



NEW MEXICO
ENVIRONMENT DEPARTMENT



Hazardous Waste Bureau

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BUTCH TONGATE
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JOHN A. SANCHEZ
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JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

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

RECEIVED
AUG. 27 2012
General Manager's
Office

**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

Mr. Franco and Mr. Sharif
August 24, 2012
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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 ~~stricken out~~. 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 Washington TRU Solutions LLC, Management and Operating Contractor (**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))]

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(1)(6)(ii))]

1.7.13.3. Written Notice

As required by 20.4.1.900 NMAC (incorporating 40 CFR §270.30(1)(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(1)(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(1)(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:

Chief, Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505

Telephone Number: (505) 476-6000
Facsimile Number: (505) 476-6060

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 CFR §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;
10. Biennial Report submitted pursuant to Permit Section 2.14.2.

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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1 A-2 Description of Activities

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

6 A-3 Property Description

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

13 A-4 Facility Type

14 There are three basic groups of structures associated with the WIPP facility: surface structures,
15 shafts and underground structures. The surface structures accommodate the personnel,
16 equipment, and support services required for the receipt, preparation, and transfer of TRU
17 mixed waste from the surface to the underground. There are two surface locations where TRU
18 mixed waste is managed and stored. The first area is the Waste Handling Building (**WHB**)
19 Container Storage Unit (**WHB Unit**) for TRU mixed waste management and storage. The WHB
20 Unit consists of the WHB contact-handled (**CH**) Bay and the remote-handled (**RH**) Complex.
21 The second area designated for managing and storing TRU mixed waste is the Parking Area
22 Container Storage Unit (**Parking Area Unit**), an outside container storage area which extends
23 south from the WHB to the rail siding. The Parking Area Unit provides storage space for up to
24 50 loaded Contact-Handled Packages and 14 loaded Remote-Handled Packages on an asphalt
25 and concrete surface. Part 3 of the permit authorizes the storage and management of CH and
26 RH TRU mixed waste containers in these two surface locations. The technical requirements of
27 20.4.1.500 NMAC (incorporating 40 CFR §§264.170 to 264.178) are applied to the operation of
28 the WHB Unit and the Parking Area Unit. Permit Attachment A1 describes the container storage
29 units, the TRU mixed waste management facilities and operations, and compliance with the
30 technical requirements of 20.4.1.500 NMAC.

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

35 The WIPP is a geologic repository mined within a bedded salt formation, which is defined in
36 20.4.1.100 NMAC (incorporating 40 CFR §260.10) as a miscellaneous unit. As such, hazardous
37 waste management units within the repository are subject to permitting according to 20.4.1.900
38 and .901 NMAC (incorporating 40 CFR §270), and are regulated under 20.4.1.500 NMAC,
39 Miscellaneous Units.

40 The underground structures include the underground Hazardous Waste Disposal Units
41 (**HWDUs**), an area for future underground HWDUs, the shaft pillar area, interconnecting drifts
42 and other areas unrelated to the Hazardous Waste Facility Permit. The underground HWDUs

1 are defined as waste panels, each consisting of seven rooms and two access drifts. The WIPP
2 underground area is designated as Panels 1 through 10, although only Panels 1 through 8 will
3 be used under the terms of this permit. Each of the seven rooms is approximately 300 feet long,
4 33 feet wide and 13 feet high. Part 4 of the permit authorizes the management and disposal of
5 CH and RH TRU mixed waste containers in underground HWDUs. The Disposal Phase consists
6 of receiving CH and RH TRU mixed waste shipping containers, unloading and transporting the
7 waste containers to the underground HWDUs, emplacing the waste in the underground
8 HWDUs, and subsequently achieving closure of the underground HWDUs in compliance with
9 applicable State and Federal regulations. As required by 20.4.1.500 NMAC (incorporating 40
10 CFR §264.601), the Permittees shall ensure that the environmental performance standards for a
11 miscellaneous unit, which are applied to the underground HWDUs in the geologic repository, will
12 be met. Permit Attachment A2 describes the underground HWDUs, the TRU mixed waste
13 management facilities and operations, and compliance with the technical requirements of
14 20.4.1.500 NMAC.

15 A-5 Waste Description

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

20 These Waste Summary Categories are:

21 S3000—Homogeneous Solids

22 Solid process residues defined as solid materials, excluding soil, that do not meet the
23 applicable regulatory criteria for classification as debris [20.4.1.800 NMAC, (incorporating
24 40 CFR §268.2(g) and (h))]. Solid process residues include inorganic process residues,
25 inorganic sludges, salt waste, and pyrochemical salt waste. Other waste streams are
26 included in this Waste Summary Category based on the specific waste stream types and
27 final waste form. This category includes wastes that are at least 50 percent by volume
28 solid process residues.

29 S4000—Soils/Gravel

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

32 S5000—Debris Wastes

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

38 The S5000 Waste Summary Category includes metal debris, metal debris containing lead,
39 inorganic nonmetal debris, asbestos debris, combustible debris, graphite debris,
40 heterogeneous debris, and composite filters, as well as other minor waste streams.
41 Particles smaller than 2.36 inches in size may be considered debris if the debris is a
42 manufactured object and if it is not a particle of S3000 or S4000 material.

1 If a waste does not include at least 50 percent of any given category by volume,
2 characterization shall be performed using the waste characterization process required for the
3 category constituting the greatest volume of waste for that waste stream.

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

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

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

16 December 19, 1997 NMED received notification of a change of name/ownership from
17 Westinghouse Electric Corporation to CBS Corporation. The WIPP
18 Management and Operating Contractor (**MOC**), Westinghouse Waste
19 Isolation Division (**WID**), became a division of Westinghouse Electric
20 Company, which in turn was a division of CBS Corporation. Notification to
21 NMED was made by the permit applicant in a letter dated December 18,
22 1997. The permit application was under review, but a draft permit was not
23 yet issued.

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

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

40 March 26, 1999 NMED received official notification of the divestiture of Westinghouse
41 Electric Company by CBS Corporation to MK/BNFL GESCO LLC
42 effective March 22, 1999. The MOC was renamed Westinghouse
43 Government Environmental Services Company LLC (**WGES**), of which

1 Westinghouse Waste Isolation Division was a division. This transaction
2 constituted a change of operational control under 20.4.1.900 NMAC
3 (incorporating 40 CFR §270.40). Notification to NMED was made by the
4 permit applicant in a letter dated March 24, 1999. The public hearing on
5 the permit was nearly concluded, but the final permit was not yet issued.

6 April 28, 1999 NMED received a revised Part A Permit Application in a letter dated April
7 21, 1999, reflecting that the Westinghouse Waste Isolation Division, co-
8 operator of the WIPP hazardous waste facility, was now a part of WGES.
9 However, the final permit, issued October 27, 1999, did not reflect the
10 change in ownership.

11 July 25, 2000 NMED received a Class 1 permit modification in a letter dated July 21,
12 2000, changing the name in the Permit from Westinghouse Electric
13 Corporation to Westinghouse Government Environmental Services
14 Company LLC (**WGES**), Waste Isolation Division (**WID**). However, this
15 notification did not constitute the required permit modification under
16 20.4.1.900 NMAC (incorporating 40 CFR §270.40) necessary to reflect
17 the transfer of the permit to a new operator.

18 December 15, 2000 DOE announced that it had awarded a five-year contract for management
19 and operation of WIPP to Westinghouse TRU Solutions LLC, a limited
20 liability company owned jointly by WGES LLC and Roy F. Weston, Inc.
21 The announcement further stated that, following a brief transition period,
22 the new contractor would assume MOC responsibilities on February 1,
23 2001. This transaction constituted a change of operational control under
24 20.4.1.900 NMAC (incorporating 40 CFR §270.40) requiring a Class 1
25 permit modification with prior written approval of NMED.

26 February 5, 2001 NMED received a Class 1 permit modification in a letter dated February 2,
27 2001, which notified NMED of an organizational name change of the
28 MOC from Westinghouse Government Environmental Services Company
29 LLC Waste Isolation Division to Westinghouse TRU Solutions LLC.
30 However, this notification did not constitute the required permit
31 modification under 20.4.1.900 NMAC (incorporating 40 CFR §270.40)
32 necessary to reflect the transfer of the permit to a new operator.

33 December 31, 2002 NMED received a Class 1 permit modification in a letter dated December
34 27, 2002, which changed the name of the MOC from Westinghouse TRU
35 Solutions LLC to Washington TRU Solutions LLC. Again, this notification
36 did not constitute the required permit modification under 20.4.1.900
37 NMAC (incorporating 40 CFR §270.40) necessary to reflect the transfer of
38 the permit to a new operator.

39 February 28, 2003 NMED received a Class 1 permit modification requiring prior agency
40 approval in a letter dated February 28, 2003, to satisfy the requirements
41 specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.40) to reflect
42 the transfer of the permit to a new operator.

- 1 September 16, 2004 NMED received a Class 1 permit modification requiring prior agency
2 approval in a letter dated September 16, 2004, describing a change of
3 ownership of Washington TRU Solutions LLC (**WTS**). WTS is owned
4 jointly by WGES, managing member, and Weston Solutions, Inc. WGES
5 had been owned jointly by Washington Group International, Inc. (**WGI**),
6 and BNFL Nuclear Services, Inc. However, WGI has acquired BNFL's
7 prior interest in the former Westinghouse government services
8 businesses, which includes BNFL's prior interest in WGES.
- 9 August 6, 2007 NMED received notification in a letter dated August 2, 2007 of the
10 pending acquisition of WGI by URS Corporation at an unknown future
11 date. This acquisition would be related to operational control, because
12 WGI is the sole owner of WGES, managing member of the joint venture,
13 along with Weston Solutions, Inc., that owns WTS, the WIPP MOC. This
14 notification was submitted to assure compliance with 20.4.1.900 NMAC
15 (incorporating 40 CFR §270.40(b)).
- 16 November 26, 2007 NMED received a Class 1 permit modification requiring prior agency
17 approval in a letter dated November 19, 2007, describing a change of
18 ownership of WTS. On November 15, 2007, WGI was acquired by URS
19 Corporation. WTS is owned jointly by WGES, managing member, and
20 Weston Solutions, Inc. WGES, formerly owned by WGI, is now owned by
21 URS Corporation.
- 22 October 1, 2012 NMED received a Class 1 permit modification requiring prior agency
23 approval in a letter dated June 25, 2012 describing a change in the MOC
24 for the WIPP facility. The new MOC for the WIPP facility will be Nuclear
25 Waste Partnership LLC. The new MOC is comprised of URS Energy and
26 Construction, Inc. and Babcock and Wilcox Technical Services Group,
27 Inc.

ATTACHMENT B
HAZARDOUS WASTE PERMIT APPLICATION PART A

Waste Isolation Pilot Plant
Hazardous Waste Permit
~~May 8~~ October 1, 2012

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ATTACHMENT B
HAZARDOUS WASTE PERMIT APPLICATION PART A

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OMB# 2050-0024; Expires 12/31/2014

SEND COMPLETED FORM TO: The Appropriate State or Regional Office.	United States Environmental Protection Agency RCRA SUBTITLE C SITE IDENTIFICATION FORM								
1. Reason for Submittal MARK ALL BOX(ES) THAT APPLY	Reason for Submittal: <input type="checkbox"/> To provide an Initial Notification (first time submitting site identification information / to obtain an EPA ID number for this location) <input checked="" type="checkbox"/> To provide a Subsequent Notification (to update site identification information for this location) <input type="checkbox"/> As a component of a First RCRA Hazardous Waste Part A Permit Application <input checked="" type="checkbox"/> As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment # <u>27</u>) <input type="checkbox"/> As a component of the Hazardous Waste Report (If marked, see sub-bullet below) <input type="checkbox"/> Site was a TSD facility and/or generator of ≥1,000 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 LQG regulations)								
2. Site EPA ID Number	EPA ID Number <input type="text" value="N"/> <input type="text" value="M"/> <input type="text" value="4"/> <input type="text" value="8"/> <input type="text" value="9"/> <input type="text" value="0"/> <input type="text" value="1"/> <input type="text" value="3"/> <input type="text" value="9"/> <input type="text" value="0"/> <input type="text" value="8"/> <input type="text" value="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 State: NM Country: USA Zip Code: 88221								
5. Site Land Type	<input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other								
6. NAICS Code(s) for the Site (at least 5-digit codes)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">A. <input type="text" value="5"/><input type="text" value="6"/><input type="text" value="2"/><input type="text" value="2"/><input type="text" value="1"/></td> <td style="width: 50%;">C. <input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/></td> </tr> <tr> <td>B. <input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/></td> <td>D. <input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/></td> </tr> </table>			A. <input type="text" value="5"/> <input type="text" value="6"/> <input type="text" value="2"/> <input type="text" value="2"/> <input type="text" value="1"/>	C. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	B. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	D. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		
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B. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	D. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>								
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 MI: R. Last: 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: jose.franco@wipp.ws Phone: (575) 234-7300 Ext.: Fax: (575) 234-7027								
9. Legal Owner and Operator of the Site	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"> A. Name of Site's Legal Owner: U.S. Department of Energy Owner Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other </td> <td style="width: 40%;"> Date Became Owner: 05/18/1981 </td> </tr> <tr> <td colspan="2"> Street or P.O. Box: P.O. Box 3090 City, Town, or Village: Carlsbad Phone: (575) 234-7300 State: NM Country: USA Zip Code: 88221 </td> </tr> <tr> <td> B. Name of Site's Operator: U.S. Department of Energy Operator Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other </td> <td> Date Became Operator: 05/18/1981 </td> </tr> </table>			A. Name of Site's Legal Owner: U.S. Department of Energy Owner Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other	Date Became Owner: 05/18/1981	Street or P.O. Box: P.O. Box 3090 City, Town, or Village: Carlsbad Phone: (575) 234-7300 State: NM Country: USA Zip Code: 88221		B. Name of Site's Operator: U.S. Department of Energy Operator Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other	Date Became Operator: 05/18/1981
A. Name of Site's Legal Owner: U.S. Department of Energy Owner Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other	Date Became Owner: 05/18/1981								
Street or P.O. Box: P.O. Box 3090 City, Town, or Village: Carlsbad Phone: (575) 234-7300 State: NM Country: USA Zip Code: 88221									
B. Name of Site's Operator: U.S. Department of Energy Operator Type: <input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other	Date Became Operator: 05/18/1981								

EPA ID Number N M 4 | 8 9 0 | 1 3 9 | 0 8 8

OMB#: 2050-0024; Expires 12/31/2014

10. Type of Regulated Waste Activity (at your site)
 Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities; Complete all parts 1-10.

<p><input checked="" type="checkbox"/> <input type="checkbox"/> 1. Generator of Hazardous Waste If "Yes", mark only one of the following – a, b, or c.</p> <p><input checked="" type="checkbox"/> a. 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.</p> <p><input type="checkbox"/> b. SQG: 100 to 1,000 kg/mo (220 – 2,200 lbs./mo) of non-acute hazardous waste.</p> <p><input type="checkbox"/> c. CESQG: Less than 100 kg/mo (220 lbs./mo) of non-acute hazardous waste.</p> <p>If "Yes" above, indicate other generator activities in 2-4.</p> <p><input type="checkbox"/> <input type="checkbox"/> 2. Short-Term Generator (generate from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section.</p>	<p><input type="checkbox"/> <input checked="" type="checkbox"/> 5. Transporter of Hazardous Waste If "Yes", mark all that apply.</p> <p><input type="checkbox"/> a. Transporter</p> <p><input type="checkbox"/> b. Transfer Facility (at your site)</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> 6. Treater, Storer, or Disposer of Hazardous Waste Note: A hazardous waste Part B permit is required for these activities.</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> 7. Recycler of Hazardous Waste</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> 8. Exempt Boiler and/or Industrial Furnace If "Yes", mark all that apply.</p> <p><input type="checkbox"/> a. Small Quantity On-site Burner Exemption</p> <p><input type="checkbox"/> b. Smelting, Melting, and Refining Furnace Exemption</p>
---	---

<p><input type="checkbox"/> <input checked="" type="checkbox"/> 3. United States Importer of Hazardous Waste</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> 4. Mixed Waste (hazardous and radioactive) Generator</p>	<p><input type="checkbox"/> <input checked="" type="checkbox"/> 9. Underground Injection Control</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> 10. Receives Hazardous Waste from Off-site</p>
---	---

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

<p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> 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.</p> <p>a. Batteries <input type="checkbox"/></p> <p>b. Pesticides <input type="checkbox"/></p> <p>c. Mercury containing equipment <input type="checkbox"/></p> <p>d. Lamps <input type="checkbox"/></p> <p>e. Other (specify) _____ <input type="checkbox"/></p> <p>f. Other (specify) _____ <input type="checkbox"/></p> <p>g. Other (specify) _____ <input type="checkbox"/></p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> 2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity.</p>	<p>C. Used Oil Activities; Complete all parts 1-4.</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> 1. Used Oil Transporter If "Yes", mark all that apply.</p> <p><input type="checkbox"/> a. Transporter</p> <p><input type="checkbox"/> b. Transfer Facility (at your site)</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> 2. Used Oil Processor and/or Re-refiner If "Yes", mark all that apply.</p> <p><input type="checkbox"/> a. Processor</p> <p><input type="checkbox"/> b. Re-refiner</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> 3. Off-Specification Used Oil Burner</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> 4. Used Oil Fuel Marketer If "Yes", mark all that apply.</p> <p><input type="checkbox"/> a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner</p> <p><input type="checkbox"/> b. Marketer Who First Claims the Used Oil Meets the Specifications</p>
---	---

EPA ID Number | N | M | 4 | 8 | 9 | 0 | 1 | 3 | 9 | 0 | 8 | 8 |

OMB#: 2050-0024; Expires 12/31/2014

10. Type of Regulated Waste Activity (at your site)
 Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities; Complete all parts 1-10.

- | | |
|--|---|
| <p>Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 1. Generator of Hazardous Waste
 If "Yes", mark only one of the following – a, b, or c.</p> <p><input checked="" type="checkbox"/> a. 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.</p> <p><input type="checkbox"/> b. SQG: 100 to 1,000 kg/mo (220 – 2,200 lbs./mo) of non-acute hazardous waste.</p> <p><input type="checkbox"/> c. CESQG: Less than 100 kg/mo (220 lbs./mo) of non-acute hazardous waste.</p> <p>If "Yes" above, indicate other generator activities in 2-4.</p> <p>Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 2. Short-Term Generator (generate from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section.</p> <p>Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 3. United States Importer of Hazardous Waste</p> <p>Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 4. Mixed Waste (hazardous and radioactive) Generator</p> | <p>Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 5. Transporter of Hazardous Waste
 If "Yes", mark all that apply.</p> <p><input type="checkbox"/> a. Transporter
 <input type="checkbox"/> b. Transfer Facility (at your site)</p> <p>Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 6. Treater, Storer, or Disposer of Hazardous Waste Note: A hazardous waste Part B permit is required for these activities.</p> <p>Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 7. Recycler of Hazardous Waste</p> <p>Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 8. Exempt Boiler and/or Industrial Furnace
 If "Yes", mark all that apply.</p> <p><input type="checkbox"/> a. Small Quantity On-site Burner Exemption
 <input type="checkbox"/> b. Smelting, Melting, and Refining Furnace Exemption</p> <p>Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 9. Underground Injection Control</p> <p>Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 10. Receives Hazardous Waste from Off-site</p> |
|--|---|

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

- Y N **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.
- a. Batteries
- b. Pesticides
- c. Mercury containing equipment
- d. Lamps
- e. Other (specify) _____
- f. Other (specify) _____
- g. Other (specify) _____
- Y N **2. Destination Facility for Universal Waste**
 Note: A hazardous waste permit may be required for this activity.

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

- Y N **1. Used Oil Transporter**
 If "Yes", mark all that apply.
- a. Transporter
 b. Transfer Facility (at your site)
- Y N **2. Used Oil Processor and/or Re-refiner**
 If "Yes", mark all that apply.
- a. Processor
 b. Re-refiner
- Y N **3. Off-Specification Used Oil Burner**
- Y N **4. Used Oil Fuel Marketer**
 If "Yes", mark all that apply.
- 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 ID Number N M 4 | 8 | 9 | 0 | 1 | 3 | 9 | 0 | 8 | 8

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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.

D004	D019	D033	F001	P030	U043	U108
D005	D021	D034	F002	P098	U044	U122
D006	D022	D035	F003	P099	U052	U133
D007	D026	D036	F004	P106	U070	U134
D008	D027	D037	F005	P120	U072	U151
D009	D028	D038	F006	U002	U078	U154
D010	D029	D039	F007	U003	U079	U159
D011	D030	D040	F009	U019	U103	U196
D018	D032	D043	P015	U037	U105	More Codes Attach.

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.

EPA ID Number | N | M | 4 | 8 | 9 | 0 | 1 | 3 | 9 | 0 | 8 | 8 |

OMB#: 2050-0024; Expires 12/31/2014

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.

D004	D019	D033	F001	P030	U043	U108
D005	D021	D034	F002	P098	U044	U122
D006	D022	D035	F003	P099	U052	U133
D007	D026	D036	F004	P106	U070	U134
D008	D027	D037	F005	P120	U072	U151
D009	D028	D038	F006	U002	U078	U154
D010	D029	D039	F007	U003	U079	U159
D011	D030	D040	F009	U019	U103	U196
D018	D032	D043	P015	U037	U105	More Codes Attach.

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.

EPA ID Number NM4890139088

Additional Hazardous Waste Numbers from Section 10						
U209						
U210						
U220						
U226						
U228						
U239						

Additional Hazardous Waste Numbers from Section 10						
U209						
U210						
U220						
U226						
U228						
U239						

1 NM4890139088

EPA ID Number | N | M | 4 | 8 | 9 | 0 | 1 | 3 | 9 | 0 | 8 | 8 |

OMB#: 2050-0024; Expires 12/31/2014

United States Environmental Protection Agency		
HARDOUS WASTE PERMIT INFORMATION FORM		
1. Facility Permit Contact	First Name: Jose	MI: R. Last Name: Franco
	Contact Title: Manager, Carlsbad Field Office	
	Phone: (575) 234-7300	Ext.: Email: jose.franco@wipp.ws
2. Facility Permit Contact Mailing Address	Street or P.O. Box: P.O. Box 3090	
	City, Town, or Village: Carlsbad	
	State: NM	
	Country: USA	Zip Code: 88221
3. Operator Mailing Address and Telephone Number	Street or P.O. Box: P.O. Box 3090	
	City, Town, or Village: Carlsbad	
	State: NM	Phone: (575) 234-7300
	Country: USA	Zip Code: 88221
4. Facility Existence Date	Facility Existence Date (mm/dd/yyyy): 05/18/1981	
5. Other Environmental Permits		
A. Facility Type (Enter code)	B. Permit Number	C. Description
		See Permit Attachment B, Appendix B1
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-bedded salt formation approximately 2,150 feet beneath the surface.		

2

EPA ID Number N M 4 | 8 9 0 | 1 3 9 | 0 8 8

OMB#: 2050-0024; Expires 12/31/2014

7. 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, T04 and X99), describe the process (including its design capacity) in the space provided in Item 8.
- B. PROCESS DESIGN CAPACITY** – For each code entered in Item 7.A; enter the capacity of the process.
- 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.
 - UNIT OF MEASURE** – For each amount entered in Item 7.B(1), enter the code in Item 7.B(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.

Process Code	Process	Appropriate Unit of Measure for Process Design Capacity	Process Code	Process	Appropriate Unit of Measure for Process Design Capacity
Disposal			Treatment (Continued)		
D79	Underground Injection Well Disposal	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; Liters Per Hour; Kilograms Per Hour; or Million BTU Per Hour
D80	Landfill	Acre-feet; Hectares-meter; Acres; Cubic Meters; Hectares; Cubic Yards	T82	Lime Kiln	
D81	Land Treatment	Acres or Hectares	T83	Aggregate Kiln	
D82	Ocean Disposal	Gallons Per Day or Liters Per Day	T84	Phosphate Kiln	
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards	T85	Coke Oven	
D99	Other Disposal	Any Unit of Measure Listed Below	T86	Blast Furnace	
Storage			T87	Smelting, Melting, or Refining Furnace	
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards	T88	Titanium Dioxide Chloride Oxidation Reactor	
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards	T89	Methane Reforming Furnace	
S03	Waste Pile	Cubic Yards or Cubic Meters	T90	Pulping Liquor Recovery Furnace	
S04	Surface Impoundment	Gallons; Liters; Cubic Meters; or Cubic Yards	T91	Combustion Device Used in the Recovery of Sulfur Values from Spent Sulfuric Acid	
S05	Drip Pad	Gallons; Liters; Cubic Meters; Hectares; or Cubic Yards	T92	Halogen Acid Furnaces	
S06	Containment Building Storage	Cubic Yards or Cubic Meters	T93	Other Industrial Furnaces Listed in 40 CFR 260.10	
S99	Other Storage	Any Unit of Measure Listed Below	T94	Containment Building Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; BTU Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million BTU Per Hour
Treatment			Miscellaneous (Subpart X)		
T01	Tank Treatment	Gallons Per Day; Liters Per Day	X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
T02	Surface Impoundment	Gallons Per Day; Liters Per Day	X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Day; Metric Tons Per Day; 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 Hour; Gallons Per Day; Metric Tons Per Hour; or Million BTU Per Hour	X03	Thermal Unit	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; 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; Short Tons Per Day; BTUs Per Hour; Gallons Per Day; Liters Per Hour; or Million BTU Per Hour	X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; BTUs Per Hour; or Million BTU Per Hour	X99	Other Subpart X	Any Unit of Measure Listed Below
Unit of Measure		Unit of Measure Code	Unit of Measure		Unit of Measure Code
Gallons	G	Short Tons Per Hour	D	Cubic Yards	Y
Gallons Per Hour	E	Short Tons Per Day	N	Cubic Meters	C
Gallons Per Day	U	Metric Tons Per Hour	W	Acres	B
Liters	L	Metric Tons Per Day	S	Acre-feet	A
Liters Per Hour	H	Pounds Per Hour	J	Hectares	Q
Liters Per Day	V	Kilograms Per Hour	X	Hectare-meter	F
		Million BTU Per Hour	X	BTU Per Hour	I

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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.

Line Number	A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY		C. Process Total Number of Units	For Official Use Only				
				(1) Amount (Specify)	(2) Unit of Measure						
X 1	S	0	2	533.788	G	001					
1	X	0	4	175600.0	C	010					
2	S	0	1	194.1	C	001					
3	S	0	1	242.0	C	001					
4											
5											
6											
7											
8											
9											
1 0											
1 1											
1 2											
1 3											

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)

Line Number (Enter #s in sequence with Item 7)	A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY		C. Process Total Number of Units	For Official Use Only				
				(1) Amount (Specify)	(2) Unit of Measure						
X 2	T	0	4	100.00	U	001					

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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)																	
Line Number	A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES										
							(1) PROCESS CODES (Enter Code)						(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))				
	1	F	0	0	1	1891	M	X	0	4	S	0	1	S	0	1	
	2	F	0	0	2	1860	M	X	0	4	S	0	1	S	0	1	
	3	F	0	0	3	1593	M	X	0	4	S	0	1	S	0	1	
	4	F	0	0	4	26	M	X	0	4	S	0	1	S	0	1	
	5	F	0	0	5	1829	M	X	0	4	S	0	1	S	0	1	
	6	F	0	0	6	915	M	X	0	4	S	0	1	S	0	1	
	7	F	0	0	7	915	M	X	0	4	S	0	1	S	0	1	
	8	F	0	0	9	915	M	X	0	4	S	0	1	S	0	1	
	9	D	0	0	4	903	M	X	0	4	S	0	1	S	0	1	
1	0	D	0	0	5	484	M	X	0	4	S	0	1	S	0	1	
1	1	D	0	0	6	1819	M	X	0	4	S	0	1	S	0	1	
1	2	D	0	0	7	1248	M	X	0	4	S	0	1	S	0	1	
1	3	D	0	0	8	3246	M	X	0	4	S	0	1	S	0	1	
1	4	D	0	0	9	1727	M	X	0	4	S	0	1	S	0	1	
1	5	D	0	1	0	186	M	X	0	4	S	0	1	S	0	1	
1	6	D	0	1	1	1090	M	X	0	4	S	0	1	S	0	1	
1	7	D	0	1	8	749	M	X	0	4	S	0	1	S	0	1	
1	8	D	0	1	9	761	M	X	0	4	S	0	1	S	0	1	
1	9	D	0	2	1	26	M	X	0	4	S	0	1	S	0	1	
2	0	D	0	2	2	1098	M	X	0	4	S	0	1	S	0	1	
2	1	D	0	2	6	609	M	X	0	4	S	0	1	S	0	1	
2	2	D	0	2	7	26	M	X	0	4	S	0	1	S	0	1	
2	3	D	0	2	8	449	M	X	0	4	S	0	1	S	0	1	
2	4	D	0	2	9	478	M	X	0	4	S	0	1	S	0	1	
2	5	D	0	3	0	26	M	X	0	4	S	0	1	S	0	1	
2	6	D	0	3	2	26	M	X	0	4	S	0	1	S	0	1	
2	7	D	0	3	4	26	M	X	0	4	S	0	1	S	0	1	
2	8	D	0	3	5	139	M	X	0	4	S	0	1	S	0	1	
2	9	D	0	3	6	26	M	X	0	4	S	0	1	S	0	1	
3	0	D	0	3	7	26	M	X	0	4	S	0	1	S	0	1	
3	1	D	0	3	8	26	M	X	0	4	S	0	1	S	0	1	
3	2	D	0	3	9	26	M	X	0	4	S	0	1	S	0	1	
3	3	D	0	4	0	140	M	X	0	4	S	0	1	S	0	1	
3	4	D	0	4	3	26	M	X	0	4	S	0	1	S	0	1	
3	5	P	0	1	5	945	M	X	0	4	S	0	1	S	0	1	
3	6	U	0	0	2	344	M	X	0	4	S	0	1	S	0	1	

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9. Description of Hazardous Wastes (Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)																	
Line Number	A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES						(2) PROCESS DESCRIPTION (If code is not entered in 9.D.1)				
	(1) PROCESS CODES (Enter Code)																
3	7	U	0	1	9	344	M	X	0	4	S	0	1	S	0	1	
3	8	U	0	3	7	344	M	X	0	4	S	0	1	S	0	1	
3	9	U	0	4	3	344	M	X	0	4	S	0	1	S	0	1	
4	0	U	0	4	4	344	M	X	0	4	S	0	1	S	0	1	
4	1	U	0	5	2	344	M	X	0	4	S	0	1	S	0	1	
4	2	U	0	7	0	344	M	X	0	4	S	0	1	S	0	1	
4	3	U	0	7	2	344	M	X	0	4	S	0	1	S	0	1	
4	4	U	0	7	8	344	M	X	0	4	S	0	1	S	0	1	
4	5	U	0	7	9	344	M	X	0	4	S	0	1	S	0	1	
4	6	U	1	0	5	344	M	X	0	4	S	0	1	S	0	1	
4	7	U	1	2	2	344	M	X	0	4	S	0	1	S	0	1	
4	8	U	1	3	3	344	M	X	0	4	S	0	1	S	0	1	
4	9	U	1	5	1	344	M	X	0	4	S	0	1	S	0	1	
5	0	U	1	5	4	344	M	X	0	4	S	0	1	S	0	1	
5	1	U	1	5	9	344	M	X	0	4	S	0	1	S	0	1	
5	2	U	1	9	6	344	M	X	0	4	S	0	1	S	0	1	
5	3	U	2	0	9	344	M	X	0	4	S	0	1	S	0	1	
5	4	U	2	1	0	344	M	X	0	4	S	0	1	S	0	1	
5	5	U	2	2	0	344	M	X	0	4	S	0	1	S	0	1	
5	6	U	2	2	6	344	M	X	0	4	S	0	1	S	0	1	
5	7	U	2	2	8	344	M	X	0	4	S	0	1	S	0	1	
5	8	U	2	3	9	344	M	X	0	4	S	0	1	S	0	1	
5	9	P	1	2	0	3.3	M	X	0	4	S	0	1	S	0	1	
6	0	U	1	3	4	344	M	X	0	4	S	0	1	S	0	1	
6	1	D	0	3	3	344	M	X	0	4	S	0	1	S	0	1	
6	2	P	0	3	0	344	M	X	0	4	S	0	1	S	0	1	
6	3	P	0	9	8	344	M	X	0	4	S	0	1	S	0	1	
6	4	P	0	9	9	344	M	X	0	4	S	0	1	S	0	1	
6	5	P	1	0	6	344	M	X	0	4	S	0	1	S	0	1	
6	6	U	0	0	3	344	M	X	0	4	S	0	1	S	0	1	
6	7	U	1	0	3	344	M	X	0	4	S	0	1	S	0	1	
6	8	U	1	0	8	344	M	X	0	4	S	0	1	S	0	1	

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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)

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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.

1 NM4890139088

2 RCRA PART A APPLICATION CERTIFICATION

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

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

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

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

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

27 Owner and Operator Signature: Original signed by Jose R. Franco
28 Title: Manager, Carlsbad Field Office
29 for: U.S. Department of Energy
30 Date: ~~2-13~~6-25-12

31 Co-Operator Signature: Original signed by Farok Sharif
32 Title: General ~~Project~~ Manager
33 for: Washington TRU Solutions LLC
34 Date: ~~2-13~~6-25-12
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**APPENDIX B1
OTHER ENVIRONMENTAL PERMITS**

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1 Active Environmental Permits and Approvals for the Waste Isolation Pilot Plant as of ~~June 25, 2012~~ March 1, 2010

	Granting Agency	Type of Permit	Permit/ Right of Way Number	Granted/ Submitted *	Expiration	Current Permit Status
1.	Department of the Interior, Bureau of Land Management	Right-of-Way for Water Pipeline	NM053809	08/17/83 (Transferred 05/15/06 to City of Carlsbad)	In Perpetuity	Ina Active (city of Carlsbad Double Eagle is the owner of the pipeline)
2.	Department of the Interior, Bureau of Land Management	Right-of-Way for the North Access Road	NM055676	08/24 3 /83	None -In Perpetuity	Active
3.	Department of the Interior, Bureau of Land Management	Right-of-Way for Railroad	NM055699	09/27/83	None -In Perpetuity	Active
4.	Department of the Interior, Bureau of Land Management	Right-of-Way for Dosimetry and Aerosol Sampling Sites	NM063136	07/31 03 /86	07/31/11 - 12/31/40	Active
5.	Department of the Interior, Bureau of Land Management	Right-of-Way for Seven Subsidence Monuments	NM065801	11/07/86	None	Active
6.	Department of the Interior, Bureau of Land Management	Right-of-Way for Aerosol Sampling Site	NM077921	08/18/89	08/18/19	Active
7.	Department of the Interior, Bureau of Land Management	Right-of-Way for 2 Survey Monuments	NM082245	12/13/89	12/13/19	Active
8.	Department of the Interior, Bureau of Land Management	Right-of-Way for telephone cable	NM046092	07/03/90 09/04/81 (Valor Telecom of NM LLC)	09/04/11	Active Renewal In Process
9.	Department of the Interior, Bureau of Land Management	Right-of-Way for SPS 115 KV Powerline	NM043203	02/20/96 10/19/81 (Southwestern Public Service)	10/19/11 - 12/31/40	Active
10.	Department of the Interior, Bureau of Land Management	Right-of-Way for South Access Road	NM123703	01/27/10	12/31/39	Active

	Granting Agency	Type of Permit	Permit/ <u>Right of Way</u> Number	Granted/Submitted *	Expiration	Current Permit Status
11.	Department of the Interior, Bureau of Land Management	Right-of-Way for Duval telephone line	NM060174	11/06/96 <u>03/08/85</u> (<u>Valor Telecom of NM LLC</u>)	03/08/15 <u>03/08/35</u>	Active
12.	Department of the Interior, Bureau of Land Management	Right-of-Way for <u>groundwater monitor wells/pads</u> Wells AEC-7 & AEC-8	NM108365	<u>08/30/02</u>	08/30/32	Active
13.	Department of the Interior, Bureau of Land Management	Right-of-Way for ERDA-6	NM108365	8/30/02	08/30/32	Active
14.	Department of the Interior, Bureau of Land Management	Right-of-Way for Well C-2756 (P-18)	NM108365	8/30/02	08/30/32	Active
15. 13.	Department of the Interior, Bureau of Land Management	Right-of-Way for Monitoring Well C-2664 (Cabin Baby)	NM107944	04/23/02	04/23/32	Active
16.	Department of the Interior, Bureau of Land Management	Right of Way for Seismic Monitoring Station	NM85426	09/23/01	None	Active
17. 14.	Department of the Interior, Bureau of Land Management	Right-of-Way for Wells C-2725 (H-4A), C-2775 (H-4B), & C-2776 (H-4C)	NM-6-5 Cooperative Agreement	04/27/78	None	Active
18. 15.	Department of the Interior, Bureau of Land Management	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), & C-2727 (WIPP-30)	NM-6-5 Cooperative Agreement	076/14/78	None	Active
19.	Department of the Interior, Bureau of Land Management	Right of Way for Aerosol Sampling Sites	NM77924	10/03/89	08/18/19	Active
20. 16.	New Mexico State Land Office <u>Commissioner of Public Lands</u>	Right-of-Way easement for accessing state trust lands in Eddy & Lea Counties	<u>RW-25430</u>	<u>09/28/04</u>	<u>09/28/14</u>	Active
21. 17.	Department of Interior, Bureau of Land Management	Right of Way for Valor Telecom	NM113339	<u>08/09/05</u> (<u>Valor Telecom Inc</u>)	12/31/34	Active

	Granting Agency	Type of Permit	Permit/ <u>Right of Way</u> Number	Granted/Submitted *	Expiration	Current Permit Status
22 <u>18</u> .	Department of Interior, Bureau of Land Management	Right of Way for South Access Road Fence	NM094304	03/15/95	In Perpetuity <u>None</u>	Active
23 <u>19</u> .	New Mexico <u>State Land Office</u> Commissioner of Public Lands	Right-of-Way for High Volume Air Sampler	RW-22789	10/03/85	10/03/20	Active
24 <u>20</u> .	New Mexico Environment Department Groundwater <u>Quality</u> Bureau	Discharge Permit	DP-831	9/9/08 <u>04/05/10</u>	<u>09/09/13</u>	Active
25 <u>21</u> .	New Mexico Environment Department Air Quality Bureau	Operating Permit for two backup diesel generators	310-M-2	12/07/93	None	Active
26 <u>22</u> .	New Mexico Environment Department- <u>UST Petroleum Storage Tank</u> Bureau	<u>Underground Storage Tanks Storage Tank Registration Certificate</u>	NMED11811 (Number changes annually) <u>Registration Number 2033</u> <u>Facility Number 31539</u>	07/01/02 <u>07/01/11</u>	06/30/03 (2003 registration submitted 6/18/02) <u>06/30/12</u>	Active <u>Currently being renewed</u>
27 <u>23</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well Exhaust Shaft Exploratory Borehole	C-2801	02/23/01	None	Active
28 <u>24</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well Exhaust Shaft Exploratory Borehole	C-2802	02/23/01	None	Active
29 <u>25</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well Exhaust Shaft Exploratory Borehole	C-2803	02/23/01	None	Active
30 <u>26</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well	C-2811	03/02/02	None	Active
31 <u>27</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Appropriation: WQSP-1 Well	C-2413	10/21/96	None	Active
32 <u>28</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Appropriation: WQSP-2 Well	C-2414	10/21/96	None	Active
33 <u>29</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Appropriation: WQSP-3 Well	C-2415	10/21/96	None	Active
34 <u>30</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Appropriation: WQSP-4 Well	C-2416	10/21/96	None	Active
35 <u>31</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Appropriation: WQSP-5 Well	C-2417	10/21/96	None	Active

	Granting Agency	Type of Permit	Permit/ <u>Right of Way</u> Number	Granted/Submitted *	Expiration	Current Permit Status
36 <u>32</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Appropriation: WQSP-6 Well	C-2418	10/21/96	None	Active
37 <u>33</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Appropriation: WQSP-6a Well	C-2419	10/21/96	None	Active
38 <u>34</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well AEC-7	C-2742	11/06/00	None	Active
39 <u>35</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well AEC-8	C-2744	11/06/00	None	P&A
40 <u>36</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well Cabin Baby	C-2664	07/30/99	None	Active
42 <u>37</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well DOE-1	C-2757	11/06/00	None	P&A
43 <u>38</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well DOE-2	C-2682	04/17/00	None	Active
44 <u>39</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well ERDA-9	C-2752	11/06/00	None	Active
45 <u>40</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-1	C-2765	11/06/00	None	P&A
46 <u>41</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-2A	C-2762	11/06/00	None	P&A
47 <u>42</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-2B1	C-2758	11/06/00	None	Active
48 <u>43</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-2B2	C-2763	11/06/00	None	Active
49 <u>44</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-2C	C-2759	11/06/00	None	P&A
50 <u>45</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-3B1	C-2764	11/06/00	None	Active
51 <u>46</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-3B2	C-2760	11/06/00	None	Active

	Granting Agency	Type of Permit	Permit/ <u>Right of Way</u> Number	Granted/Submitted *	Expiration	Current Permit Status
52 47 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-3B3	C-2761	11/06/00	None	P&A
53 48 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-3D	C-3207	11/06/00	None	Active
54 49 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-4A	C-2725	11/06/00	None	P&A
55 50 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-4B	C-2775	11/06/00	None	P&A
56 51 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-4C	C-2776	11/06/00	None	Active
57 52 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-5A	C-2746	11/06/00	None	P&A
58 53 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-5B	C-2745	11/06/00	None	Active
59 54 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-5C	C-2747	11/06/00	None	Active
60 55 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-6A	C-2751	11/06/00	None	P&A
61 56 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-6B	C-2749	11/06/00	None	P&A
62 57 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-6C	C-2750	11/06/00	None	Active
63 58 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-7A	C-2694	04/17/00	None	P&A
64 59 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-7B1	C-2770	11/06/00	None	Active
65 60 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-7B2	C-2771	11/06/00	None	P&A
67 61 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-8A	C-2780	11/06/00	None	Active

	Granting Agency	Type of Permit	Permit/ <u>Right of</u> <u>Way</u> Number	Granted/ Submitted *	Expiration	Current Permit Status
70 <u>62</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-9A	C-2785	11/06/00	None	P&A
71 <u>63</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-9B	C-2783	11/06/00	None	P&A
72 <u>64</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-9C	C-2784	11/06/00	None	Active
73 <u>65</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-10A	C-2779	11/06/00	None	Active
74 <u>66</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-10B	C-2778	11/06/00	None	P&A
75 <u>67</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-10C	C-2695	04/17/00	None	Active
76 <u>68</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-11B1	C-2767	11/06/00	None	Active
77 <u>69</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-11B2	C-2687	04/17/00	None	Active
78 <u>70</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-11B3	C-2768	11/06/00	None	P&A
79 <u>71</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-11B4	C-2769	11/06/00	None	Active <u>P&A</u>
80 <u>72</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-12	C-2777	11/06/00	None	Active
81 <u>73</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-14	C-2766	11/06/00	None	Active
82 <u>74</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-15	C-2685	04/17/00	None	Active
83 <u>75</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-16	C-2753	11/06/00	None	Active
84 <u>76</u> .	New Mexico Office of New <u>Mexico</u> State Engineer Office	Monitoring Well H-17	C-2773	11/06/00	None	Active

	Granting Agency	Type of Permit	Permit/ <u>Right of Way</u> Number	Granted/Submitted *	Expiration	Current Permit Status
85 77 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-18	C-2683	04/17/00	None	Active
86 78 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-19B0	C-2420	01/25/95	None	Active
87 79 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-19B1	C-2420	01/25/95	None	Active
88 80 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-19B2	C-2421	01/25/95	None	Active
89 81 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-19B3	C-2422	01/25/95	None	Active
90 82 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-19B4	C-2423	01/25/95	None	Active
91 83 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-19B5	C-2424	01/25/95	None	Active
92 84 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-19B6	C-2425	01/25/95	None	Active
93 85 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well H-19B7	C-2426	01/25/95	None	Active
94 86 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well P-14	C-2637	01/02/99	None	P&A
95 87 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well P-15	C-2686	04/17/00	None	P&A
96 88 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well P-17	C-2774	11/06/00	None	P&A
97 89 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well P-18	C-2756	11/06/00	None	P&A
98 90 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well WIPP-12	C-2639	01/12/99	None	P&A
99 91 .	New Mexico Office of New Mexico State Engineer Office	Monitoring Well WIPP-13	C-2748	11/06/00	None	Active

	Granting Agency	Type of Permit	Permit/ Right of Way Number	Granted/ Submitted *	Expiration	Current Permit Status
400 92	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP-18	C-2684	04/17/00	None	Active
401 93	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP-19	C-2755	11/06/00	None	Active
402 94	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP-21	C-2754	11/06/00	None	P&A
403 95	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP-25	C-2723	07/26/00	None	P&A
404 96	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP-26	C-2724	11/06/00	None	P&A
405 97	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP-27	C-2722	11/06/00	None	P&A
407 98	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP28	C-2636	01/12/99	None	P&A
407 99	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP-29	C-2743	11/06/00	None	P&A
408 100	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP-30	C-2727	08/04/00	None	P&A
409 101	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-6BR	C-3362	12/27/07	None	Active
440 102	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-15R	C-3361	12/27/07	None	Active
441 103	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-2	C-2948	<u>02/14/03</u>	None	Active
442 104	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-9	C-2950	<u>02/14/03</u>	None	Active
443 105	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-12	C-2954	<u>02/25/03</u>	None	Active
444 106	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-1	C-2953	<u>02/25/03</u>	None	Active
445 107	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-3	C-2949	<u>02/14/03</u>	None	Active
446 108	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-5	C-3002	10/ <u>01/03</u>	None	Active

	Granting Agency	Type of Permit	Permit/ <u>Right of Way</u> Number	Granted/Submitted *	Expiration	Current Permit Status
117 <u>109</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well IMC-461	C-3015	11/25/03	None	Active
118 <u>110</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-10	C-3221	<u>07/26/05</u>	None	Active
119 <u>111</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-16	C-3220	<u>07/26/05</u>	None	Active
120 <u>112</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-17	C-3222	<u>07/26/05</u>	None	Active
124 <u>113</u> .	US Environmental Protection Agency Region 6	Conditions of Approval for Disposal of PCB/TRU and PCB/TRU Mixed Waste at the US Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) Carlsbad, New Mexico	N/A	<u>04/30/08</u>	<u>04/30/13</u>	Active- <u>In Renewal Process</u>
122 <u>114</u> .	US Fish and Wildlife Service	Migratory Bird Special Purpose – Relocate	NMED 31539 <u>MB155189-0</u>	7/1/10 <u>06/01/10</u>	6/30/11 <u>05/31/12</u>	Active- <u>In Renewal Process</u>
<u>115</u> .	<u>New Mexico Department of Game and Fish</u>	<u>Biotic Collection Permit</u>	<u>Authorization # 3293</u>	<u>01/26/11</u>	<u>12/31/13</u>	<u>Active</u>
123 <u>116</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-4bR	C-3404	<u>01/13/09</u>	None	Active
124 <u>117</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well H-9bR	C-2783-POD2	<u>07/14/10</u>	None	Active
125 <u>118</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well C-2737	C-2737	<u>09/27/00</u>	None	Active
126 <u>119</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well WIPP-11	C3112	12/27/07	None	Active
127 <u>120</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-6	C-3151	<u>02/10/05</u>	None	Active
128 <u>121</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-8	C-3150	<u>02/10/05</u>	None	Active
129 <u>122</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-13	C-3139	12/17/04	None	Active
130 <u>123</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-14	C-3140	12/17/04	None	Active
131 <u>124</u> .	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-15	C-3152	<u>02/10/05</u>	None	Active

	Granting Agency	Type of Permit	Permit/ <u>Right of Way</u> Number	Granted/Submitted *	Expiration	Current Permit Status
132 <u>125.</u>	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-18	C-3233	10/ <u>06</u> /05	None	Active
133 <u>126.</u>	New Mexico <u>Office of New Mexico</u> State Engineer Office	Monitoring Well SNL-19	C-3234	10/ <u>06</u> /05	None	Active
134.	Department of the Interior, Bureau of Land Management	Right-of-Way reservation amendment for SNL-6, SNL-8, and SNL-15	NM108365	3/15/05	8/30/32	Active
135.	Department of the Interior, Bureau of Land Management	Right-of-Way reservation amendment for SNL-13 and SNL-14	NM108365	1/25/05	8/30/32	Active
136 <u>127.</u>	Department of the Interior, Bureau of Land Management	Right-of-Way grant for SNL-18 and SNL-19 <u>well pads</u>	NM115315	<u>03</u> /21/06	12/31/35	Active
<u>128.</u>	<u>Department of the Interior, Bureau of Land Management</u>	<u>Right-of-Way grant for SNL-11 and SNL-5</u>	<u>NM110735</u>	<u>10/17/03</u>	<u>10/17/33</u>	<u>Active</u>
<u>129.</u>	<u>Department of the Interior, Bureau of Land Management</u>	<u>Right-of-Way grant for SNL-12 well pad</u>	<u>NM109176</u>	<u>04/15/03</u>	<u>04/15/33</u>	<u>Active</u>
<u>130.</u>	<u>Department of the Interior, Bureau of Land Management</u>	<u>Right-of-Way grant for SNL-9 well pad</u>	<u>NM109175</u>	<u>04/15/03</u>	<u>04/15/33</u>	<u>Active</u>
<u>131.</u>	<u>Department of the Interior, Bureau of Land Management</u>	<u>Right-of-Way grant for SNL-2 well pad</u>	<u>NM109174</u>	<u>04/15/03</u>	<u>04/15/33</u>	<u>Active</u>
<u>132.</u>	<u>Department of the Interior, Bureau of Land Management</u>	<u>Right-of-Way grant for SNL-1 Access Road</u>	<u>NM109177</u>	<u>06/17/03</u>	<u>06/17/33</u>	<u>Active</u>
<u>133.</u>	<u>Department of the Interior, Bureau of Land Management</u>	<u>Right-of-Way for SPS 69KV Electric Distribution line</u>	<u>NM091163</u>	<u>12/16/94</u> <u>(Southwestern Public Service)</u>	<u>12/15/24</u>	<u>Active</u>
<u>134.</u>	<u>Office of New Mexico State Engineer</u>	<u>Monitor Well H-11b4R</u>	<u>C-2769-POD2</u>	<u>05/16/11</u>	<u>None</u>	<u>Active</u>

- 1
- 2 *Non DOE grantee is noted
- 3 P&A=Plugged and Abandoned

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**(APPENDIX B2
MAPS**

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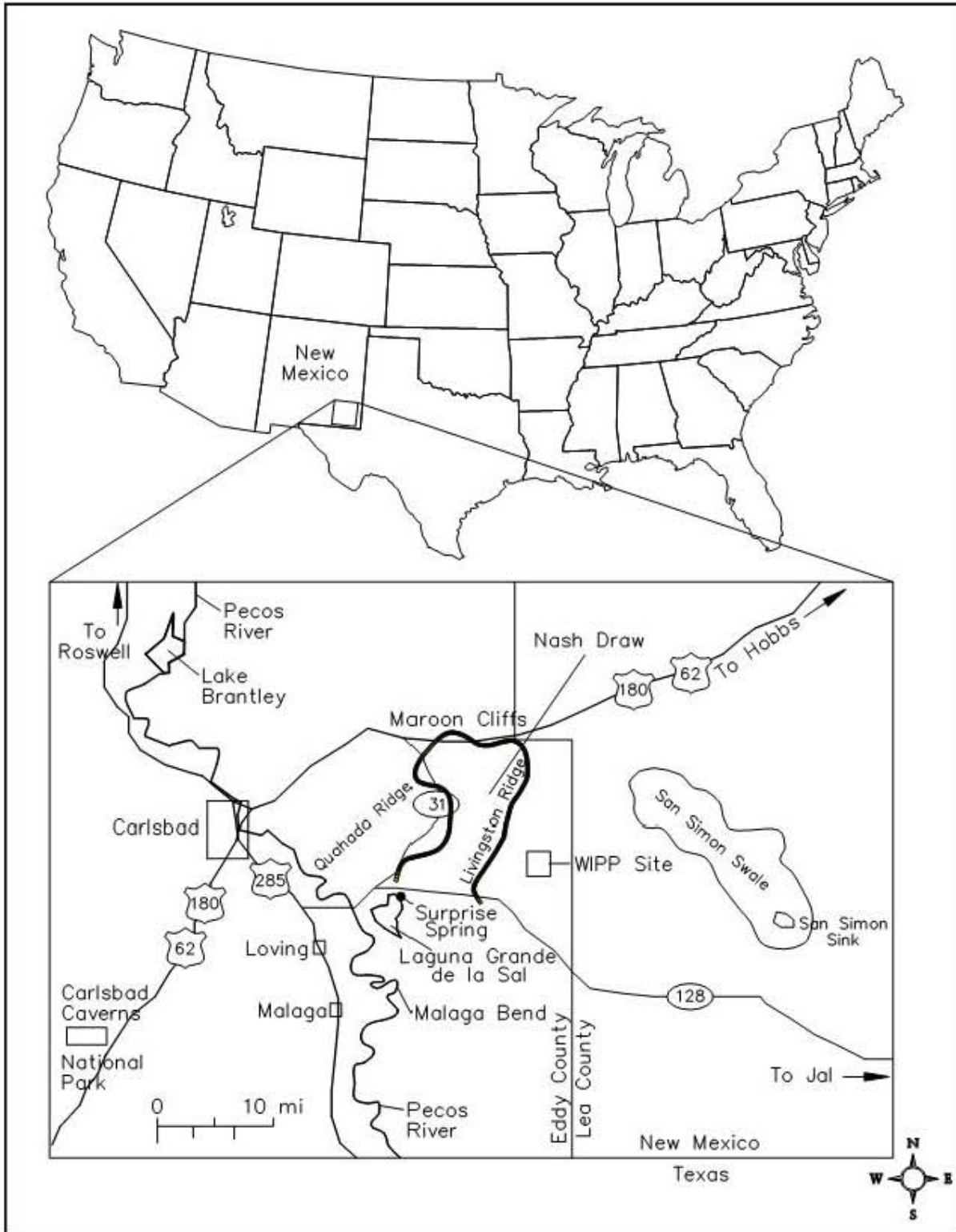


Figure B2-1
General Location of the WIPP Facility

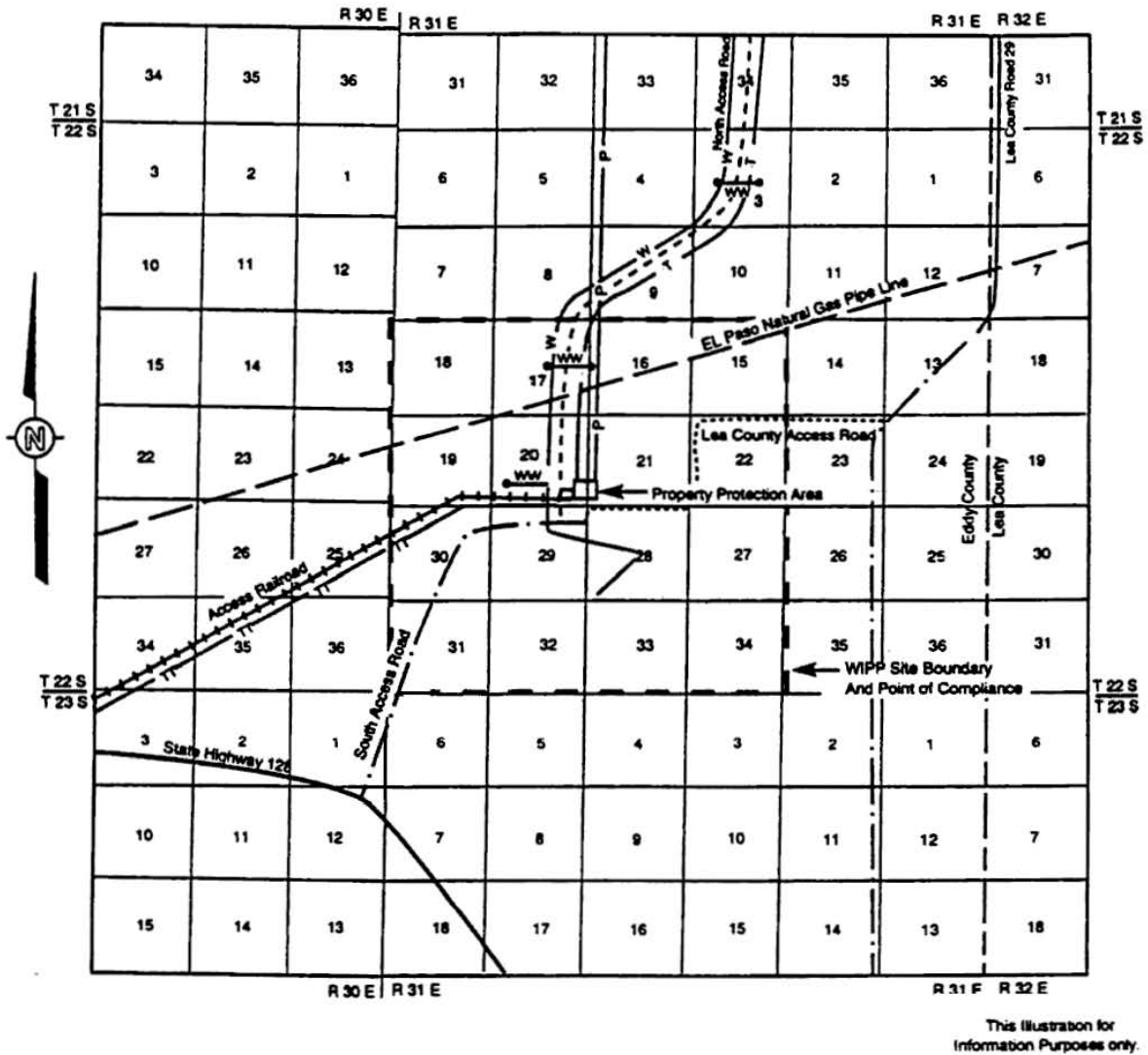


Figure B2-2
Planimetric Map-WIPP Facility Boundaries

LEGEND

- — • WIPP Site Boundary 10,240 Acres.
- W — 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.
- W W — Stock Water Tanks and Tap Lines Connected to the Main WIPP Waterline.
- P — Southwestern Public Service Company Right of Way Number NM-43203 for Power 60 Feet Wide.
- T — General Telephone of the Southwest Right of Way for Telephone Line, 30 Feet Wide, Located within the North access Road Right of Way.
- T T — 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.
- . . . U.S. DOE Right of Way for Access Roads Includes Right of Way Number NM-123703 for the South Access Road which is 140 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**

**Figure B2-3
Topographic Map**

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**APPENDIX B3
FACILITIES**

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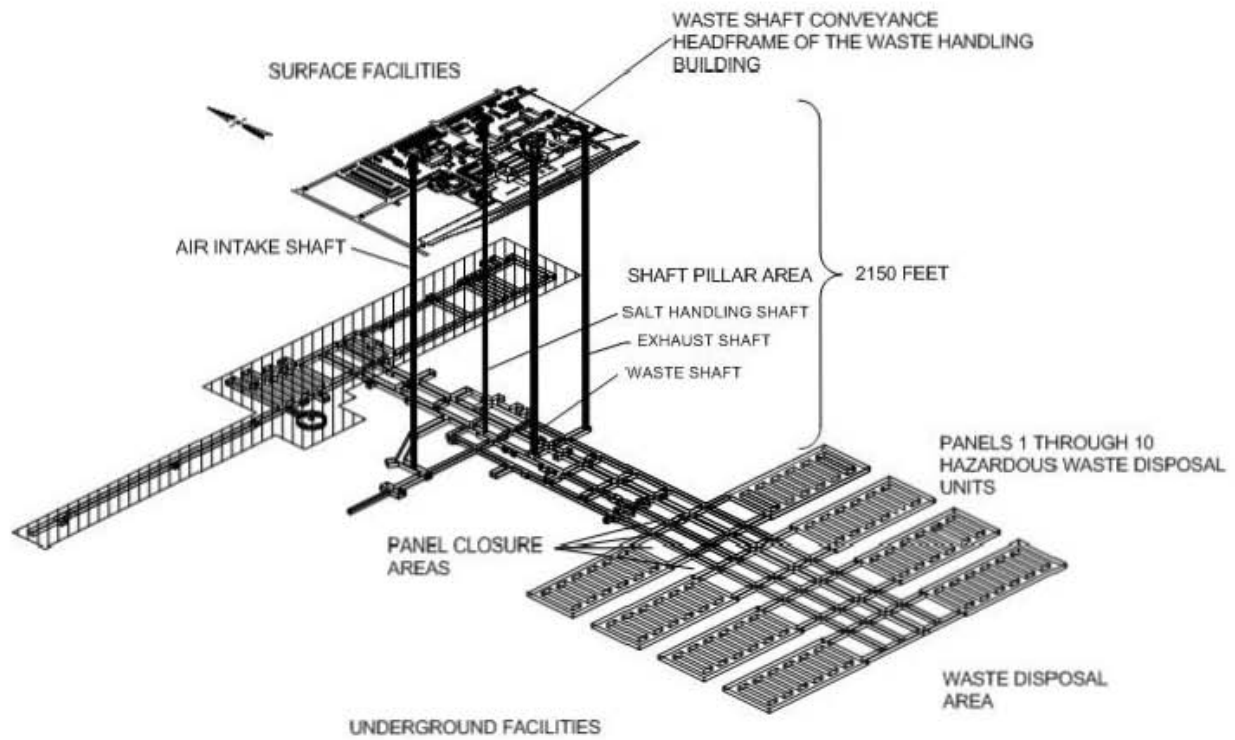


Figure B3-1
Spatial View of the WIPP Facility

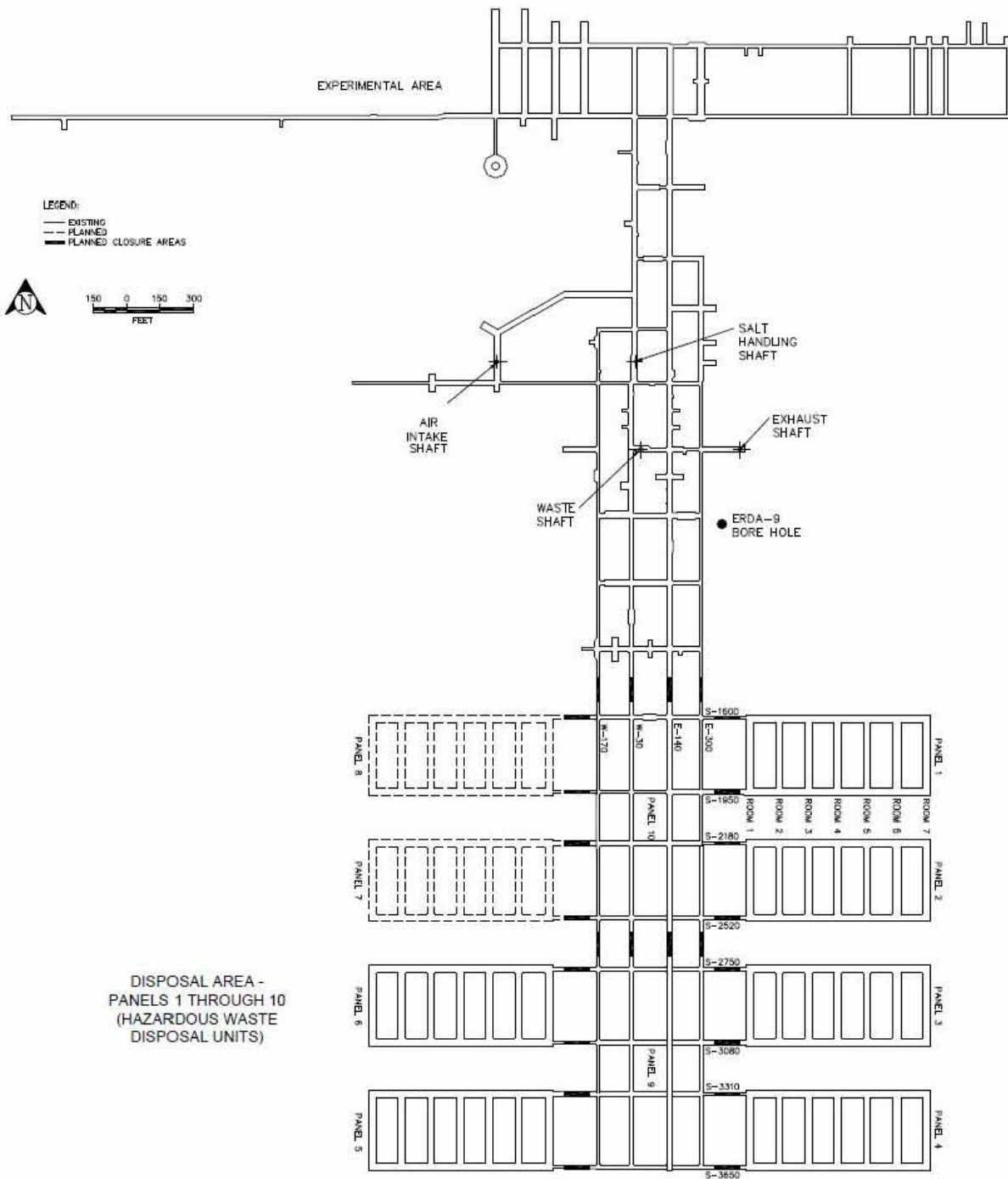


Figure B3-2
Repository Horizon

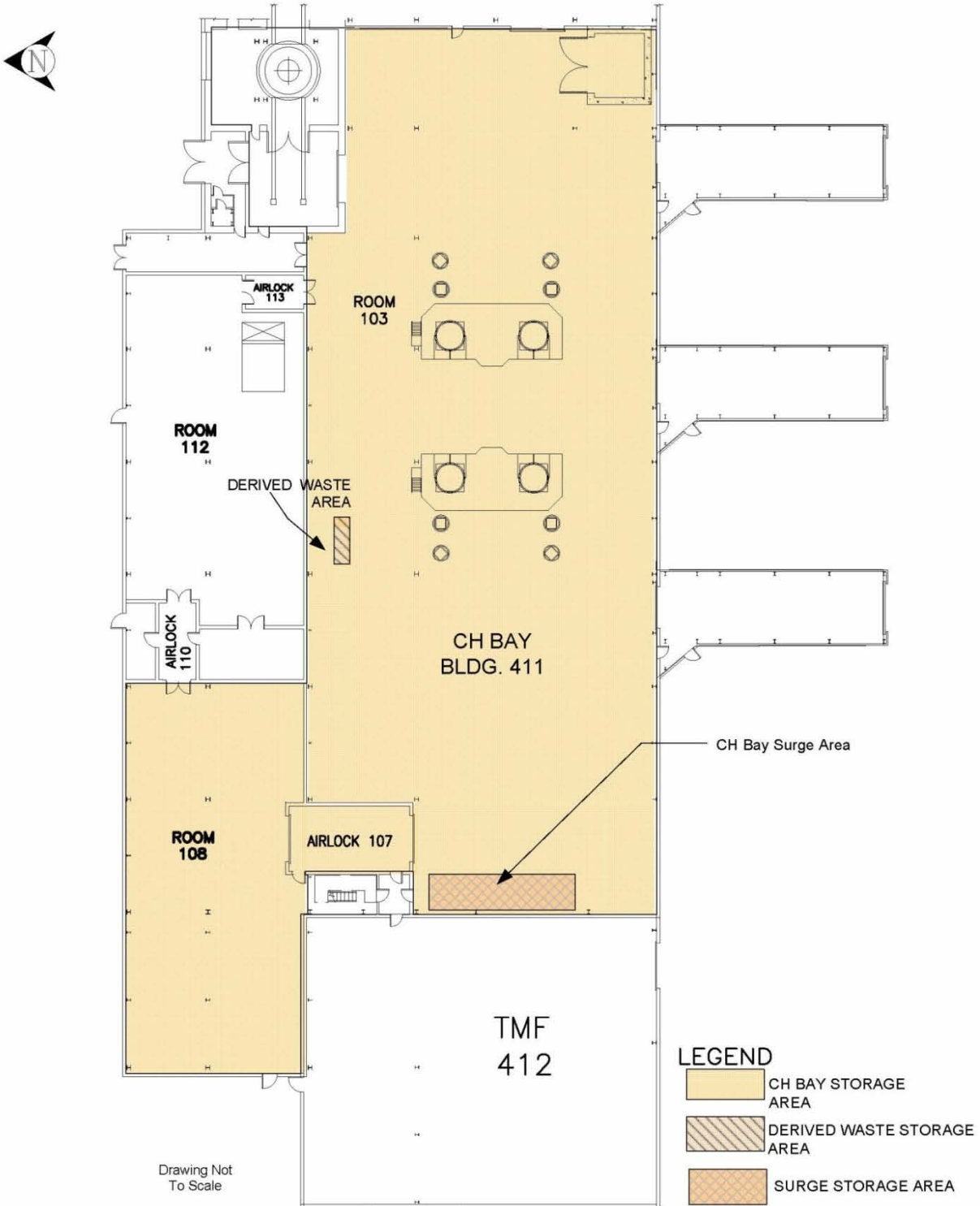


Figure B3-3
Waste Handling Building - CH TRU Mixed Waste Container Storage and Surge Areas

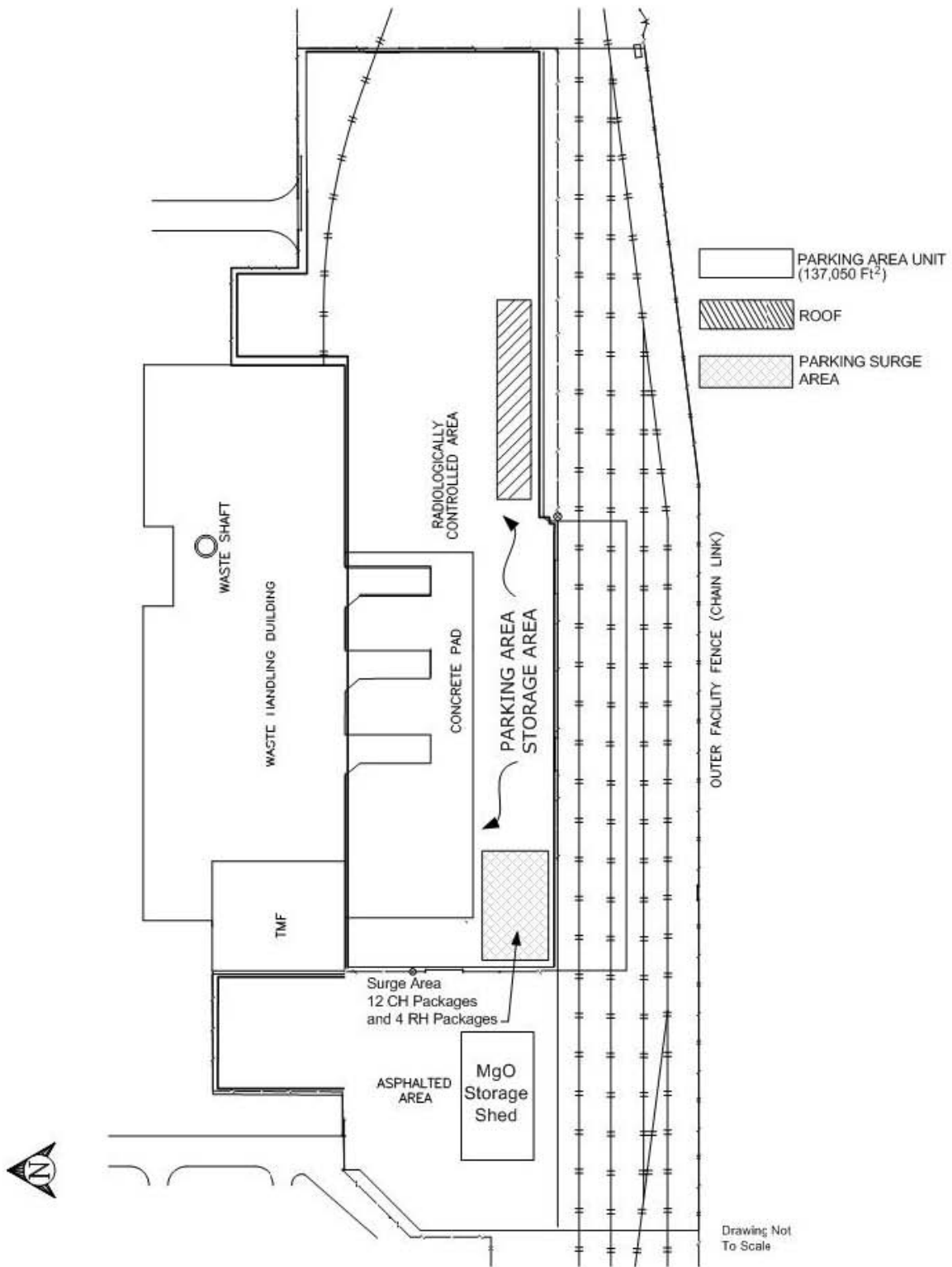


Figure B3-4
Parking Area-Container Storage and Surge Areas

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**APPENDIX B4
PHOTOGRAPHS**

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Figure B4-1
Aerial Photograph of the Waste Isolation Pilot Plant



Figure B4-2
Underground - Panel One - Waste Disposal Room

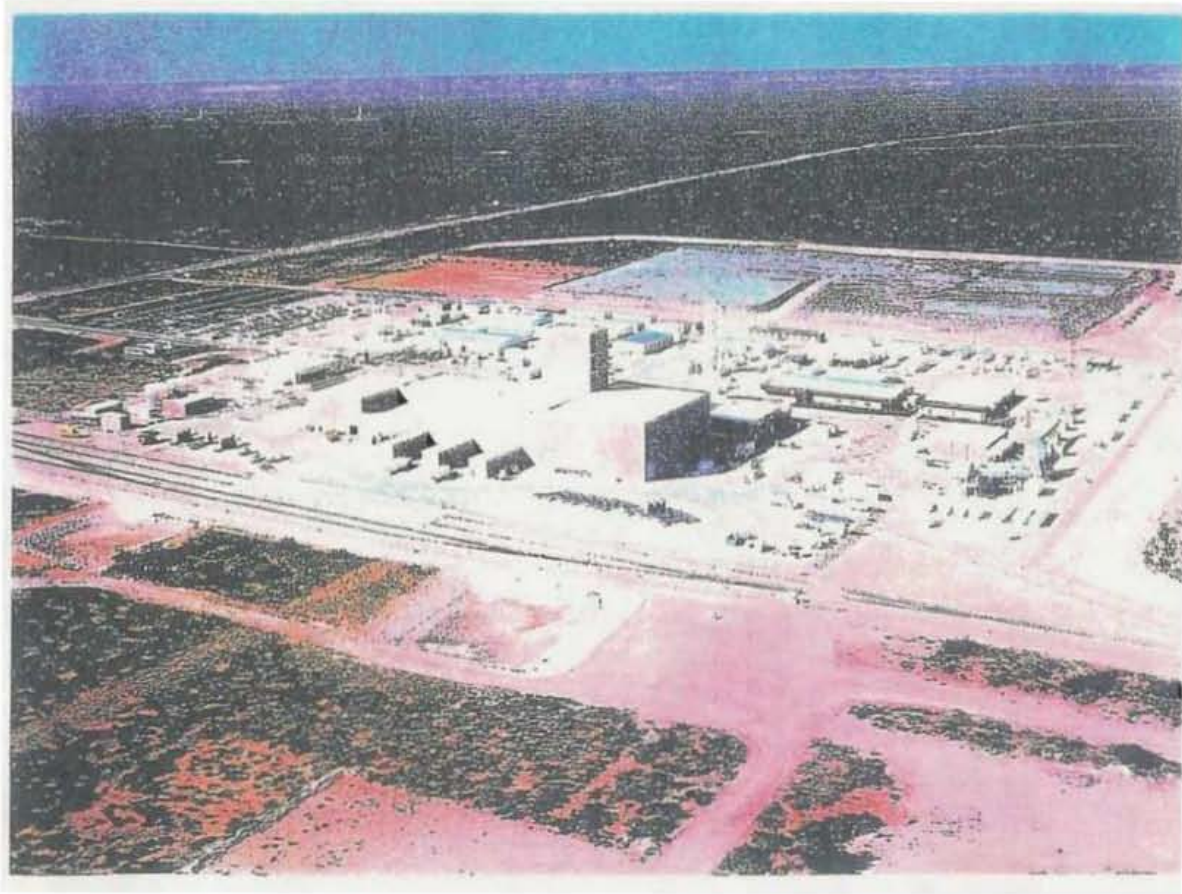


Figure B4-3
Aerial Photograph of the Waste Handling Building



Figure B4-4
TRUDOCKs in CH Bay of the Waste Handling Building



Figure B4-5
NE Corner of CH Bay of the Waste Handling Building



Figure B4-6
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



Figure B4-8
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**

Waste Isolation Pilot Plant
Hazardous Waste Permit
~~November 30, 2010~~ October 1, 2012

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**ATTACHMENT G1
APPENDIX G**

TECHNICAL SPECIFICATIONS

**PANEL CLOSURE SYSTEM
WASTE ISOLATION PILOT PLANT
CARLSBAD, NEW MEXICO**

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Figure G1G-3	Waste Shaft Collar and Airlock Arrangement

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DIVISION 1 - GENERAL REQUIREMENTS

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- 1 • Coordinate construction with operations
- 2 • Perform the following for the air intake entry and the air exhaust entry.
 - 3 – Excavate the surface preparation for the explosion isolation wall
 - 4 – Construct the explosion isolation wall
 - 5 – Excavate the DRZ
 - 6 – Install the form work for the concrete barrier
 - 7 – Place concrete for the concrete barrier
 - 8 – Grout the interface of concrete barrier/back wall
 - 9 – Provide contact grouting along the contact surface (if required by the engineer)
- 10 • Clean up construction areas in underground and above ground
- 11 • Submit all required record documents
- 12 • Demobilize from site

13 **1.3 Definitions and Abbreviations**

14 **Definitions**

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

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

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

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

24 Creep—Plastic deformation of salt under deviatoric stress.

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

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

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

31 Health-based concentration level—The concentration level for a VOC in air that must not be
32 exceeded at the point of compliance during the WIPP operational period.

- 1 Health-based migration limit—The mass flow rate of a VOC from all closed panels that results in
2 the health-based concentration level at the point of compliance.
- 3 Hydration temperature—The temperature developed by a cementitious material due to the
4 hydration of the cement.
- 5 Interface grouting—Grouting performed through grout boxes and pipe lines to fill the void at the
6 concrete barrier/back-wall interface.
- 7 Methane explosion—A postulated deflagration caused by the buildup of methane gas to
8 explosive levels.
- 9 Partial closure—The process of rendering a part of the underground repository inactive and
10 closed according to approved facility closure plans. The partial-closure process is considered
11 complete after partial-closure activities are performed in accordance with approved Resource
12 Conservation and Recovery Act (**RCRA**) partial closure plans.
- 13 Point of compliance—The operating point of compliance for VOC levels at the WIPP, which is
14 the 16-section land withdrawal boundary.
- 15 Remote-handled waste—Any of the various forms of high beta-gamma defense TRU waste
16 requiring remote-handling and with a surface dose rate exceeding 200 millirem per hour.
- 17 Standard barrier—A concrete barrier emplaced into the panel-access drifts without major
18 excavation of the surrounding rock.
- 19 Volatile Organic Compound (VOC)—Any VOC comprising the land-disposal-restricted indicator
20 VOC constituents in the WIPP waste inventory.

21 **Abbreviations/Acronyms**

22	ACI	American Concrete Institute
23	AISC	American Institute for Steel Construction
24	ANSI	American National Standards Institute
25	ASTM	American Society for Testing and Materials
26	AWS	American Welding Society
27	CFR	Code of Federal Regulations
28	DOE	U.S. Department of Energy
29	DRZ	Disturbed rock zone
30	EPA	U.S. Environmental Protection Agency
31	MB 139	Marker Bed 139
32	MSHA	U.S. Mine Safety and Health Administration
33	NMAC	New Mexico Administrative Code
34	NMED	New Mexico Environment Department
35	MOC	Management and Operating Contractor (Permit Section 1.5.3)
36	RCRA	Resource Conservation and Recovery Act
37	SMC	Salado Mass Concrete
38	USACE	U.S. Army Corps of Engineers
39	WIPP	Waste Isolation Pilot Plant

1 **1.4 List of Drawings**

2 The following drawings are made apart of this specification:

- 3 762447-E1 Panel closure system, air intake and exhaust drifts, title sheet
- 4 762447-E2 Panel closure system, underground waste-emplacement panel plan
- 5 762447-E3 Panel closure system, air intake drift, construction details
- 6 762447-E4 Panel closure system, air exhaust drift, construction details
- 7 762447-E5 Panel closure system, construction and explosion walls, construction details
- 8 762447-E6 Panel closure system, air intake and exhaust drifts, grouting and miscellaneous
- 9 details

10 **1.5 Work by Others**

11 Survey

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

16 Excavation

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

19 **1.6 Contractor's Use of Site**

20 Site Conditions

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

28 Contractor's Use of Site

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

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

33 Coordination of Contractor's Work

34 The Contractor is advised that on-going waste emplacement and excavation operations are
35 being conducted throughout the period of construction of the panel barrier system. The

1 Contractor shall coordinate his construction operations with that of the waste emplacement and
2 mining operations. All coordination shall be through the Engineer.

3 **1.7 Contractor's Use of Facilities**

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

- 5 • WIPP roadheader
- 6 • Waste shaft conveyance
- 7 • Salt skip hoist
- 8 • (1) 20 ton forklift
- 9 • (1) 40 ton forklift
- 10 • 460 volt AC, 3 phase power
- 11 • Water (underground, at waste shaft only) (above ground, at location designated by
12 Engineer)

13 Additional information on these facilities is presented in Section 02010.

14 **1.8 Work Sequence**

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

16 **1.9 Work Plan**

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

22 **1.10 Submittals**

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

28 **Part 2 - Products**

29 Not used.

1

Part 3 - Execution

2 Not Used.

3

End of Section

4

Ph: 312-670-2400
Fax: 312-670-5403

ANSI	American National Standards Institute 11 West 42nd St. New York NY 10036 Ph: 212-642-4900 Fax: 212-302-1286
API	American Petroleum Institute 1220 L. St., NW Washington, DC 20005 Ph: 202-682-8375 Fax: 202-962-4776
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103 Ph: 215-299-5585 Fax: 215-977-9679
AWS	American Welding Society 550 LeJeune Road Miami, FL 33135 Ph: 800-443-9353 Fax: 305-443-7559
CFR	Code of Federal Regulations Government Printing Office Washington, DC 20402 Ph: 202-783-3238 Fax: 202-223-7703
EPA	Environmental Protection Agency Public Information Center Ariel Rios Building 1200 Pennsylvania Avenue, NW Washington, DC 20460 Ph: 202-272-0167
FTM-STO	Federal Test Method Standards Standardization Documents Order Desk Bldg. 4D 700 Robbins Ave. Philadelphia, PA 19111-5094 Ph: 215-697-2179 Fax: 215-697-2978
NRMCA	National Ready-Mixed Concrete Association 900 Spring St.

Silver Spring, MD 20910
Ph: 301-587-1400
Fax: 301-585-4219

NTIS National Technical Information Service
U.S. Department of Commerce
Springfield, VA 22161
(703) 487-4650

PCA Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60077

USACE U.S. Army Corps of Engineers
U.S. Army Engineer Waterway Experiment Station
ATTN: Technical Report Distribution Section, Services Branch, TIC
3909 Halls Ferry Rd.
Vicksburg, MS 39180-6199
Ph: 601-634-2355
Fax: 601-634-2506

MOC ~~Washington TRU Solutions~~ Nuclear Waste Partnership LLC
PO Box 2078
Carlsbad, New Mexico 88221

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End of Section

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1 **3.2.2 Content of the CQC Plan**

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

- 5 • A description of the quality control organization, including a chart showing lines of
6 authority and acknowledgment that the CQC staff shall implement the control system
7 for all aspects of the work specified. The staff shall include a CQC System Manager
8 who shall report to the project superintendent.
- 9 • The name, qualifications (in resume format), duties, responsibilities, and authorities of
10 each person assigned a CQC function.
- 11 • Description of the CQC System Manager's responsibilities and delegation of authority
12 to adequately perform the functions of the CQC System Manager, including authority
13 to stop work which is not in compliance with the contract. The CQC System Manager
14 shall issue letters of direction to all other various quality control representatives
15 outlining duties, authorities, and responsibilities.
- 16 • Procedures for scheduling, reviewing, certifying, and managing submittals, including
17 those of subcontractors, off site fabricators, suppliers, and purchasing agents. These
18 procedures shall be in accordance with the Permittees' Submittal Procedures.
- 19 • Control, verification, and acceptance testing procedures for each specific test to
20 include the test name, specification paragraph requiring test, feature of work to be
21 tested, test frequency, and person responsible for each test. (Laboratory facilities will
22 be subject to approval by the Engineer.)
- 23 • Procedures for tracking construction deficiencies from identification through acceptable
24 corrective action. These procedures will establish verification that identified
25 deficiencies have been corrected.
- 26 • Reporting procedures, including proposed reporting formats.
- 27 • A list of the definable features of work. A definable feature of work is a task which is
28 separate and distinct from other tasks and has separate control requirements. It could
29 be identified by different trades or disciplines, or it could be work by the same trade in
30 a different environment. Although each section of the specifications may generally be
31 considered as a definable feature of work, there are frequently more than one
32 definable feature under a particular section. This list will be agreed upon by the
33 Engineer.

34 **3.2.3 Acceptance of Plan**

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

1 **3.2.4 Notification of Changes**

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

4 **3.3 Quality Control Organization**

5 **3.3.1 General**

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

12 **3.3.2 CQC System Manager**

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

22 **3.3.3 CQC Personnel**

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

29 **3.3.4 Organizational Changes**

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

33 **3.4 Tests**

34 **3.4.1 Testing Procedure**

35 The Contractor shall perform specified or required tests to verify that control measures are
36 adequate to provide a product which conforms to contract requirements. Upon request, the
37 Contractor shall furnish to the Engineer duplicate samples of test specimens for possible testing

1 by the Engineer. Testing includes operation and/or acceptance tests when specified. The
2 Contractor shall procure the services of an approved testing laboratory. The Contractor shall
3 perform the following activities and record and provide the following data:

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

18 **3.5 Testing Laboratory**

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

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

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

29 The laboratory may not:

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

33 The laboratory has no authority to stop the work.

34 **3.6 Inspection Services**

35 The inspection firm shall provide qualified personnel at site to supplement the Contractor's
36 Quality Control Program to perform specified inspection of Products in accordance with

1 specified standards. He shall ascertain compliance of materials and mixes with requirements of
2 Contract Documents, and promptly notify the CQC System Manager, the Engineer and the
3 Contractor of observed irregularities or non-conformance of Work or Products. The inspector
4 does not have the authority to stop the work. The inspector shall refer such cases to the CQC
5 System Manager who has the authority to stop work (see Section 3.2.2).

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

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

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

12 **3.7 Completion Inspection**

13 **3.7.1 Pre-Final Inspection**

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

24 **3.7.2 Final Acceptance Inspection**

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

31 **3.8 Documentation**

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

- 36 • Contractor/subcontractor and their area of responsibility.
- 37 • Operating plant/equipment with hours worked, idle, or down for repair.

1

DIVISION 2 - SITE WORK

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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.

1 **Section 02222 - Excavation**

2 **Part 1 - General**

3 **1.1 Scope**

4 This section includes:

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

8 **1.2 Related Sections**

- 9 • 01010 - Summary of Work
- 10 • 01600 - Material and Equipment
- 11 • 03100 - Concrete Form Work
- 12 • 04300 - Unit Masonry System.

13 **1.3 Reference Documents**

14 “Reference Stratigraphy and Rock Properties for the Waste Isolation Pilot Plant (WIPP) Project”
15 by R.D. Krieg-Sandia National Laboratory Document Sand 83-1908. [Available through National
16 Technical Information Service (NTIS).]

17 **1.4 Field Measurements and Survey**

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

21 **Part 2 - Products**

22 Not used.

23 **Part 3 - Execution**

24 **3.1 Excavating for Concrete Barrier**

25 Excavation for the main concrete barrier shall be performed to the lines and grades shown on
26 the drawings. Excavate the back a minimum of 1 inch to 3 inches beyond clay seam G, and the
27 floor a minimum of 1 inch to 3 inches below the anhydride marker bed 139 (**MB-139**) to assure
28 removal of the disturbed rock zone (**DRZ**). Excavation shall be performed utilizing mechanical
29 means such as a cutting head on a suitable boom, by drilling boreholes and using an expansive
30 agent to fragment the rock or other competent equipment or methods submitted to the Engineer
31 for review and approval. The use of explosives is prohibited. The existing WIPP roadheader
32 mining machine may also be available for use. The Contractor is to determine availability and
33 coordinate proposed use of the roadheader with the Engineer. The existing roadheader is
34 capable of excavating the back and the portions of the ribs above the floor level. However, it is
35 not capable of excavating the portion below floor level.

1 The tolerances for the concrete barrier excavation shall be +6 inches, to 0 inch. In addition, the
2 Contractor is to remove all loose or spalling rock from the excavation surface to provide a sound
3 surface abutting the concrete barrier. The Contractor shall provide and install roof bolts for
4 support as required for personnel protection and approved ground control plans.

5 **3.2 Excavating for Surface Preparation and leveling of Base Areas for Isolation Walls**

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

11 **3.3 Disposition of Excavated Materials**

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

15 **3.4 Field Measurements and Survey**

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

24 End of section.

25

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

ASTM C109 Test Method for Compressive Strength of Hydraulic Cement Mortars

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.

Salt-Saturated Grout (BCT-1F)

Component	Percent of total Mass (wt.)
Class H Cement	48.3
Class C Fly Ash	16.2
Cal Seal (Plaster - from Halliburton)	5.7
Sodium chloride	7.9
Dispersant	0.78
Defoamer	0.02
Water	21.1

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. The

1 exact location of the boxes and lines shall be determined in the field. Additional grout delivery
2 and return lines and boxes may be required by the Engineer.

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

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

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

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

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

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

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

22 **3.2 Interface Grouting of Concrete Barrier**

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

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

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

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

1 **3.3 Contact Grouting**

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

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

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

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

13 **3.3.1 Drilling**

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

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

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

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

22 **3.3.2 Materials for Contact Grouting**

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

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

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

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DIVISION 3 - CONCRETE

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1 Mill test certification of materials utilized in construction of the forms.

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

3 **1.5 Quality Assurance**

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

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

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

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

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

12 **Part 2 - Products**

13 **2.1 Form Materials**

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

15 Pipe inserts shall be ASTM A-53 black standard weight pipe.

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

17 Bolts shall be ASTM A325 high strength structural bolts.

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

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

20 Welding electrodes shall conform to AWS A5.1.

21 **Part 3 - Execution**

22 **3.1 General**

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

26 The Contractor may, at his option submit an alternate design or modify the design shown on the
27 drawings, subject to the approval of the Engineer. All designs must be supported by design
28 calculations stamped and sealed by a registered professional engineer.

1 The Contractor shall furnish, fabricate and install all grout pipes and grout boxes for both the
2 concrete barrier and the isolation walls.

3 **3.2 Shop Drawings**

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

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

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

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

15 **3.3 Fabrication**

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

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

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

25 **3.4 Installation**

26 **3.4.1 Grout Pipes**

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

1	ASTM D 2216	Standard Test Method for Laboratory Determination of Water (moisture)
2		Content of Soil and Rock
3	USACE CRD-C 36	Method of Test for Thermal Diffusivity of Concrete
4	USACE CRD-C 48	Standard Test Method for Water Permeability of Concrete
5	API 10	Cements
6	NRMCA	Check List for Certification of Ready Mixed Concrete Production
7		Facilities
8	NRMCA	Concrete Plant Standards
9	MOC Standards	
10	WIPP-DOE-71	Design Criteria Waste Isolation Pilot Plant, Revised Mission Concept --
11		IIA (DOE, 1984)
12	WP 03-1	WIPP Startup and Acceptance Test Program (Westinghouse, 1993b)
13	WP 09-010	Design Development Testing (Westinghouse, 1991)
14	WP 09-CN3021	Component Numbering (Westinghouse, 1994a)
15	WP 09-024	Configuration Management Board/Engineering Change Proposal (ECP)
16		(Westinghouse, 1994b)

17 **1.4 Submittals for Review/Approval**

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

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

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

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

25 **1.5 Submittals at Completion**

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

27 **1.6 Quality Assurance**

28 Perform work in accordance with the Contractor's Quality Control Plan and referenced ACI and
29 ASTM standards.

1 Acquire cement, aggregate and component materials from the same source throughout the
2 work.

3 **Part 2 - Products**

4 **2.1 Cement**

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

8 **2.2 Aggregates**

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

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

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

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

16 **2.3 Water**

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

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

- 21 • pH not less 6.0 or greater than 8.0
- 22 • Carbonates and/or bicarbonates of sodium and potassium: 1000 ppm maximum
- 23 • Chloride ions (Cl⁻): 250 ppm maximum
- 24 • Sulfate ions (SO₄²⁻): 1000 ppm maximum
- 25 • Iron content: 0.3 ppm maximum
- 26 • Total solids: 2000 ppm maximum

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

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

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

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

4 **Part 3 - Execution**

5 **3.1 General**

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

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

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

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

20 The Contractor is to provide all transport vehicles or means to transfer the wet concrete from the
21 mixer truck to the pump. It is expected that the Contractor will use the waste conveyance hoist
22 to transfer from the ground surface to the mine level. The Contractor is to familiarize himself
23 with the dimensions of the waste conveyance and the airlock in order to provide suitable
24 transport vehicles. The Contractor is also to familiarize himself with the capacity and speed of
25 the conveyance to allow transfer of sufficient concrete to sustain the continuing placement of
26 concrete. (See Figures G1-2 and G1-3, attached).

1 The Contractor shall determine the horizontal distance to the entry where placement of the
2 concrete barrier is to occur, and develop a route, with the approval of the Engineer for traffic
3 flow within the underground.

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

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

11 **3.2 Pumping Concrete**

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

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

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

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

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

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

30 **3.3 Coordination of Work**

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

34 **3.4 Clean-Up**

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

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DIVISION 4 - MASONRY

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1 **Section 04100 - Mortar**

2 **Part 1 - General**

3 **1.1 Scope**

4 This section includes:

- 5
 - Mortar for Isolation Wall Construction.

6 **1.2 Related Sections**

- 7
 - 01010 - Summary of Work
 - 8 • 01400 - Contractor Quality Control
 - 9 • 01600 - Material and Equipment
 - 10 • 04300 - Unit Masonry System

11 **1.3 References**

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

21 **1.4 Submittals for Review and Approval**

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

24 Design mix.

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

27 **1.5 Submittals at Completion**

28 Certified laboratory test results for the construction testing of mortar mix.

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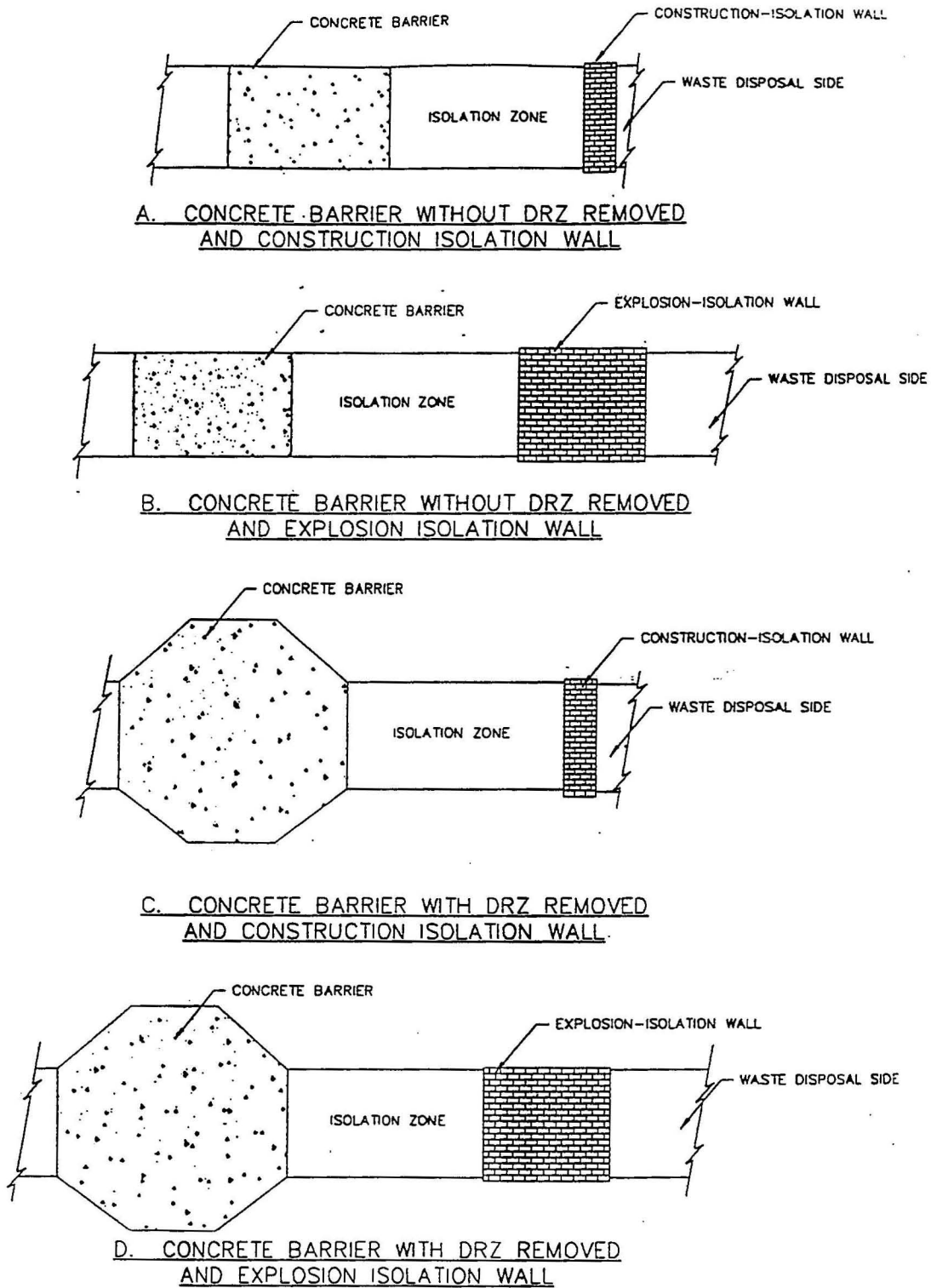
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FIGURES

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**Figure G1G-1
Plan Variations**

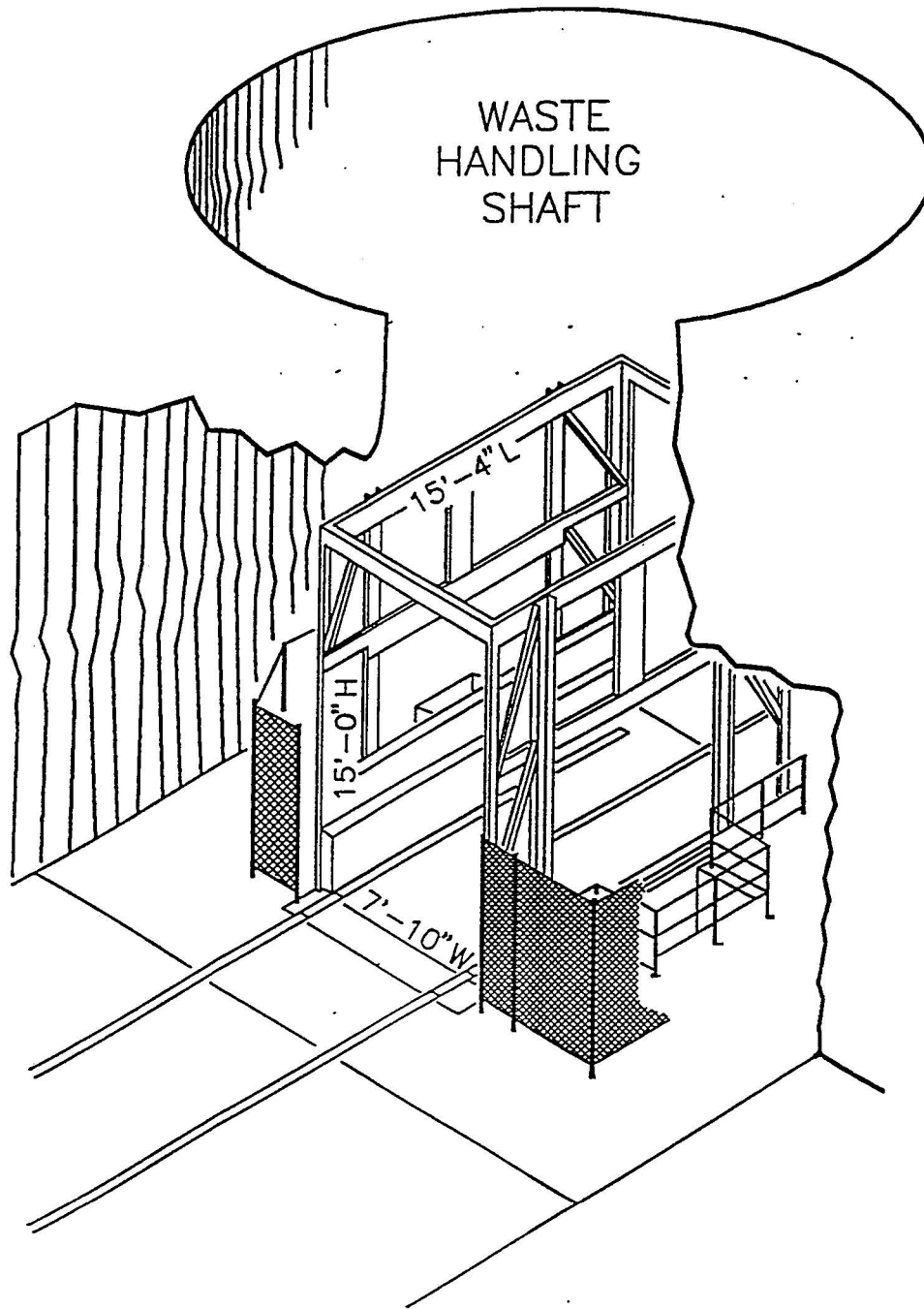


Figure G1G-2
Waste Handling Shaft Cage Dimensions

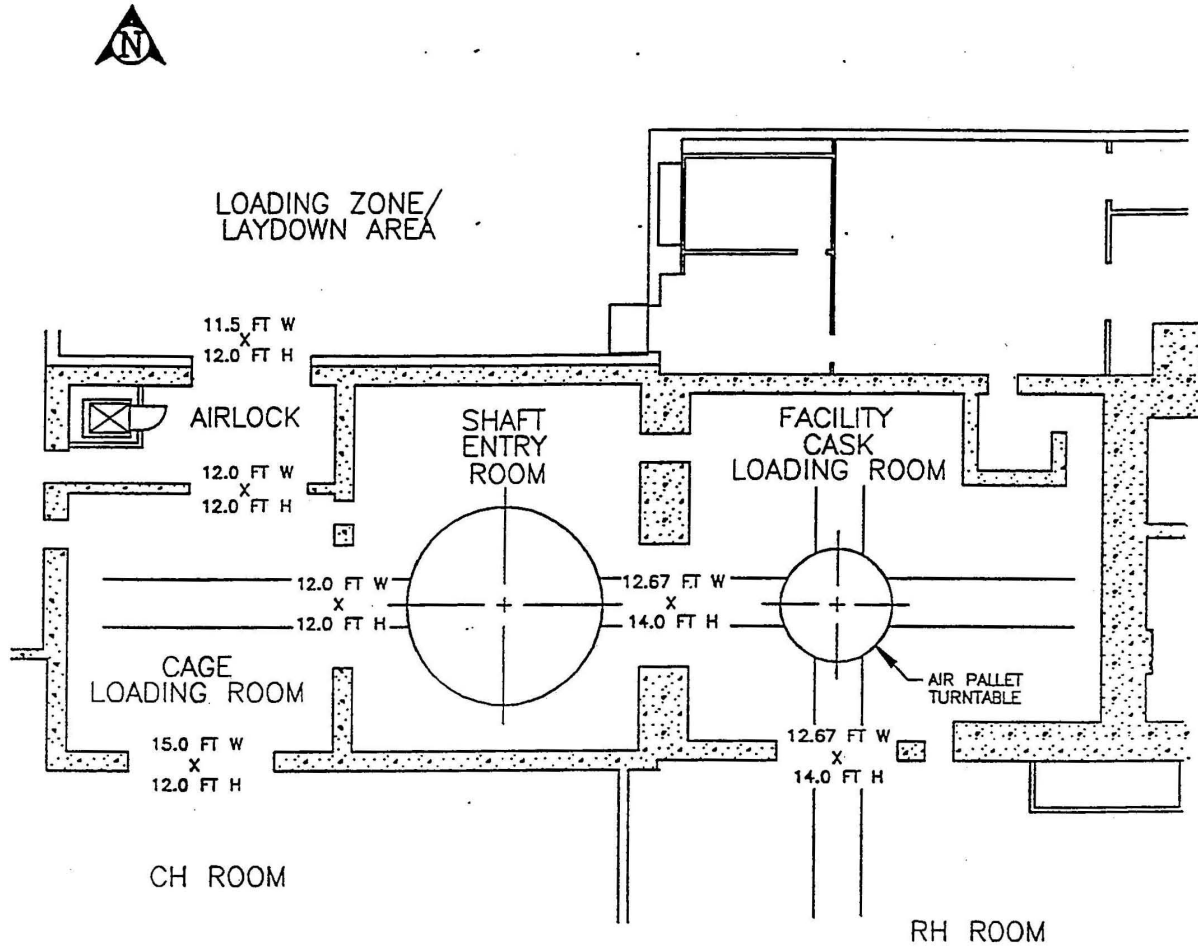


Figure G1G-3
Waste Shaft Collar and Airlock Arrangement

ATTACHMENT L

WIPP GROUNDWATER DETECTION MONITORING PROGRAM PLAN

Waste Isolation Pilot Plant
Hazardous Waste Permit
~~May 8~~ October 1, 2012

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ATTACHMENT L

WIPP GROUNDWATER DETECTION MONITORING PROGRAM PLAN

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LIST OF ABBREVIATIONS/ACRONYMS/UNITS

Bell Canyon bgs	Bell Canyon Formation below ground surface
Castile cm Culebra CofC/RFA °C %C	Castile Formation centimeter(s) Culebra Member of the Rustler Formation chain of custody/request for analysis degree(s) Celsius percent completeness
Dewey Lake DI DMP DMW DOE DQO	Dewey Lake Redbeds Formation deionized Detection Monitoring Program Detection Monitoring Well U.S. Department of Energy data quality objectives
EPA ft ft ²	U.S. Environmental Protection Agency foot (feet) square foot (square feet)
g/cm ³ HWDU	gram(s) per cubic centimeter hazardous waste disposal unit(s)
km km ²	kilometer(s) square kilometer(s)
lb/in. ² LCS LCSD Los Medaños LWA	pound(s) per square inch laboratory control samples lab control sample duplicate Los Medaños Member of the Rustler Formation Land Withdrawal Act
m M&DC m ² Magenta mg/L mi mi ² molal MOC MPa mV	meter(s) monitoring and data collection square meter(s) Magenta Member of the Rustler Formation milligram(s) per liter mile(s) square mile(s) moles per kilogram Management and Operating Contractor megapascal(s) millivolt(s)
NIST NMAC NMED	National Institute for Standards and Technology New Mexico Administrative Code New Mexico Environment Department

QA	Quality Assurance
QA/QC	quality assurance/quality control
QAO	Quality Assurance Objective
QC	quality control
PABC	Performance Assessment Baseline Calculation
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
Rustler	Rustler Formation
%R	percent recovery
Salado	Salado Formation
SAP	Sampling and Analysis Plans
SC	specific conductance
SOP	Standard Operating Procedure
TDS	total dissolved solids
TOC	total organic carbon
TRU	transuranic
TSDF	treatment, storage, and disposal facilities
UTLV	upper tolerance limit value
VOC	volatile organic compound
WIPP	Waste Isolation Pilot Plant
WLMP	WIPP Groundwater Level Monitoring Program
µg/L	microgram(s) per liter
µm	micrometers

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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

1 from the basin-scale groundwater model is discussed in detail in Amended Renewal Application
2 Addendum L1, Section L1-2a, (DOE, 2009).

3 This monitoring plan addresses requirements for sample collection, Culebra groundwater
4 surface elevation monitoring, Culebra groundwater flow direction and rate determination, data
5 management, and reporting of Culebra groundwater monitoring data. It also identifies indicator
6 parameters and hazardous constituents selected to assess Culebra groundwater quality for the
7 WIPP groundwater detection monitoring program (**DMP**). Because quality assurance is an
8 integral component of the groundwater sampling, analysis, and reporting process, quality
9 assurance/quality control (**QA/QC**) elements and associated data acceptance criteria are
10 included in this plan.

11 Instructions for performing field activities that will be conducted in conjunction with this DMP are
12 provided in the WIPP Standard Operating Procedures (**SOPs**) (see Table L-3), which are
13 maintained in facility files and which comply with the applicable requirements of 20.4.1.500
14 NMAC (incorporating 40 CFR § 264.97 (d)). Procedures are required for each aspect of the
15 Culebra groundwater sampling process, including Culebra groundwater surface elevation
16 measurement, Culebra groundwater flow direction and rate determination, sampling equipment
17 installation and operation, field water-quality measurements, and sample collection. Data
18 required by this plan will be collected by qualified personnel in accordance with SOPs (Table L-
19 3).

20 L-1a Geologic and Hydrologic Characteristics

21 L-1a(1) Geology

22 The WIPP facility is situated within the Delaware Basin bounded to the north and east by the
23 Capitan Reef, which is part of the larger Permian Basin, located in the south-central region of
24 North America. Three major evaporite-bearing formations were deposited in the Delaware Basin
25 (see Figures L-3 and L-4 and Amended Renewal Application Addendum L1, Section L1-1 (DOE,
26 2009) for more detail):

- 27 • The Castile consists of interbedded anhydrites and halite. Its upper boundary is at a
28 depth of about 2,825 ft (861 m) below ground surface (**bgs**), and its thickness at the
29 WIPP facility is 1,250 ft (381 m).
- 30 • The repository is located in the Salado, which overlies the Castile and resulted from
31 prolonged desiccation that produced predominantly halite, with some carbonates,
32 anhydrites, and clay seams. Its upper boundary is at a depth of about 850 ft (259 m)
33 bgs, and it is about 2,000 ft (610 m) thick in the repository area.
- 34 • The Rustler Formation was deposited in a lagoonal environment during a major
35 freshening of the basin and consists of carbonates, anhydrites, and halites. Its beds
36 consist of clay and anhydrite and contain small amounts of brine. The Rustler's upper
37 boundary is about 500 ft (152 m) bgs, and it ranges up to 350 ft (107 m) in thickness in
38 the repository area.

39 These evaporite-bearing formations lie between two other formations significant to the geology
40 and hydrology of the WIPP facility. The Dewey Lake Redbeds Formation (**Dewey Lake**)
41 overlying the Rustler is dominated by nonmarine sediments and consists almost entirely of

1 mudstone, claystone, siltstone, and interbedded sandstone (see Amended Renewal Application
2 Addendum L1, Section L1-1c(6) (DOE, 2009)). This formation forms a 500-ft- (152-m) thick
3 barrier of fine-grained sediments that retard the downward percolation of water into the
4 evaporite units below. The Bell Canyon is the first water-bearing unit below the repository (see
5 Amended Renewal Application Addendum L1, Section L1-1c(2) (DOE, 2009)) and is confined
6 above by the thick evaporite deposits of the Castile. It consists of 1,200 ft (366 m) of
7 interbedded sandstone, shale, and siltstone.

8 The Salado was selected to host the WIPP repository for several reasons. First, it is regionally
9 extensive, underlying an area of more than 36,000 square mi (mi²) (93,240 square kilometers
10 [km²]). Second, its permeability is extremely low. Third, salt behaves mechanically in a plastic
11 manner under pressure (the lithostatic pressure at the disposal horizon is approximately 2,200
12 pounds per square inch [lb/in.²] or 14.9 megapascals [MPa]) and eventually deforms to fill any
13 opening (referred to as creep). Fourth, any fluid remaining in small fractures or openings is
14 saturated with salt, is incapable of further salt dissolution, and has probably remained in place
15 since deposition. Finally, the Salado lies between the Rustler and the Castile (Figure L-4), which
16 contain very low permeability layers that help confine and isolate waste within and keep water
17 outside of the WIPP repository (see Amended Renewal Application Addendum L1, Section L1-
18 1c(5) and L1-1c(3) (DOE, 2009)).

19 L-1a(2) Groundwater Hydrology

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

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

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

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

36 The Salado is an evaporite sequence that filled the remainder of the Delaware Basin and lapped
37 extensively over the Capitan Reef and the back-reef sediments beyond. The Salado consists of
38 approximately 2,000 ft (610 m) of bedded halite, with interbeds or seams of anhydrite, clay, and
39 polyhalite. It acts hydrologically as a regional confining bed. The porosity of the Salado is very
40 low and naturally interconnected pores are probably nonexistent in halite at the depth of the
41 disposal horizon. Fluids associated with the Salado occur mainly as very small fluid inclusions in
42 the halite crystals and also occur between crystal boundaries (interstitial fluid) of the massive
43 crystalline salt formation; fluids also occur in clay seams and anhydrite beds. Permeabilities

1 measured from the surface in the area of the WIPP facility range from 0.01 to 25 microdarcsies.
2 The most reliable value, 0.3 microdarcy, was obtained from well DOE-2. The results of
3 permeability testing at the disposal horizon are within the range of 0.001 to 0.01 microdarcy.

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

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

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

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

19 The hydraulic tests consist of pump, injection, and slug testing of wells across the study area
20 (see Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)). The
21 most detailed hydraulic test data exist for the WIPP hydropads (e.g., H-19). The hydropads
22 generally comprise a network of three or more wells located within a few tens of meters of each
23 other. Long-term pumping tests have been conducted at hydropads H-3, H-11, and H-19 and at
24 well WIPP-13 (see Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE,
25 2009)). These pumping tests provided transient pressure data both at the hydropad and over a
26 much larger area. Tests often included use of automated data-acquisition systems, providing
27 high-resolution (in both space and time) data sets. In addition to long-term pumping tests, slug
28 tests and short-term pumping tests have been conducted at individual wells to provide pressure
29 data that can be used to interpret the transmissivity at that well (see Amended Renewal
30 Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)). Detailed cross-hole hydraulic
31 testing has been conducted at the H-19 hydropad (see Amended Renewal Application
32 Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)).

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

40 There is strong evidence that the permeability of the Culebra varies spatially and varies
41 sufficiently that it cannot be characterized with a uniform value or range over the region of
42 interest to WIPP. The transmissivity of the Culebra varies spatially over ten orders of magnitude
43 from east to west in the vicinity of WIPP. Transmissivities have been calculated at 1×10^{-7}

1 square feet per day (1×10^{-13} square meters per second) at well SNL-15 east of the WIPP site
2 to 1×10^3 square feet per day (1×10^{-3} square meters per second) at well H-7 in Nash Draw
3 (see Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009)).

4 Transmissivity variations in the Culebra are believed to be controlled by the relative abundance
5 of open fractures rather than by primary (that is, depositional) features of the unit (Roberts
6 2007). Lateral variations in depositional environments were small within the mapped region, and
7 primary features of the Culebra show little map-scale spatial variability, according to Holt and
8 Powers, 1988. Direct measurements of the density of open fractures are not available from core
9 samples because of incomplete recovery and fracturing during drilling, but observation of the
10 relatively unfractured exposures in the WIPP shafts suggests that the density of open fractures
11 in the Culebra decreases to the east.

12 Geochemical and radioisotope characteristics of the Culebra have been studied. There is
13 considerable variation in groundwater geochemistry in the Culebra. The variation has been
14 described in terms of different hydrogeochemical facies that can be mapped in the Culebra. A
15 halite-rich hydrogeochemical facies exists in the region of the WIPP site and to the east,
16 approximately corresponding to the regions in which halite exists in units above and below the
17 Culebra, and in which a large portion of the Culebra fractures are gypsum filled. An anhydrite-
18 rich hydrogeochemical facies exists west and south of the WIPP site, where there is relatively
19 less halite in adjacent strata and where there are fewer gypsum-filled fractures. Radiogenic
20 isotopic signatures suggest that the age of the groundwater in the Culebra is on the order of
21 10,000 years or more (see Amended Renewal Application Addendum L1 (DOE, 2009)).

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

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

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

39 Using data from 22 wells, Siegel, Robinson, and Myers (1991) originally defined four
40 hydrochemical facies (A, B, C, and D) for Culebra groundwater based primarily on ionic strength
41 and major constituents. With the data now available from 59 wells, Domski and Beauheim
42 (2008) defined transitional A/C and B/C facies, as well as a new facies E for high-moles per
43 kilogram (molal) Na-Mg Cl brines.

- 1 • Zone B - Dilute (ionic strength ≤ 0.1 molal) CaSO_4 -rich groundwater, from southern high-
2 transmissivity area. Mg/Ca molar ratio 0.32 to 0.52.
- 3 • Zone B/C - Ionic strength 0.18 to 0.29 molal, Mg/Ca molar ratio 0.4 to 0.6.
- 4 • Zone C - Variable composition waters, ionic strength 0.3 to 1.0 molal, Mg/Ca molar ratio
5 0.4 to 1.1.
- 6 • Zone A/C - Ionic strength 1.1 to 1.6 molal, Mg/Ca molar ratio 0.5 to 1.2.
- 7 • Zone A - Ionic strength > 1.66 molal, up to 5.3 molal, Mg/Ca molar ratio 1.2 to 2.4.
- 8 • Zone D - Defined based on inferred contamination related to potash refining operations.
9 Ionic strength 3 molal, K/Na weight ratios of ~ 0.2 .
- 10 • Zone E - Wells east of the mudstone-halite margins, ionic strength 6.4 to 8.6 molal,
11 Mg/Ca molar ratio 4.1 to 6.6.

12 The low-ionic-strength (≤ 0.1 molal) facies B waters contain more sulfate than chloride, and are
13 found southwest and south of the WIPP site within and down the Culebra hydraulic gradient
14 from the southernmost closed catchment basins, mapped by Powers (2006), in the southwest
15 arm of Nash Draw. These waters reflect relatively recent recharge through gypsum karst
16 overlying the Culebra. However, with total dissolved solids (**TDS**) concentrations in excess of
17 3,000 mg/L, the facies B waters do not represent modern-day precipitation rapidly reaching the
18 Culebra. They must have residence times in the Rustler sulfate units of thousands of years
19 before reaching the Culebra.

20 The higher-ionic-strength (0.3-1 molal) facies C brines have differing compositions, representing
21 meteoric waters that have dissolved CaSO_4 , overprinted with mixing and localized processes.
22 Facies A brines (ionic strength 1.6 - 5.3 molal) are high in NaCl and are clustered along the
23 extent of halite in the middle of the Tamarisk Member of the Rustler Formation. Facies A
24 represents old waters (long flow paths) that have dissolved halite and/or connate brine, or a
25 mixture of the two from facies E. The facies D brines, as identified by Siegel, Robinson, and
26 Myers (1991), are high-ionic-strength solutions found in western Nash Draw with high K/Na
27 ratios representing waters contaminated with effluent from potash refining operations. Similar
28 water is found at shallow depth (< 36 ft (11 m)) in the upper Dewey Lake at SNL-1, just south of
29 the Intrepid East tailings pile. The newly defined facies E waters are very high ionic strength (6.4
30 - 8.6 molal) NaCl brines with high Mg/Ca ratios. The facies E brines are found east of the WIPP
31 site, where Rustler halite is present above and below the Culebra, and halite cements are
32 present in the Culebra. They represent primitive brines present since deposition of the Culebra
33 and immediately overlying strata.

34 Previously, the Permittees and others believed the geochemistry of Culebra groundwater was
35 inconsistent with flow directions. This was based on the premise that facies C water must
36 transform to facies B water (e.g. become "fresher"), which is inconsistent with the observed flow
37 direction. It is now believed that the observed geochemistry and flow directions can be
38 explained with different recharge areas and Culebra travel paths (Amended Renewal
39 Application Addendum L1 (DOE, 2009)).

1 Head distribution in the Culebra (see Amended Renewal Application Addendum L1 (DOE,
2 2009)) is consistent with basin-scale groundwater basin modeling results indicating that the
3 generalized groundwater flow direction in the Culebra is currently north to south. However, the
4 fractured nature of the Culebra, coupled with variable fluid densities, can cause localized flow
5 patterns to differ from general flow patterns.

6 Groundwater levels in the Culebra in the region around the WIPP facility have been measured
7 in numerous wells. Water-level rises have been observed and are attributed to causes
8 discussed in the Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE, 2009). The
9 extent of water-level rise observed at a particular well depends on several factors, but the
10 proximity of the observation point to the cause of the water-level change appears to be a
11 primary factor.

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

18 As discussed in Amended Renewal Application Addendum L1, Section L1-2a(3)(a)(ii) (DOE,
19 2009), extensive hydrological testing has been performed in the new wells. This testing has
20 involved both single well tests, which provide information on local transmissivity and
21 heterogeneity, and long-term (19 to 32 days) pumping tests that have created observable
22 responses in wells up to 5.9 mi (9.5 km) away.

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

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

32 L-2 General Regulatory Requirements

33 Because geologic repositories such as the WIPP facility are defined under the Resource
34 Conservation and Recovery Act (**RCRA**) as land disposal facilities and as miscellaneous units,
35 the groundwater monitoring requirements of 20.4.1.500 NMAC (incorporating 40 CFR
36 §§264.600 through 264.603) shall be addressed. The requirements of 20.4.1.500 NMAC
37 (incorporating 40 CFR §§264.90 through 264.101) apply to miscellaneous unit treatment,
38 storage, and disposal facilities (**TSDF**) only if groundwater monitoring is needed to satisfy
39 20.4.1.500 NMAC (incorporating 40 CFR §§264.601 through 264.603) environmental
40 performance standards.

41 The New Mexico Environment Department (**NMED**) has concluded that groundwater monitoring
42 in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264 Subpart F) at the WIPP

1 facility is necessary to meet the requirements of 20.4.1.500 NMAC (incorporating 40 CFR
2 §§264.601 through 264.603).

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

4 L-3a Scope

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

10 There are two separate components of the Groundwater Monitoring Program, the Detection
11 Monitoring Program (DMP) and the Water Level Monitoring Program (WLMP). The first
12 component consists of a network of six Detection Monitoring Wells (DMWs). The DMWs
13 (WQSP 1-6) were constructed to be consistent with the specifications provided in the
14 Groundwater Monitoring Technical Enforcement Guidance Document and constitute the RCRA
15 groundwater monitoring network specified in the DMP. The DMWs were used to establish
16 background groundwater quality in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §
17 264.97 and 264.98 (f)). The second component of the Groundwater Monitoring Program is the
18 WLMP, which is used to determine the groundwater surface elevation and flow direction. Table
19 L-4 is a list of the wells used in the WLMP as of January 1, 2011. The list of wells is subject to
20 change due to plugging and abandonment and drilling of new wells.

21 L-3b Current WIPP DMP

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

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

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

37 Transport modeling suggests that travel times from the Waste Handling Shaft to the LWA
38 boundary could be on the order of thousands of years. This assumes conditions where
39 hazardous constituents migrate from the sealed repository (post closure) to the Culebra via the
40 sealed shafts.

1 Potentiometric surfaces and groundwater flow directions defined for the Culebra prior to large-
2 scale pumping in the WIPP facility area and the excavation of WIPP facility shafts suggests that
3 flow was generally to the south-southeast from the waste disposal and shaft areas (Mercer,
4 1983; Davies, 1989). Potentiometric surface maps of the Culebra adjusted for density
5 differences show very similar characteristics. The wells used for measuring the potentiometric
6 surface of the Culebra are measured monthly and listed in Table L-4.

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

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

10 The six DMP Culebra wells were drilled between September 13 and October 16, 1994. The total
11 depth of each well is shown in Table L-5. The wells were drilled through the Culebra into the
12 Los Medaños as shown in Table L-5. The wells were drilled to the top of the Culebra using
13 compressed air as the drilling fluid and a 9 $\frac{7}{8}$ -in. drill bit. The wells were then cored using a 5 $\frac{1}{4}$ -
14 in. core bit to cut 4-in. (0.1-m) diameter core to total depth. See Table L-5 for the drilling and
15 coring intervals for each well. After coring, DMP wells were reamed to 9 $\frac{7}{8}$ -in. (0.3 m) in
16 diameter to total depth. After reaming, wells were cased from the surface to total depth with 5-in.
17 (0.1-m) (0.28-in. [0.7-centimeter (cm)] wall) blank fiberglass casing with in-line 5-in.- (0.1-m)
18 diameter fiberglass 0.02-in. (0.1-cm) slotted screen across the Culebra interval as shown in
19 Table L-5 . The annulus between the borehole wall and the casing/screen is packed with sand
20 and with 8/16 Brady gravel as indicated in Table L-5.

21 L-4 Monitoring Program Description

22 The WIPP DMP has been designed to meet the groundwater monitoring requirements of
23 20.4.1.500 NMAC (incorporating 40 CFR §§264.90 through 264.101). The following sections of
24 the monitoring plan specify the components of the DMP.

25 L-4a Monitoring Frequency

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

32 L-4b Analytical Parameters and Hazardous Constituents

33 The parameters listed in Part 5, Table 5.4.a and hazardous constituents listed in Part 5, Table
34 5.4.b are measured as part of the DMP.

35 Additional hazardous constituents may be identified through changes to the list of hazardous
36 waste numbers authorized for disposal at the WIPP facility. If hazardous constituents are
37 identified, these will be added to Part 5, Table 5.4.b, unless the Permittees provide justification
38 for their omission (e.g. hazardous constituent not in 40 CFR §264 Appendix IX), and this
39 omission is approved by NMED.

1 L-4c Groundwater Surface Elevation Measurement, Sample Collection and Laboratory
2 Analysis

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

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

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

12 Groundwater surface elevation measurements will be taken monthly at each of the six DMWs
13 and prior to the annual sampling event. Additionally, groundwater surface elevation
14 measurements will be taken monthly in the other Culebra wells as listed in Table L-4, when
15 accessible. Well locations are shown in Figure L-14. If a cumulative groundwater surface
16 elevation change of more than 2 feet is detected in any DMP well over the course of one year
17 which is not attributable to site tests or natural stabilization of the site hydrologic system, the
18 Permittees will notify NMED in writing and discuss the origin of the changes in the Annual
19 Culebra Groundwater Report specified in Permit Part 5. Abnormal, unexplained changes in
20 groundwater surface elevation will be evaluated to determine if they indicate changes in site
21 recharge/discharge which could affect the assumptions regarding DMW placement and
22 constitute new information as specified in 20.4.1.900 NMAC (incorporating 40 CFR
23 §270.41(a)(2)).

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

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

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

1
$$p = \rho y h$$

2 where

3 p = freshwater head (length of freshwater head)

4 y = average specific gravity of the borehole fluid (unitless ratio of borehole fluid density to
5 density of fresh water)

6 ρ = freshwater density (mass/volume)

7 h = fluid column height above the datum (length)

8 If the freshwater density is assumed to be 1.000 gram per cubic centimeter (g/cm^3), then the
9 equivalent freshwater head is equal to the fluid column height times the average borehole fluid
10 specific gravity.

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

15
16 L-4c(1)(i) Field Methods and Data Collection Requirements

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

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

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

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

38 A check print will be made of the work sheet printout. The check print will be used to verify that
39 data taken in the field was properly reported on the database printout. A minimum of 10 percent

1 of the spreadsheet calculations will be randomly verified on the check print to ensure that
2 calculations are being performed correctly. If errors are found, the work sheet will be corrected.
3 Groundwater surface elevation data and equivalent freshwater heads for the Culebra wells in
4 Table L-4 will be transmitted to NMED by May 31 and November 30. Semi-annual groundwater
5 reports will also include annotated hydrographs and trend analysis.

6 L-4c(2) Groundwater Sampling

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

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

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

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

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

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

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

37 Serial sampling is the collection of sequential samples for the purpose of determining when the
38 groundwater chemistry stabilizes and is therefore representative of undisturbed groundwater.
39 The Permittees' SOP for serial sampling will provide criteria for determining when a final sample
40 should be taken. Each DMW will be purged to no more than three well bore volumes, or until
41 field parameters stabilize, whichever occurs first. Well stabilization occurs when the field-

1 analyzed parameters are within $\pm 5\%$ of three consecutive measurements. A well bore volume
2 is defined as the volume of water from static water level to the bottom of the well sump. Serial
3 samples will be analyzed in the mobile field laboratory for field indicator parameters. The
4 Permittees will provide an explanation of why the sample was collected when field indicator
5 parameters were not stabilized and place that explanation in the WIPP facility Operating
6 Record.

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

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

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

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

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

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

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

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

36 The final sample will be collected once the measured field indicator parameters have stabilized
37 (refer to Section L-4(c)(2)(ii)). A serial sample will also be collected and analyzed for each day
38 of final sampling to ensure that samples collected for laboratory analysis are still representative
39 of stable conditions. Sample preservation, handling, and transportation methods will maintain
40 the integrity and representativeness of the final samples.

1 Prior to collecting the final samples, the collection team shall consider the analyses to be
2 performed so that proper shipping or storage containers can be assembled. Table L-6 presents
3 the sample containers, volumes, and holding times for laboratory samples collected as part of
4 the DMP.

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

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

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

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

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

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

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

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

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

37 The analytical laboratory receiving the samples will prescribe the type and amount of
38 preservative, the container material type, the required sample volumes that shall be collected,
39 and the shipping requirements. This information will be recorded on the Final Sample Checklist
40 for use by field personnel when final samples are being collected. The Permittees will follow the

1 EPA "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document," Table 4-1
2 (EPA, 1986), when laboratory SOPs do not specify sample container, volume, or preservation
3 requirements. WIPP SOPs (see Table L-3) provide instructions to ensure proper sample
4 preservation and shipping.

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

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

10 To ensure the integrity of samples from the time of collection through reporting date, sample
11 collection, handling, and custody shall be documented. Sample custody and documentation
12 procedures for sampling and analysis activities are detailed in WIPP facility SOPs (see Table L-
13 3).

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

17 Sample Numbers and Labels

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

25 Custody Seals

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

33 Sample Identification and Tracking

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

1 WQ6¹C²R2³N1⁴

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

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

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

13 Chain of Custody and Request for Analysis

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

26 L-4c(3) Laboratory Analysis

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

31 The Permittees will establish the criteria for laboratory selection, including the stipulation that
32 the laboratory follow the procedures specified in SW 846 and that the laboratory follow EPA
33 protocols unless alternate methods or protocols are approved by the NMED. The analytical
34 laboratory shall demonstrate, through laboratory SOPs that it will follow appropriate EPA SW
35 846 requirements and the requirements specified by the EPA protocols unless alternate
36 methods or protocols are approved by the NMED. The analytical laboratory shall also provide
37 documentation to the Permittees describing the sensitivity of laboratory instrumentation. This
38 documentation will be retained in the WIPP facility Operating Record. Instrumentation sensitivity
39 needs to be considered because of regulatory requirements governing constituent
40 concentrations in groundwater and the complexity of brines associated with the Culebra
41 groundwater.

1 The laboratory will maintain documentation of sample handling and custody, analytical results,
2 and internal quality control (QC) data. Additionally, the laboratory will analyze QC samples in
3 accordance with this plan and its own internal QC program for indicators of analytical accuracy
4 and precision. Data generated outside of laboratory acceptance limits will trigger an evaluation
5 and, if appropriate, corrective action as directed by the Permittees. The laboratory will report the
6 results of the environmental sample and QC sample analyses and any necessary corrective
7 actions that were performed. In the event that more than one analytical laboratory is used (e.g.,
8 for different analyses), each one will have the responsibilities specified above. A copy of the
9 laboratory SOPs will be maintained in WIPP facility files. The Permittees will provide NMED with
10 an initial set of applicable laboratory SOPs for information purposes, and provide NMED with
11 any updated SOPs on an annual basis by January 31.

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

14 L-4d Calibration

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

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

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

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

25 L-4e Statistical Analysis of Laboratory Analytical Data

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

28 L-4e(1) Temporal and Spatial Analysis

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

35 The analytical results for constituents will be reported as time series, either in tabular form or as
36 time plots or both, and compared to the 95th percentile values or reporting limits identified in
37 Part 5, Table 5.6.

1 L-4e(2) Distributions and Descriptive Statistics

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

11 L-4e(3) Action Levels

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

18 L-4e(4) Comparisons and Reporting

19 Prior to TRU mixed waste receipt, measurements were made of each background groundwater
20 quality hazardous constituent specified in Part 5, Table L-5.4b at every detection monitoring well
21 during each of the ten background sampling events (with the exception of trans-1,2-
22 dichloroethylene and vanadium that were added after TRU mixed disposal began). These
23 measurements serve as a statistical baseline (Part 5, Table 5.6) that is used for evaluating the
24 significance of the results of subsequent sampling events during detection monitoring. Time-
25 trend control charts with associated screening values for each hazardous constituent are used
26 for this evaluation. The Permittees will compare the results from groundwater hazardous
27 constituents of ongoing annual groundwater sample analysis to these baseline values in
28 accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.97(h)(4)). If the comparisons
29 show that a constituent statistically exceeds the baseline of the DMWs (as defined in 20.4.1.500
30 NMAC (incorporating 40 CFR §264.98(f)), the well shall be resampled and an analysis
31 performed as soon as possible, in accordance with 20.4.1.500 NMAC (incorporating 40 CFR
32 §264.98(g)(3)). The results of the statistical comparison will be reported annually to the NMED
33 in the Annual Culebra Groundwater Report by November 30, as required under 20.4.1.500
34 NMAC (incorporating 40 CFR §264.98(g)).

35 L-5 Reporting

36 L-5a Laboratory Data Reports

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

- 39
- 40 • A brief narrative summarizing laboratory analyses performed, date of issue, deviations
from the analytical method, technical problems affecting data quality, laboratory quality

1 checks, corrective actions (if any), and the project manager's signature approving
2 issuance of the data report.

- 3 • Header information for each analytical data summary sheet including: sample number
4 and corresponding laboratory identification number; sample matrix; date of collection,
5 receipt, preparation and analysis; and analyst's name.
- 6 • Parameter and hazardous constituents, analytical results, reporting units, reporting limit,
7 analytical method used.
- 8 • Results of QC sample analyses for all concurrently analyzed QC samples.

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

10 L-5b Statistical Analysis and Reporting of Results

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

16 L-5c Semi-Annual Groundwater Surface Elevation Report and Annual Culebra Groundwater 17 Report

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

- 22 • DMW and WLMP well configuration changes that may have occurred from the time of
23 the last measurement (i.e., plug installation and removal, packer removal and
24 reinstallation, or both; and the type and quantity of fluids that may have been introduced
25 into the test wells).
- 26 • Pumping activities that may have taken place since publication of the last annual report
27 (i.e., related to groundwater quality sampling, hydraulic testing, and shaft installation or
28 grouting) that may have taken place since the last annual groundwater report.
- 29 • A discussion of the origins of abnormal unexpected changes in the groundwater surface
30 elevation, which is not attributable to site tests or natural stabilization of the site
31 hydrologic system that exceeds 2 ft in a DMP well over the course of the period covered
32 by the Annual Culebra Groundwater Report (this may indicate changes in
33 recharge/discharge which would affect the assumptions regarding DMP well placement
34 and constitute new information as specified in 20.4.1.900 NMAC (incorporating 40 CFR
35 §270.41(a)(2)).
- 36 • The results of the annual measurements of densities.

- 1 • Annotated hydrographs.
- 2 • Groundwater flow rate and direction.
- 3 • Potentiometric surface map generated using the following steps:
 - 4 – Examine hydrographs to identify month having the largest number of Culebra water
 - 5 levels available with the fewest wells affected by pumping or other anthropogenic
 - 6 events.
 - 7 – Convert water levels from subject month to equivalent freshwater heads using fluid
 - 8 densities appropriate to the date.
 - 9 – Fit trend surface through freshwater heads.
 - 10 – Extrapolate the trend surface to the boundaries of the model domain used for the
 - 11 current Performance Assessment Baseline Calculations (**PABCs**) and define initial
 - 12 fixed-head boundary conditions based on the trend surface.
 - 13 – Using the ensemble-average Culebra transmissivity field used for the current PABC,
 - 14 optimize the model boundary heads to improve the fit of the model to the freshwater
 - 15 heads at the wells using optimization software interactively with MODFLOW.
 - 16 – Run MODFLOW with optimal boundary conditions fit.
 - 17 – Contour MODFLOW head results on WIPP site.
 - 18 – Compute particle path and travel time from the Waste Handling Shaft to the LWA
 - 19 Boundary.
 - 20 – Data analysis that will accompany the potentiometric surface map will include:
 - 21 • Measured versus modeled scatter plot diagram
 - 22 • Frequency of modeled head residuals
 - 23 • Modeled residual freshwater head at each well
 - 24 • Explanations for modeled misfit residuals greater than 16.4 feet (5 meters).
 - 25 • Semi-annual groundwater surface elevation results will be reported as specified in
 - 26 Permit Part 5, Condition 5.10.2.2.

27 The DMP data used in generating the Annual Culebra Groundwater Report will be maintained
28 as part of the WIPP facility Operating Record and will be provided to NMED for review as
29 specified in the permit.

1 L-6 Records Management

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

- 5 • Sampling and Analysis Plans (**SAPs**)
- 6 • SOPs
- 7 • Field Data Entry Sheets
- 8 • CofC/RFA forms
- 9 • Analytical Laboratory Data Reports
- 10 • Variance Logs and Nonconformance Reports
- 11 • Corrective Action Reports.

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

14 L-7 Quality Assurance Requirements

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

16 L-7a Data Quality Objectives and Quality Assurance Objectives

17 L-7a(1) Data Quality Objectives

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

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

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

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

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

28 L-7a(2) Quality Assurance Objectives

29 Quality Assurance Objectives (**QAOs**) for measurement data have been specified in terms of
30 accuracy, precision, completeness, representativeness, and comparability.

31

1 L-7a(2)(i) Accuracy

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

8
$$\%R = \frac{(\text{measured sample concentration})}{\text{true concentration}} \times 100$$

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

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

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

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

25 L-7a(2)(ii) Precision

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

30
$$RPD = \frac{(|\text{measured value sample 1} - \text{measured value sample 2}|)}{\text{average of measured samples 1 + 2}} \times 100$$

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

32 Specific conductance, pH, and temperature will be measured during well purging and after
33 sampling. SC measurements will be precise to $\pm 10\%$ pH to 0.10 standard unit, specific gravity to
34 0.01 by hydrometer and temperature to 0.10 degrees Celsius ($^{\circ}\text{C}$). Water-level measurements
35 will be precise to ± 0.01 ft. The precision of water density measurements, when measured in the

1 field using down hole instrumentation, will be determined on a well-by-well basis and will result
2 in no more than a ± 2 ft of error in the derived fresh-water head.

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

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

10 L-7a(2)(iii) Contamination

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

29 L-7a(2)(iv) Completeness

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

33 Occurrences that reduce the amount of data collected include sample container breakage
34 during sample shipment or in the laboratory and data generated while the laboratory was
35 operating outside prescribed QC limits. All attempts will be made to minimize data loss and to
36 recover lost data whenever possible. The completeness objective for analysis of Part 5, Table
37 5.4a parameters will be 90 percent and 100 percent analysis of Part 5, Table 5.4.b hazardous
38 constituents. If the completeness objective for Part 5 Table 5.4.b hazardous constituents is not
39 met, the Permittees will determine the need for resampling on a case-by-case basis. Numerical
40 expression of the completeness (**%C**) of data is as follows:

$$\%C = \frac{\text{number of accepted samples}}{\text{total number of samples collected}} \times 100$$

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.

1 L-7e Inspection and Surveillance

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

5 L-7f Control of Monitoring and Data Collection Equipment

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

15 L-7g Control of Nonconforming Conditions

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

21 L-7h Corrective Action

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

29 L-7i Quality Assurance Records

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

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

36

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TABLES

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

Unit	Hydraulic Conductivity	Storage	Thickness	Hydraulic Gradient	
Santa Rosa	2×10^{-8} to 2×10^{-6} m/s (1) (2)		0 to 91 m	0.001 (5)	
Dewey Lake	10^{-8} m/s	Specific storage 1×10^{-5} (1/m) (2)	152 m	0.001 (5)	
Rustler	Forty-niner	1×10^{-13} to 1×10^{-11} m/s (anhydrite) 1×10^{-9} m/s (mudstone) (2)	Specific storage 1×10^{-5} (1/m) (2)	13 to 23 m	NA (6)
	Magenta	$1 \times 10^{-8.5}$ to $1 \times 10^{-6.5}$ m/s (2)	Specific storage 1×10^{-5} (1/m) (2)	7 to 8.5 m	3 to 6
	Tamarisk	1×10^{-13} to 1×10^{-11} m/s (anhydrite) 1×10^{-9} m/s (mudstone) (2)	Specific storage 1×10^{-5} (1/m) (2)	26 to 56 m	NA (6)
	Culebra	$1 \times 10^{-7.5}$ to $1 \times 10^{-5.5}$ m/s (2)	Specific storage 1×10^{-5} (1/m) (2)	4 to 11.6 m	0.003 to 0.007 (5)
	Los Medaños	6×10^{-15} to 1×10^{-13} m/s 1.5×10^{-11} to 1.2×10^{-11} m/s (basal interval)	Specific storage 1×10^{-5} (1/m) (2)	29 to 38 m	NA (6)

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; Earrough, 1977.

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Table L-2
WIPP Groundwater Detection Monitoring Program Sample Collection and Groundwater Surface Elevation Measurement Frequency

Installation	Frequency
Groundwater Quality Sampling	
DMWs	Annually
Groundwater Surface Elevation Monitoring	
DMWs	Monthly and prior to sampling events
WLMP Wells (see Table L-4)	Monthly

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**Table L-3
 Standard Operating Procedures Applicable to the DMP**

Number	Title/Description
WP 02-EM1010	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.
WP 02-EM1014	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.
WP 02-EM1021	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.
WP 02-EM1026	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.
WP 02-EM3001	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.
WP 02-EM3003	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.
WP-02-RC.01	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) <u>Management and Operating Contractor (MOC)</u> policies and procedures. This plan implements applicable sections of 20.4.1.100-1102 New Mexico Administrative Code (NMAC), <i>Hazardous Waste Management</i> (incorporating 40 <i>Code of Federal Regulations</i> [CFR] Parts 260-268 and 273).
WP 10-AD3029	Calibration and Control of Monitoring and Data Collection Equipment: This procedure provides direction for the control and calibration of Monitoring and Data Collection (M&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&DC equipment.
WP 13-1	Management and Operating Contractor <u>Washington TRU Solutions LLC</u> Quality Assurance Program Description: This document establishes the minimum quality requirements for Management and Operating Contractor (MOC) personnel and guidance for the development and

Number	Title/Description
	implementation of QA programs by MOC organizations.

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**Table L-4
January 2011 Culebra WLMP**

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

*H-19b0 monthly

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Table L-5
Details of Construction for the Six Culebra Detection Monitoring Wells

NAME (Figure)	DATE DRILLED	TOTAL DEPTH feet (meters) bgs	DEPTH INTO LOS MEDAÑOS feet (meters)	DRILLING DEPTHS feet (meters) bgs		CASING feet (meters) bgs		PACKING feet (meters) bgs		CULEBRA INTERVAL feet (meters) bgs
				WITH AIR	CORING	DEPTH FOR 5 in. CASING	INTERVAL FOR SLOTTED SCREEN	SAND PACK INTERVAL	BRADY GRAVEL PACK INTERVAL	
WQSP-1 Figure L-7	September 13 through 16, 1994	737 (225)	15 (5)	696 (212)	696 to 737 (212 to 225)	737 (225)	702 to 727 (214 to 222)	640 to 651 (195 to 198)	651 to 737 (198 to 225)	699 to 722 (213 to 220)
WQSP-2 Figure L-8	September 6 through 12, 1994	846 (258)	12 (4)	800 (244)	800 to 846 (244 to 258)	846 (258)	811 to 836 (247 to 255)	790 to 793 (241 to 242)	793 to 846 (242 to 258)	810.1 to 833.7 (247 to 254)
WQSP-3 Figure L-9	October 20 through 26, 1994	880 (268)	10 (3)	833 (254)	833 to 880 (254 to 268)	880 (268)	844 to 869 (257 to 265)	827 to 830 (252 to 253)	830 to 880 (253 to 268)	844 to 870 (257 to 265)
WQSP-4 Figure L-10	October 5 through 10, 1994,	800 (244)	9 (3)	740 (226)	740 to 798 (226 to 243)	800 (244)	764 to 789 (233 to 240)	752 to 755 (229 to 230)	755 to 800 (230 to 244)	766 to 790.8 (233 to 241)
WQSP-5 Figure L-11	October 12 through 18, 1994,	681 (208)	7 (2)	648 (198)	648 to 676 (198 to 206)	681 (208)	646 to 671 (197 to 205)	623 to 626 (190 to 191)	626 to 681 (191 to 208)	648 to 674.4 (198 to 205)
WQSP-6 Figure L-12	September 26 through October 3, 1994	616.6 (188)	10 (3)	568 (173)	568 to 617 (173 to 188)	617 (188)	581 to 606 (177 to 185)	567 to 570 (173 to 174)	570 to 616.6 (174 to 188)	582 to 606.9 (177 to 185)

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**Table L-6
 Analytical Parameter and Sample Requirements**

(10) PARAMETERS	(12) NO. OF BOTTLES	(13) VOLUME	(14) TYPE	(15) ACID WASH	(16) SAMPLE FILTER	(17) PRESERVATIVE	(18) HOLDING TIME
Indicator ¹ Parameters: <ul style="list-style-type: none"> • pH • SC • TOC 	- - 4	25 ml ² 100 ml ² 15 ml ²	Glass Glass Glass	Field determined Field determined yes	No? No No	Field determined Field determined HCl	None None 28 days ²
General Chemistry	1	1 Liter	Plastic	Yes	No	HNO ₃ , 4pH<2	not specified in DMP
Phenolics	1	1 Liter	Amber Glass	Yes	No	H ₂ SO ₄ , pH<2	not specified in DMP
Metals/Cations	2	1 Liter	Plastic	Yes	No	HNO ₃ , pH<2	6 months ^{2, 3}
VOC	4	40 ml	Glass	No	No	HCL, ph<2	14 days ²
VOC (Purgable)	2	40 ml	Glass	No	No	HCL, ph<2	14 days ²
VOC (Non-Purgable)	2	40 ml	Glass	No	No	HCL, ph<2	14 days ²
BN/As	1	½ Gallon	Amber Glass	Yes	No	None	
TCLP	1	1 Liter	Plastic	Yes	No	HNO ₃ , pH<2	7 days ²
Cyanide (Total)	1	1 Liter	Plastic	Yes	No	NaOH, pH>12	14 days ²
Sulfide	1	250 ml	Amber Glass	Yes	No	NaOH + Zn Acetate	28 days ²
Radionuclides	1	1 Gallon	Plastic Cube	Yes	Yes	HNO ₃ , pH<2	6 months ²

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.

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FIGURES

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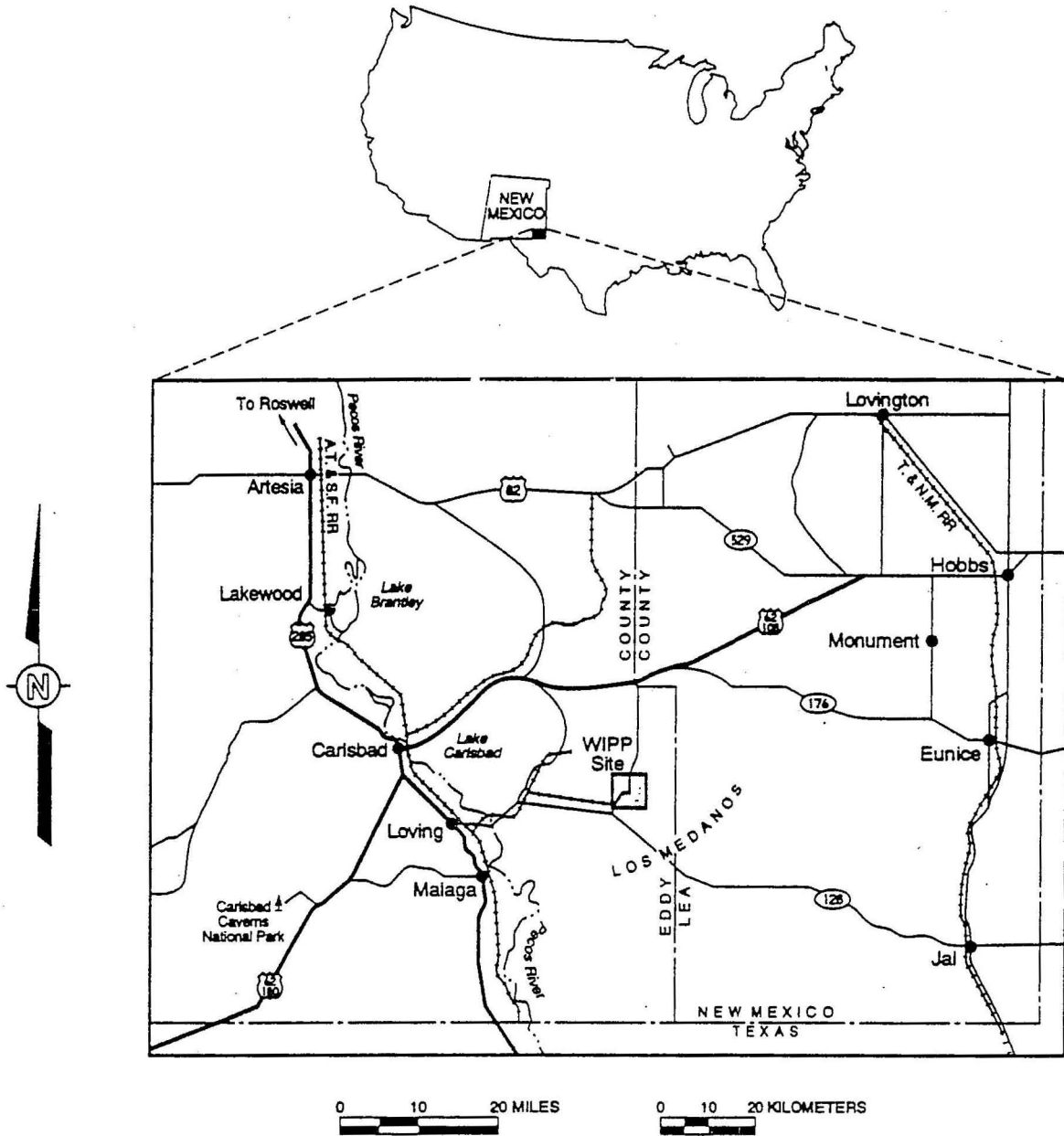


Figure L-1
General Location of the WIPP Facility

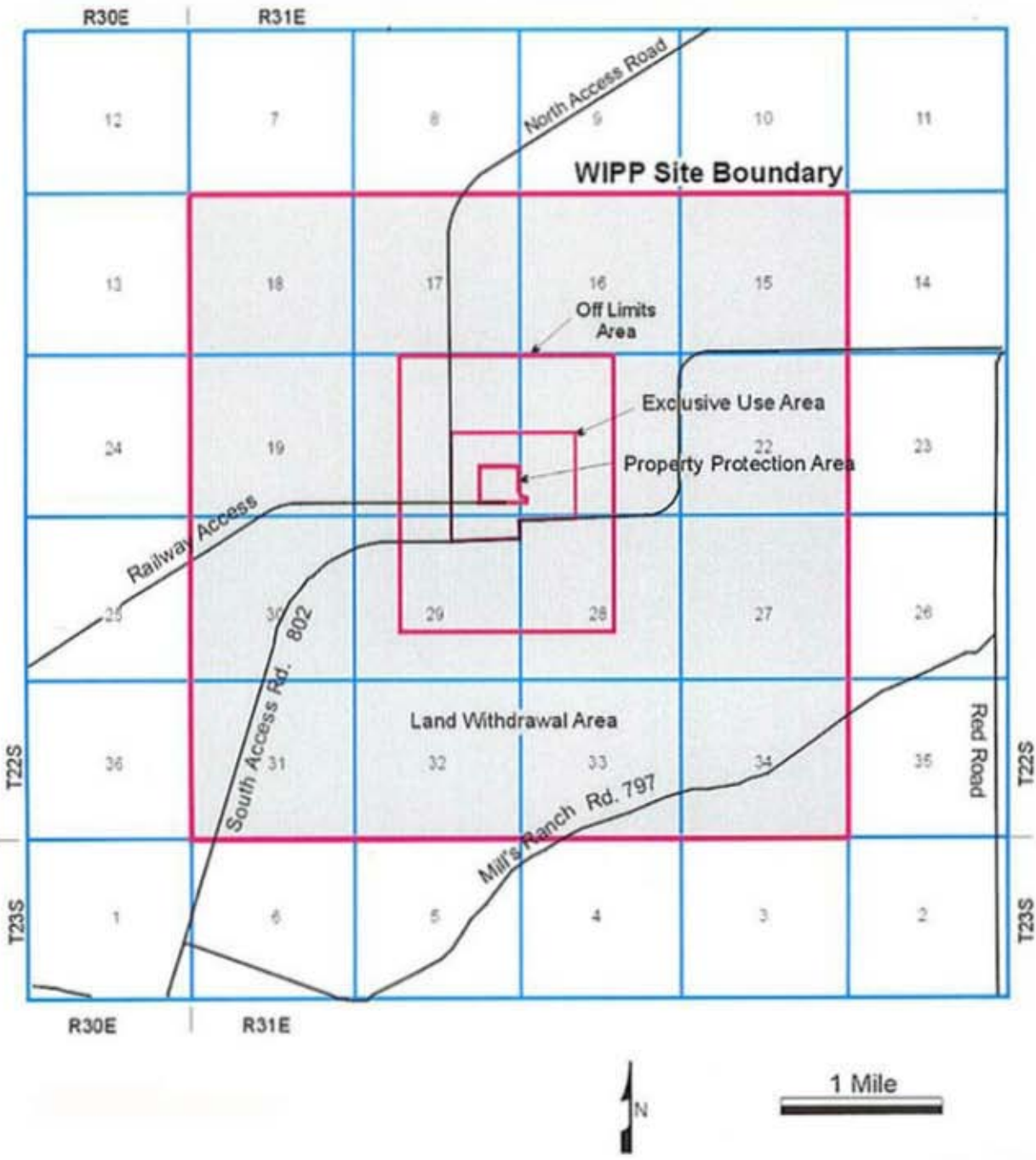


Figure L-2
WIPP Facility Boundaries Showing 16-square-Mile Land Withdrawal Boundary

SYSTEM	SERIES	GROUP	FORMATION	MEMBER
RECENT	RECENT		SURFICIAL DEPOSITS	
QUATERNARY	PLEISTOCENE		MESCALERO CALICHE	
			GATUÑA	
TERTIARY	MID-PLIOCENE		OGALLALA	
TRIASSIC		DOCKUM	SANTA ROSA	
PERMIAN	OCHOAN		DEWEY LAKE	
			RUSTLER	Forty-niner
				Magenta
				Tamarisk
				Culebra
				Los Medaños
			SALADO	Upper
	McNitt Potash			
	Lower			
	CASTILE			
	GUADALUPIAN	DELAWARE MOUNTAIN	BELL CANYON	
			CHERRY CANYON	
			BRUSHY CANYON	

Figure L-3
 Site Geologic Column

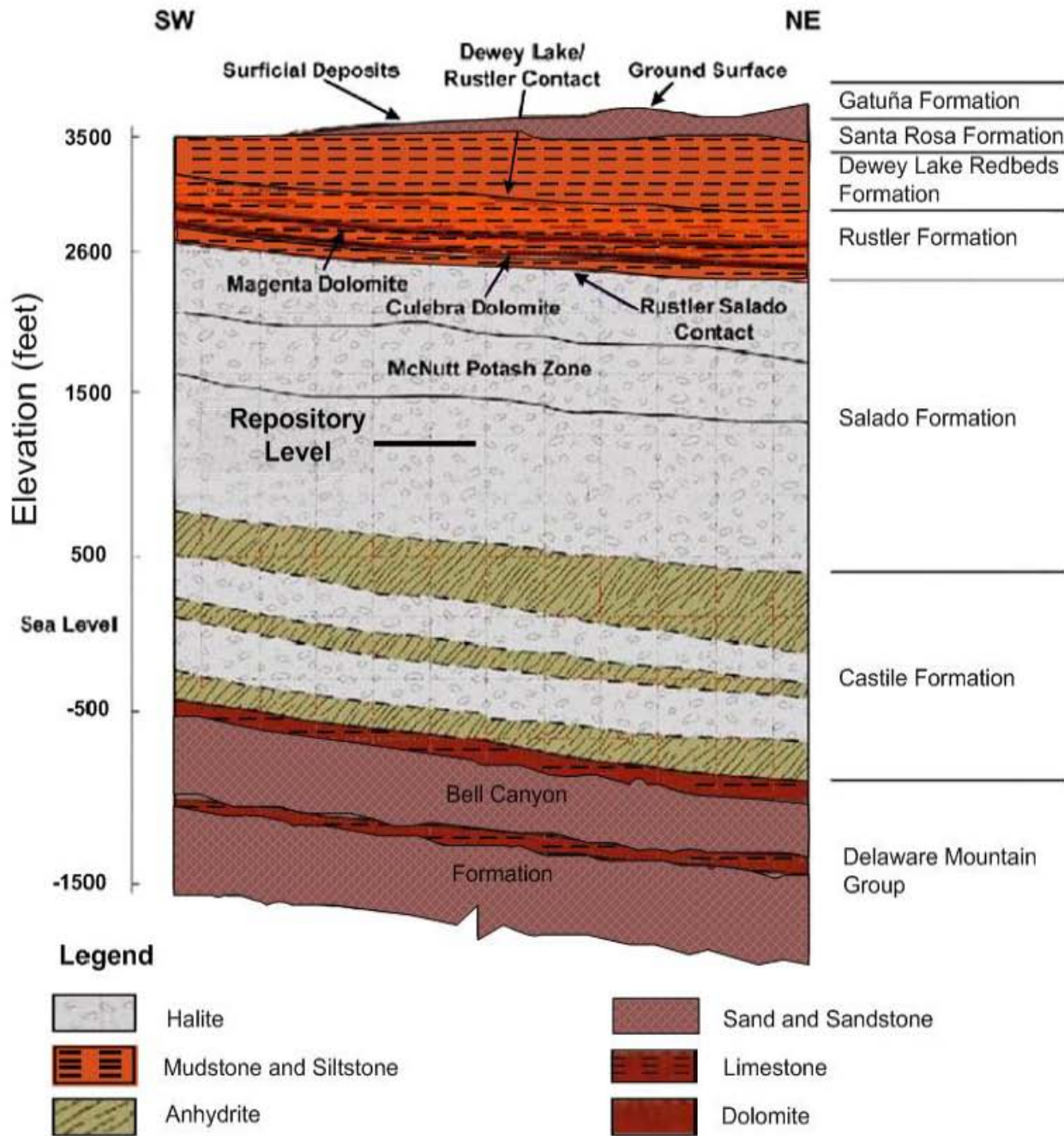
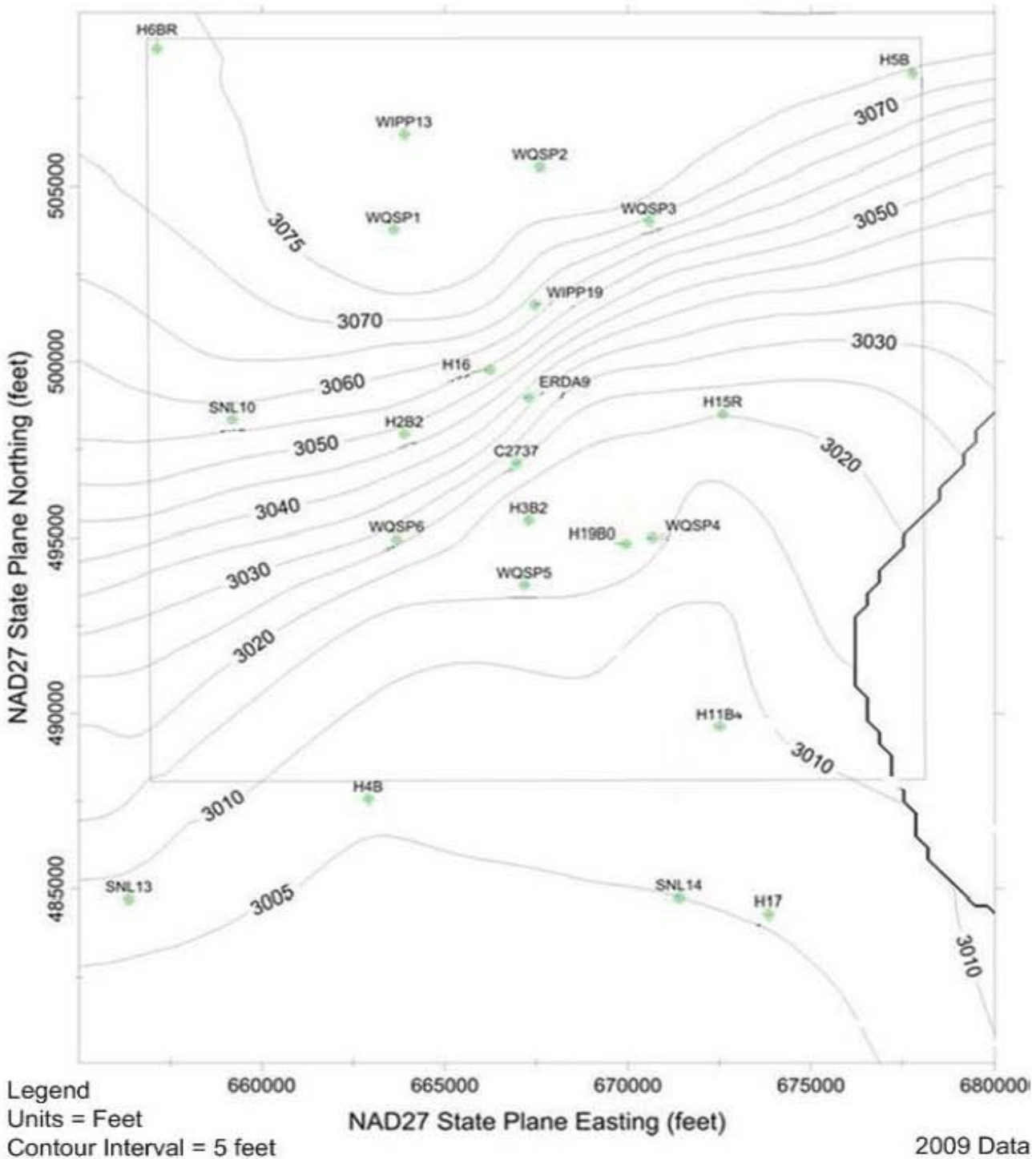
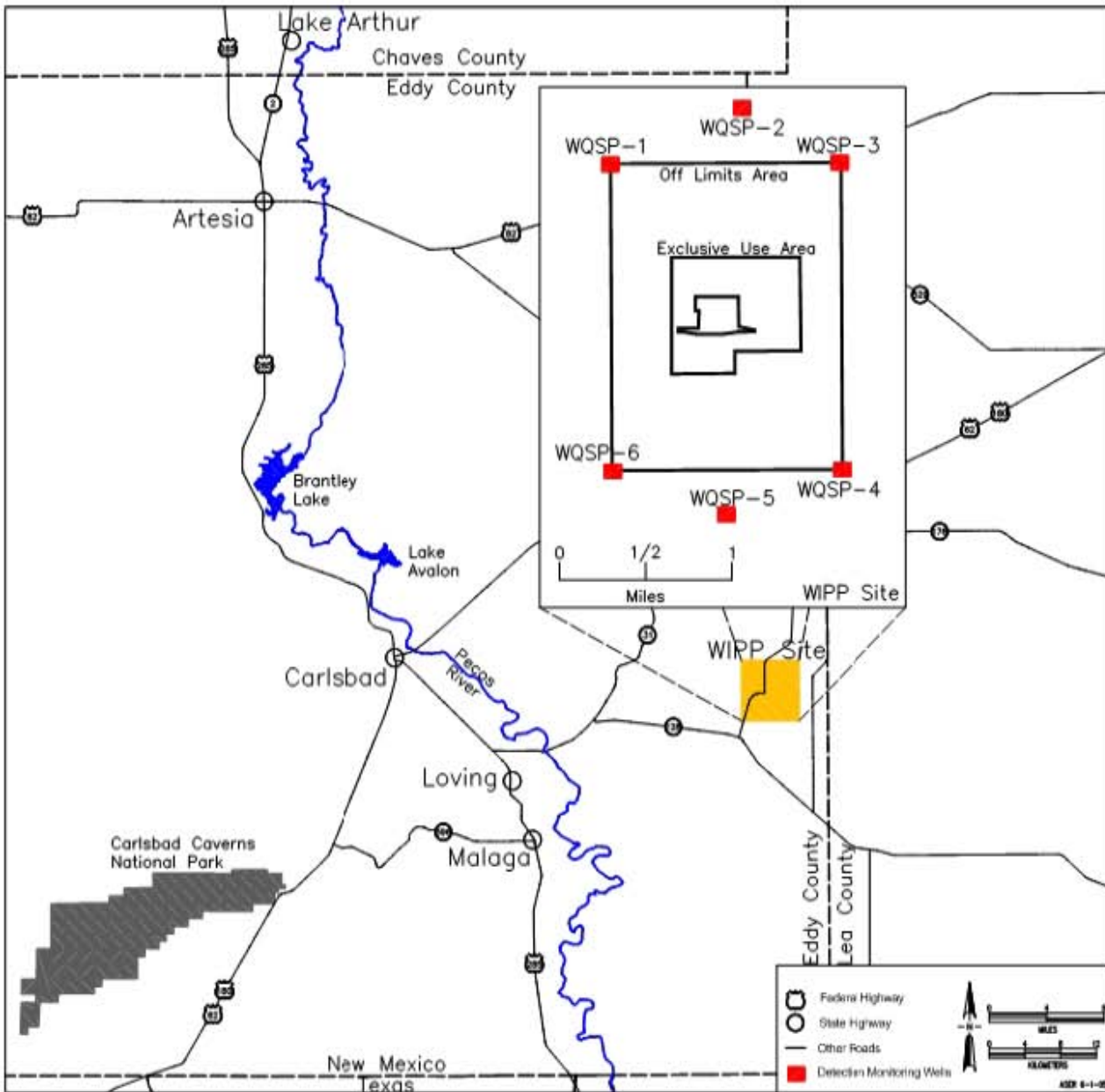


Figure L-4
Generalized Stratigraphic Cross Section above Bell Canyon Formation at WIPP Site

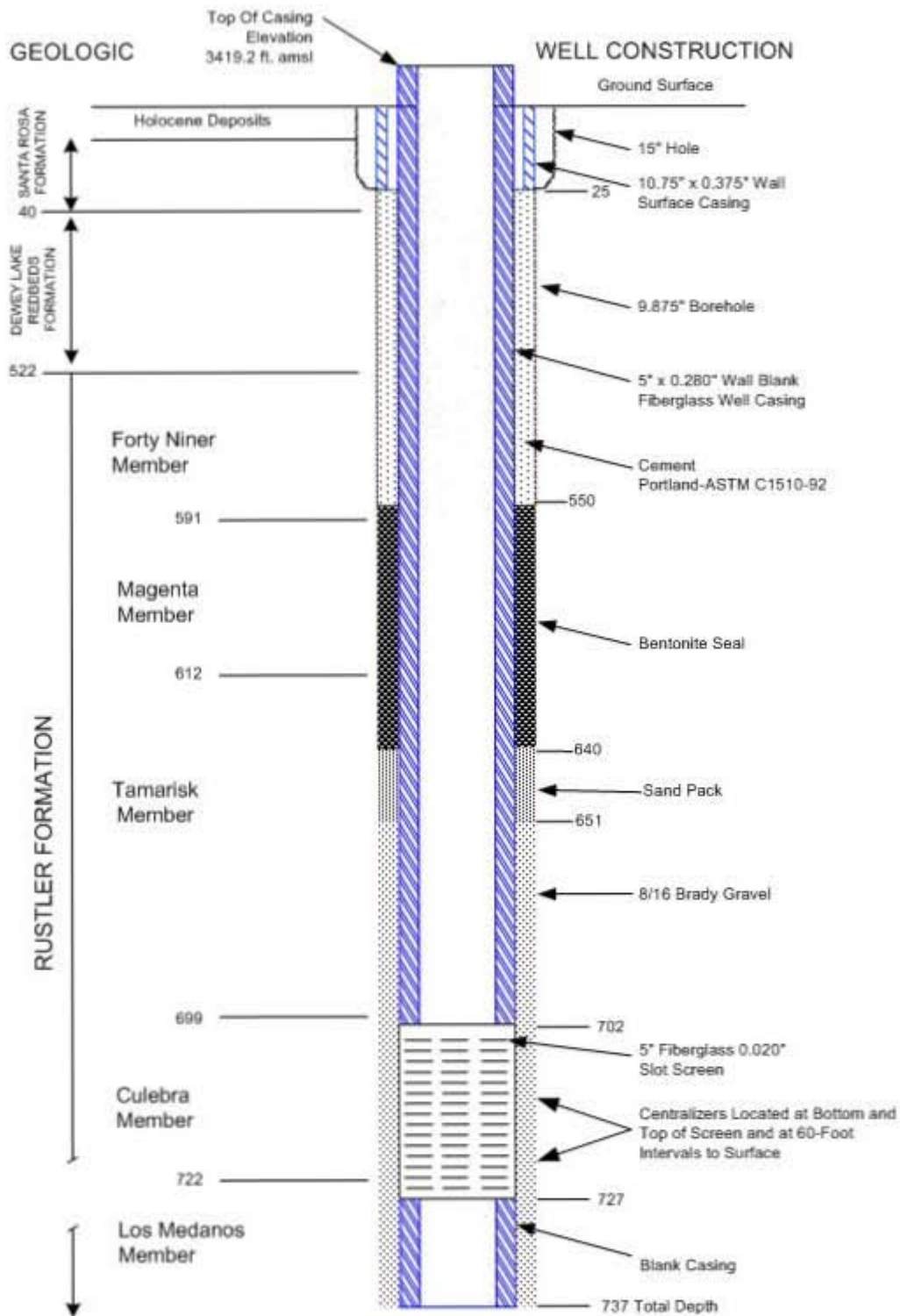


**Figure L-5
Culebra Freshwater-Head Potentiometric Surface**



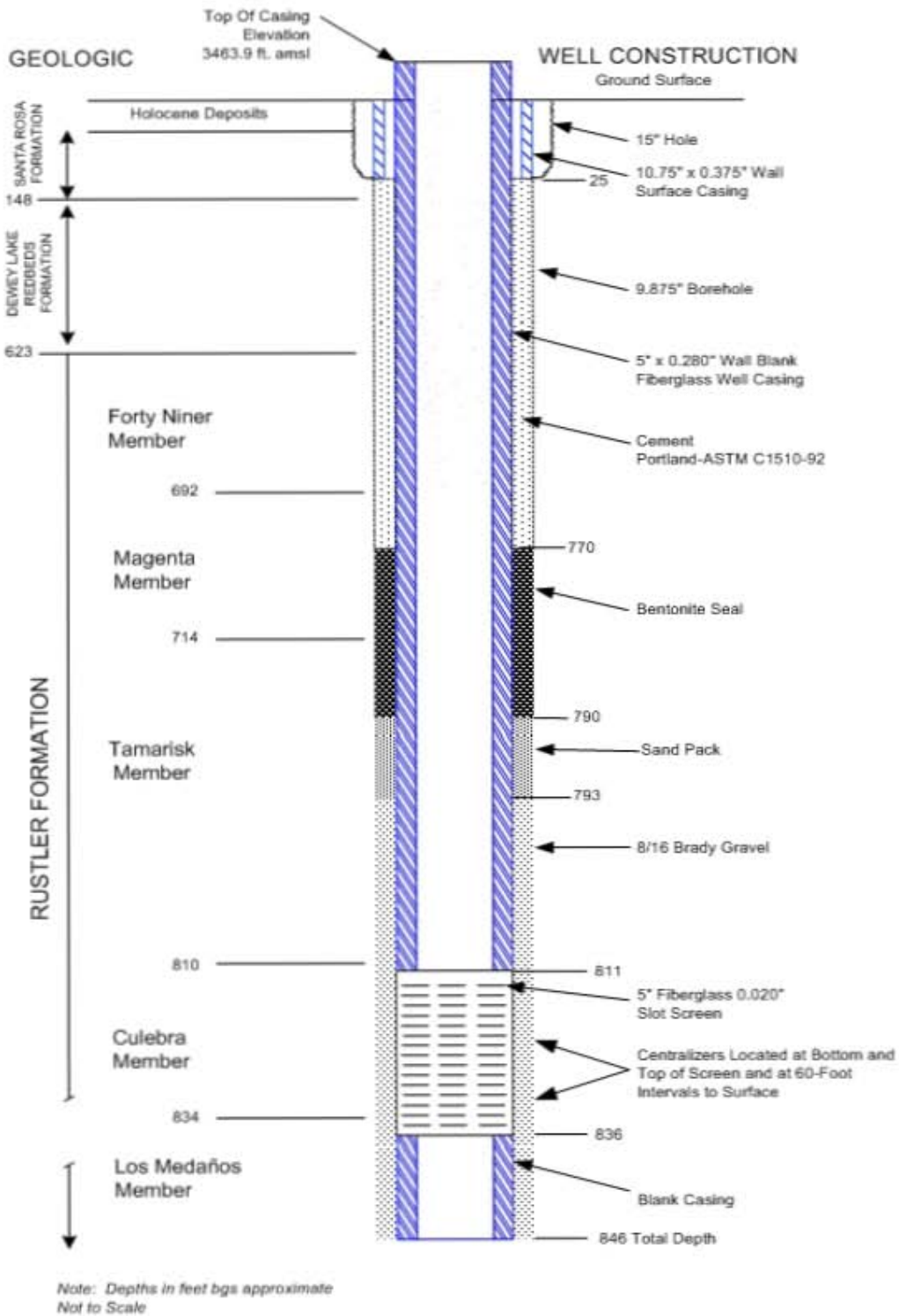
NOTE: Point of compliance is defined in Part 5.3.1.

Figure L-6
Detection Monitoring Well Locations

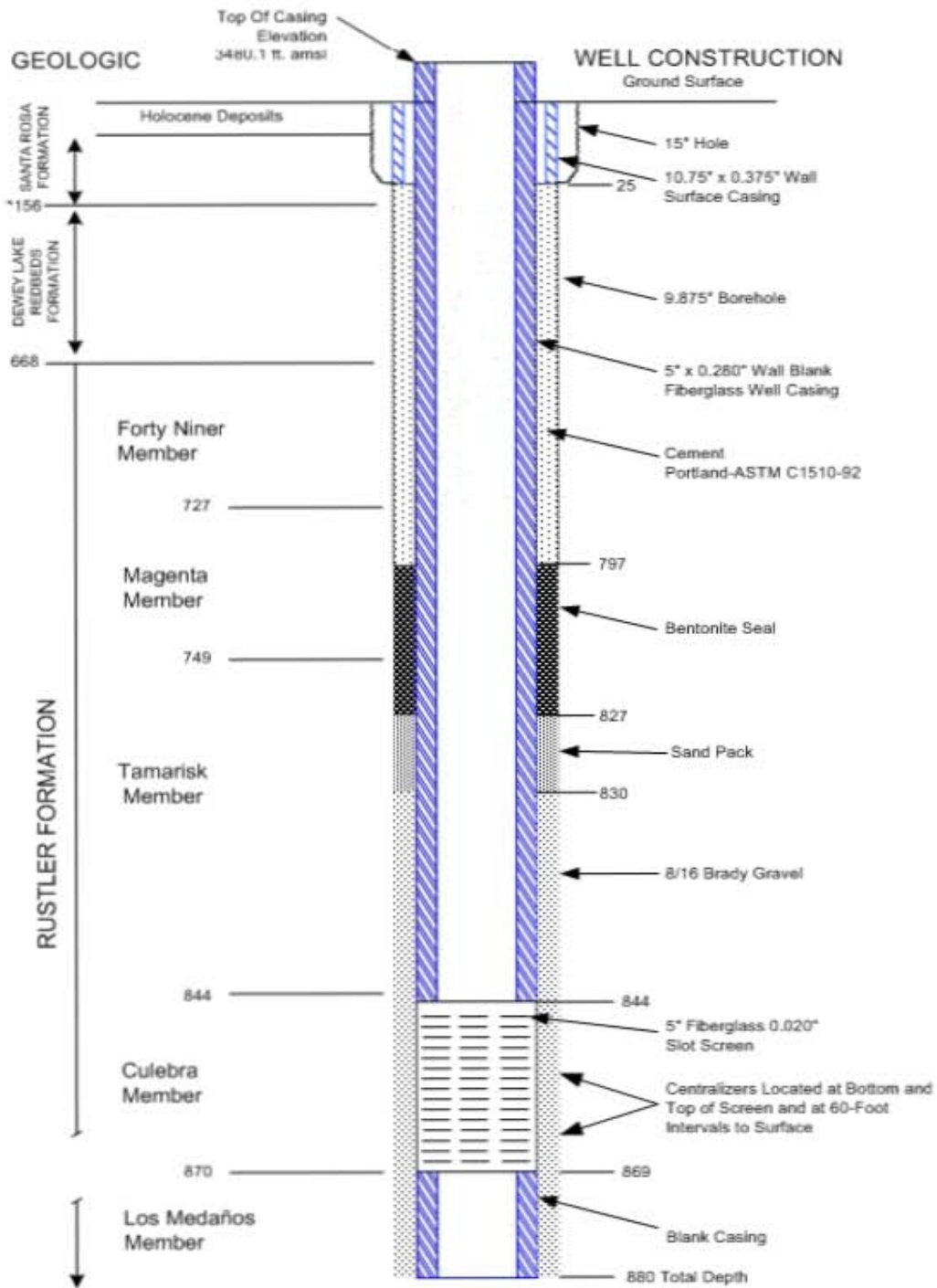


Note: Depths in feet bgs approximate
 Not to Scale

Figure L-7
 As-Built Configuration of Well WQSP-1



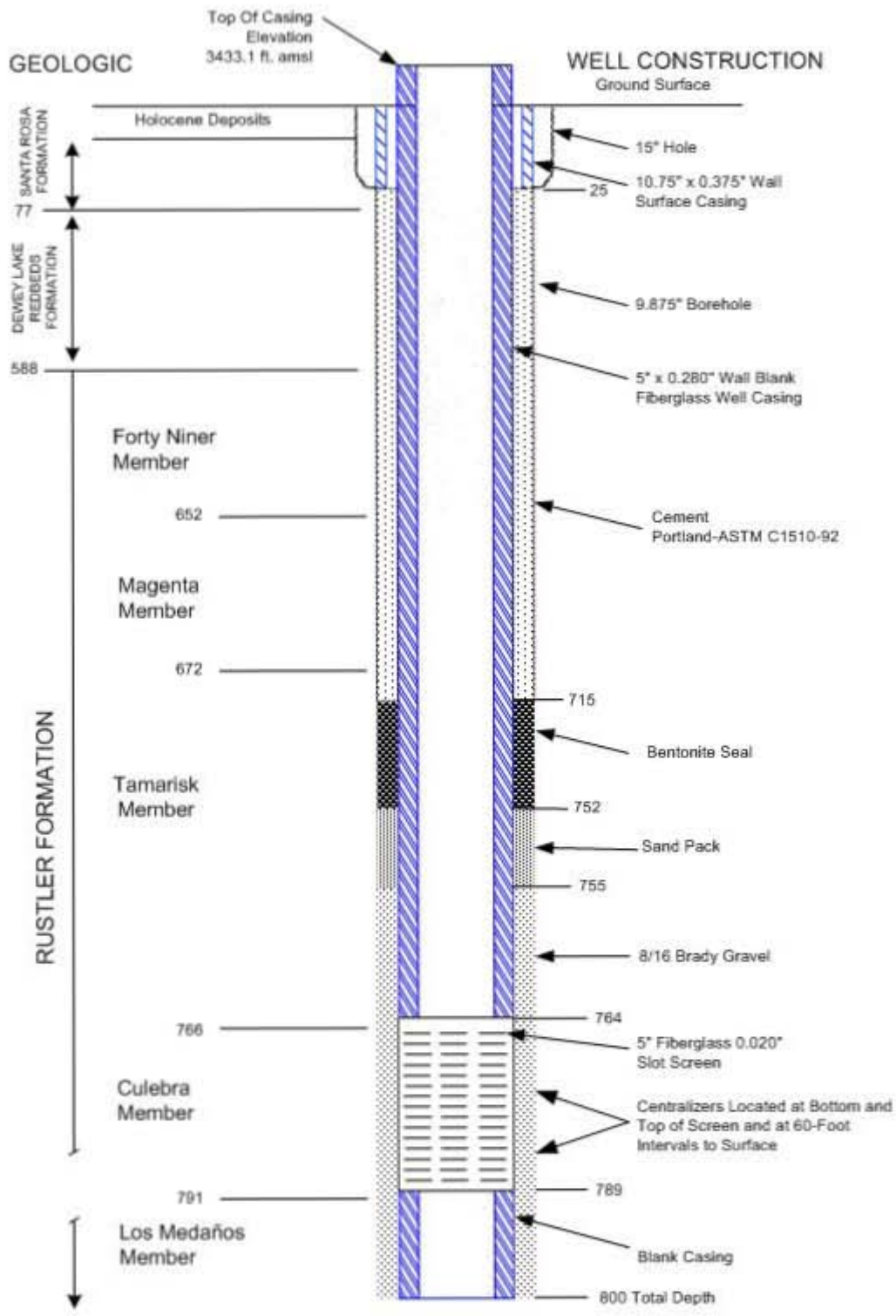
**Figure L-8
 As-Built Configuration of Well WQSP-2**



Note: Depths in feet bgs approximate
 Not to Scale

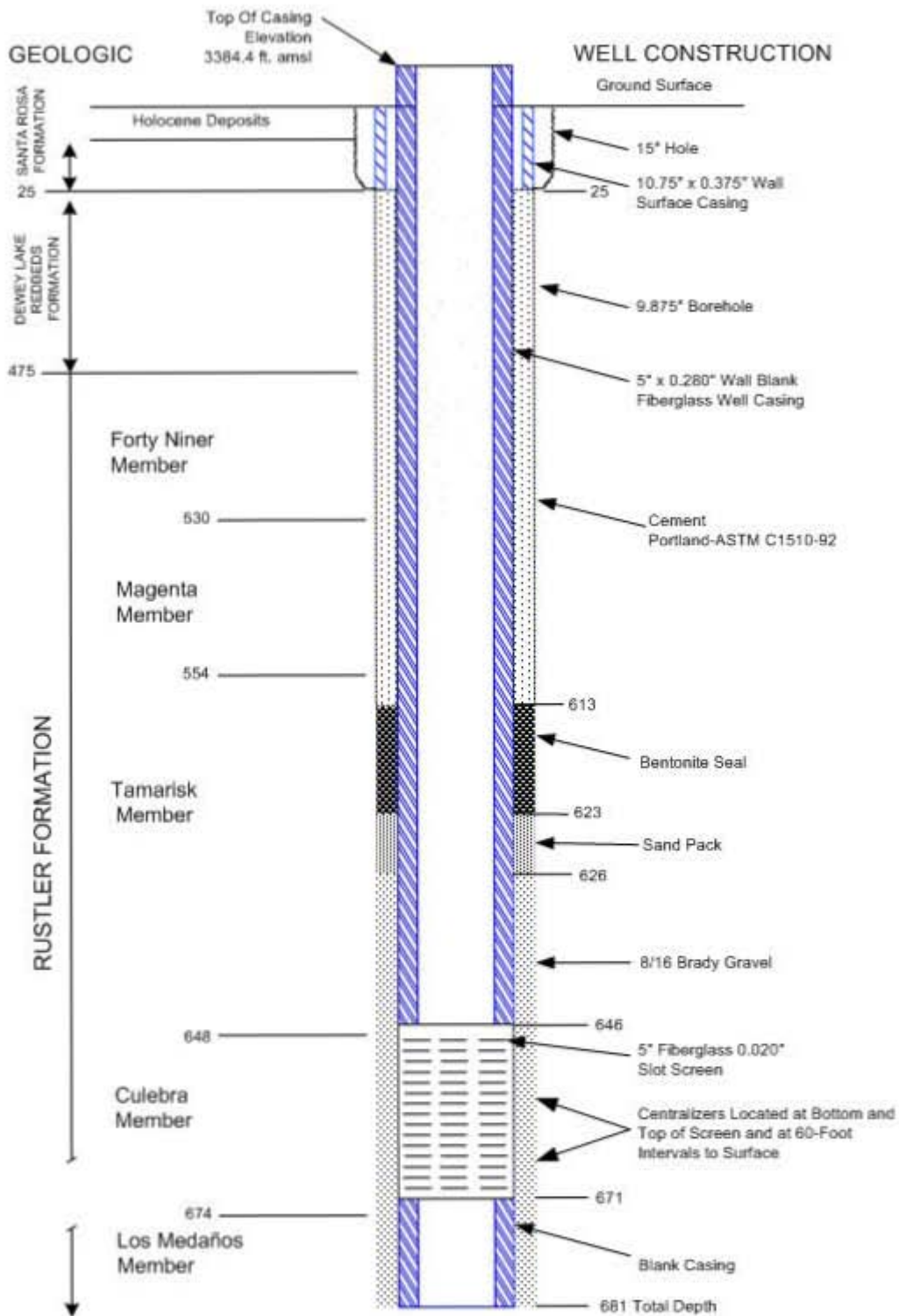
*from DOE/WIPP-95-2154

Figure L-9
As-Built Configuration of Well WQSP-3



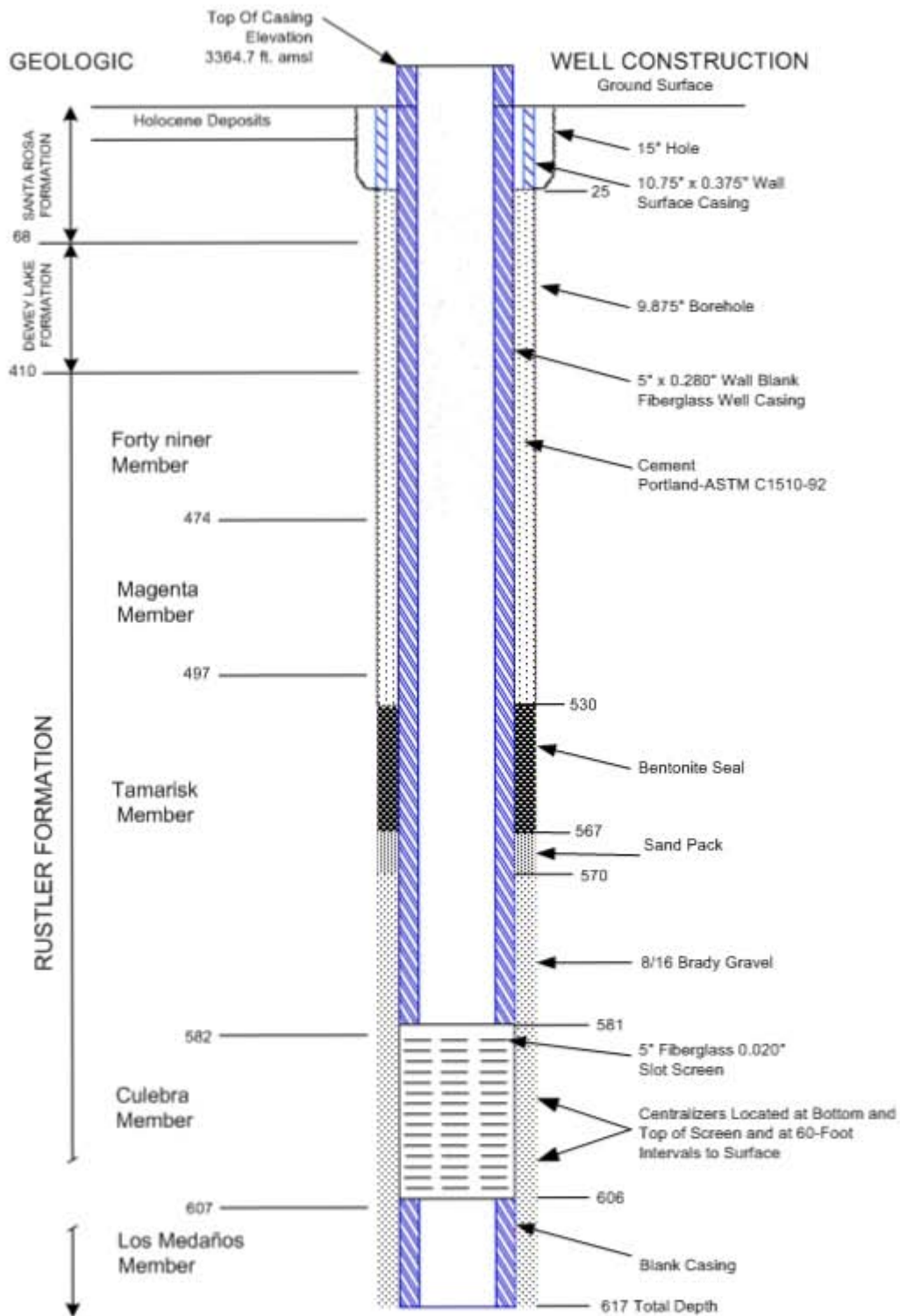
Note: Depths in feet bgs approximate
 Not to Scale

Figure L-10
As-Built Configuration of Well WQSP-4



Note: Depths in feet bgs approximate
 Not to Scale

Figure L-11
As-Built Configuration of Well WQSP-5



Note: Depths in feet bgs approximate
 Not to Scale

Figure L-12
As-Built Configuration of Well WQSP-6

CHAIN OF CUSTODY RECORD

Page ___ of ___

Project Number	Project Name:	Container Size / Request Analytes	Contract Laboratory
Samplers:			
Date	Time	Matrix	Sample Number
<div style="font-size: 4em; opacity: 0.5; transform: rotate(-45deg); pointer-events: none;"> EXAMPLE </div>			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Date / Time
Relinquished By: (Signature)	Date / Time	Relinquished By: (Signature)	Date / Time
Requested Turnaround Time:		Special Instructions:	
<input type="checkbox"/> Routine <input type="checkbox"/> Rush			
Sample Disposal:		Results To:	
<input type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab			
Carrier / Airbill No.:			

WHITE - Testing Laboratory
 AF - Air Filter(s)
 SE - Sediment

YELLOW - Field copy
 AN - Animal(s)
 SO - Soil

PRK - Record Copy
 DI - Deionized Water
 SW - Surface Water

GW - Ground Water
 VG - Vegetation

WP 03 (6/2001, revision xx)

Figure L-13
Example Chain-of-Custody/Request for Analysis Form

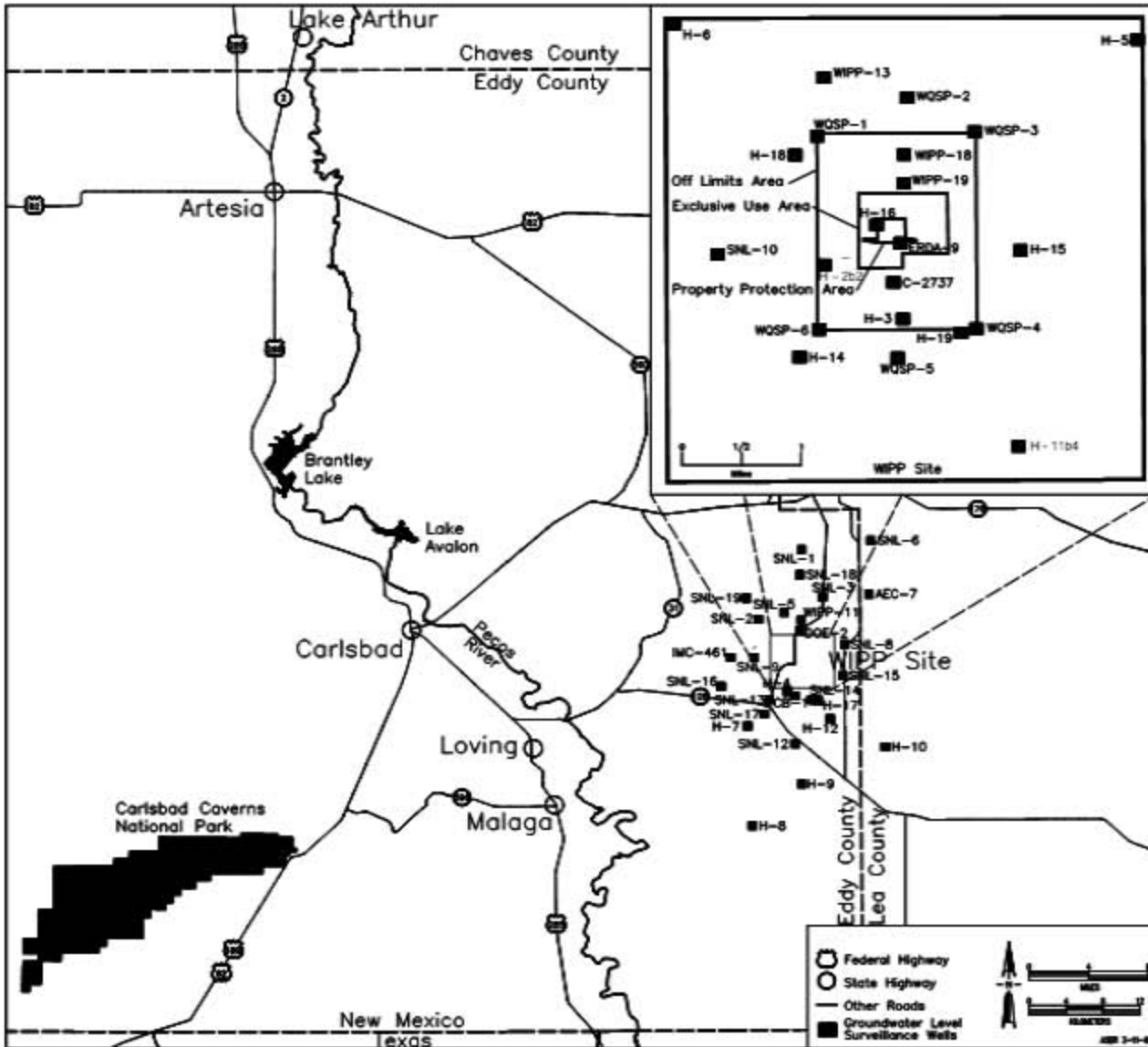


Figure L-14
Groundwater Level Surveillance Wells
(inset represents the groundwater surveillance wells in WIPP Land Withdrawal Area)