cm³</td>
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<td>NIST</td>
<td>National Institute for Standards and Technology</td>
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<td>New Mexico Environment Department</td>
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<td>Term</td>
<td>Definition</td>
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<td>relative percent difference</td>
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<td>percent recovery</td>
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<td>Sampling and Analysis Plans</td>
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<td>Standard Operating Procedure</td>
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<td>TDS</td>
<td>total dissolved solids</td>
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<td>total organic carbon</td>
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<td>transuranic</td>
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<td>TSDF</td>
<td>treatment, storage, and disposal facilities</td>
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<td>UTLV</td>
<td>upper tolerance limit value</td>
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<td>VOC</td>
<td>volatile organic compound</td>
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<td>Waste Isolation Pilot Plant</td>
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<td>WIPP Groundwater Level Monitoring Program</td>
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<tr>
<td>μg/L</td>
<td>microgram(s) per liter</td>
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ATTACHMENT L

WIPP GROUNDWATER DETECTION MONITORING PROGRAM PLAN

L-1 Introduction

The Waste Isolation Pilot Plant (WIPP) facility is subject to regulation under Title 20 of the New Mexico Administrative Code (NMAC), Chapter 4, Part 1, Subpart V (20.4.1.500 NMAC). As required by 20.4.500 NMAC (incorporating 40 CFR §264.601), the Permittees shall demonstrate that the environmental performance standards for a miscellaneous unit, which are applied to the hazardous waste disposal units (HWDUs) in the underground, will be met.

The WIPP facility is located in Eddy County in southeastern New Mexico (Figure L-1), within the Pecos Valley section of the southern Great Plains physiographic province. The facility is 26 miles (mi) (42 kilometers [km]) east of Carlsbad, New Mexico, in an area known as Los Medaños (the dunes). Los Medaños is a relatively flat, sparsely inhabited plateau with little water and limited land uses.

The WIPP facility (Figure L-2) consists of 16 sections of Federal land in Township 22 South, Range 31 East. The 16 sections of Federal land were withdrawn from the application of public land laws by the WIPP Land Withdrawal Act (LWA), Public Law 102-579. The WIPP LWA transferred the responsibility for the administration of the 16 sections from the Department of Interior, Bureau of Land Management, to the U.S. Department of Energy (DOE). This law specified that mining and drilling for purposes other than support of the WIPP project are prohibited within this 16 section area with the exception of Section 31. Oil and gas drilling activities are restricted in Section 31 from the surface down to 6,000 feet.

The WIPP facility includes a mined geologic repository for the disposal of transuranic (TRU) waste. The disposal horizon is located 2,150 feet (ft) (655 meters [m]) below the land surface in the bedded salt of the Salado Formation (Salado). At the WIPP facility, water-bearing units occur both above and below the disposal horizon. Groundwater monitoring of the uppermost aquifer below the facility is not required because the water-bearing unit (the Bell Canyon Formation (Bell Canyon)) is not considered a credible pathway for a release from the repository. This is because the repository horizon and water-bearing sandstones of the Bell Canyon are separated by over 2,000 ft (610 m) of very low-permeability evaporite sediments (Amended Renewal Application Addendum L1 (DOE, 2009)). No natural credible pathway has been established for contaminant transport to water-bearing zones below the repository horizon, as there is no hydrologic communication between the repository and underlying water-bearing zones. The U.S. Environmental Protection Agency (EPA) concluded in 1990 that natural vertical communication does not exist based on review of numerous studies (EPA, 1990). Furthermore, drilling boreholes for groundwater monitoring through the Salado and the Castile Formation (Castile) into the Bell Canyon would compromise the isolation properties of the repository medium.

Groundwater monitoring at the WIPP facility focuses on the Culebra Member (Culebra) of the Rustler Formation (Rustler) because it represents the most significant hydrologic contaminant migration pathway to the accessible environment. The Culebra is the most significant water-bearing unit lying above the repository. Groundwater movement in the Culebra, using results
This monitoring plan addresses requirements for sample collection, Culebra groundwater surface elevation monitoring, Culebra groundwater flow direction and rate determination, data management, and reporting of Culebra groundwater monitoring data. It also identifies indicator parameters and hazardous constituents selected to assess Culebra groundwater quality for the WIPP groundwater detection monitoring program (DMP). Because quality assurance is an integral component of the groundwater sampling, analysis, and reporting process, quality assurance/quality control (QA/QC) elements and associated data acceptance criteria are included in this plan.

Instructions for performing field activities that will be conducted in conjunction with this DMP are provided in the WIPP Standard Operating Procedures (SOPs) (see Table L-3), which are maintained in facility files and which comply with the applicable requirements of 20.4.1.500 NMAC (incorporating 40 CFR § 264.97 (d)). Procedures are required for each aspect of the Culebra groundwater sampling process, including Culebra groundwater surface elevation measurement, Culebra groundwater flow direction and rate determination, sampling equipment installation and operation, field water-quality measurements, and sample collection. Data required by this plan will be collected by qualified personnel in accordance with SOPs (Table L-3).

L-1a Geologic and Hydrologic Characteristics

L-1a(1) Geology

The WIPP facility is situated within the Delaware Basin bounded to the north and east by the Capitan Reef, which is part of the larger Permian Basin, located in the south-central region of North America. Three major evaporite-bearing formations were deposited in the Delaware Basin (see Figures L-3 and L-4 and Amended Renewal Application Addendum L1, Section L1-1 (DOE, 2009) for more detail):

- The Castile consists of interbedded anhydrites and halite. Its upper boundary is at a depth of about 2,825 ft (861 m) below ground surface (bgs), and its thickness at the WIPP facility is 1,250 ft (381 m).

- The repository is located in the Salado, which overlies the Castile and resulted from prolonged desiccation that produced predominantly halite, with some carbonates, anhydrites, and clay seams. Its upper boundary is at a depth of about 850 ft (259 m) bgs, and it is about 2,000 ft (610 m) thick in the repository area.

- The Rustler Formation was deposited in a lagoonal environment during a major freshening of the basin and consists of carbonates, anhydrites, and halites. Its beds consist of clay and anhydrite and contain small amounts of brine. The Rustler’s upper boundary is about 500 ft (152 m) bgs, and it ranges up to 350 ft (107 m) in thickness in the repository area.

These evaporite-bearing formations lie between two other formations significant to the geology and hydrology of the WIPP facility. The Dewey Lake Redbeds Formation (Dewey Lake) overlying the Rustler is dominated by nonmarine sediments and consists almost entirely of...
mudstone, claystone, siltstone, and interbedded sandstone (see Amended Renewal Application Addendum L1, Section L1-1c(6) (DOE, 2009)). This formation forms a 500-ft- (152-m) thick barrier of fine-grained sediments that retard the downward percolation of water into the evaporite units below. The Bell Canyon is the first water-bearing unit below the repository (see Amended Renewal Application Addendum L1, Section L1-1c(2) (DOE, 2009)) and is confined above by the thick evaporite deposits of the Castile. It consists of 1,200 ft (366 m) of interbedded sandstone, shale, and siltstone.

The Salado was selected to host the WIPP repository for several reasons. First, it is regionally extensive, underlying an area of more than 36,000 square mi (mi²) (93,240 square kilometers [km²]). Second, its permeability is extremely low. Third, salt behaves mechanically in a plastic manner under pressure (the lithostatic pressure at the disposal horizon is approximately 2,200 pounds per square inch [lb/in.²] or 14.9 megapascals [MPa]) and eventually deforms to fill any opening (referred to as creep). Fourth, any fluid remaining in small fractures or openings is saturated with salt, is incapable of further salt dissolution, and has probably remained in place since deposition. Finally, the Salado lies between the Rustler and the Castile (Figure L-4), which contain very low permeability layers that help confine and isolate waste within and keep water outside of the WIPP repository (see Amended Renewal Application Addendum L1, Section L1-1c(5) and L1-1c(3) (DOE, 2009)).

L-1a(2) Groundwater Hydrology

The general hydrogeology of the area surrounding the WIPP facility is described in this section starting with the first geologic unit below the Salado. Addendum L1, Section L1-2a of the Amended Renewal Application (DOE, 2009) provides more detailed discussions of the local and regional hydrogeology. Relevant hydrological parameters for the various rock units above the Salado at WIPP are summarized in Table L-1.

L-1a(2)(i) The Castile

The Castile is a basin-filling evaporite sequence of sediments surrounded by the Capitan Reef. The Castile represents a major regional groundwater aquitard that effectively prevents upward migration of water from the underlying Bell Canyon. Fluid present in the Castile is very restricted because evaporites do not readily maintain pore space, solution channels, or open fractures at depth. Drill-stem tests conducted in the Castile during construction of the WIPP facility determined its permeability to be lower than detection limits; however, the hydraulic conductivity has been conservatively estimated to be less than $10^{-8}$ ft ($3 \times 10^{-9}$ m) per day. A description of the Castile brine reservoirs outside the WIPP facility area is provided in Addendum L1, Section L1-2a(2)(b) of the Amended Renewal Application (DOE, 2009).

L-1a(2)(ii) The Salado

The Salado is an evaporite sequence that filled the remainder of the Delaware Basin and lapped extensively over the Capitan Reef and the back-reef sediments beyond. The Salado consists of approximately 2,000 ft (610 m) of bedded halite, with interbeds or seams of anhydrite, clay, and polyhalite. It acts hydrologically as a regional confining bed. The porosity of the Salado is very low and naturally interconnected pores are probably nonexistent in halite at the depth of the disposal horizon. Fluids associated with the Salado occur mainly as very small fluid inclusions in the halite crystals and also occur between crystal boundaries (interstitial fluid) of the massive crystalline salt formation; fluids also occur in clay seams and anhydrite beds. Permeabilities...
measured from the surface in the area of the WIPP facility range from 0.01 to 25 microdarcies. The most reliable value, 0.3 microdarcy, was obtained from well DOE-2. The results of permeability testing at the disposal horizon are within the range of 0.001 to 0.01 microdarcy.

L-1a(2)(iii) The Rustler

The Rustler has been the subject of extensive characterization activities because it contains the most transmissive hydrologic units overlying the Salado. Within the Rustler, five members have been identified. Of these, the Culebra is the most transmissive and has been the focus of most of the Rustler hydrologic studies.

The Culebra is the first continuous water-bearing zone above the Salado and is up to approximately 30 ft (9 m) thick. Water in the Culebra is usually present in fractures and is confined by overlying gypsum or anhydrite and underlying clay and anhydrite beds. The hydraulic gradient within the Culebra in the area of the WIPP facility is approximately 20 ft per mi (3.8 m per km) and becomes much flatter south and southwest of the site (Figure L-5). Culebra transmissivities in the Nash Draw range up to 1,250 square ft (ft²) (116 square m [m²]) per day; closer to the WIPP facility, they are as low as 0.007 to 74 ft² (0.00065 to 7.0 m²) per day.

The two primary types of field tests that are being used to characterize the flow and transport characteristics of the Culebra are hydraulic tests and tracer tests.

The hydraulic tests consist of pump, injection, and slug testing of wells across the study area (see Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)). The most detailed hydraulic test data exist for the WIPP hydropads (e.g., H-19). The hydropads generally comprise a network of three or more wells located within a few tens of meters of each other. Long-term pumping tests have been conducted at hydropads H-3, H-11, and H-19 and at well WIPP-13 (see Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)). These pumping tests provided transient pressure data both at the hydropad and over a much larger area. Tests often included use of automated data-acquisition systems, providing high-resolution (in both space and time) data sets. In addition to long-term pumping tests, slug tests and short-term pumping tests have been conducted at individual wells to provide pressure data that can be used to interpret the transmissivity at that well (see Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)). Detailed cross-hole hydraulic testing has been conducted at the H-19 hydropad (see Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)).

Pressure data are collected during hydraulic tests for estimation of hydrologic characteristics such as transmissivity, permeability, and storativity. The pressure data from long-term pumping tests and the interpreted transmissivity values for individual wells are used in calibration of flow models. Some of the hydraulic test data and interpretations are also important for the interpretation of transport characteristics. For instance, the permeability values interpreted from the hydraulic tests at a given hydropad are needed for interpretations of tracer test data at that hydropad.

There is strong evidence that the permeability of the Culebra varies spatially and varies sufficiently that it cannot be characterized with a uniform value or range over the region of interest to WIPP. The transmissivity of the Culebra varies spatially over ten orders of magnitude from east to west in the vicinity of WIPP. Transmissivities have been calculated at $1 \times 10^{-7}$.
square feet per day ($1 \times 10^{-13}$ square meters per second) at well SNL-15 east of the WIPP site to $1 \times 10^3$ square feet per day ($1 \times 10^{-3}$ square meters per second) at well H-7 in Nash Draw (see Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)).

Transmissivity variations in the Culebra are believed to be controlled by the relative abundance of open fractures rather than by primary (that is, depositional) features of the unit (Roberts 2007). Lateral variations in depositional environments were small within the mapped region, and primary features of the Culebra show little map-scale spatial variability, according to Holt and Powers, 1988. Direct measurements of the density of open fractures are not available from core samples because of incomplete recovery and fracturing during drilling, but observation of the relatively unfractured exposures in the WIPP shafts suggests that the density of open fractures in the Culebra decreases to the east.

Geochemical and radioisotope characteristics of the Culebra have been studied. There is considerable variation in groundwater geochemistry in the Culebra. The variation has been described in terms of different hydrogeochemical facies that can be mapped in the Culebra. A halite-rich hydrogeochemical facies exists in the region of the WIPP site and to the east, approximately corresponding to the regions in which halite exists in units above and below the Culebra, and in which a large portion of the Culebra fractures are gypsum filled. An anhydrite-rich hydrogeochemical facies exists west and south of the WIPP site, where there is relatively less halite in adjacent strata and where there are fewer gypsum-filled fractures. Radiogenic isotopic signatures suggest that the age of the groundwater in the Culebra is on the order of 10,000 years or more (see Amended Renewal Application Addendum L1 (DOE, 2009)).

The radiogenic ages of the Culebra groundwater and the geochemical differences provide information potentially relevant to the groundwater flow directions and groundwater interaction with other units and are important constraints on conceptual models of groundwater flow.

The Permittees have proposed a conceptualization of groundwater flow that explains observed geochemical facies and groundwater flow patterns. The conceptualization, referred to as the basin-scale groundwater model, offers a three dimensional approach to treatment of Supra-Salado rock units, and assumes vertical leakage (albeit very slow) between rock units of the Rustler exists (where hydraulic head is present).

Flow in the Culebra is considered transient. The model assumes that the groundwater system is dynamic and is responding to the drying of climate that has occurred since the late Pleistocene period. The Permittees assumed that recharge rates during the late Pleistocene period were sufficient to maintain the water table near land surface, but has since dropped significantly. Therefore, the impact of local topography on groundwater flow was greater during wetter periods, with discharge from the Rustler in the vicinity of the WIPP facility to the west toward Nash Draw; flow is currently dominated by more regional topographic effects during drier times, with flow in the Rustler from the vicinity of the WIPP facility towards the Balmorhea-Loving Trough to the south.

Using data from 22 wells, Siegel, Robinson, and Myers (1991) originally defined four hydrochemical facies (A, B, C, and D) for Culebra groundwater based primarily on ionic strength and major constituents. With the data now available from 59 wells, Domski and Beauheim (2008) defined transitional A/C and B/C facies, as well as a new facies E for high-moles per kilogram (molal) Na-Mg Cl brines.
- Zone B - Dilute (ionic strength ≤0.1 molal) CaSO₄-rich groundwater, from southern high-transmissivity area. Mg/Ca molar ratio 0.32 to 0.52.

- Zone B/C - Ionic strength 0.18 to 0.29 molal, Mg/Ca molar ratio 0.4 to 0.6.

- Zone C - Variable composition waters, ionic strength 0.3 to 1.0 molal, Mg/Ca molar ratio 0.4 to 1.1.

- Zone A/C - Ionic strength 1.1 to 1.6 molal, Mg/Ca molar ratio 0.5 to 1.2.

- Zone A - Ionic strength >1.66 molal, up to 5.3 molal, Mg/Ca molar ratio 1.2 to 2.4.

- Zone D - Defined based on inferred contamination related to potash refining operations. Ionic strength 3 molal, K/Na weight ratios of ~0.2.

- Zone E - Wells east of the mudstone-halite margins, ionic strength 6.4 to 8.6 molal, Mg/Ca molar ratio 4.1 to 6.6.

The low-ionic-strength (≤0.1 molal) facies B waters contain more sulfate than chloride, and are found southwest and south of the WIPP site within and down the Culebra hydraulic gradient from the southernmost closed catchment basins, mapped by Powers (2006), in the southwest arm of Nash Draw. These waters reflect relatively recent recharge through gypsum karst overlying the Culebra. However, with total dissolved solids (TDS) concentrations in excess of 3,000 mg/L, the facies B waters do not represent modern-day precipitation rapidly reaching the Culebra. They must have residence times in the Rustler sulfate units of thousands of years before reaching the Culebra.

The higher-ionic-strength (0.3-1 molal) facies C brines have differing compositions, representing meteoric waters that have dissolved CaSO₄, overprinted with mixing and localized processes. Facies A brines (ionic strength 1.6 - 5.3 molal) are high in NaCl and are clustered along the extent of halite in the middle of the Tamarisk Member of the Rustler Formation. Facies A represents old waters (long flow paths) that have dissolved halite and/or connate brine, or a mixture of the two from facies E. The facies D brines, as identified by Siegel, Robinson, and Myers (1991), are high-ionic-strength solutions found in western Nash Draw with high K/Na ratios representing waters contaminated with effluent from potash refining operations. Similar water is found at shallow depth (<36 ft (11 m)) in the upper Dewey Lake at SNL-1, just south of the Intrepid East tailings pile. The newly defined facies E waters are very high ionic strength (6.4 - 8.6 molal) NaCl brines with high Mg/Ca ratios. The facies E brines are found east of the WIPP site, where Rustler halite is present above and below the Culebra, and halite cements are present in the Culebra. They represent primitive brines present since deposition of the Culebra and immediately overlying strata.

Previously, the Permittees and others believed the geochemistry of Culebra groundwater was inconsistent with flow directions. This was based on the premise that facies C water must transform to facies B water (e.g. become “fresher”), which is inconsistent with the observed flow direction. It is now believed that the observed geochemistry and flow directions can be explained with different recharge areas and Culebra travel paths (Amended Renewal Application Addendum L1 (DOE, 2009)).
Head distribution in the Culebra (see Amended Renewal Application Addendum L1 (DOE, 2009)) is consistent with basin-scale groundwater basin modeling results indicating that the generalized groundwater flow direction in the Culebra is currently north to south. However, the fractured nature of the Culebra, coupled with variable fluid densities, can cause localized flow patterns to differ from general flow patterns.

Groundwater levels in the Culebra in the region around the WIPP facility have been measured in numerous wells. Water-level rises have been observed and are attributed to causes discussed in the Renewal Application Addendum L1, Section L1-2a3(a)(ii) (DOE, 2009). The extent of water-level rise observed at a particular well depends on several factors, but the proximity of the observation point to the cause of the water-level change appears to be a primary factor.

Hydrological investigations conducted from 2003 through 2007 provided new information, some of it confirming long-held assumptions and some offering new insight into the hydrological system around the WIPP site. A Culebra monitoring network optimization study was completed by McKenna (2004) and updated by Kuhlman (2010) to identify locations where new Culebra monitoring wells would be of greatest value and to identify wells that could be removed from the network with little loss of information.

As discussed in Amended Renewal Application Addendum L1, Section L1-2a3(a)(ii) (DOE, 2009), extensive hydrological testing has been performed in the new wells. This testing has involved both single well tests, which provide information on local transmissivity and heterogeneity, and long-term (19 to 32 days) pumping tests that have created observable responses in wells up to 5.9 mi (9.5 km) away.

Inferences about vertical flow directions in the Culebra have been made from well data collected by the Permittees. Beauheim (1987) reported flow directions towards the Culebra from both the underlying Los Medaños Member (Los Medaños) of the Rustler and the overlying Magenta Member (Magenta) of the Rustler across the WIPP site, indicating that the Culebra acts as a drain for the units around it. This is consistent with results of basin-scale groundwater modeling.

Use of water from the Culebra in the WIPP facility area is quite limited because of its varying yields and high salinity. The Culebra is not used for water supply in the immediate WIPP facility vicinity. Its nearest use is approximately 7 mi (11 km) southwest of the WIPP facility, where salinity is low enough to allow its use for livestock watering.

L-2 General Regulatory Requirements

Because geologic repositories such as the WIPP facility are defined under the Resource Conservation and Recovery Act (RCRA) as land disposal facilities and as miscellaneous units, the groundwater monitoring requirements of 20.4.1.500 NMAC (incorporating 40 CFR §§264.600 through 264.603) shall be addressed. The requirements of 20.4.1.500 NMAC (incorporating 40 CFR §§264.90 through 264.101) apply to miscellaneous unit treatment, storage, and disposal facilities (TSDF) only if groundwater monitoring is needed to satisfy 20.4.1.500 NMAC (incorporating 40 CFR §§264.601 through 264.603) environmental performance standards.

The New Mexico Environment Department (NMED) has concluded that groundwater monitoring in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264 Subpart F) at the WIPP
facility is necessary to meet the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §§264.601 through 264.603).

L-3 WIPP Detection Monitoring Program (DMP)—Overview

L-3a Scope

This DMP plan governs groundwater sampling events conducted to meet the applicable requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264 Subpart F), and ensures that such data are gathered in accordance with these and other applicable requirements. Analytical results collected during the DMP are compared to the baseline established in this Permit to determine whether or not a release has occurred.

There are two separate components of the Groundwater Monitoring Program, the Detection Monitoring Program (DMP) and the Water Level Monitoring Program (WLMP). The first component consists of a network of six Detection Monitoring Wells (DMWs). The DMWs (WQSP 1-6) were constructed to be consistent with the specifications provided in the Groundwater Monitoring Technical Enforcement Guidance Document and constitute the RCRA groundwater monitoring network specified in the DMP. The DMWs were used to establish background groundwater quality in accordance with 20.4.1.500 NMAC (incorporating 40 CFR § 264.97 and 264.98 (f)). The second component of the Groundwater Monitoring Program is the WLMP, which is used to determine the groundwater surface elevation and flow direction. Table L-4 is a list of the wells used in the WLMP as of January 1, 2011. The list of wells is subject to change due to plugging and abandonment and drilling of new wells.

L-3b Current WIPP DMP

Wells WQSP-1, WQSP-2, and WQSP-3 are located directly upgradient (north) of the WIPP shaft area.

WQSP-4, WQSP-5, and WQSP-6 are located downgradient (south) of the WIPP shaft area. All three Culebra downgradient wells (WQSP-4, 5, and 6) were sited to be located generally in the path of contaminants that might be released from the shaft area in the Culebra. Well WQSP-4 was also specifically located to monitor the zone of higher transmissivity which may represent faster flow path away from the WIPP shaft area to the LWA boundary (Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)).

The compliance point is defined in 20.4.1.500 NMAC (incorporating 40 CFR §264.95) as the vertical plane immediately downgradient of the hazardous waste management unit area (i.e., at the downgradient footprint of the WIPP repository). Permit Part 5 specifies the point of compliance as “the vertical surface located at the hydraulically downgradient limit of the Underground HWDUs that extends to the Culebra Member of the Rustler Formation.” Wells WQSP-4, 5, and 6 are situated to demonstrate that during the operating life of the facility (including closure), release of contaminants to the general public will not occur.

Transport modeling suggests that travel times from the Waste Handling Shaft to the LWA boundary could be on the order of thousands of years. This assumes conditions where hazardous constituents migrate from the sealed repository (post closure) to the Culebra via the sealed shafts.
Potentiometric surfaces and groundwater flow directions defined for the Culebra prior to large-scale pumping in the WIPP facility area and the excavation of WIPP facility shafts suggests that flow was generally to the south-southeast from the waste disposal and shaft areas (Mercer, 1983; Davies, 1989). Potentiometric surface maps of the Culebra adjusted for density differences show very similar characteristics. The wells used for measuring the potentiometric surface of the Culebra are measured monthly and listed in Table L-4.

L-3b(1) Detection Monitoring Well Construction Specification

Diagrams of the six DMP wells are shown in Figures L-7 through L-12. Detailed descriptions of geology and construction methods may be found in DOE 1995.

The six DMP Culebra wells were drilled between September 13 and October 16, 1994. The total depth of each well is shown in Table L-5. The wells were drilled through the Culebra into the Los Medaños as shown in Table L-5. The wells were drilled to the top of the Culebra using compressed air as the drilling fluid and a 9/4-in. drill bit. The wells were then cored using a 5⅞-in. core bit to cut 4-in. (0.1-m) diameter core to total depth. See Table L-5 for the drilling and coring intervals for each well. After coring, DMP wells were reamed to 9⅞-in. (0.3 m) in diameter to total depth. After reaming, wells were cased from the surface to total depth with 5-in. (0.1-m) (0.28-in. [0.7-centimeter (cm)] wall) blank fiberglass casing with in-line 5-in.- (0.1-m) diameter fiberglass 0.02-in. (0.1-cm) slotted screen across the Culebra interval as shown in Table L-5. The annulus between the borehole wall and the casing/screen is packed with sand and with 8/16 Brady gravel as indicated in Table L-5.

L-4 Monitoring Program Description

The WIPP DMP has been designed to meet the groundwater monitoring requirements of 20.4.1.500 NMAC (incorporating 40 CFR §§264.90 through 264.101). The following sections of the monitoring plan specify the components of the DMP.

L-4a Monitoring Frequency

Groundwater surface elevations will be monitored in each of the six DMWs on a monthly basis. The groundwater surface elevation in each DMW will also be measured prior to each annual sampling event. The groundwater surface elevation measurements in the WLMP wells will also be monitored on a monthly basis when accessible. The characteristics of the DMW (sampling frequency, location) will be evaluated if significant changes are observed in the groundwater flow direction or gradient.

L-4b Analytical Parameters and Hazardous Constituents

The parameters listed in Part 5, Table 5.4.a and hazardous constituents listed in Part 5, Table 5.4.b are measured as part of the DMP.

Additional hazardous constituents may be identified through changes to the list of hazardous waste numbers authorized for disposal at the WIPP facility. If hazardous constituents are identified, these will be added to Part 5, Table 5.4.b, unless the Permittees provide justification for their omission (e.g. hazardous constituent not in 40 CFR §264 Appendix IX), and this omission is approved by NMED.
L-4c  Groundwater Surface Elevation Measurement, Sample Collection and Laboratory Analysis

Groundwater surface elevations will be measured in each DMW prior to groundwater sample collection. Groundwater will be extracted using serial and final sampling methods. Serial samples will be collected until groundwater field indicator parameters stabilize or three well bore volumes, whichever occurs first, after which the final sample for complete analysis will be collected. Final samples will then be analyzed for the parameters and constituents in Part 5, Tables 5.4.a and 5.4.b.

L-4c(1)  Groundwater Surface Elevation Monitoring Methodology

The WIPP groundwater level monitoring program (WLMP) activities are conducted in accordance with the WIPP facility SOPs listed in Table L-3.

Groundwater surface elevation measurements will be taken monthly at each of the six DMWs and prior to the annual sampling event. Additionally, groundwater surface elevation measurements will be taken monthly in the other Culebra wells as listed in Table L-4, when accessible. Well locations are shown in Figure L-14. If a cumulative groundwater surface elevation change of more than 2 feet is detected in any DMP well over the course of one year which is not attributable to site tests or natural stabilization of the site hydrologic system, the Permittees will notify NMED in writing and discuss the origin of the changes in the Annual Culebra Groundwater Report specified in Permit Part 5. Abnormal, unexplained changes in groundwater surface elevation will be evaluated to determine if they indicate changes in site recharge/discharge which could affect the assumptions regarding DMW placement and constitute new information as specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.41(a)(2)).

Groundwater surface elevation monitoring will continue through the post-closure care period specified in Permit Part 7. The Permittees may temporarily increase the frequency of monitoring to effectively document naturally occurring or artificial perturbations that may be imposed on the hydrologic systems at any point in time. This will be conducted in selected key wells by increasing the frequency of the manual groundwater surface elevation measurements or by monitoring water pressures with the aid of electronic pressure transducers and remote data-logging systems. The Permittees will include such additional data in the reports specified in Section L-5c.

Interpretation of groundwater surface elevation measurements and corresponding fluctuations over time is complicated at the WIPP facility by spatial variation in fluid density. To monitor the hydraulic gradients of the hydrologic flow systems accurately, actual groundwater surface elevation measurements will be monitored at the frequencies specified in Table L-2, and the Culebra groundwater densities of the fluids in the wells listed in Table L-4 will be measured annually.

Measured Culebra water surface elevation data can be converted to equivalent freshwater head from knowledge of the density of the borehole fluid, using the following formula.

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\[ p = \rho y h \]

where

- \( p \) = freshwater head (length of freshwater head)
- \( y \) = average specific gravity of the borehole fluid (unitless ratio of borehole fluid density to density of fresh water)
- \( \rho \) = freshwater density (mass/volume)
- \( h \) = fluid column height above the datum (length)

If the freshwater density is assumed to be 1.000 gram per cubic centimeter (g/cm³), then the equivalent freshwater head is equal to the fluid column height times the average borehole fluid specific gravity.

Density measurements are made annually. Density for the DMWs will be expressed as specific gravity as measured in the field during sampling events using a hydrometer. Freshwater head for other Culebra wells will be calculated as described above from fluid density measurements obtained using pressure transducers.

L-4c(1)(i) Field Methods and Data Collection Requirements

To obtain an accurate groundwater surface elevation measurement, a calibrated water-level measuring device will be lowered into a test well and the depth to water recorded from a known reference point. An SOP will be used when making water-level measurements for this program. The SOP will specify the methods to be used in obtaining groundwater-level measurements, and provide general instructions including prerequisites, safety precautions, performance frequency, quality assurance, data management, and records.

L-4c(1)(ii) Groundwater Surface Elevation Records and Document Control

Incoming data will be processed in a manner that ensures data integrity. The data management process for groundwater surface elevation measurements will begin with completion of the field data sheets. Date, time, tape measurement, equipment identification number, calibration due date, initial of the field personnel, and equipment/comments will be recorded on the field data sheets. If, for some unexpected reason, a measurement is not possible (e.g., a test is under way that blocks entry to the well bore), then a notation as to why the measurement was not taken will be recorded in the comment column. Personnel will also use the comment column to report any security observations (i.e., well lock missing).

Data recorded on the field data sheets and submitted by field personnel will be subject to applicable SOPs (see Table L-3). These procedures specify the processes for administering and managing such data. The data will be entered onto a computerized work sheet. The work sheet program calculates groundwater surface elevation in both feet and meters relative to the top of the casing and also relative to mean sea level. The work sheet program adjusts groundwater surface elevations to equivalent freshwater heads.

A check print will be made of the work sheet printout. The check print will be used to verify that data taken in the field was properly reported on the database printout. A minimum of 10 percent
of the spreadsheet calculations will be randomly verified on the check print to ensure that
calculations are being performed correctly. If errors are found, the work sheet will be corrected.
Groundwater surface elevation data and equivalent freshwater heads for the Culebra wells in
Table L-4 will be transmitted to NMED by May 31 and November 30. Semi-annual groundwater
reports will also include annotated hydrographs and trend analysis.

L-4c(2) Groundwater Sampling

L-4c(2)(i) Groundwater Pumping and Sampling Systems

The groundwater pumping and sampling systems used to collect a groundwater sample from
the six DMWs will provide continuous and adequate production of water so that a representative
groundwater sample can be obtained.

The type of pumping and sampling system to be used in a well depends primarily on the aquifer
characteristics of the Culebra and well construction. The DMWs are individually equipped with
dedicated submersible pumping assemblies. Each well has a specific type of submersible
pump, matched to the ability of the well to yield water during pumping. The down-hole
submersible pumps are controlled by a variable electronic flow controller to match the
production capacity of the formation at each well.

As recommended in the “RCRA Ground-Water Monitoring Technical Enforcement Guidance
Document” (EPA, 1986) the wells will be purged no more than three well bore volumes or until
field parameters have stabilized, whichever comes first. Well purging will performed in
accordance with an SOP in conjunction with serial sampling to determine when the groundwater
chemistry stabilizes and is therefore representative of undisturbed groundwater.

The DMWs are cased and screened through the production interval with materials that do not
yield contamination to the aquifer or allow the production interval to collapse under stress (high
epoxy fiberglass). An electric, submersible pump installation without the use of a packer is used
in this instance. The largest amount of discharge from the submersible pump takes place from a
discharge pipe. In addition to this main discharge pipe, a dedicated sample line running parallel
to the discharge pipe is used. The sampling line is manufactured from a chemically inert
material. Cumulative flow is measured using a totalizing flow meter. Flow from the discharge
pipe is routed to a discharge tank for disposal.

The dedicated sampling line is used to collect the water sample that will undergo analysis. By
using a dedicated sample line, the water will not be contaminated by the metal discharge pipe.
The sample line will branch from the main discharge pipe a few inches above the pump. Flow
from the sample line will be routed into the sample collection area. Flow through the sample
collection line is regulated by a flow-control valve. The sample line is insulated at the surface to
minimize temperature fluctuations.

L-4c(2)(ii) Serial Samples

Serial sampling is the collection of sequential samples for the purpose of determining when the
groundwater chemistry stabilizes and is therefore representative of undisturbed groundwater.
The Permittees’ SOP for serial sampling will provide criteria for determining when a final sample
should be taken. Each DMW will be purged to no than more three well bore volumes, or until
field parameters stabilize, whichever occurs first. Well stabilization occurs when the field-
analyzed parameters are within ± 5% of three consecutive measurements. A well bore volume
is defined as the volume of water from static water level to the bottom of the well sump. Serial
samples will be analyzed in the mobile filed laboratory for field indicator parameters. The
Permittees will provide an explanation of why the sample was collected when field indicator
parameters were not stabilized and place that explanation in the WIPP facility Operating
Record.

Serial samples will be collected and analyzed to detect and monitor the chemical variation of the
groundwater as a function of the volume of water pumped. Once serial sampling begins, the
frequency at which serial samples are collected and analyzed will be left to the discretion of the
Permittees, but will be performed a minimum of three times during a sampling round.

The Permittees will use appropriate field methods to identify stabilization of the following field
indicator parameters: pH, temperature, specific conductance, and specific gravity.

The three field indicator parameters of temperature, specific conductance, and pH will be
determined by either an “in-line” technique, using a self-contained flow cell, or an "off-line"
technique, in which the samples will be collected from a sample line at atmospheric pressure.
Specific conductance and specific gravity samples will be collected from the sample line at
atmospheric pressure. Because of the lack of sophisticated weights and measures equipment
available for field density assessments, field density evaluations will be expressed in terms of
specific gravity, which is a unitless measure. Density is expressed as unit weight per unit
volume.

New polyethylene containers, that are certified clean by the laboratory, will be used to collect
the serial samples from the sample line.

Serial samples collected in laboratory-certified clean containers do not require rinsing prior to
sample collection. Unfiltered groundwater will be used when determining temperature, pH,
specific conductance, and specific gravity. Sample bottles will be properly identified and labeled.

Samples collected will immediately be analyzed for pH and specific conductance (SC) as these
parameters are most sensitive to changes in ambient temperature. Temperature, pH, and
specific conductance, when not measured in a flow cell, will be measured at the approximate
time of serial sample collection. These samples will be collected from the unfiltered sample line.

Upon completion of the collection of the last serial sample suite, the serial sample bottles
accrued throughout the duration of the pumping of the well will be discarded. No serial sample
bottles will be reused for sampling purposes of any sort. However, serial samples may be stored
for a period of time depending upon the need. Standard Operating Procedures (see Table L-3)
defines the protocols for the collection of final and serial samples and analysis.

L-4c(2)(iii) Final Samples

The final sample will be collected once the measured field indicator parameters have stabilized
(refer to Section L-4(c)(2)(ii)). A serial sample will also be collected and analyzed for each day
of final sampling to ensure that samples collected for laboratory analysis are still representative
of stable conditions. Sample preservation, handling, and transportation methods will maintain
the integrity and representativeness of the final samples.
Prior to collecting the final samples, the collection team shall consider the analyses to be performed so that proper shipping or storage containers can be assembled. Table L-6 presents the sample containers, volumes, and holding times for laboratory samples collected as part of the DMP.

The monitoring system will use dedicated pumping systems and sample collection lines from the sampled formation to the well head.

Sample integrity will be ensured through appropriate decontamination procedures. Laboratory glassware will be washed after each use with a solution of nonphosphorus detergent and deionized (DI) water and rinsed in DI water. Sample containers will be new, certified clean containers that will be discarded after one use. Groundwater surface elevation measurement devices will be rinsed with fresh water after each use. Non-dedicated sample collection manifold assemblies will be rinsed in accordance with SOPs after each use. The exposed ends will be capped off during storage. Prior to the next use of the sampling manifold, it will be rinsed a second time with DI water and a rinsate blank sample will be collected to verify cleanliness.

Water samples will be collected at atmospheric pressure using either the filtered or unfiltered sampling lines. Detailed protocols, in the form of SOPs (see Table L-3) define how final samples will be collected in a consistent and repeatable fashion for analyses.

Final samples will be collected in the appropriate type of container for the specific analysis to be performed. The samples will be collected in new and unused glass and plastic containers (refer to Table L-6). For each parameter analyzed, a sufficient volume of sample will be collected to satisfy the volume requirements of the analytical laboratory (as specified by laboratory SOPs). This includes an additional volume of sample water necessary for maintaining quality control standards. All final samples will be treated, handled, and preserved as required for the specific type of analysis to be performed. Details about sample containers, preservation, and volumes required for individual types of analyses are found in the applicable SOPs generated, approved, and maintained by the contract analytical laboratory.

Final samples will be sent to the analytical laboratories and analyzed for parameters and hazardous constituents specified in Part 5, Tables 5.4a and 5.4b.

Duplicates of the final sample will be provided to WIPP Project oversight agencies when requested.

Wastes resulting from the sampling and field analysis of groundwater are disposed of in accordance with the WIPP SOPs (see Table L-3).

L-4c(2)(iv) Sample Preservation, Tracking, Packaging, and Transportation

Many of the chemical constituents measured by the DMP are not chemically stable and require preservation and special handling techniques. Samples requiring acidification will be treated as requested by the analytical laboratory.

The analytical laboratory receiving the samples will prescribe the type and amount of preservative, the container material type, the required sample volumes that shall be collected, and the shipping requirements. This information will be recorded on the Final Sample Checklist for use by field personnel when final samples are being collected. The Permittees will follow the
EPA “RCRA Ground-Water Monitoring Technical Enforcement Guidance Document,” Table 4-1 (EPA, 1986), when laboratory SOPs do not specify sample container, volume, or preservation requirements. WIPP SOPs (see Table L-3) provide instructions to ensure proper sample preservation and shipping.

The sample tracking system at the WIPP facility uses uniquely numbered chain of custody/ request for analysis (CofC/RFA) forms. The primary consideration for storage or transportation is that samples shall be analyzed within the prescribed holding times for the analytes of interest. WIPP SOPs (see Table L-3) provide instructions to ensure proper sample tracking protocol.

L-4c(2)(v) Sample Documentation and Custody

To ensure the integrity of samples from the time of collection through reporting date, sample collection, handling, and custody shall be documented. Sample custody and documentation procedures for sampling and analysis activities are detailed in WIPP facility SOPs (see Table L-3).

Standardized forms used to document samples will include sample identification numbers, sample labels, custody tape, the sample tracking data, and CofC/RFA form. An example form is shown in Figure L-13.

Sample Numbers and Labels

A unique sample identification number will be assigned to each sample sent to the laboratory for analysis. The sample identification numbers will be used to track the sample from the time of collection through data reporting. Every sample container sent to the laboratory for analysis will be identified with a label affixed to it. Sample label information will be completed in indelible ink and will contain the following information: sample identification number with sample matrix type; sample location; analysis requested; time and date of collection; preservative(s), if any; and the sampler’s name or initials.

Custody Seals

Custody seals will be used to detect unauthorized sample tampering from collection through analysis. For example, custody seals that are adhesive-backed strips are destroyed when removed or when the container is opened. The seal will be dated, initialed, and affixed to the sample container in such a manner that it is necessary to break the seal to open the container. Seals will be affixed to sample containers in the field immediately after collection. Upon receipt at the laboratory, the laboratory custodian will inspect the seal for integrity; a broken seal will invalidate the sample.

Sample Identification and Tracking

Sample tracking information will be completed for each sample collected. The sample tracking information includes the following information: CofC/RFA form number; date sample(s) were sent to the lab; laboratory name; acknowledgment of receipt or comments; well name and round number. Sample codes will indicate the well location; the geologic formation where the water was collected from, the sampling round number; and the sample number. The code is broken down as follows:
WQ6¹C²R²N1⁴

1. Well identification (e.g., WQSP-6 in this case)
2. Geologic formation (e.g., the Culebra in this case)
3. Sample round no. (Round 2)
4. Sample no. (N1)

To distinguish duplicate samples from other samples, a “D” is added as the last digit to signify a duplicate. Sample tracking information will be completed in the field by the sampling team.

Sample tracking is monitored and documented with the CofC/RFA form and the shipping airbill. Both of these documents are included in the data packets. Receipt at the analytical laboratory may be monitored, if necessary, via the shipper’s website tracking application. Samples are considered complete when a copy of the original CofC/RFA form is merged with the Field Lab copy of the same document.

Chain of Custody and Request for Analysis

A CofC/RFA form will be completed during or immediately following sample collection and will accompany the sample through analysis and disposal. The CofC/RFA form will be signed and dated each time the sample custody is transferred. A sample will be considered to be in a person’s custody if: the sample is in his/her physical possession; the sample is in his/her unobstructed view; and/or the sample is placed, by the last person in possession of it, in a secured area with restricted access. During shipment, the carrier’s air bill number serves as custody verification. Upon receipt of the samples at the analytical laboratory, the laboratory sample custodian acknowledges possession of the samples by signing and dating the CofC/RFA form. The completed original (top page) of the CofC/RFA will be returned to the Permittees with the laboratory analytical report and becomes part of the permanent record of the sampling event. The CofC/RFA form also contains specific instructions to the analytical laboratory for sample analysis, potential hazards, and disposal instructions.

L-4c(3) Laboratory Analysis

Analysis of samples will be performed using methods selected to be consistent with EPA recommended procedures in SW 846 (EPA, 1996). Additional detail on analytical techniques and methods will be given in laboratory SOPs. In Part 5, Tables 5.4.a and 5.4.b presents the analytical parameters and hazardous constituents for the WIPP DMP.

The Permittees will establish the criteria for laboratory selection, including the stipulation that the laboratory follow the procedures specified in SW 846 and that the laboratory follow EPA protocols unless alternate methods or protocols are approved by the NMED. The analytical laboratory shall demonstrate, through laboratory SOPs that it will follow appropriate EPA SW 846 requirements and the requirements specified by the EPA protocols unless alternate methods or protocols are approved by the NMED. The analytical laboratory shall also provide documentation to the Permittees describing the sensitivity of laboratory instrumentation. This documentation will be retained in the WIPP facility Operating Record. Instrumentation sensitivity needs to be considered because of regulatory requirements governing constituent concentrations in groundwater and the complexity of brines associated with the Culebra groundwater.
The laboratory will maintain documentation of sample handling and custody, analytical results, and internal quality control (QC) data. Additionally, the laboratory will analyze QC samples in accordance with this plan and its own internal QC program for indicators of analytical accuracy and precision. Data generated outside of laboratory acceptance limits will trigger an evaluation and, if appropriate, corrective action as directed by the Permittees. The laboratory will report the results of the environmental sample and QC sample analyses and any necessary corrective actions that were performed. In the event that more than one analytical laboratory is used (e.g., for different analyses), each one will have the responsibilities specified above. A copy of the laboratory SOPs will be maintained in WIPP facility files. The Permittees will provide NMED with an initial set of applicable laboratory SOPs for information purposes, and provide NMED with any updated SOPs on an annual basis by January 31.

Data validation will be performed and reported in the Annual Culebra Groundwater Report and will be maintained in the WIPP facility Operating Record.

L-4d  Calibration

L-4d(1)  Sampling and Groundwater Elevation Monitoring  Equipment Calibration

The equipment used to collect data for this DMP will be calibrated in accordance with SOPs. The Permittees will be responsible for calibrating needed equipment on schedule and for maintaining current calibration records for each piece of equipment.

L-4d(2)  Groundwater Surface Elevation Monitoring Equipment Calibration Requirements

The equipment used in taking groundwater surface elevation measurements will be maintained in accordance with WIPP facility SOPs (see Table L-3). The Permittees will be responsible for ensuring equipment is calibrated on schedule in accordance with SOPs. The Permittees will also be responsible for maintaining copies of records of the most recent calibration for each piece of equipment.

L-4e  Statistical Analysis of Laboratory Analytical Data

Analytical data collected as part of the DMP will be evaluated using appropriate statistical techniques. The following specifies the statistical analysis to be performed by the Permittees.

L-4e(1)  Temporal and Spatial Analysis

Temporal and spatial analyses of the data were completed as part of establishing the water quality baseline (Crawley and Nagy, 1998; IT, 2000). As a result, the Permittees determined to evaluate changes relative to baseline on an individual location basis and to report the concentrations of constituents as a time series, either in tabular form or as time plots. No particular seasonal variations have been noted in the concentrations of groundwater samples collected during the spring and autumn; therefore, continuing temporal analysis is not required.

The analytical results for constituents will be reported as time series, either in tabular form or as time plots or both, and compared to the 95th percentile values or reporting limits identified in Part 5, Table 5.6.
L-4e(2) Distributions and Descriptive Statistics

Techniques were established to compare detection monitoring data generated during the baseline studies. A 95th upper tolerance limit value (UTLV) or 95th percentile was determined from those data sets where target analytes were measured at concentrations above the method detection limits. The UTLV is provided for normal or lognormal distributions and a 95th percentile confidence interval is provided for data sets that are nonparametric or have greater than 15 percent non-detects. For analytes with only a few detects (greater than 95 percent non-detects), an accurate 95th percentile cannot be calculated. For these analytes, the maximum detected concentration is used as the baseline value. For the analytes that are non-detect in all the samples, the method reporting limit was used as the baseline value.

L-4e(3) Action Levels

Using baseline distributions, actions levels were identified in accordance with methodologies described in the baseline documents. Action levels are based on the 95th percentile or reporting limits identified in the baseline. If the groundwater concentration of a constituent identified in Part 5, Table 5.6 is found to exceed an action level, a test for outliers is performed in accordance with the methodologies specified in “Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities” (EPA, 2009).

L-4e(4) Comparisons and Reporting

Prior to TRU mixed waste receipt, measurements were made of each background groundwater quality hazardous constituent specified in Part 5, Table L-5.4b at every detection monitoring well during each of the ten background sampling events (with the exception of trans-1,2-dichloroethylene and vanadium that were added after TRU mixed disposal began). These measurements serve as a statistical baseline (Part 5, Table 5.6) that is used for evaluating the significance of the results of subsequent sampling events during detection monitoring. Time-trend control charts with associated screening values for each hazardous constituent are used for this evaluation. The Permittees will compare the results from groundwater hazardous constituents of ongoing annual groundwater sample analysis to these baseline values in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.97(h)(4)). If the comparisons show that a constituent statistically exceeds the baseline of the DMWs (as defined in 20.4.1.500 NMAC (incorporating 40 CFR §264.98(f))), the well shall be resampled and an analysis performed as soon as possible, in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.98(g)). The results of the statistical comparison will be reported annually to the NMED in the Annual Culebra Groundwater Report by November 30, as required under 20.4.1.500 NMAC (incorporating 40 CFR §264.98(g)).

L-5 Reporting

L-5a Laboratory Data Reports

Laboratory data will be provided in electronic and hard copy reports to the Permittees and will contain the following information for each analytical report:

- A brief narrative summarizing laboratory analyses performed, date of issue, deviations from the analytical method, technical problems affecting data quality, laboratory quality
checks, corrective actions (if any), and the project manager’s signature approving issuance of the data report.

- Header information for each analytical data summary sheet including: sample number and corresponding laboratory identification number; sample matrix; date of collection, receipt, preparation and analysis; and analyst’s name.

- Parameter and hazardous constituents, analytical results, reporting units, reporting limit, analytical method used.

- Results of QC sample analyses for all concurrently analyzed QC samples.

All analytical results will be provided to NMED as specified in the Permit Part 5.

L-5b  Statistical Analysis and Reporting of Results

Analytical results for hazardous constituents from annual groundwater sampling activities will be compared and interpreted by the Permittees through generation of statistical analyses as specified in Section L-4e. The Permittees will perform statistical analyses; the results will be included in the Annual Culebra Groundwater Report in summary form, and will also be provided to NMED as specified in Permit Part 5.

L-5c  Semi-Annual Groundwater Surface Elevation Report and Annual Culebra Groundwater Report

Data collected from this DMP will be reported to NMED as specified in Permit Part 5 in the Annual Culebra Groundwater Report. The report will include all applicable information that may affect the comparison of background groundwater quality and groundwater surface elevation data through time. This information will include but is not limited to:

- DMW and WLMP well configuration changes that may have occurred from the time of the last measurement (i.e., plug installation and removal, packer removal and reinstallation, or both; and the type and quantity of fluids that may have been introduced into the test wells).

- Pumping activities that may have taken place since publication of the last annual report (i.e., related to groundwater quality sampling, hydraulic testing, and shaft installation or grouting) that may have taken place since the last annual groundwater report.

- A discussion of the origins of abnormal unexpected changes in the groundwater surface elevation, which is not attributable to site tests or natural stabilization of the site hydrologic system that exceeds 2 ft in a DMP well over the course of the period covered by the Annual Culebra Groundwater Report (this may indicate changes in recharge/discharge which would affect the assumptions regarding DMP well placement and constitute new information as specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.41(a)(2)).

- The results of the annual measurements of densities.
• Annotated hydrographs.

• Groundwater flow rate and direction.

• Potentiometric surface map generated using the following steps:
  
  - Examine hydrographs to identify month having the largest number of Culebra water levels available with the fewest wells affected by pumping or other anthropogenic events.
  
  - Convert water levels from subject month to equivalent freshwater heads using fluid densities appropriate to the date.
  
  - Fit trend surface through freshwater heads.
  
  - Extrapolate the trend surface to the boundaries of the model domain used for the current Performance Assessment Baseline Calculations (PABCs) and define initial fixed-head boundary conditions based on the trend surface.
  
  - Using the ensemble-average Culebra transmissivity field used for the current PABC, optimize the model boundary heads to improve the fit of the model to the freshwater heads at the wells using optimization software interactively with MODFLOW.
  
  - Run MODFLOW with optimal boundary conditions fit.
  
  - Contour MODFLOW head results on WIPP site.
  
  - Compute particle path and travel time from the Waste Handling Shaft to the LWA Boundary.
  
  - Data analysis that will accompany the potentiometric surface map will include:
    
    • Measured versus modeled scatter plot diagram
    
    • Frequency of modeled head residuals
    
    • Modeled residual freshwater head at each well
    
    • Explanations for modeled misfit residuals greater than 16.4 feet (5 meters).
    
    • Semi-annual groundwater surface elevation results will be reported as specified in Permit Part 5, Condition 5.10.2.2.
  
  The DMP data used in generating the Annual Culebra Groundwater Report will be maintained as part of the WIPP facility Operating Record and will be provided to NMED for review as specified in the permit.
L-6 Records Management

Records generated during groundwater sampling and water level monitoring will be maintained in either project files at the Permittees facility or the Operating Record. Project files will include, but are not limited to:

- Sampling and Analysis Plans (SAPs)
- SOPs
- Field Data Entry Sheets
- CofC/RFA forms
- Analytical Laboratory Data Reports
- Variance Logs and Nonconformance Reports
- Corrective Action Reports.

Detection Monitoring Program monitoring, testing, and analytical data and WLMP data will be maintained in the WIPP facility Operating Record.

L-7 Quality Assurance Requirements

Quality Assurance (QA) requirements specific to the DMP are presented in this section.

L-7a Data Quality Objectives and Quality Assurance Objectives

L-7a(1) Data Quality Objectives

Data Quality Objectives (DQOs) are qualitative and quantitative statements that specify the quality of data required to support project decisions. DQOs have been established to ensure that the data collected will be of a sufficient and known quality for their intended uses. The overall DQOs for this DMP are shown in the following sections.

L-7a(1)(i) Detection Monitoring Program

Collect accurate and defensible data of known quality that will be sufficient to assess the concentrations of constituents in the groundwater underlying the WIPP facility.

L-7a(1)(ii) Water Level Monitoring Program

Collect accurate and defensible data of known quality that will be sufficient to assess the groundwater flow direction and rate at the WIPP facility.

L-7a(2) Quality Assurance Objectives

Quality Assurance Objectives (QAOs) for measurement data have been specified in terms of accuracy, precision, completeness, representativeness, and comparability.
L-7a(2)(i) Accuracy

Accuracy is the closeness of agreement between a measurement and an accepted reference value. When applied to a set of observed values, accuracy is a combination of a random component and a common systematic error (bias) component. Measurements for accuracy will include analysis of calibration standards, laboratory control samples, matrix spike samples, and surrogate spike recoveries. The bias component of accuracy is expressed as percent recovery (%R). Percent recovery is expressed as follows:

\[ \%R = \left( \frac{\text{measured sample concentration}}{\text{true concentration}} \right) \times 100 \]

L-7a(2)(i)(A) Accuracy Objectives for Field Measurements

Field measurements will include pH, Specific Conductance (SC), temperature, specific gravity and static groundwater surface elevation. Field measurement accuracy will be determined using calibration standards. Thermometers used for field measurements will be calibrated to the National Institute for Standards and Technology (NIST) traceable standard on an annual basis to ensure accuracy. Accuracy of groundwater surface elevation measurements will be checked before each measurement period by verifying calibration of the device within the specified schedule. WIPP document WP 13-1 outlines the basic requirements for field equipment use and calibration. WIPP facility SOPs contain instructions that outline protocols for maintaining current calibration of groundwater surface elevation measurement instrumentation.

L-7a(2)(i)(B) Accuracy Objectives for Laboratory Measurements

Analytical system accuracy will be quantified using the following laboratory accuracy QC checks: calibration standards, laboratory control samples (LCS), laboratory blanks, matrix and surrogate spike recoveries. Single LCSs and matrix spike and surrogate spike sample analyses will be expressed as %R. Laboratory analytical accuracy is parameter dependent and will be prescribed in the laboratory SOP.

L-7a(2)(ii) Precision

Precision is the agreement among a set of replicate measurements without assumption or knowledge of the true value. Precision data will be derived from duplicate field and laboratory measurements. Precision will be expressed as relative percent difference (RPD), which is calculated as follows:

\[ \text{RPD} = \left( \frac{|\text{measured value sample } 1 - \text{measured value sample } 2|}{\text{average of measured samples } 1 + 2} \right) \times 100 \]

L-7a(2)(ii)(A) Precision Objectives for Field Measurements

Specific conductance, pH, and temperature will be measured during well purging and after sampling. SC measurements will be precise to ±10% pH to 0.10 standard unit, specific gravity to 0.01 by hydrometer and temperature to 0.10 degrees Celsius (°C). Water-level measurements will be precise to ± 0.01 ft. The precision of water density measurements, when measured in the
field using down hole instrumentation, will be determined on a well-by-well basis and will result in no more than a ± 2 ft of error in the derived fresh-water head.

L-7a(2)(ii)(B) Precision Objectives for Laboratory Measurements

Precision of laboratory analyses will be determined by analyzing a LCS and a lab control sample duplicate (LCSD) or by analyzing one of the field samples in duplicate depending on the requirements of the particular standard method. The precision is measured as the RPD of the recoveries for the spiked LCS/LCSD pair or the RPD of the duplicate sample analysis results. Laboratory analytical precision is also parameter dependent and will be prescribed in laboratory SOPs.

L-7a(2)(iii) Contamination

In addition to measurements of precision and bias, QC checks for contamination will be performed. QC samples including trip blanks, field blanks, and method blanks will be analyzed to assess and document contamination attributable to sample collection equipment, sample handling and shipping, and laboratory reagents and glassware. Trip blanks will be used to assess volatile organic compound (VOC) sample contamination during shipment and handling and will be collected and analyzed at a frequency of 1 sample per sample shipment. Field blanks will be used to assess field sample collection methods and will be collected and analyzed at a minimum frequency of one sample per 20 samples (five percent of the samples collected). Method blanks will be used to assess contamination resulting from the analytical process and will be analyzed at a minimum frequency of one sample per 20 samples, or five percent of the samples collected. Evaluation of sample blanks will be performed following U.S. EPA “National Functional Guidelines for Organic Data Review” (EPA, 1999) and “National Functional Guidelines for Evaluating Inorganics Analyses” (EPA, 2004). Only method blanks will be analyzed via wet chemistry methods. The criteria for evaluating method blanks will be established as follows: If method blank results exceed method reporting limits, then that value will become the detection limit for the sample batch. Detection of analytes of interest in method blank samples may be used to disqualify some samples, requiring resampling and additional analyses on a case-by-case basis.

L-7a(2)(iv) Completeness

Completeness is a measure of the amount of usable valid data resulting from a data collection activity, given the sample design and analysis. Completeness may be affected by unexpected conditions that may occur during the data collection process.

Occurrences that reduce the amount of data collected include sample container breakage during sample shipment or in the laboratory and data generated while the laboratory was operating outside prescribed QC limits. All attempts will be made to minimize data loss and to recover lost data whenever possible. The completeness objective for analysis of Part 5, Table 5.4a parameters will be 90 percent and 100 percent analysis of Part 5, Table 5.4.b hazardous constituents. If the completeness objective for Part 5 Table 5.4.b hazardous constituents is not met, the Permittees will determine the need for resampling on a case-by-case basis. Numerical expression of the completeness (%C) of data is as follows:
L-7a(2)(v) Representativeness

Representativeness is the degree to which sample analyses accurately and precisely represent the media they are intended to represent. Data representativeness for this DMP will be accomplished through implementing approved sampling procedures and the use of validated analytical methods. Sampling procedures will be designed to minimize factors affecting the integrity of the samples. Groundwater samples will only be collected after well purging criteria have been met. The analytical methods selected will be those that will most accurately and precisely represent the true concentration of analytes of interest.

For water levels and density, representativeness is a qualitative term that describes the extent to which a sampling design adequately reflects the environmental conditions of a site. The SOPs for measurement ensure that samples are representative of site conditions.

L-7a(2)(vi) Comparability

Comparability is the extent to which one data set can be compared to another. Comparability will be achieved through reporting data in consistent units and collection and analysis of samples using consistent methodology. Aqueous samples will consistently be reported in units of measures dictated by the analytical method. Units of measure include:

- Milligrams per liter (mg/L) for alkalinity, inorganic compounds and metals
- Micrograms per liter (μg/L) for VOCs and semivolatile organic compounds (SVOCs).

Culebra groundwater surface elevation measurements will be expressed as equivalent freshwater elevation in feet above mean sea level.

L-7b Design Control

The approved design for the DMP is specified in this Permit. Modifications to the DMP will be processed in accordance with 20.4.1.900 NMAC (incorporating 40 CFR §§ 270.42).

L-7c Instructions, Procedures, and Drawings

The preparation and use of instructions and procedures at the WIPP facility are outlined in the WIPP facility document WP 13-1 (see Table L-3). Activities performed for the DMP that may affect groundwater data quality will be performed in accordance with approved procedures which comply with the Permit.

L-7d Document Control

Permittees will ensure that the latest approved versions of WIPP facility SOPs will be used in performing groundwater monitoring functions and that obsolete materials will be adequately identified or removed from work areas.
L-7e Inspection and Surveillance

Inspection and surveillance activities will be conducted as outlined in WIPP document WP 13-1 (see Table L-3). The Permittees will be responsible for performing the applicable WIPP facility SOPs.

L-7f Control of Monitoring and Data Collection Equipment

WIPP document WP 13-1 (see Table L-3) outlines the basic requirements for control and calibrating monitoring and data collection (M&DC) equipment. M&DC equipment shall be properly controlled, calibrated, and maintained according to WIPP facility SOPs (see Table L-3) to ensure continued accuracy of groundwater monitoring data. Results of calibrations, maintenance, and repair will be documented. Calibration records will identify the reference standard and the relationship to national standards or nationally accepted measurement systems. Records will be maintained to track uses of M&DC equipment. If M&DC equipment is found to be out of tolerance, the equipment will be tagged and it will not be used until corrections are made.

L-7g Control of Nonconforming Conditions

In accordance with WP 13-1 (see Table L-3), equipment that does not conform to specified requirements will be controlled to prevent use. The disposition of defective items will be documented on records traceable to the affected items. Prior to final disposition, faulty items will be tagged and segregated. Repaired equipment will be subject to the original acceptance inspections and tests prior to use.

L-7h Corrective Action

Requirements for the development and implementation of a system to determine, document, and initiate appropriate corrective actions after encountering conditions adverse to quality at the WIPP facility are outlined in WIPP document WP 13-1 (see Table L-3). Conditions adverse to acceptable quality will be documented and reported in accordance with corrective action procedures and corrected as soon as practical. Immediate action will be taken to control work performed under conditions adverse to acceptable quality and its results to prevent quality degradation.

L-7i Quality Assurance Records

WIPP document WP 13-1 (see Table L-3) outlines the policy that will be used at the WIPP facility regarding identification, preparation, collection, storage, maintenance, disposition, and permanent storage of QA records.

Records to be generated in the DMP will be specified by procedure. QA and RCRA operating records will be identified. This will be the basis for the labeling of records as "QA" or "RCRA operating record" on the Environmental Monitoring Records Inventory and Disposition Schedule.
L-8 References


DOE, see U.S. Department of Energy.


EPA, see U.S. Environmental Protection Agency.


TABLES

1

2
### Table L-1
Hydrological Parameters for Rock Units above the Salado at WIPP

<table>
<thead>
<tr>
<th>Unit</th>
<th>Hydraulic Conductivity</th>
<th>Storage</th>
<th>Thickness</th>
<th>Hydraulic Gradient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Rosa</td>
<td>$2 \times 10^{-8}$ to $2 \times 10^{-6}$ m/s</td>
<td>0 to 91 m</td>
<td>0.001 (5)</td>
<td></td>
</tr>
<tr>
<td>Dewey Lake</td>
<td>$10^{-8}$ m/s</td>
<td>Specific storage $1 \times 10^{-5}$ (1/m)</td>
<td>152 m</td>
<td>0.001 (5)</td>
</tr>
<tr>
<td>Forty-niner</td>
<td>$1 \times 10^{-13}$ to $1 \times 10^{-11}$ m/s (anhydrite)</td>
<td>Specific storage $1 \times 10^{-5}$ (1/m)</td>
<td>13 to 23 m</td>
<td>NA (6)</td>
</tr>
<tr>
<td>Magenta</td>
<td>$1 \times 10^{-8.5}$ to $1 \times 10^{-6.5}$ m/s</td>
<td>Specific storage $1 \times 10^{-5}$ (1/m)</td>
<td>7 to 8.5 m</td>
<td>3 to 6</td>
</tr>
<tr>
<td>Tamarisk</td>
<td>$1 \times 10^{-13}$ to $1 \times 10^{-11}$ m/s (anhydrite)</td>
<td>Specific storage $1 \times 10^{-5}$ (1/m)</td>
<td>26 to 56 m</td>
<td>NA (6)</td>
</tr>
<tr>
<td>Culebra</td>
<td>$1 \times 10^{-7.5}$ to $1 \times 10^{-5.5}$ m/s</td>
<td>Specific storage $1 \times 10^{-5}$ (1/m)</td>
<td>4 to 11.6 m</td>
<td>0.003 to 0.007 (5)</td>
</tr>
<tr>
<td>Los Medaños</td>
<td>$6 \times 10^{-15}$ to $1 \times 10^{-13}$ m/s</td>
<td>Specific storage $1 \times 10^{-5}$ (1/m)</td>
<td>29 to 38 m</td>
<td>NA (6)</td>
</tr>
</tbody>
</table>

Matrix characteristics relevant to fluid flow include values used in this table such as permeability, hydraulic conductivity, gradient, etc.

**Table Notes:**

1. The Santa Rosa Formation is not present in the western portion of the WIPP site. It was combined with the Dewey Lake Red Beds in three-dimensional regional groundwater flow modeling (Corbet and Knupp, 1996), and the range of values entered here are those used in that study for the Dewey Lake/Triassic hydrostratigraphic unit.

2. Values or ranges of values given for these entries are the values used in three-dimensional regional groundwater flow modeling (Corbet and Knupp, 1996). Values are estimated based on literature values for similar rock types, adjusted to be consistent with site-specific data where available. Ranges of values include spatial variation over the WIPP site and differences in values used in different simulations to test model sensitivity to the parameter.
(3) Hydraulic gradient is a dimensionless term describing change in the elevation of hydraulic head divided by change in horizontal distance. Values given in these entries are determined from potentiometric surfaces. The range of values given for the Culebra reflects the highest and lowest gradients observed within the WIPP site boundary. Values for the Dewey Lake and Santa Rosa are assumed to be the same as the gradient determined from the water table. Note that the Santa Rosa Formation is absent or above the water table in most of the controlled area, and that the concept of a horizontal hydraulic gradient is not meaningful for these regions.

(4) Flow in units of very low hydraulic conductivity is slow, and primarily vertical. The concept of a horizontal hydraulic gradient is not applicable.

Sources: Beauheim, 1986; Domenico and Schwartz, 1990; Domski, Upton, and Beauheim, 1996; Earlough, 1977.
Table L-2
WIPP Groundwater Detection Monitoring Program Sample Collection and Groundwater Surface Elevation Measurement Frequency

<table>
<thead>
<tr>
<th>Installation</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater Quality Sampling</td>
<td></td>
</tr>
<tr>
<td>DMWs</td>
<td>Annually</td>
</tr>
<tr>
<td>Groundwater Surface Elevation Monitoring</td>
<td></td>
</tr>
<tr>
<td>DMWs</td>
<td>Monthly and prior to sampling events</td>
</tr>
<tr>
<td>WLMP Wells (see Table L-4)</td>
<td>Monthly</td>
</tr>
</tbody>
</table>
### Standard Operating Procedures Applicable to the DMP

<table>
<thead>
<tr>
<th>Number</th>
<th>Title/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP 02-EM1010</td>
<td>Field Parameter Measurements and Final Sample Collection: This procedure provides general instructions necessary to perform field analyses of serial samples in support of the DMP. Serial samples are collected and analyzed at the field laboratory for field indicators. Serial sample results help determine if pumped groundwater is representative of undisturbed groundwater within the formation. This procedure also describes the steps for collecting groundwater samples from the DMWs near the WIPP facility. Samples are collected and analyzed at the Field Laboratory until stabilization of the field parameters occurs. Final samples for Resource Conservation and Recovery Act (RCRA) analyses are collected and analyzed by a contract laboratory.</td>
</tr>
<tr>
<td>WP 02-EM1014</td>
<td>Groundwater Level Measurement: This document describes the method used for groundwater level measurements in support of groundwater monitoring at the WIPP facility using a portable electronic water-level probe.</td>
</tr>
<tr>
<td>WP 02-EM1021</td>
<td>Pressure Density Survey: This procedure defines the field methodology used to determine the average density of fluid standing in the well bores of groundwater-level monitoring wells. The data derived from the survey are used to calculate equivalent freshwater heads at non-detection monitoring wells. Because most pressure densities are obtained by Sandia National Laboratories via pressure transducers installed in wells, this procedure is used to obtain pressure densities at wells not equipped with fixed transducers.</td>
</tr>
<tr>
<td>WP 02-EM1026</td>
<td>Water Level Data Handling and Reporting: This procedure provides instructions on handling water level data. Data are collected and recorded on field forms in accordance with WP 02-EM1014. This procedure is initiated when wells in the water surveillance program have been measured for a given month.</td>
</tr>
<tr>
<td>WP 02-EM3001</td>
<td>Administrative Processes for Environmental Monitoring and Hydrology Programs: This procedure provides the administrative guidance environmental monitoring personnel use to maintain quality control associated with environmental monitoring sampling and reporting activities. This administrative procedure does not pertain to volatile organic compound (VOC) monitoring, with the exception of Section 5.0 which pertains to the regulatory reporting review process.</td>
</tr>
<tr>
<td>WP 02-EM3003</td>
<td>Data Validation and Verification of RCRA Constituents: This procedure provides instructions on performing verification and validation of laboratory data containing the analytical results of groundwater monitoring samples. This procedure is applied only to the non-radiological analyses results for compliance data associated with the detection monitoring samples. The data reviewed for this procedure includes general chemistry parameters and RCRA constituents.</td>
</tr>
<tr>
<td>WP-02-RC.01</td>
<td>Hazardous and Universal Waste Management Plan: This plan describes the responsibilities and handling requirements for hazardous and universal wastes generated at the WIPP facility. It is meant to ensure that these wastes are properly handled, accumulated, and transported to an approved Treatment, Storage, Disposal Facility (TSDF) in accordance with applicable state and federal regulations, U.S. Department of Energy (DOE) Orders, and Washington TRU Solutions LLC (WTS) Management and Operating Contractor (MOC) policies and procedures. This plan implements applicable sections of 20.4.1.100-1102 New Mexico Administrative Code (NMAC), Hazardous Waste Management (incorporating 40 Code of Federal Regulations [CFR] Parts 260-268 and 273).</td>
</tr>
<tr>
<td>WP 10-AD3029</td>
<td>Calibration and Control of Monitoring and Data Collection Equipment: This procedure provides direction for the control and calibration of Monitoring and Data Collection (M&amp;DC) equipment at the WIPP facility, and ensures traceability to NIST (National Institute of Standards and Technology) standards, international standards, or intrinsic standards. This procedure also establishes requirements and responsibilities for identifying recall equipment, and for obtaining calibration services for WIPP facility M&amp;DC equipment.</td>
</tr>
</tbody>
</table>
| WP 13-1    | Management and Operating Contractor (MOC) Quality Assurance Program Description: This document establishes the minimum quality requirements for Management and Operating Contractor (MOC) personnel and guidance for the development and
<table>
<thead>
<tr>
<th>Number</th>
<th>Title/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>implementation of QA programs by MOC organizations.</td>
</tr>
</tbody>
</table>

Table L-4
January 2011 Culebra WLMP

<table>
<thead>
<tr>
<th>WELL ID</th>
<th>WELL ID</th>
<th>WELL ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEC-7</td>
<td>H-17</td>
<td>SNL-15</td>
</tr>
<tr>
<td>C-2737</td>
<td>H-19 pad*</td>
<td>SNL-16</td>
</tr>
<tr>
<td>ERDA-9</td>
<td>I-461</td>
<td>SNL-17</td>
</tr>
<tr>
<td>H-02b2</td>
<td>SNL-01</td>
<td>SNL-18</td>
</tr>
<tr>
<td>H-03b2</td>
<td>SNL-02</td>
<td>SNL-19</td>
</tr>
<tr>
<td>H-04bR</td>
<td>SNL-03</td>
<td>WQSP-1</td>
</tr>
<tr>
<td>H-05b</td>
<td>SNL-05</td>
<td>WQSP-2</td>
</tr>
<tr>
<td>H-06bR</td>
<td>SNL-06</td>
<td>WQSP-3</td>
</tr>
<tr>
<td>H-07b1</td>
<td>SNL-08</td>
<td>WQSP-4</td>
</tr>
<tr>
<td>H-9bR</td>
<td>SNL-09</td>
<td>WQSP-5</td>
</tr>
<tr>
<td>H-10c</td>
<td>SNL-10</td>
<td>WQSP-6</td>
</tr>
<tr>
<td>H-11b4</td>
<td>SNL-12</td>
<td>WIPP-11</td>
</tr>
<tr>
<td>H-12</td>
<td>SNL-13</td>
<td>WIPP-13</td>
</tr>
<tr>
<td>H-15R</td>
<td>SNL-14</td>
<td>WIPP-19</td>
</tr>
<tr>
<td>H-16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*H-19b0 monthly
### Table L-5
Details of Construction for the Six Culebra Detection Monitoring Wells

<table>
<thead>
<tr>
<th>NAME (Figure)</th>
<th>DATE DRILLED</th>
<th>TOTAL DEPTH feet (meters) bgs</th>
<th>DEPTH INTO LOS MEDAÑOS feet (meters)</th>
<th>DRILLING DEPTHS WITH AIR CORING</th>
<th>DEPTH FOR 5 in. CASING</th>
<th>INTERVAL FOR SLOTTED SCREEN</th>
<th>CASING feet (meters) bgs</th>
<th>PACKING feet (meters) bgs</th>
<th>CULEBRA INTERVAL feet (meters) bgs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WQSP-1 Figure L-7</td>
<td>September 13 through 16, 1994</td>
<td>737 (225)</td>
<td>15 (5)</td>
<td>696 (212)</td>
<td>696 to 737 (212 to 225)</td>
<td>737 (225)</td>
<td>702 to 727 (214 to 222)</td>
<td>640 to 651 (195 to 198)</td>
<td>651 to 737 (198 to 225)</td>
</tr>
<tr>
<td>WQSP-2 Figure L-8</td>
<td>September 6 through 12, 1994</td>
<td>846 (258)</td>
<td>12 (4)</td>
<td>800 (244)</td>
<td>800 to 846 (244 to 258)</td>
<td>846 (258)</td>
<td>811 to 836 (247 to 255)</td>
<td>790 to 793 (241 to 242)</td>
<td>793 to 846 (242 to 258)</td>
</tr>
<tr>
<td>WQSP-3 Figure L-9</td>
<td>October 20 through 26, 1994</td>
<td>880 (268)</td>
<td>10 (3)</td>
<td>833 (254)</td>
<td>833 to 880 (254 to 268)</td>
<td>880 (268)</td>
<td>844 to 869 (257 to 265)</td>
<td>827 to 830 (252 to 253)</td>
<td>830 to 880 (253 to 268)</td>
</tr>
<tr>
<td>WQSP-4 Figure L-10</td>
<td>October 5 through 10, 1994,</td>
<td>800 (244)</td>
<td>9 (3)</td>
<td>740 (226)</td>
<td>740 to 798 (226 to 243)</td>
<td>800 (244)</td>
<td>764 to 789 (233 to 240)</td>
<td>752 to 755 (229 to 230)</td>
<td>755 to 800 (230 to 244)</td>
</tr>
<tr>
<td>WQSP-5 Figure L-11</td>
<td>October 12 through 18, 1994,</td>
<td>681 (208)</td>
<td>7 (2)</td>
<td>648 (198)</td>
<td>648 to 676 (198 to 206)</td>
<td>681 (208)</td>
<td>646 to 671 (197 to 205)</td>
<td>623 to 626 (190 to 191)</td>
<td>626 to 681 (191 to 208)</td>
</tr>
<tr>
<td>WQSP-6 Figure L-12</td>
<td>September 26 through October 3, 1994</td>
<td>616.6 (188)</td>
<td>10 (3)</td>
<td>568 (173)</td>
<td>568 to 617 (173 to 188)</td>
<td>617 (188)</td>
<td>581 to 606 (177 to 185)</td>
<td>567 to 570 (173 to 174)</td>
<td>570 to 616.6 (174 to 188)</td>
</tr>
</tbody>
</table>
### Table L-6
Analytical Parameter and Sample Requirements

<table>
<thead>
<tr>
<th>(10) PARAMETERS</th>
<th>(12) NO. OF BOTTLES</th>
<th>(13) VOLUME</th>
<th>(14) TYPE</th>
<th>(15) ACID WASH</th>
<th>(16) SAMPLE FILTER</th>
<th>(17) PRESERVATIVE</th>
<th>(18) HOLDING TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator Parameters:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• pH</td>
<td>-</td>
<td>25 ml&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Glass</td>
<td>Field determined</td>
<td>No?</td>
<td>HCl</td>
<td>None</td>
</tr>
<tr>
<td>• SC</td>
<td>-</td>
<td>100 ml&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Glass</td>
<td>Field determined</td>
<td>No</td>
<td>None</td>
<td>28 days&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>• TOC</td>
<td>4</td>
<td>15 ml&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Glass</td>
<td>Yes</td>
<td>Field determined</td>
<td>Yes</td>
<td>None</td>
</tr>
<tr>
<td>General Chemistry</td>
<td>1</td>
<td>1 Liter</td>
<td>Plastic</td>
<td>Yes</td>
<td>No</td>
<td>HNO&lt;sub&gt;3&lt;/sub&gt;, pH&lt;2</td>
<td>not specified in DMP</td>
</tr>
<tr>
<td>Phenolics</td>
<td>1</td>
<td>1 Liter</td>
<td>Amber Glass</td>
<td>Yes</td>
<td>No</td>
<td>H&lt;sub&gt;2&lt;/sub&gt;SO&lt;sub&gt;4&lt;/sub&gt;, pH&lt;2</td>
<td>not specified in DMP</td>
</tr>
<tr>
<td>Metals/Cations</td>
<td>2</td>
<td>1 Liter</td>
<td>Plastic</td>
<td>Yes</td>
<td>No</td>
<td>HNO&lt;sub&gt;3&lt;/sub&gt;, pH&lt;2</td>
<td>6 months&lt;sup&gt;2,3&lt;/sup&gt;</td>
</tr>
<tr>
<td>VOC</td>
<td>4</td>
<td>40 ml</td>
<td>Glass</td>
<td>No</td>
<td>No</td>
<td>HCl, pH&lt;2</td>
<td>14 days&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>VOC (Purgable)</td>
<td>2</td>
<td>40 ml</td>
<td>Glass</td>
<td>No</td>
<td>No</td>
<td>HCl, pH&lt;2</td>
<td>14 days&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>VOC (Non-Purgable)</td>
<td>2</td>
<td>40 ml</td>
<td>Glass</td>
<td>No</td>
<td>No</td>
<td>HCl, pH&lt;2</td>
<td>14 days&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>BN/As</td>
<td>1</td>
<td>½ Gallon</td>
<td>Amber Glass</td>
<td>Yes</td>
<td>No</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>TCLP</td>
<td>1</td>
<td>1 Liter</td>
<td>Plastic</td>
<td>Yes</td>
<td>No</td>
<td>HNO&lt;sub&gt;3&lt;/sub&gt;, pH&lt;2</td>
<td>7 days&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cyanide (Total)</td>
<td>1</td>
<td>1 Liter</td>
<td>Plastic</td>
<td>Yes</td>
<td>No</td>
<td>NaOH, pH&gt;12</td>
<td>14 days&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sulfide</td>
<td>1</td>
<td>250 ml</td>
<td>Amber Glass</td>
<td>Yes</td>
<td>No</td>
<td>NaOH + Zn Acetate</td>
<td>28 days&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Radionuclides</td>
<td>1</td>
<td>1 Gallon</td>
<td>Plastic Cube</td>
<td>Yes</td>
<td>Yes</td>
<td>HNO&lt;sub&gt;3&lt;/sub&gt;, pH&lt;2</td>
<td>6 months&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1 = RCRA Detection Monitoring Analytes
2 = As specified in Table 4-1 of the RCRA TEGD
3 = Reduced holding time of 1 week for WIPP-specific Divalent cation 2 samples noted in the GMD
Note: Unless otherwise indicated, data are from DOE Procedure WP 02-EM1006 methods and are provided as information only.
Note: Deviations from this table are allowed with prior approval by the NMED.
Figure L-1
General Location of the WIPP Facility
Figure L-2
WIPP Facility Boundaries Showing 16-square-Mile Land Withdrawal Boundary
<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>SERIES</th>
<th>GROUP</th>
<th>FORMATION</th>
<th>MEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECENT</td>
<td>RECENT</td>
<td>SURFICIAL</td>
<td>DEWEY LAKE</td>
<td>Forty-niner</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DEPOSITS</td>
<td></td>
<td>Magenta</td>
</tr>
<tr>
<td>QUATERNARY</td>
<td>PLEISTOCENE</td>
<td>MESCALERO</td>
<td>RUSTLER</td>
<td>Tamarisk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CALICHE</td>
<td></td>
<td>Culebra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GATUÑA</td>
<td></td>
<td>Los Medanos</td>
</tr>
<tr>
<td>TERTIARY</td>
<td>MID.</td>
<td>OGALLALA</td>
<td>SALADO</td>
<td>Upper</td>
</tr>
<tr>
<td></td>
<td>PLIOCENE</td>
<td></td>
<td></td>
<td>McKlutt Potash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SANTA ROSA</td>
<td>CASTILE</td>
<td>Lower</td>
</tr>
<tr>
<td>TRIASSIC</td>
<td></td>
<td></td>
<td>BELL CANYON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DOCKUM</td>
<td></td>
<td>CHERRY CANYON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SANTA</td>
<td></td>
<td>BRUSHY CANYON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ROSA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure L-3
Site Geologic Column
Figure L-4
Generalized Stratigraphic Cross Section above Bell Canyon Formation at WIPP Site

Legend
- Halite
- Mudstone and Siltstone
- Anhydrite
- Sand and Sandstone
- Limestone
- Dolomite
Figure L-5
Culebra Freshwater-Head Potentiometric Surface
NOTE: Point of compliance is defined in Part 5.3.1.

Figure L-6
Detection Monitoring Well Locations

PERMIT ATTACHMENT L
Page L-46 of 54
Figure L-7
As-Built Configuration of Well WQSP-1
Figure L-8
As-Built Configuration of Well WQSP-2
Figure L-9
As-Built Configuration of Well WQSP-3
Figure L-10
As-Built Configuration of Well WQSP-4
Figure L-11
As-Built Configuration of Well WQSP-5
Figure L-12
As-Built Configuration of Well WQSP-6
Figure L-13
Example Chain-of-Custody/Request for Analysis Form
Figure L-14
Groundwater Level Surveillance Wells
(inset represents the groundwater surveillance wells in WIPP Land Withdrawal Area)