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## List of Abbreviations/Acronyms

AOC	Area of Concern
AOP	Administrative Operating Procedure
bgs	below ground surface
CAMU	Corrective Action Management Unit
C.F.R.	Code of Federal Regulations
Cr	Chromium
CWL	Chemical Waste Landfill
°C	degrees Celsius
DO	dissolved oxygen
DOE	U.S. Department of Energy
DOE/SNL	U.S. Department of Energy/Sandia National Laboratories
DQO	Data Quality Objective
EC	Emergency Coordinator
EPA	U.S. Environmental Protection Agency
ES&H	Environmental Safety and Health
FOP	Field Operating Procedure
HWA	New Mexico Hazardous Waste Act
HWB	New Mexico Hazardous Waste Bureau
KAFB	Kirtland Air Force Base
L	liter(s)
LCS	laboratory control samples
LE	Landfill Excavation
LOP	Laboratory Operating Procedure
MAA	Mutual Aid Agreement
MCL	maximum contaminant level
µg	microgram(s)
mg	milligram(s)
MOU	Memorandum of Understanding
MS	matrix spike
Ni	Nickel
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMSA	New Mexico Statutory Authority
NTU	Nephelometric Turbidity Unit

OSHA	Occupational Safety and Health Administration
%R	percent recovery
PCIF	Post-Closure Inspection Form
pH	potential of Hydrogen
PLA	Plan
ppmv	part(s) per million volume basis
QA	Quality assurance
QC	Quality control
RAP	Remedial Action Proposal
RCRA	Resource Conservation and Recovery Act
RPD	Relative percent difference
SAP	Sampling and Analysis Plan
SC	Specific conductance
SMO	Sample Management Office
SNL/NM	Sandia National Laboratories/New Mexico
SOB	Site operational boundary
SOW	Statement of Work
SVOC	Semi-volatile organic compound
SWMU	Solid Waste Management Unit
TA	Technical Area
TB	Trip Blank
TCE	Trichloroethene
VCM	Voluntary Corrective Measure
VE	Vapor Extraction
VOC	Volatile organic compound

## **PERMIT PART 1: GENERAL PERMIT CONDITIONS**

### **1.0 GENERAL**

This Permit Part contains general permit conditions pertaining to post-closure care of the Chemical Waste Landfill (CWL) at the Sandia National Laboratories (SNL) Facility, as permitted under the New Mexico Hazardous Waste Act (HWA), NMSA 1978, §§ 74-4-1 to 74-4-14, and in accordance with the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 to 6992k.

In accordance with 40 C.F.R. § 270.1(c), owners and operators of landfills that received waste after July 26, 1982, or that certified closure after July 26, 1983, must have a Post-Closure Care permit. This permit addresses applicable 40 C.F.R. Part 264 groundwater monitoring, corrective action, and post-closure requirements. The CWL was an interim status landfill that was closed in accordance with 40 C.F.R. Part 265 Subpart G and the 1992 CWL Final Closure Plan, as amended. This Post-Closure Care Permit (the Permit) identifies the post-closure activities that shall be performed at the CWL. This Permit is designed to meet RCRA post-closure care requirements in 40 C.F.R. §§ 264.117 through 264.120 and, once effective, shall immediately supersede the CWL Closure Plan (SNL/NM December 1992) after the New Mexico Environment Department (the Department) certifies, in writing, the closure of the CWL.

#### **1.1. LEGAL AUTHORITY**

The Department issues this Post-Closure Care Permit to the United States Department of Energy and Sandia Corporation (the Permittees) pursuant to Section 74-4-10 of the HWA. Additionally, Section 6001 of RCRA provides, in part, that "[e]ach department, agency, and instrumentality of the executive branch of the Federal Government (1) having jurisdiction over any solid waste management facility or disposal site, or (2) engaged in any activity resulting, or which may result, in the disposal or management of solid waste or hazardous waste shall be subject to, and comply with, all Federal, State, interstate, and local requirements, both substantive and procedural..., respecting control and abatement of solid waste or hazardous waste disposal and management in the same manner, and to the same extent, as any person is subject to such requirements...." [42 U.S.C. § 6961(a)].

Any violation of any condition of this Permit may subject the Permittees, and its officers, employees, successors, and assigns, to a compliance order under Section 74-4-10 of the HWA or Section 3008(a) of RCRA, 42 U.S.C. § 6928(a); to an injunction under Section 74-4-10 of the HWA, Section 3008(a) of RCRA, 42 U.S.C. § 6928(a), or Section 7002(a) of RCRA, 42 U.S.C. § 6972(a); to civil penalties under Section 74-4-10 of the HWA, Section 3008(a) and (g) of RCRA, 42 U.S.C. § 6928(a) and (g), or Section 7002(a) of RCRA, 42 U.S.C. § 6972(a); to criminal penalties under Section 74-4-11 of the HWA or Section 3008(d), (e), and (f) of RCRA, 42 U.S.C. § 6928(d), (e), and (f), or to some combination of the foregoing. The list of authorities in this paragraph is not exhaustive, and the Department reserves the right to take any action authorized by law to enforce the requirements of this Permit.

## **1.2. PERMIT CONSTRUCTION**

Whenever provisions of this Permit or of the New Mexico Hazardous Waste Management Regulations (HWMR), 20.4.1 NMAC, incorporating 40 C.F.R. Parts 260 through 270 are cited, the citation shall include all subordinate provisions of the cited provision paragraphs of this Permit or of the HWMR. When subordinate sections are cited, such citations shall include all subsections of the cited paragraphs.

Hazardous waste management regulations are frequently cited throughout this Permit. The federal Hazardous Waste Management Regulations, 40 C.F.R. Parts 260 through 273, are generally cited rather than the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC. The federal regulations are cited because only the federal regulations set forth the detailed regulatory requirements; the State regulations incorporate by reference, with certain exceptions, the federal regulations in their entirety. Citing only the federal regulations also serves to avoid encumbering each citation with references to two sets of regulations. However, it is the State regulations that are legally applicable and enforceable. Therefore, for the purpose of this Permit, and enforcement of its terms and conditions, all references to provisions of federal regulations that have been incorporated into the State regulations shall be deemed to include the State incorporation of those provisions.

If there is a conflict between the provisions of the Permit Parts and the provisions of the Permit Attachments, then the provisions of the Permit Parts shall override the provisions of the Permit Attachments.

## **1.3. SEVERABILITY**

The provisions of the Permit are severable, and if any provision of this Permit, or any 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.

## **1.4. DEFINITIONS**

For purposes of this Permit, terms used herein shall have the same meanings as those in HWA, RCRA, and their implementing regulations, unless this Permit specifically provides otherwise. Where a term is not defined in HWA, RCRA, their implementing regulations or this Permit, the meaning associated with such a term shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

**“Area of Concern” (AOC)** means any area of the Facility under the control or ownership of the Permittees which is not a solid waste management unit, where a release of a hazardous waste or hazardous constituent has occurred, is suspected to have occurred, or may occur, regardless of the frequency or duration. An area of concern includes areas and structures at which releases of hazardous waste or hazardous constituents were not remediated, including one time and accidental events.

**“Chemical Waste Landfill” (CWL)** is a 1.9-acre RCRA hazardous waste landfill undergoing post-closure care. It is located in the southeastern corner of Technical Area III at the Facility. From 1962 through 1985 the CWL was used for the disposal of chemical, radioactive, and solid wastes into unlined pits and trenches. These wastes were generated by SNL research activities. It is the Solid Waste Management Unit subject to this Permit.

**“Corrective Action Management Unit” (CAMU)** is a site adjacent to the CWL that is used for the containment of hazardous waste that was generated during environmental restoration project remediation activities at the Facility.

**“Days”** refers to calendar days unless specified otherwise in this Permit.

**“Department” or “NMED”** means the New Mexico Environment Department and any successor agencies.

**“DOE”** means the United States Department of Energy, which is a Department of the United States government, and any successor departments or agencies.

**“EPA”** means the United States Environmental Protection Agency and any successor agencies.

**“Facility”** means Sandia National Laboratories including all contiguous land, and structures, other appurtenances, and improvements on the land. For the purposes of implementing corrective action under 40 C.F.R. § 264.101, or RCRA Section 3008(h), or the HWA, NMSA 1978, § 74-4-10(E), the Facility includes all contiguous property under the control of the owner or operator seeking a Permit under Subtitle C of RCRA, that is, 40 C.F.R. Parts 260 through 273.

**“Hazardous Constituent” or “Hazardous Waste Constituent”** means any constituent identified in 40 C.F.R. Part 261 Appendix VIII, or 40 C.F.R. Part 264 Appendix IX.

**“Hazardous waste”** means a solid waste that is not excluded from regulation under 40 C.F.R. § 261.4(b) and that either is listed in 40 C.F.R. Part 261 Subpart D, exhibits any of the characteristics identified in 40 C.F.R. Part 261 Subpart C, or is a mixture of solid waste and one or more wastes listed in 40 C.F.R. Part 261 Subpart D. However, for purposes of corrective action for solid waste management units and areas of concern conducted pursuant to 40 C.F.R. § 264.101, 40 C.F.R. Part 264 and 40 C.F.R. § 270.32(b)(2), “hazardous waste” shall have the meaning set forth in the HWA, Section 74-4-3(K).

**“Hazardous Waste Regulations” or “HWMR”** means the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC and all provisions of 40 C.F.R. Parts 260 through 273 incorporated therein.

**“Permit”** means this Permit issued to the Permittees for the Facility, pursuant to the HWA and the HWMR for the Facility to conduct post-closure care of the CWL following the procedures in this Permit, EPA ID No. NM5890110518-2, as it may be modified or amended.

**“Permittees”** mean Sandia Corporation and the United States Department of Energy.

**“RCRA”** means the Resource Conservation and Recovery Act of 1980, as amended, 42 U.S.C. §§ 6901 to 6992k, as amended.

**“Release”** means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of any hazardous waste or hazardous constituents into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous waste or hazardous constituents).

**“Solid Waste”** means a solid waste as defined in 40 C.F.R. § 261.2.

**“Solid Waste Management Unit” (SWMU)** means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at the Facility at which solid wastes have been routinely and systematically released.

**“Technical Area” (TA)** means a specific parcel of land controlled by Sandia National Laboratories and owned by the DOE.

If, subsequent to the issuance of this Permit, regulations are promulgated which redefine any of the above terms, the Department may, at its discretion, apply the new definition to this Permit.

## **1.5. EFFECT OF PERMIT**

The New Mexico Environment Department issues this Permit to the Permittees, the owner and operators of the CWL, located at the Facility (EPA I.D. Number NM5890110518-2). This Permit requires the Permittees to conduct post-closure care of the CWL, and establishes the general and specific standards for these activities, pursuant to the HWA and the HWMR.

### **1.5.1. Compliance with Permit (Permit Shield)**

Compliance with this Permit during its term constitutes compliance, for purposes of enforcement, with 40 C.F.R. Parts 264 and 268, only for those management practices specifically authorized by this permit. The Permittees must also comply with 40 C.F.R. Parts 260, 261, 262, and 263, to the extent the requirements of those Parts are applicable. The Permittees must also comply with all applicable self-implementing provisions imposed by statute or rule. Compliance with this Permit shall not constitute a defense to any order issued or any action brought under HWA, NMSA 1978, § 74-4-10(E) or § 74-4-13; RCRA § 3008(a), § 3008(h), § 3013, § 7002, or § 7003; the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601 *et seq.*, or any other law providing for protection of public health or the environment.

Pursuant to 40 C.F.R. § 270.4 and § 270.30(g), 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 in accordance with 40 C.F.R. § 270.4 and § 270.30(g).

The complete Permit consists of Permit Parts 1 through 3 and Permit Attachments 1 through 6 as follows.

- Part 1 - General Permit Conditions
- Part 2 - General Facility Conditions
- Part 3 - Post-Closure Care Requirements for the Chemical Waste Landfill
- Attachment 1 - Post-Closure Care Plan for the Chemical Waste Landfill
- Attachment 2 - Groundwater Sampling and Analysis Plan
- Attachment 3 - Soil-Gas Sampling and Analysis Plan
- Attachment 4 - Inspection Forms
- Attachment 5 - Personnel Training Program

PERMIT PART 1

## Attachment 6 - Contingency Plan

### **1.6. PERMIT ACTIONS**

#### **1.6.1. Term of Permit**

This Permit shall be effective for a fixed period of 10 years from the effective date of issuance as specified in the Permit certificate, in accordance with 40 C.F.R. § 270.50(a), subject to Section 1.6.2 of this Permit Part.

#### **1.6.2. Permit Modification, Suspension, Revocation, and Termination**

##### *1.6.2.1. Permit Modification*

If at any time for any of the reasons specified in 40 C.F.R. § 270.41, the Department determines that modification of this Permit is necessary, in accordance with 20.4.1.901 NMAC, the Department may modify or revoke and reissue the Permit accordingly.

##### *1.6.2.2. Permit Modification at the Request of the Permittees*

The Permittees may initiate permit modifications in accordance with 40 C.F.R. § 270.42 and 20.4.1.901 NMAC. All applicable requirements specified in 40 C.F.R. § 270.42 shall be followed.

##### *1.6.2.3. Permit Suspension, Revocation, and Termination*

This Permit may be modified, suspended, revoked or terminated for cause in accordance with the provisions of HWA, NMSA 1978, § 74-4-4.2, 40 C.F.R. §§ 270.41 through 270.43 and 20.4.1.901 NMAC. 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, in accordance with 40 C.F.R. § 270.30(f).

Modifications to this Permit do not constitute a reissuance of this Permit

#### **1.6.3. Permit Renewal/Duty to Reapply**

The Permittees shall renew this Permit by submitting an application for a new permit at least two hundred forty (240) days before the expiration date of this Permit.

#### **1.6.4. Continuation of Expiring Permit**

In accordance with 40 C.F.R. § 270.51, if the Permittees have submitted a timely and complete application for renewal of this Permit as specified in 40 C.F.R. §§ 270.10, 270.11, 270.12 (as applicable), and 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 Department has not issued a new permit on or before the expiration date of this Permit.

### **1.6.5. Transfer of Permit**

The Permittees may only transfer this Permit after providing notice to and receiving approval from the Department. The prospective new owner or operator must file a disclosure statement with the Department as specified at HWA, NMSA 1978, § 74-4-4.7. The Department may require modification or revocation and reissuance of this Permit in accordance with 40 C.F.R. §§ 270.40(b) and 270.41(b)(2).

Before transferring ownership or post-closure care of the CWL, the Permittees shall notify the new owner or operator in writing of the requirements of 40 C.F.R. Parts 264 and 270, and 40 C.F.R. §§ 264.12(c) and 270.30(l)(3) and shall provide the Department with a copy of this notice.

### **1.6.6. Permit Review**

In accordance with 40 C.F.R. § 270.50(d), the Department will review this Permit five years after the effective date of Permit issuance, and may modify this Permit as necessary pursuant to Section 74-4-4.2 of the HWA and 40 C.F.R. § 270.41. Nothing in this section shall preclude the Department from reviewing and, in accordance with applicable requirements, modifying the Permit at any time during its term.

In accordance with 40 C.F.R. § 270.50(b), such modification(s) shall not extend the effective term of this Permit as specified in Permit Condition 1.6.2. Nothing in this Section shall preclude the Department from reviewing and modifying the Permit at any time during its term.

### **1.7. POINTS OF CONTACT DURING POST-CLOSURE CARE**

Points of contact during the compliance monitoring and post-closure care periods are identified below.

The DOE contact person is:

Ms. Patty Wagner  
Manager  
U.S. Department of Energy  
National Nuclear Security Administration  
Sandia Site Office  
P.O. Box 5400, M/S 0184  
Albuquerque, NM 87185-0184  
(505) 845-6036

The Sandia contact person is:

Mr. Francisco A. Figueroa  
Vice President  
Department 10000  
Sandia National Laboratories  
P.O. Box 5800, MS 0112  
Albuquerque, NM 87185-5800

The Permittees shall provide written notification to the Department within thirty days of any changes related to any of the contact persons listed above. This latter notification shall constitute a Class I

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modification to this Permit that does not require prior approval by the Department.

## **1.8. DUTIES AND REQUIREMENTS**

### **1.8.1. Duty to Comply**

In accordance with 40 C.F.R. § 270.30(a), the Permittees shall comply with all conditions in this Permit, except to the extent and for the duration such noncompliance is authorized in an emergency permit specified in 40 C.F.R. § 270.61. Any Permit noncompliance, except under the terms of an emergency permit, constitutes a violation of HWA and RCRA and may subject the Permittees, its successors and assigns, officers, directors, employees, parents, or subsidiaries, to:

1. An administrative or civil enforcement action, including civil penalties and injunctive relief, as specified under Section 74-4-10 of the HWA or Sections 3008(a) and (g), 7002, or 7003 of RCRA;
2. Permit modification, suspension, or revocation, or to denial of a permit application or modification request, under Section 74-4-4.2 of the HWA; or
3. Criminal fines or imprisonment under the HWA, NMSA § 74-4-11, or Section 3008(d), (e), or (f) of RCRA; or to a combination of the foregoing.

### **1.8.2. Need to Halt or Reduce Activity Not a Defense**

In accordance with 40 C.F.R. § 270.30(c), it shall not be a defense for the Permittees in an enforcement action that it would have been necessary for the Permittees to halt or reduce the permitted activities in order to maintain compliance with the terms of this Permit.

### **1.8.3. Duty to Mitigate**

In accordance with 40 C.F.R. § 270.30(d), 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.

### **1.8.4. Proper Operation and Maintenance**

In accordance with 40 C.F.R. § 270.30(e), 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 includes 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.

### **1.8.5. Duty to Provide Information**

In accordance with 40 C.F.R. §§ 264.74(a) and 270.30(h), the Permittees shall furnish to the Department, within a reasonable time as specified by the Department, any relevant information which the Department 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 Department, upon request, copies of records required to be kept by this Permit.

This Permit Condition shall not be construed to limit, in any manner, the Department's authority under HWA, NMSA 1978, § 74-4-4.3 or RCRA § 3007(a).

#### **1.8.6. Inspection and Entry**

In accordance with 40 C.F.R. § 270.30(i), the Permittees shall allow the Department, or authorized representatives, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter at reasonable times into the Permittees' premises where the regulated Facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;
3. Inspect at reasonable times the Facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and
4. Sample or monitor at reasonable times, for the purposes of assuring Permit compliance or as otherwise authorized by RCRA and/or the HWA, any substances or parameters, including soil, air, sediment, surface water, and groundwater at the Facility.

This Permit Condition shall not be construed to limit, in any manner, the Department's authority under HWA, NMSA 1978, § 74-4-4.3 or RCRA § 3007(a).

#### **1.8.7. Monitoring and Records**

1. Representative sampling - For purposes of monitoring, in accordance with 40 C.F.R. § 270.30(j)(1), the Permittees shall take samples and measurements that are representative of the monitored activity.
2. Record Retention - In accordance with 40 C.F.R. § 270.30(j)(2), 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, copies of all reports required by this permit, the certification required by 40 C.F.R. § 264.73(b)(9) and records of all data used to complete the Permit application for a period of at least three (3) years from the date of the sample, measurement, report, record, certification, or application. The Permittees shall maintain records from all groundwater monitoring wells and associated groundwater surface elevations for the post-closure period.

In addition, all records must be furnished upon request, and made available at all reasonable times for inspection by any representative of the Department. The record retention period may be extended by request of the Department at any time and is automatically extended during the course of any unresolved enforcement action regarding this Facility.

3. Monitoring Records Contents - In accordance with 40 C.F.R. § 270.30(j)(3), records of monitoring information shall include:

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- a. The dates, exact place, and times of sampling or measurements;
- b. The names and qualifications of the individuals who performed the sampling or measurements;
- c. The name and address of the laboratory that performed the analysis;
- d. The dates analyses were performed;
- e. The names and qualifications of the individuals who performed the analyses;
- f. The analytical techniques or methods used; and
- g. The results of such analyses.

**1.8.8. Reporting Planned Changes**

In accordance with 40 C.F.R. § 270.30(1)(1), the Permittees shall give notice to the Department, as soon as possible, of any planned physical alterations or additions to the CWL.

**1.8.9. Reporting Anticipated Noncompliance**

In accordance with 40 C.F.R. § 270.30(1)(2), the Permittees shall give advance notice to the Department of any planned changes to the CWL or in any activities which may result in noncompliance with Permit requirements.

**1.8.10. Certification of Construction or Modification**

In accordance with 40 C.F.R. § 270.30(1)(2), if the CWL is modified, the Permittees shall not treat or store hazardous, mixed, or energetic waste in the modified portion of the CWL, except as provided in Section 1.6.3 of this Permit and 40 C.F.R. § 270.42, unless the following conditions have been satisfied:

1. The Permittees have submitted to the Department, by certified mail or hand delivery, a letter signed by the Permittees and an independent professional engineer registered in New Mexico stating that the CWL's modification meets the requirements of this Permit; and
2. The Department has:
  - a. inspected the modified or newly constructed portion of the CWL and it meets the requirements and conditions of this Permit; or
  - b. waived the inspection or, within fifteen (15) calendar days from the date of submission of the letter required by Permit Condition 1.8.11.a., has not notified the Permittees of its intent to inspect.

**1.8.11. Twenty-Four Hour and Subsequent Reporting**

*1.8.11.1. Oral Report*

In accordance with 40 C.F.R. § 270.30(1)(6)(i) and (ii), the Permittees shall report to the Department any noncompliance which may endanger human health or the environment. Any such information

shall be reported orally within 24 hours from the time the Permittees become aware of the circumstances. The report shall include the following:

1. Information concerning release of any hazardous waste, or hazardous constituents, that may cause an endangerment to public drinking water supplies; and
2. Any information about a release or discharge of hazardous waste, or hazardous constituents, or of a fire or explosion at the permitted unit which could threaten the environment or human health outside the permitted unit.
3. The description of the occurrence and its cause shall include:
  - a. Name, address, and telephone number of the owner or operator and the name and phone number of the contact person;
  - b. Name, address, and telephone number of the Facility;
  - c. Date, time, and type of incident;
  - d. Name and quantity of material(s) involved;
  - e. The extent of injuries, if any;
  - f. An assessment of actual or potential hazards to the environment and human health at or outside of the permitted unit, where this is applicable; and
  - g. Estimated quantity and disposition of recovered material that resulted from the incident.

*1.8.11.2. Written Report*

In accordance with 40 C.F.R. § 270.30(l)(6)(iii), the Permittees shall also submit a written report within five (5) calendar days from the time the Permittees become aware of the noncompliance. The written report shall contain a description of the noncompliance and its cause; the period of noncompliance including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The report shall also include the following:

1. Information concerning release of any hazardous waste, or hazardous constituents, that may cause an endangerment to public drinking water supplies; and
2. Any information about a release or discharge of hazardous waste, or hazardous constituents, or of a fire or explosion at the permitted unit which could threaten the environment or human health outside the permitted unit.
3. The description of the occurrence and its cause shall include:
  - a. Name, address, and telephone number of the owner or operator and the name and phone number of the contact person;

- b. Name, address, and telephone number of the Facility;
- c. Date, time, and type of incident;
- d. Name and quantity of material(s) involved;
- e. The extent of injuries, if any;
- f. An assessment of actual or potential hazards to the environment and human health at or outside of the permitted unit, where this is applicable; and
- g. Estimated quantity and disposition of recovered material that resulted from the incident.

The Department, at its discretion, may extend the time for submitting the written report to up to fifteen (15) calendar days.

#### *1.8.11.3. Reports Required by Contingency Plan*

Any time the Contingency Plan in Permit Attachment 6 is implemented, the Permittees shall comply with the reporting requirements required by 40 C.F.R. § 264.56(j).

#### **1.8.12. Admissibility of Data**

In any administrative or judicial action to enforce a condition of this Permit, the Permittees waive any objection to the admissibility as evidence of any data generated pursuant to this Permit.

#### **1.8.13. Other Noncompliance**

In accordance with 40 C.F.R. § 270.30(l)(10), the Permittees shall report all other instances of noncompliance not otherwise required to be reported under this Permit at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition 1.8.11.

#### **1.8.14. Other Information**

In accordance with 40 C.F.R. § 270.30(l)(11), 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 Department, the Permittees shall promptly submit such facts or information in writing to the Department.

### **1.9. REPORTS, NOTIFICATIONS, AND INFORMATION SUBMITTALS**

#### **1.9.1. Information Submittal**

The Permittees shall submit by certified mail or hand delivery all reports, notifications, or other submittals that are required by this Permit to be sent or given to the Department.

In accordance with 40 C.F.R. § 270.43, failure to comply with any condition of the Permit, including relevant information submittal, constitutes a violation of the Permit and is grounds for enforcement action, Permit amendment, termination, revocation, suspension, or denial of Permit renewal

application. Misrepresentation of any relevant facts at any time is grounds for termination of this Permit.

The Permittees shall ensure that all plans, reports, notifications, and other submittals to the Department required in this Permit are signed and certified in accordance with 40 C.F.R. § 270.11. Two (2) copies each of these plans, reports, notifications or other submissions shall be submitted to the Department by Certified Mail or hand delivered to:

New Mexico Environment Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303  
Telephone Number: (505) 476-6000  
Facsimile Number: (505) 476-6030

### **1.9.2. Incorporation of Plans and Schedules into the Permit**

All plans and schedules required by this Permit are, upon approval by the Department, incorporated into this Permit by reference and become an enforceable part of this Permit. Because required items are essential elements of this Permit, failure to submit any of the required items or submission of inadequate or insufficient relevant information may subject the Permittees to enforcement action under Section 74-4-10 of the HWA, which may include penalties and suspension or revocation of this Permit.

Any noncompliance with approved plans and schedules shall be deemed noncompliance with this Permit. Written requests for extensions of due dates for submittals may be granted by the Department.

### **1.10. CONFIDENTIAL INFORMATION**

The Permittees may claim confidentiality for any information required to be submitted 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 Department may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with 40 C.F.R. § 270.12, the Inspection of Public Records Act, NMSA 1978, 14-2-1 to -12, and the HWA, NMSA 1978, 74-4-1 to -14.

## **PERMIT PART 2: GENERAL FACILITY CONDITIONS**

### **2.0 INTRODUCTION**

This Permit requires the Permittees to conduct post-closure care of the Chemical Waste Landfill (CWL), which is located at Technical Area III (TA-III), in compliance with the post-closure care requirements at 40 C.F.R. §§ 264.117 through 264.120 and this Permit.

The Permittees must comply with the groundwater protection standard at 40 C.F.R. § 264.92. Trichloroethene (TCE), chromium, and nickel have been detected in groundwater in the uppermost aquifer underlying the CWL. Therefore, in accordance with 40 C.F.R. § 264.91(a)(1), the Permittees must institute a compliance monitoring program meeting the requirements of 40 C.F.R. § 264.99.

#### **2.1. HAZARDOUS WASTE PROHIBITION**

The Permittees shall not accept hazardous waste for treatment, storage or disposal at the CWL.

#### **2.2. SECURITY**

In order to prevent the unknowing entry and to minimize the possibility of unauthorized entry of persons or livestock into the CWL, the Permittees shall comply with the security provisions and procedures described in Section 1.6 of Permit Attachment 1, in accordance with 40 C.F.R. § 264.14.

#### **2.3. GENERAL INSPECTION REQUIREMENTS**

In accordance with 40 C.F.R. § 264.15, the Permittees shall implement the inspection schedule required by Section 1.10 of Permit Attachment 1 and shall remedy any container and equipment malfunctions and deteriorations, operator errors, and discharges in accordance with 40 C.F.R. § 264.15(c). Records of inspection shall be kept in accordance with 40 C.F.R. § 264.15(d).

#### **2.4. PREPAREDNESS AND PREVENTION**

##### **2.4.1. Required Equipment**

The Permittees shall maintain at the Facility the equipment required by 40 C.F.R. § 264.32 as well as the additional equipment set forth in Permit Attachment 6, Tables 6-2, 6-3 and 6-4.

##### **2.4.2. Testing and Maintenance of Equipment**

The Permittees shall test and maintain the equipment specified in Permit Attachment 6, as necessary, to assure its proper operation in time of emergency in accordance with 40 C.F.R. § 264.33.

##### **2.4.3. Access to Communications or Alarm System**

The Permittees shall maintain at the CWL access to a communications or alarm system in accordance with 40 C.F.R. § 264.34.

##### **2.4.4. Arrangements with Local Authorities**

The Permittees shall maintain coordination agreements with the New Mexico Department of Public Safety, the KAFB 377<sup>th</sup> Air Base Wing, the U.S. Forest Service, and the City of Albuquerque as well as with the University of New Mexico Medical Center, Lovelace Medical Center and Presbyterian Health Care Services, as described in Permit Attachment 6, Table 6-1. These arrangements shall be

either Memoranda of Understanding (MOU) or Mutual Aid Agreements (MAA) between the Permittees and the off-site cooperating agencies, and shall include the elements required by 40 C.F.R. § 264.37(a). Copies and descriptions of these MOUs and MAAs shall be maintained at the Facility office in the operating record. If such coordination agreements can not be reached through Permittees' best efforts, the Permittees shall document their attempts to reach such agreements which failed.

## **2.5. CONTINGENCY PLAN**

### **2.5.1. Implementation of Contingency Plan**

The Permittees shall immediately implement the Contingency Plan contained in Permit Attachment 6 whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents that could threaten human health or the environment in accordance with 40 C.F.R. § 264.51(b).

Within 30 days of issuance of this Permit, the Permittees shall submit to the Department a figure showing the evacuation route to be used during an emergency in accordance with 40 C.F.R. § 264.52(f).

### **2.5.2. Copies of the Contingency Plan**

The Permittees shall maintain copies of the Contingency Plan and all revisions and amendments to the Plan at the CAMU, the Facility EOC and the Facility Records Center, in accordance with 40 C.F.R. § 264.53 and Section 6-1 of Attachment 6 of this Permit. Any person working at the CWL shall have a copy of the current Contingency Plan in their possession while at the CWL. The Permittees shall provide copies of the current Contingency Plan and all revisions of the Plan to the Department and all entities with which the Permittees have emergency MOUs or MAAs in accordance with 40 C.F.R. § 264.53.

### **2.5.3. Amendments to Contingency Plan**

In accordance with 40 C.F.R. § 264.54, the Permittees shall review and immediately amend, if necessary, the Contingency Plan whenever:

1. The Facility permit is revised;
2. The plan fails in an emergency;
3. The Facility or CWL changes—in design, construction, operation, maintenance, or other circumstances—in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency;
4. The list of emergency coordinators changes; or
5. The list of emergency equipment changes.

#### **2.5.4. Emergency Coordinator**

An Emergency Coordinator (EC) and an alternate EC, as specified in Permit Attachment 6, shall be available at all times in case of an emergency. The EC and alternate EC shall be thoroughly familiar with the Contingency Plan and shall have the authority to commit the resources needed to implement the Contingency Plan in accordance with 40 C.F.R. § 264.55. In the event of an imminent or actual emergency, the EC shall activate the internal emergency alarms, notify the appropriate State or local agencies with designated response roles, and implement other procedures in accordance with 40 C.F.R. § 264.56, and as described in Permit Attachment 6.

Within 30 days of the issuance of this Permit, the Permittees shall submit to the Department a revision of Table 6-5 of Permit Attachment 6 that includes the office (specific office locations, not mailing addresses) and home addresses of the Emergency Coordinators in addition to the information already presented in the table.

#### **2.6. RECORD KEEPING AND REPORTING**

In addition to the record keeping and reporting requirements specified elsewhere in this Permit and 40 C.F.R. § 264.73(a), the Permittees shall comply with the following conditions:

##### **2.6.1. Data Retention**

All raw data, such as laboratory reports, drilling logs, bench scale or pilot scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Permit shall be maintained at the Facility during the term of this Permit, including any reissued Permits. In accordance with 40 C.F.R. § 270.32(b)(2), raw data shall be made available to the Department upon request.

##### **2.6.2. Operating Record**

The Permittees shall maintain a written Operating Record at the Corrective Action Management Unit administration trailer, and at the Environmental Safety and Health Records Center.

##### **2.6.3. Annual Report**

The Permittees shall submit a post-closure care report to the Department on an annual basis, as specified in Section 1.12 of Attachment 1 of this Permit.

##### **2.6.4. Personnel and Telephone Number Changes**

The Permittees shall inform the Department in writing of changes in its management personnel and Emergency Coordinators and their telephone numbers and addresses within fifteen (15) calendar days of the changes.

##### **2.6.5. Post-Closure Notices**

A copy of the post-closure notice required by 40 C.F.R. § 264.119 shall be submitted to the local zoning authority (Bernalillo County Zoning, Building, and Planning Commission and County Clerk) and the Department within 60 days of certification of closure. The post-closure notice shall include a legal description of the CWL and associated land-use restrictions. The following general restrictions apply to the CWL:

1. Industrial land-use designation shall be maintained;
2. The elevation of the surface of the landfill (the engineered cover) shall not be lowered;
3. The cover and surrounding area shall not be altered in any manner such that drainage onto and infiltration of moisture into the landfill is increased; and
4. Excavation, drilling, or construction involving intrusive activities are prohibited during the post-closure care period, unless authorized by the Department.

#### **2.6.6. Certification of Completion of Post-Closure Care**

In accordance with 40 C.F.R. § 264.120, within 60 days of the end of the post-closure care period for the CWL, the Permittees shall submit to the Department, by registered mail, a written certification that post-closure care for the CWL was performed in accordance with the specifications of this Permit. Responsible officials of the Permittees, as well as an independent professional engineer, registered in the State of New Mexico, shall sign the certification. The Permittees shall furnish documentation supporting the independent registered professional engineer's certification of completion of post-closure care to the Department upon request and at cost to the Permittees. In addition, the Permittees shall prepare a final post-closure care report containing, in an appendix, all Post-Closure Care Inspection Forms (PCIFs) generated during the post-closure care period. The final post-closure care report shall summarize pertinent PCIF information regarding post-closure care and compliance monitoring, inspections, maintenance, and repair activities and any variances from this Permit and the reasons for the variances, summarize results of groundwater and soil gas monitoring conducted during the compliance and post-closure care periods, and summarize the results of any corrective actions taken. The final post-closure care report shall be provided with the certification to the Department for approval within 60 days of the end of the post-closure period. Transmittal of the report shall include a request from the Permittees for the Department to approve termination of the post-closure care period for the CWL. However, submittal of the latter request does not obligate the Department to terminate post-closure care, and the Department, instead, may extend the period of post-closure care if necessary to protect human health and the environment in accordance with 40 C.F.R. 264.117(a)(2)(ii).

#### **2.7. COST ESTIMATE AND FINANCIAL ASSURANCE FOR FACILITY POST-CLOSURE CARE**

Pursuant to 40 CFR § 264.140(c), DOE as an agency of the Federal government is exempt from the requirement to provide a cost estimate for post-closure care as required by 40 C.F.R. § 264.144 and to provide for financial assurance for post-closure care as required by 40 C.F.R. § 264.145. Pursuant to Pub. L. 108-199 (Jan. 23, 2004), Sandia Corporation is not required to fulfill any financial responsibility requirement relating to closure or post-closure care and monitoring of Sandia National Laboratories and is therefore exempt from the requirement to provide a cost estimate for post-closure care as required by 40 C.F.R. § 264.144 and to provide for financial assurance for post-closure care as required by 40 C.F.R. § 264.145.

## **2.8. FINANCIAL RESPONSIBILITY**

All obligations of the Permittees arising under this Permit shall be fully funded.

The Department reserves the right to take appropriate enforcement action if the requirements of this Permit are not fulfilled.

## **2.9. LIABILITY REQUIREMENTS**

### **2.18.1 Coverage by Sandia Corporation**

Sandia Corporation shall have and maintain liability coverage for sudden accidental occurrences in the amount of at least \$1 million per occurrence with an annual aggregate of at least \$2 million, exclusive of legal defense costs. 40 CFR § 264.147(a). Sandia Corporation shall have and maintain liability coverage for nonsudden accidental occurrences in the amount of at least \$3 million per occurrence with an annual aggregate of at least \$6 million, exclusive of legal defense costs. 40 CFR § 264.147(b). Sandia Corporation may combine the required per-occurrence coverage levels for sudden and nonsudden accidental occurrences into a single per-occurrence level, and combine the required annual aggregate coverage levels for sudden and nonsudden accidental occurrences into a single annual aggregate level. 40 CFR § 264.147(b).

### **2.18.2 Exemption from Coverage for DOE**

Pursuant 40 CFR § 264.140(c), DOE as an agency of the Federal government is exempt from the requirement to have and to maintain liability coverage for sudden and nonsudden accidental occurrences as required by 40 CFR § 264.147(a) & (b).

## **2.10. DOCUMENTS TO BE MAINTAINED AT THE FACILITY**

The Permittees shall maintain at the Facility, until post-closure care is approved as completed by the Department, the following documents and all amendments, revisions, and modifications to these documents:

1. This Permit and its Attachments;
2. The Inspection Plan described in Permit Attachment 1 and the inspection schedules and results in accordance with 40 C.F.R. § 264.15(b);
3. The Operating Record described in Permit Attachment 1, in accordance with 40 C.F.R. § 264.73;
4. The Personnel Training documents and records described in Permit Attachment 5, in accordance with 40 C.F.R. § 264.16(d) and (e);
5. The Contingency Plan described in Permit Attachment 6, in accordance with 40 C.F.R. § 264.53(a), and including summary reports and details of all incidents or emergencies that require implementation of the Contingency Plan, in accordance with 40 C.F.R. § 264.56(j);

6. The names, addresses, and phone numbers of the Emergency Coordinator (EC) and all persons designated as alternate EC, in accordance with Permit Condition 2.6.4, and as contained in Permit Attachment 6;
7. A list of all emergency equipment, as contained in Permit Attachment 6;
8. Groundwater monitoring and soil gas sampling analytical results and data included in the semi-annual and annual reports required under Part 3, Permit Conditions 3.4 and 3.5, and as described in detail in Attachments 2 and 3 of this Permit; and
9. Copies of manifests for any shipments off-site of any hazardous waste generated at the CWL.

## **PERMIT PART 3: POST-CLOSURE CARE REQUIREMENTS FOR THE CHEMICAL WASTE LANDFILL**

### **3.0 GENERAL**

This Permit Part includes information on the types of waste disposed of in the Chemical Waste Landfill (CWL) and requirements for the length of post-closure care, planned monitoring and maintenance activities, and other requirements for post-closure care. More detailed post-closure care requirements for the CWL are presented in the Attachments to this Permit.

In addition to the post-closure care requirements of 40 C.F.R. §§ 264.117 through 264.120, the Permittees must comply with the groundwater protection standard at 40 C.F.R. § 264.92. Trichloroethene (TCE), chromium, and nickel have been detected in groundwater in the uppermost aquifer underlying the CWL. Therefore, in accordance with 40 C.F.R. § 264.91(a)(1), the Permittees must institute a compliance groundwater monitoring program meeting the requirements of 40 C.F.R. § 264.99. In accordance with 40 C.F.R. § 264.96(a), the compliance period shall last for 45 years, and shall begin when the Permittees initiate the required compliance monitoring program in accordance with 40 C.F.R. § 264.99. In accordance with 40 C.F.R. § 264.96(c), if the Permittees are engaged in a corrective action program at the end of the compliance period, the compliance period shall be extended until the Permittees can demonstrate that the groundwater protection standard of 40 C.F.R. § 264.92 has not been exceeded for a period of three consecutive years.

### **3.1. TYPES OF WASTE**

A maximum of 31,800 cubic yards of hazardous and solid waste were disposed of in the CWL. Tables 3-1 and 3-2 contain lists of waste numbers associated with contaminated soil and wastes that were excavated and removed from the CWL and managed at the Corrective Action Management Unit (CAMU).

Within 30 days from the issuance of this Permit, the Permittees shall submit to the Department a description of the quantities of replaceable soils placed back into the CWL as part of the Landfill Excavation Voluntary Corrective Measures. The description shall indicate the concentration or levels of the contaminants contained in the replaceable soils.

**TABLE 3-1**

**Hazardous Wastes Types Removed From the Chemical Waste Landfill**

**Maximum Waste Inventory: 31,800 yd<sup>3</sup>**

D001	F001	P087	U061
D002	F002	P120	U117
D003	F003		U134
D004	F004		U151
D005	F005		U154
D006	F039		U165
D007			
D008			
D009			
D010			
D011			
D018			
D021			
D022			
D023			
D027			
D028			
D030			
D032			
D033			
D034			
D035			
D036			
D037			
D038			
D039			
D040			
D041			
D042			

**TABLE 3-2**  
**Additional Hazardous Waste Types Removed from the Chemical Waste**  
**Landfill<sup>a</sup>**

Superfund LDR Guide #6A Structural Functional Group <sup>b</sup>	ER Site 74 Contaminant <sup>c</sup>	Potential EPA Hazardous Waste Numbers <sup>d</sup>	Concentration in ER Site 74 Waste Samples <sup>e</sup>		
			(ppm)		
			Minimum	Maximum	Average
Halogenated Non-Polar Aromatics	1,4-Dichloro-benzene	D027	3.8	3.8	3.8
Halogenated Phenols	Pentachlorophenol	D037	6.7	6.7	6.7
Halogenated Aliphatics	1,1,1-Trichloroethane	F001, F002	0.0054	2,300	167.59
	Chloroform	D022	0.012	0.012	0.01
	Chloroform	D022	0.011	0.034	0.021
	Dichloromethane(methylene chloride)	F001, F002	0.0061	63	3.11
	Dichloromethane(methylene chloride)	F001, F002	0.0061	0.190	0.038
	Tetrachloroethene	D039, F001, F002	0.009	35	11.26
	Tetrachloroethene	D039, F001, F002	0.02	1,700	440.103
	Trichloroethene	D040, F001, F002	0.007	9,500	726.46
Other polar organics	Acetone	F003	0.011	1,300	15.47
	Acetone	F003	0.011	270	11.63
	Benzene	D018, F005	0.046	0.046	0.046
	Ethyl benzene	F003	0.006	26	11.02
	Ethyl benzene	F003	3.0	230	102.4
	Toluene	F005	0.0093	680	82.82
	Toluene	F005	0.0059	1,300	178.62
	Total xylenes	F003	0.007	810	103.72
	Total xylenes	F003	0.006	1,110	225.853
Metals	Arsenic	D004	0.43	93	3.89
	Barium	D005	2.7	730	85.39
	Cadmium	D006	0.1	87	1.96
	Chromium	D007	1.6	61,700	363.06
	Chromium	D007	0.037	35,400	1,421.1
	Lead	D008	1	45,100	275.79
	Mercury	D009	0.05	17.2	1.02
	Selenium	D010	0.18	78	26.25
	Selenium total	D010	0.2	21	1.81
	Silver	D011	0.2	23	2.63

May 21, 2007

Draft Post-Closure Care Permit No.NM5890110518-CWL

## TABLE 3-2 (continued)

a	Provided by the Permittees based on site investigation data collected through June 1996.
b	Information in this column is based on U.S. Environmental Protection Agency (EPA), 1990. "Superfund LDR Guide #6A, 2nd Edition, Obtaining a Soil and Debris Treatability Variance for Remedial Actions," Superfund Publication 9347.3-06FS, U.S. Environmental Protection Agency, Washington, D.C.
c	Note: Information in this table is derived from two sets of data from different sampling events at the Chemical Waste Landfill. For some chemical constituents there were insufficient data in the two data sets to calculate statistically valid averages and standard deviations. Thus, for these constituents, the values from each individual data set are included.
d	The potential EPA hazardous waste numbers were taken from Title 40 of the Code of Federal Regulations (40 C.F.R.) Part 261.
e	Concentrations reflect data collected for a limited time (up through entry into this document).
EPA	Environmental Protection Agency
ER	Environmental Restoration
mg/L	milligrams per liter
NA	Not applicable
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act

**TABLE 3-2**  
**Additional Hazardous Waste Types Removed from the Chemical Waste**  
**Landfill<sup>a</sup>**

Superfund LDR Guide #6A Structural Functional Group <sup>b</sup>	ER Site 74 Contaminant <sup>c</sup>	Potential EPA Hazardous Waste Numbers <sup>d</sup>	Concentration in ER Site 74 Waste Samples (ppm)		
			Minimum	Maximum	Average
Halogenated Non-Polar Aromatics	1,2,3-Trichlorobenzene	NA	0.25	0.47	0.41
	1,2,4-Trichlorobenzene	NA	0.73	0.73	0.73
	1,2-Dichlorobenzene	NA	0.55	4.9	1.6
	1,3-Dichlorobenzene	NA	0.54	0.54	0.54
	1,4-Dichlorobenzene	NA	0.28	0.28	0.28
	Chlorobenzene	NA	0.41	0.58	0.49
	Pentachlorobenzene	NA	0.58	0.58	0.58
Halogenated Aliphatics	Bromomethane	NA	0.29	0.29	0.29
	Dichlorodifluoromethane	NA	0.78	0.78	0.78
	Hexachloro-1,3-butadiene	NA	2.53	64.75	33.64
	Idomethane	NA	0.31	0.65	0.41
Other Polar Organics	1,2,4-Trimethylbenzene	NA	0.42	0.96	0.67
	1,3,5-Trimethylbenzene	NA	0.62	0.62	0.62
	2-Butanone	NA	1.3	27.4	11.8
	2-Hexanone	NA	0.37	1.3	0.60

Refer to footnotes at end of table.

**TABLE 3-2 (continued)**  
**Additional Hazardous Waste Types Removed from the Chemical Waste**  
**Landfill<sup>a</sup>**

Superfund LDR Guide #6A Structural Functional Group <sup>b</sup>	ER Site 74 Contaminant <sup>c</sup>	Potential EPA Hazardous Waste Numbers <sup>d</sup>	Concentration in ER Site 74 Waste Samples (ppm)		
			Minimum	Maximum	Average
Other Polar Organics	2-Methylphenol	NA	0.60	2.6	1.3
	3,3'- Dimethylbenzidine	NA	3.0	3.0	3.0
	4-Methyl-2-pentanone	NA	0.58	1.4	0.92
	Acetophenone	NA	0.95	10.8	3.5
	Aniline	NA	1.04	1.04	1.04
	Di-n-butylphthalate	NA	0.30	6.4	1.5
	Phenol	NA	0.52	14.0	5.4
	Bis(2-ethylhexyl) phthalate	NA	0.36	29.1	4.1
Heterocyclics	Dibenzofuran	NA	6.1	6.1	6.1
	Tetrahydrofuran	d	0.31	21.5	5.0
Nitrated Aromatics	Nitrobenzene	NA	0.37	1.5	0.92
Polynuclear Aromatics	2-Methylnapthalene	NA	0.36	0.36	0.36
	Fluorene	NA	0.36	0.36	0.36
	Napthalene	NA	0.36	0.36	0.36
	Pyrene	NA	0.36	0.36	0.36
Radionuclide <sup>e</sup>	Tritium	NA	f	f	f

Refer to footnotes at end of table.

**TABLE 3-2 (continued)**

- a Constituents based on samples collected during the Landfill Excavation Voluntary Corrective Measure (LE VCM) for the Chemical Waste Landfill, October 1998 – August 1999.
- b Information in this column is based on U.S. Environmental Protection Agency (EPA), 1990. “Superfund LDR Guide #6A, 2nd Edition, Obtaining a Soil and Debris Treatability Variance for Remedial Actions,” Superfund Publication 9347.3-06FS, U.S. Environmental Protection Agency, Washington, D.C.
- c Information in this column is based on constituents identified during the Landfill Excavation Voluntary Corrective Measure (LE VCM) for the Chemical Waste Landfill, October 1998 – August 1999.
- d The potential hazardous waste numbers were taken from Title 40 of the Code of Federal Regulations (40 C.F.R.) Part 261. Entries marked NA (Not Applicable) indicate that, although the constituent was identified, there are no records to link the constituent to a source-based hazardous waste number.
- e Although tritium is not a RCRA constituent, it is included for completeness in describing contaminant concentrations accepted at the CAMU.
- f The CAMU accepted soils containing tritium at concentrations up to 20,000 picoCuries/liter in soil moisture content. Background concentration of tritium for CWL soils is 420 picoCuries/liter in soil moisture content.

EPA Environmental Protection Agency  
 ER Environmental Restoration  
 mg/L milligrams per liter  
 NA Not applicable  
 ppm Parts per million  
 RCRA Resource Conservation and Recovery Act

### **3.2. POST-CLOSURE CARE PROCEDURES AND USE OF PROPERTY**

#### **3.2.1. Duration of Post-Closure Care**

The Permittees shall conduct post-closure care for the CWL to begin after certification of closure of the unit by the Department and continue for 30 years after that date, except that the 30-year post-closure care period may be shortened or extended, as follows:

1. In accordance with 40 C.F.R. § 264.117(a)(2)(i), the Department may, in accordance with the permit modification procedures in 40 C.F.R. Part 270 and 20.4.1.901 NMAC, shorten the post-closure care period if it finds that human health and the environment will be protected sufficiently.
2. In accordance with 40 C.F.R. § 264.117(a)(2)(ii), the Department may, in accordance with the permit modification procedures in 40 C.F.R. Part 270 and 20.4.1.901 NMAC, extend the post-closure care period if it finds that this is necessary to protect human health or the environment.

#### **3.2.2. Groundwater Monitoring System**

The Permittees shall operate and maintain the groundwater monitoring system and shall comply with all applicable requirements of 40 C.F.R. Part 264, Subpart F during the post-closure care and compliance periods, in accordance with 40 C.F.R. § 264.117(a)(1), and as specified in this Permit.

#### **3.2.3. Special Post-Closure Requirements for Landfills**

The Permittees shall comply with the requirements for landfills at 40 C.F.R. § 264.310(b), except for the requirements for a leachate collection and removal system, and as described in Attachment 1 of this Permit, as follows.

1. Maintain the integrity and effectiveness of the final cover, including making repairs to the cover, as necessary, to correct the effects of settling, subsidence, erosion, or other events;
2. Operate and maintain the groundwater monitoring system described in Section 1.4 of Attachment 1 of this Permit, and comply with all other applicable requirements of 40 C.F.R. Part 264 Subpart F;
3. Prevent run-on and run-off from eroding or otherwise damaging the final cover; and
4. Protect and maintain surveyed benchmarks used in complying with the surveying and recordkeeping requirements of 40 C.F.R. § 264.309.

#### **3.2.4. Security Requirements**

In accordance with 40 C.F.R. § 264.117(b), the Permittees shall comply with all security requirements, as specified in Attachment 1 of this Permit, and as required by 40 C.F.R. § 264.14.

#### **3.2.5. Future Land Use Requirements**

The Permittees shall not allow any use of the CWL that will disturb the integrity of the final cover or the function of the unit's monitoring systems during the post-closure care period, as required by 40 C.F.R. § 264.117(c).

### **3.3. INSPECTION**

The Permittees shall inspect the components, structures, and equipment at the CWL in accordance with the Inspection and Maintenance/Repair Schedule described in Section 1.9 of Attachment 1 of this Permit using the Inspection Checklists in Permit Attachment 4, and in accordance with the inspection requirements of 40 C.F.R. § 264.15.

### **3.4. GROUNDWATER SAMPLING AND ANALYSIS PLAN**

The Permittees shall conduct groundwater sampling and analysis following the procedures described in Attachment 2 of this Permit.

### **3.5. SOIL GAS SAMPLING AND ANALYSIS**

The Permittees shall conduct soil-gas sampling and analysis following the procedures described in Attachment 3 of this Permit.

### **3.6. PERSONNEL TRAINING FOR POST-CLOSURE CARE PERIOD**

The Permittees shall implement the CWL-specific personnel training program for the post-closure care period specified in Attachment 5 of this Permit, and as required by 40 C.F.R. § 264.16.

Within 30 days of issuance of this Permit, the Permittees shall submit to the Department revisions to Figures 5-2 and 5-3 of Permit Attachment 5. The revised figures shall indicate specifically the time required for sufficient prior work experience related to duties for both the field technician and staff biologist positions (for example, 6 months, one year, 2 years).

### **3.7. POST-CLOSURE PERMIT MODIFICATIONS**

In accordance with 40 C.F.R. § 264.118(d), the Permittees must request a permit modification to authorize a change in this Permit. This request must be in accordance with applicable requirements of 40 C.F.R. Part 270 and 20.4.1.901 NMAC, and must include a copy of the proposed amended portions of this Permit for approval by the Department. The Permittees shall request a permit modification whenever changes in operating plans or facility design affect any part of this Permit, there is a change in the expected year of final closure, or other events occur during the post-closure care period of the CWL that affect this Permit. The Permittees must submit a written request for a permit modification to the Department at least sixty (60) days prior to the proposed change in CWL design or operation, or no later than 60 days after an unexpected event has occurred which has affected the post-closure care requirements contained in this Permit.

## **PERMIT ATTACHMENT 1: POST-CLOSURE CARE PLAN FOR THE CHEMICAL WASTE LANDFILL**

### **1.0 INTRODUCTION**

This Permit Attachment presents general information and provides the context by which post-closure care activities at the Chemical Waste Landfill (CWL) shall be conducted.

#### **1.1. GENERAL DESCRIPTION OF THE FACILITY**

Sandia National Laboratories (the Facility), EPA Identification Number NM5890110518-CWL, is a multidisciplinary laboratory engaged in the research and development of weapons and alternative energy sources. Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, manages the Facility for the Department of Energy (DOE). Work at the laboratory is also performed for the U.S. Department of Defense and the Nuclear Regulatory Commission as well as other entities. Generation and management of solid, hazardous, and mixed waste occur at the Facility as a result of these activities. The Facility is located south of Albuquerque, New Mexico, within the boundaries of Kirtland Air Force Base (KAFB) in Bernalillo County (Figure 1).

#### **1.2. LOCATION, CONDITIONS, AND DESCRIPTION OF THE CWL**

##### **1.2.1. Location and General Description**

The CWL is a 1.9-acre site located in the southeast corner of Technical Area (TA) III (TA-III). A Facility map, which shows the topography of the area, the location of the TAs, and the location of the CWL is presented in Figure 1. A more detailed map of TA-III is presented in Figure 2.

The regional aquifer is located within the Santa Fe Group, with the water table at a depth of approximately 485 feet below ground surface (bgs). Groundwater appears to flow toward the northwest at a rate of approximately 2 feet per year (DOE/SNL, 1992; DOE/SNL, 1993).

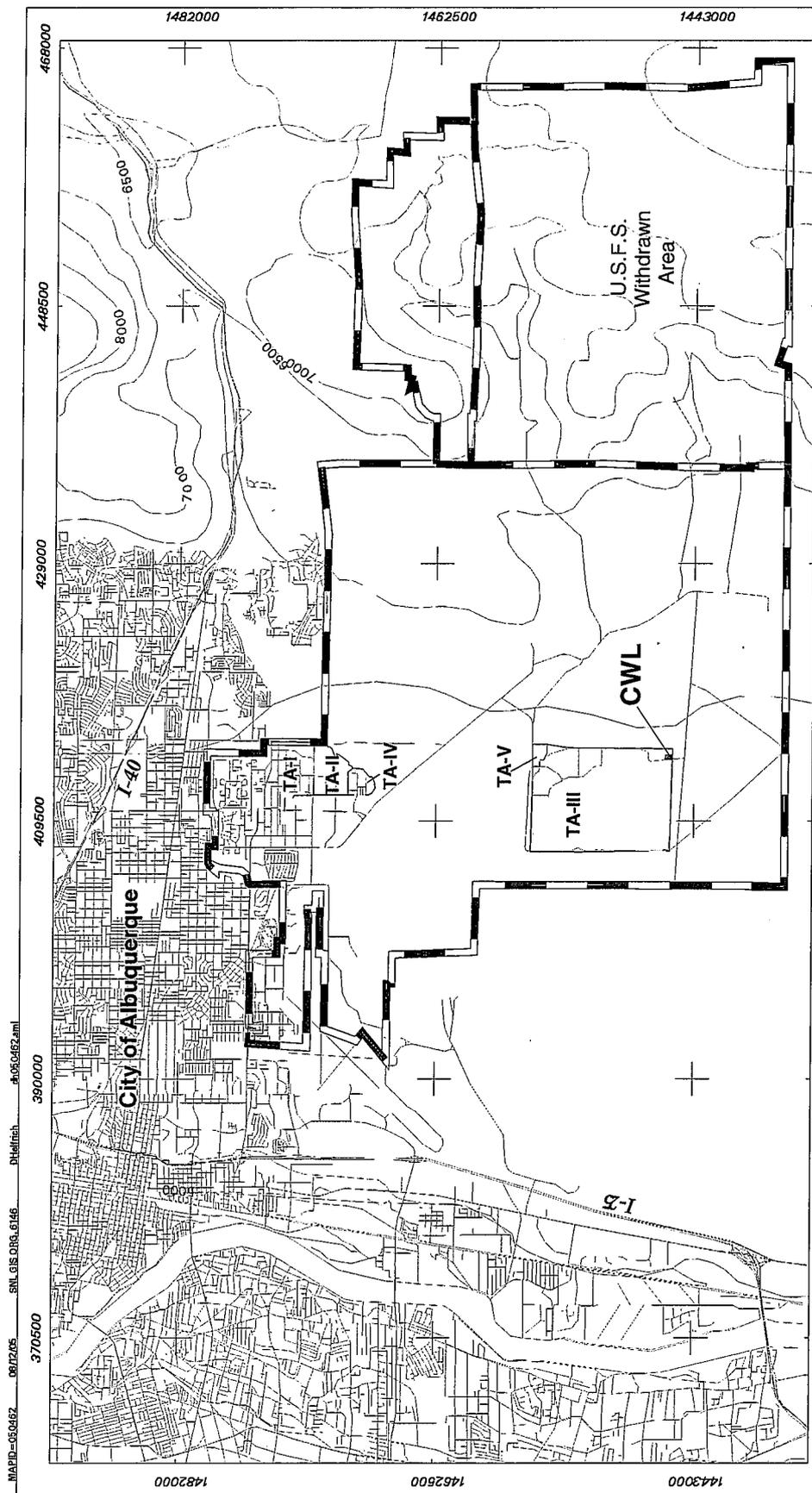
Several major well fields have been developed in the regional aquifer to supply drinking water to Albuquerque, KAFB, and surrounding areas. The closest well field is located approximately 4 miles north-northwest and down gradient of the CWL. Within that well field, the closest down gradient water supply well is KAFB-4, located approximately 4.3 miles north-northwest of the CWL. Water levels at the CWL have been declining at an approximate rate of 0.6 feet/year. Over the past 15 years, the water level has decreased by approximately 9 feet at the CWL (DOE/SNL July 2004).

The surface winds at the Facility are light. Winds from the east and southwest are particularly common and generally less than 8 miles per hour (Figure 3).

From 1962 until 1981, the CWL was used for the disposal of chemical, radioactive, and solid waste generated by research activities at the Facility. The CWL was used as a hazardous waste storage unit from 1981 to 1989. From 1981 through 1985, only solid waste, including hazardous waste, was disposed of at the CWL. After 1985, all waste disposals ended, and after 1989, the CWL was no longer used as a hazardous waste storage unit.

##### **1.2.2. Current Landfill Conditions**

The CWL was excavated from September 1998 through February 2002 as part of the Landfill Excavation (LE) Voluntary Corrective Measure (VCM). Soil-vapor extraction was also conducted



MAPID=060667 06/17/05 SNL GIS DRG 6146 PHellish #060667.dwg

**Legend**

Road  
KAFB Boundary  
500 Foot Contour  
CWL  
SNL Technical Area

**Figure 1 Location of the Chemical Waste Landfill with respect to Kirtland Air Force Base and the City of Albuquerque**

Scale in Feet  
0 6250 12500

Scale in Meters  
0 1500 3000

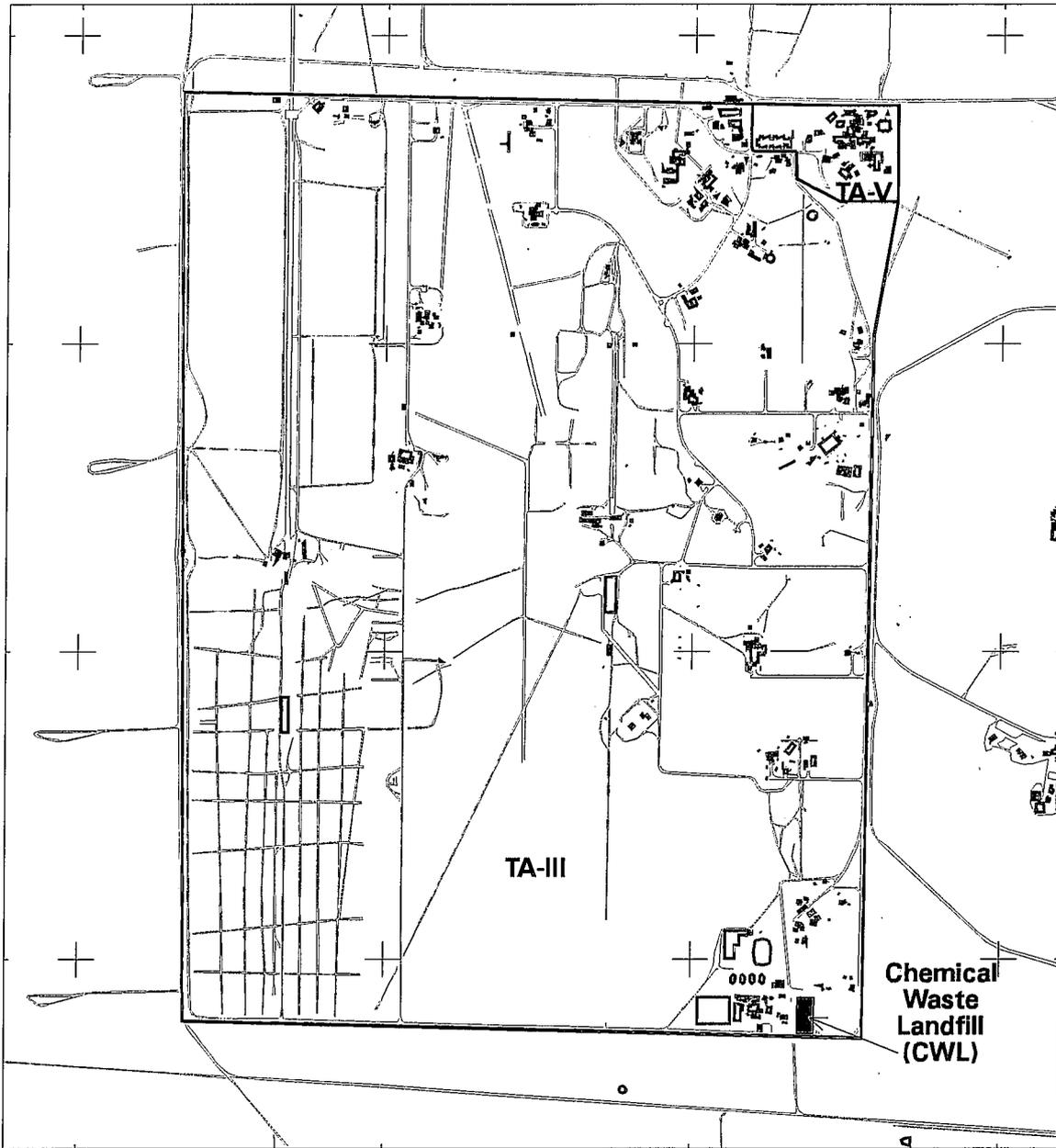
**Sandia National Laboratories, New Mexico  
Environmental Geographic Information System**

Bernalillo County

KAFB

New Mexico

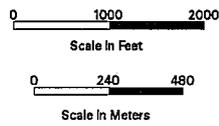
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### Legend

-  Building / Structure
-  Paved & Unpaved Road
-  SNL Technical Areas III/V
-  CWL

### Figure 2 Location of the Chemical Waste Landfill within Technical Area III



### **FIGURE 3**

Figure 3 is an oversized map and is unavailable in electronic format.

Figure 3 can be viewed at the New Mexico Environment Department (NMED) - Hazardous Waste Bureau Offices in Santa Fe or the NMED District 1 Office in Albuquerque. Contact Information is provided in the Public Notice and Fact Sheet for this draft Permit.

as a VCM prior to landfill excavation to reduce the concentrations of soil vapor in the vadose zone. All former disposal areas were excavated. Approximately 52,000 cubic yards of contaminated soil and debris were removed during the landfill VCM. Figure 4 shows the post-LE VCM subsurface configuration of the volatile organic compound (VOC) soil-gas contaminant plume. The extent of the excavation and the associated confirmatory soil sampling grid locations on the excavation floor and sidewalls are shown in Figure 5.

The CWL excavation was backfilled with soil, some of it having low concentrations of contaminants, to a uniform depth of 4 feet bgs from June 2002 through February 2003, following the construction specifications in the CWL Backfill and Compaction Plan (DOE/SNL July 2002). An at-grade vegetative soil cover was installed over the CWL. The cover is described in Section 1.3 of this Permit Attachment. Figure 6 presents the current configuration and features of the CWL and delineates the area subject to post-closure care.

Due to the remote location of the CWL in TA-III, general Facility traffic patterns will neither affect nor be affected by CWL post-closure activities. Traffic within the CWL will be light and normally will only occur during periodic inspection and sampling periods.

During the LE VCM, the CWL site operational boundary (SOB) was expanded to the east and north to include an additional 11.4 acres for waste management activities. The current conditions of the SOB meet the New Mexico Environment Department (Department)-approved cleanup standards/criteria (Lewis October 2000).

### **1.2.3. Description of Cover Installation**

The vegetative at-grade soil cover was installed from March through August 2005, originally as an interim measure, which was conditionally approved by the Department in September 2004 (Kieling September 2004a). Conditions were addressed in the revised remedial action proposal (RAP) that was included as Annex I of the revised Corrective Measures Study Report. The cover comprises two layers, a native soil layer (approximately 3 feet thick) and a topsoil layer (approximately 1.5 feet thick), and is described in more detail in Section 1.3 of this Permit Attachment.

### **1.2.4. Seismic Considerations**

With respect to 40 C.F.R. § 264.18(a), there are no known faults with Holocene displacements located within 200 feet of the CWL.

### **1.2.5. Floodplain**

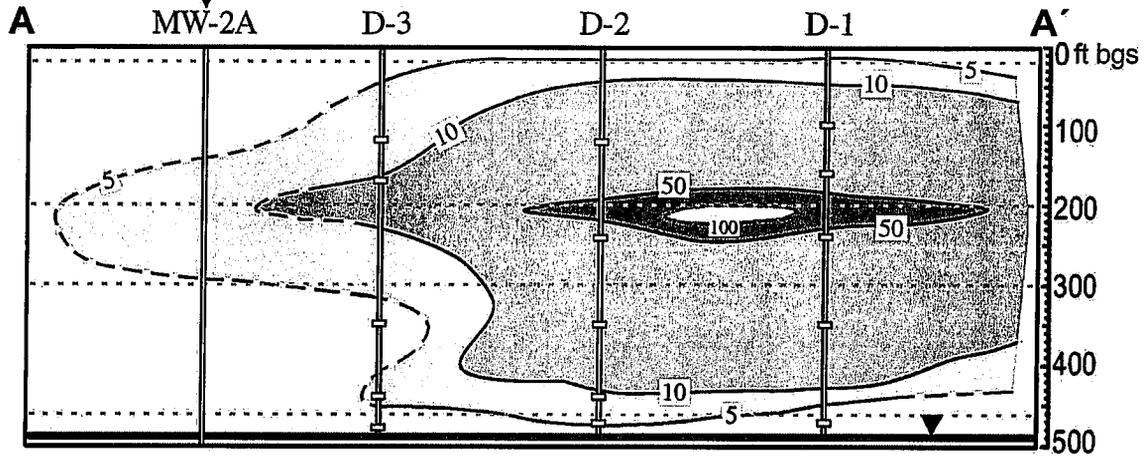
The locations of the 100-year floodplains in the vicinity of the CWL are shown in Figure 3. With respect to 40 C.F.R. § 264.18(b)(2)(i), the CWL is not located within a 100-year floodplain.

## **1.3. DESCRIPTION OF THE FINAL COVER**

The vegetative soil cover consists of two discrete layers: 1) a 3-foot-thick native soil layer (sub-grade for topsoil layer) installed from 4 feet bgs to 1 foot bgs, and 2) a 1.5-foot-thick (minimum 1-foot-thickness) topsoil layer comprised of minimally compacted topsoil admixed with 3/8-inch, crushed gravel installed from 1 foot bgs to the local grade. Both the native soil and topsoil layers consist of soil excavated from the TA-III borrow pit located west of the CWL. The soil utilized for the cover was sampled to confirm that it meets both the risk-based criteria for surface soil and the

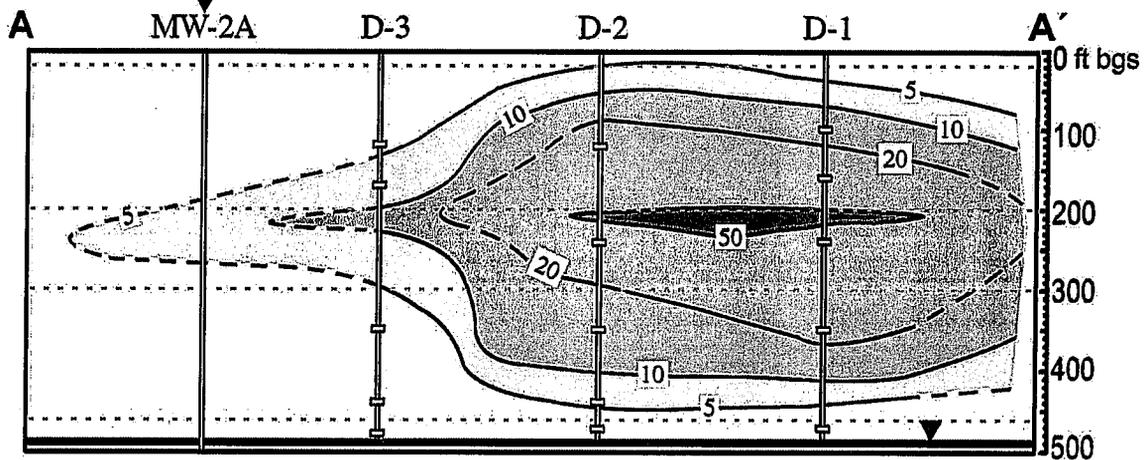
**Post-VE VCM Total VOC Concentration - September 2004**

(Plugged & Abandoned)



**Post-VE VCM TCE Concentration - September 2004**

(Plugged & Abandoned)



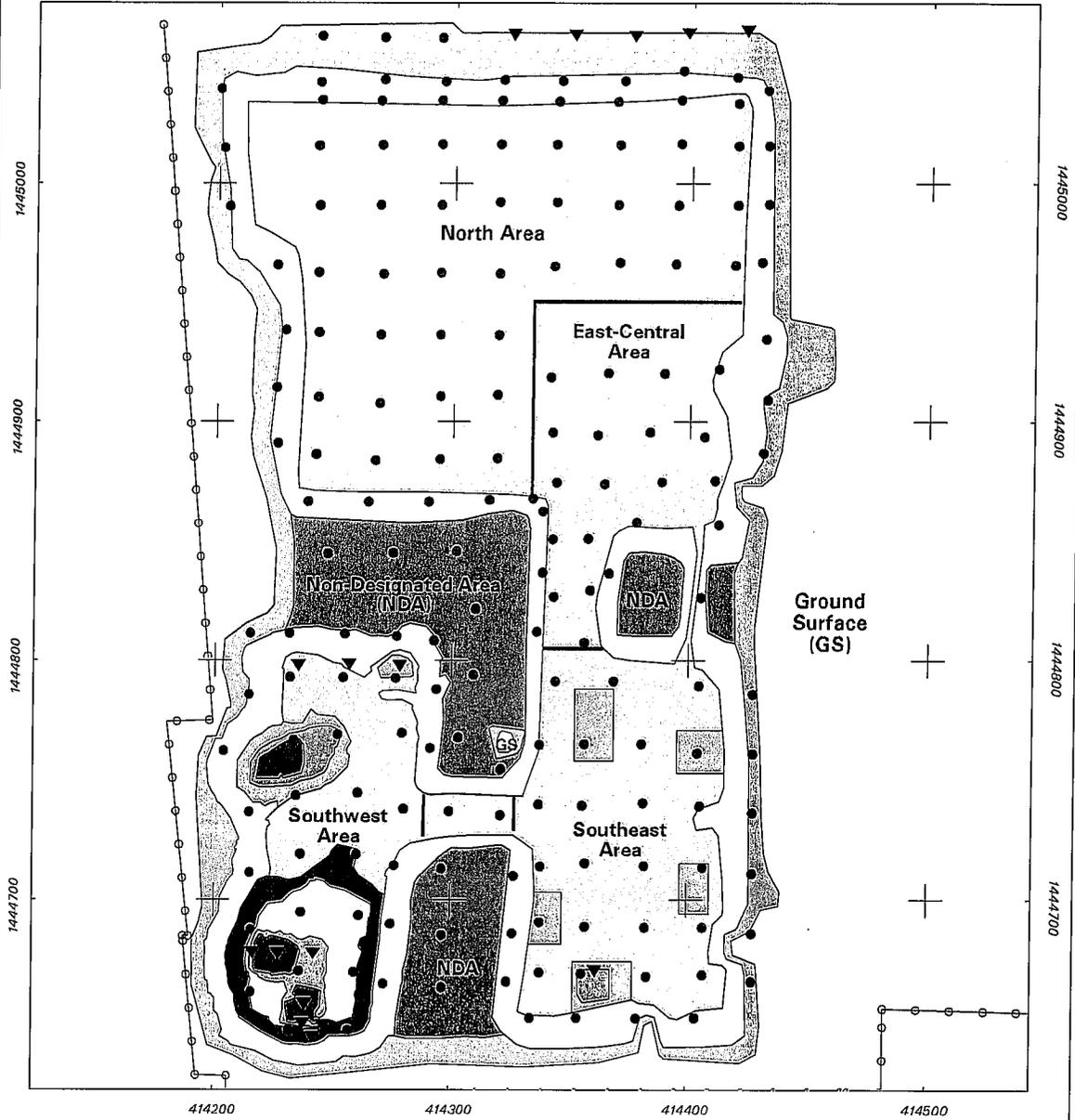
**LEGEND:**

- Soil Gas Monitoring Port Location
- Screen Interval
- Water Table
- BGS = Below Ground Surface
- VE = Vapor Extraction
- VOC = Volatile Organic Compounds
- VCM = Voluntary Corrective Measure
- = Concentration Parts per Million Volume Basis

NOT TO SCALE. These illustrations are approximate in nature.

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**Figure 4**  
**Post-VE VCM Volatile Organic Compound Soil-Gas Plume - September 2004**  
**Chemical Waste Landfill**



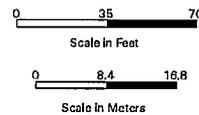
**Legend**

- Verification Grid Sample
- ▼ Judgemental Sample
- Area Boundary
- Fence

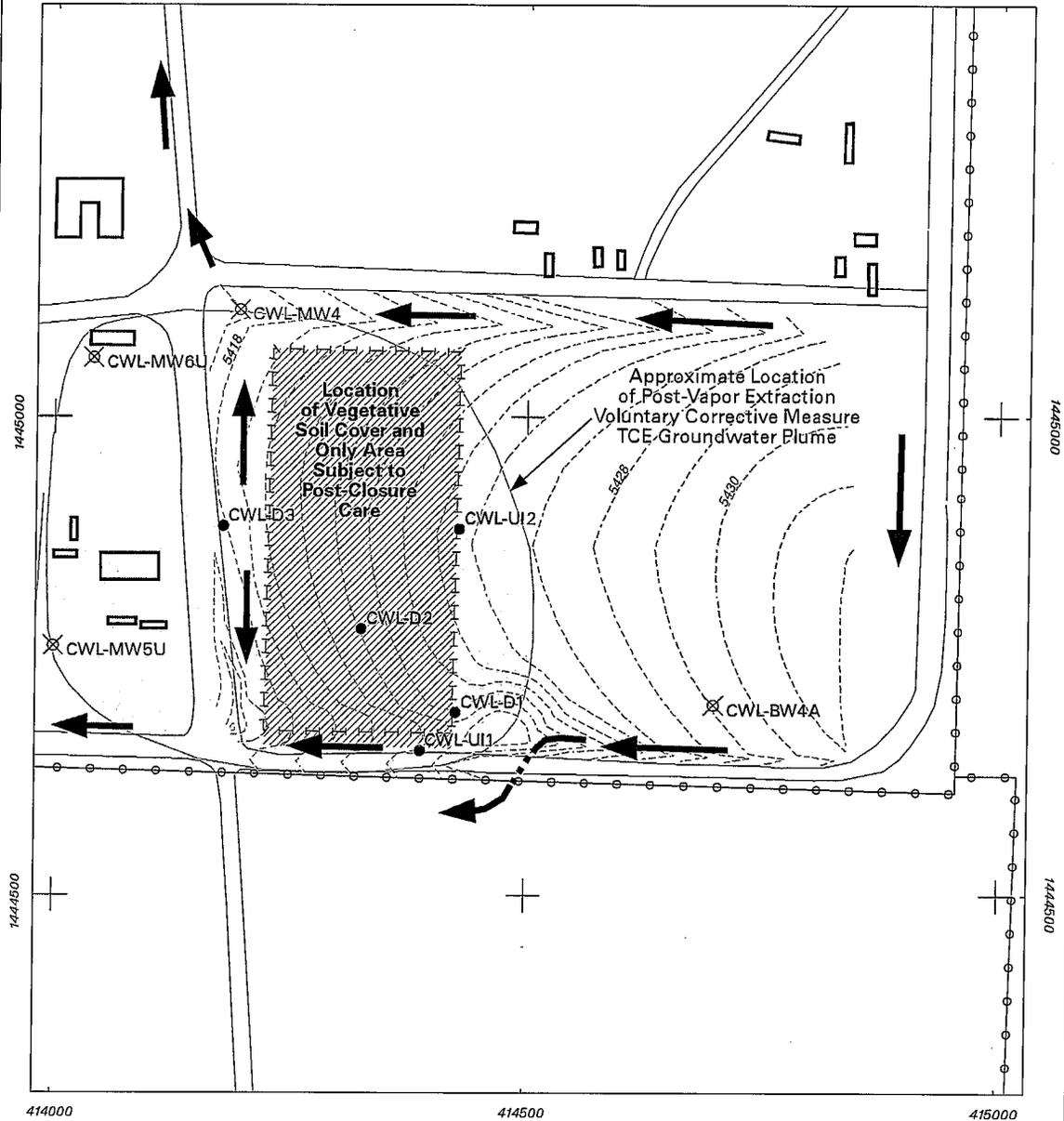
**Depth of Excavation**

	0 - 4'		12 - 14'		20'
	4' NDA Floor		14 - 16'		25'
	4 - 12'		16 - 18'		30'
	12' Floor		12 - 20'		

**Figure 5**  
 Extent of LE VCM Excavation and  
 Final Verification Soil Sampling  
 Grid Locations



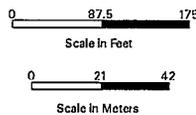
Sandia National Laboratories, New Mexico  
 Environmental Geographic Information System



**Legend**

- Post-Closure Groundwater Monitoring Well
- Post-Closure Soil Gas Monitoring Well
- Approximate location of surface water drainage swales. Arrows indicate flow direction
- Tech. Area III Fence
- Paved and Unpaved Road
- Perimeter Security Fence
- Building / Structure
- Contour Intervals (approximate) for the Cover Area and Immediate Vicinity
- Former CWL Footprint

**Figure 6**  
**Site Layout for the**  
**Post-Closure Care Period**  
**Chemical Waste Landfill**



Sandia National Laboratories, New Mexico  
Environmental Geographic Information System

construction specifications for the two layers documented in the revised RAP (SNL/NM December 2004). The topsoil layer was revegetated with native plants according to the specifications contained in the RAP (SNL/NM December 2004). Table 1-1 shows the seed mix and seeding rate from the general seeding specifications presented in the RAP. Figure 7 shows the CWL excavation backfilled to 4 feet below ground surface (bgs) (March 2004) and the newly installed cover prior to drainage swale installation, reseeding, and completing the perimeter security fence (August 2005).

**TABLE 1-1  
 Native Plant Species and Seeding Rate Calculations for the  
 Chemical Waste Landfill Cover**

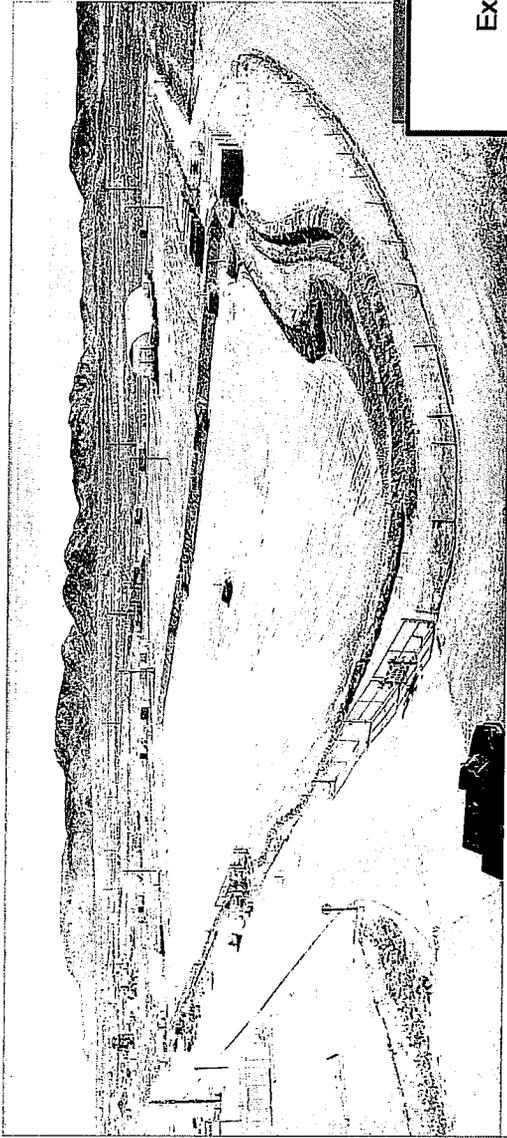
<b>Species</b>	<b>Percent of Total Seed Mix</b>	<b>Calculated Seeding Rate (lbs/acre)<sup>a</sup></b>
Indian Rice grass	39.0%	7.8 lbs/acre
Galleta	19.5%	3.9 lbs/acre
Blue Grama Grass	29.5%	5.9 lbs/acre
Sand Dropseed	6.0%	1.2 lbs/acre
Alkali sacaton	6.0%	1.2 lbs/acre
<b>Total</b>	<b>100%</b>	<b>20 lbs/acre</b>

<sup>a</sup>Calculated seeding rate when mixed with the other listed seed species and normalized to a combined seeding rate of 20 lbs/acre.  
 lbs/acre = Pound(s) per acre.

The primary objectives for the CWL vegetative cover system are to minimize infiltration of moisture into the former landfill and to minimize long-term maintenance consistent with 40 C.F.R. § 264.111(a). A secondary objective is to provide a physical barrier between the surface and excavation floor, where the highest concentrations of residual soil contamination occur. Figure 8 shows a conceptual schematic diagram of the CWL excavation, backfill layers, and cover layers. The cover system utilizes soil-water balance properties to minimize infiltration/percolation by using vegetation growing on the cover to transpire water from the soil and as well as natural evaporation processes. Once established, native vegetation on the cover will require little or no maintenance, is best adapted to removing moisture from the local soil, and is best suited for local climatic conditions.

**1.3.1. Surface Topsoil Layer**

The minimally compacted topsoil layer is designed to support and facilitate the development of maximum root density and will act as the primary moisture storage layer. The topsoil layer is a blend of 75 percent local topsoil and 25 percent 3/8-inch, crushed gravel. The installed thickness of this layer is 18 to 24 inches to ensure that the minimum thickness requirement of 12 inches is maintained. The topsoil-gravel blend and minimum thickness specifications are intended to reduce the effects of erosion, facilitate the development of maximum near-surface root density, and optimize near-surface moisture for seedlings. Once vegetation is established, it will minimize potential surface erosion, maintain the topsoil thickness over time, and transpire moisture to the



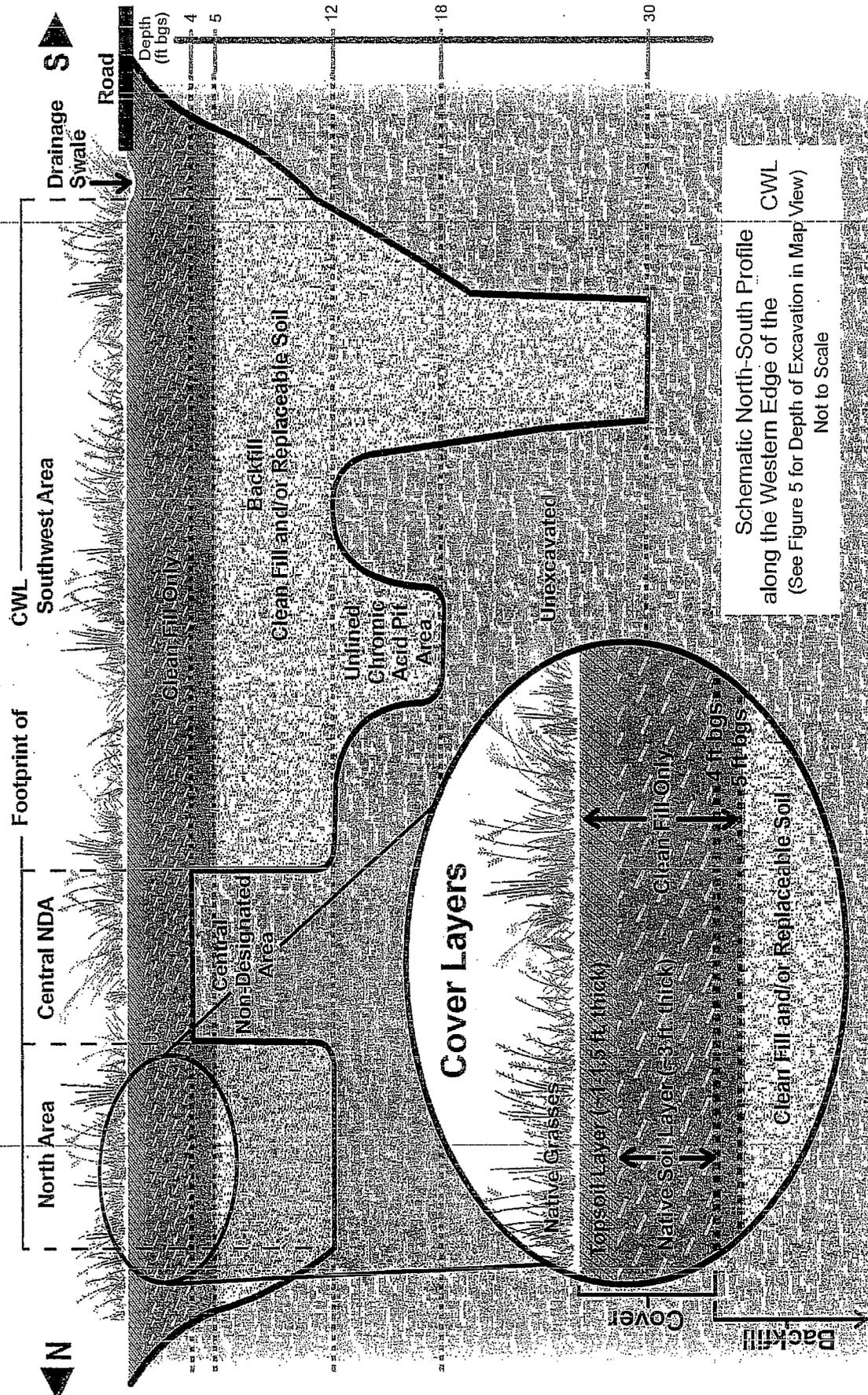
**Pre-cover installation**  
Excavation backfilled to 4 ft bgs



**Post-cover installation**  
Drainage swales/revegetation not completed  
Restoration of asphalt road in progress

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**Figure 7**  
**Panoramic Photographs of the Former CWL Prior to and After Cover Installation**



Schematic North-South Profile along the Western Edge of the CWL (See Figure 5 for Depth of Excavation in Map View) Not to Scale

**Figure 8**  
Schematic of the CWL Excavation Backfill and Cover Layers

atmosphere. Infiltration/percolation of surface moisture will be minimized through a combination of evaporation and transpiration to the atmosphere. For the dominant native grass species of the local east mesa ecosystem, maximum root density occurs in the upper 1 foot of soil (Peace et al. November 2004).

### **1.3.2. Native Soil Layer**

A 3-foot-thick native soil layer comprises the subgrade for the topsoil layer and provides a secondary moisture storage layer designed to limit deeper moisture penetration.

### **1.3.3. Surface Drainage Controls**

In addition to the topsoil layer and vegetation, engineering controls shall be applied to minimize erosion losses and control run-on/run-off. These include slope control, surface run-off control, and perimeter surface water flow control. The CWL cover is an “at grade” landfill cover and is crowned to prevent ponding. The crown of the cover slopes to the north and south at a 1-percent grade, and east to west at a 3-percent grade. This design facilitates low-profile mounding and gentle slopes that enhance resistance to erosion caused by wind and precipitation.

## **1.4. DESCRIPTION OF THE COMPLIANCE MONITORING SYSTEM**

Groundwater monitoring shall be conducted during the compliance and post-closure care periods. Soil-gas monitoring shall be conducted during the post-closure period. Groundwater monitoring shall include monitoring of the uppermost aquifer, utilizing Department-approved monitoring wells. VOC soil-gas plume monitoring shall include monitoring of the approximately 500-foot-thick vadose zone beneath the general vicinity of the former liquid organic disposal areas (southern portion of the CWL) and shall utilize existing vapor extraction (VE) wells.

### **1.4.1. Groundwater Monitoring System**

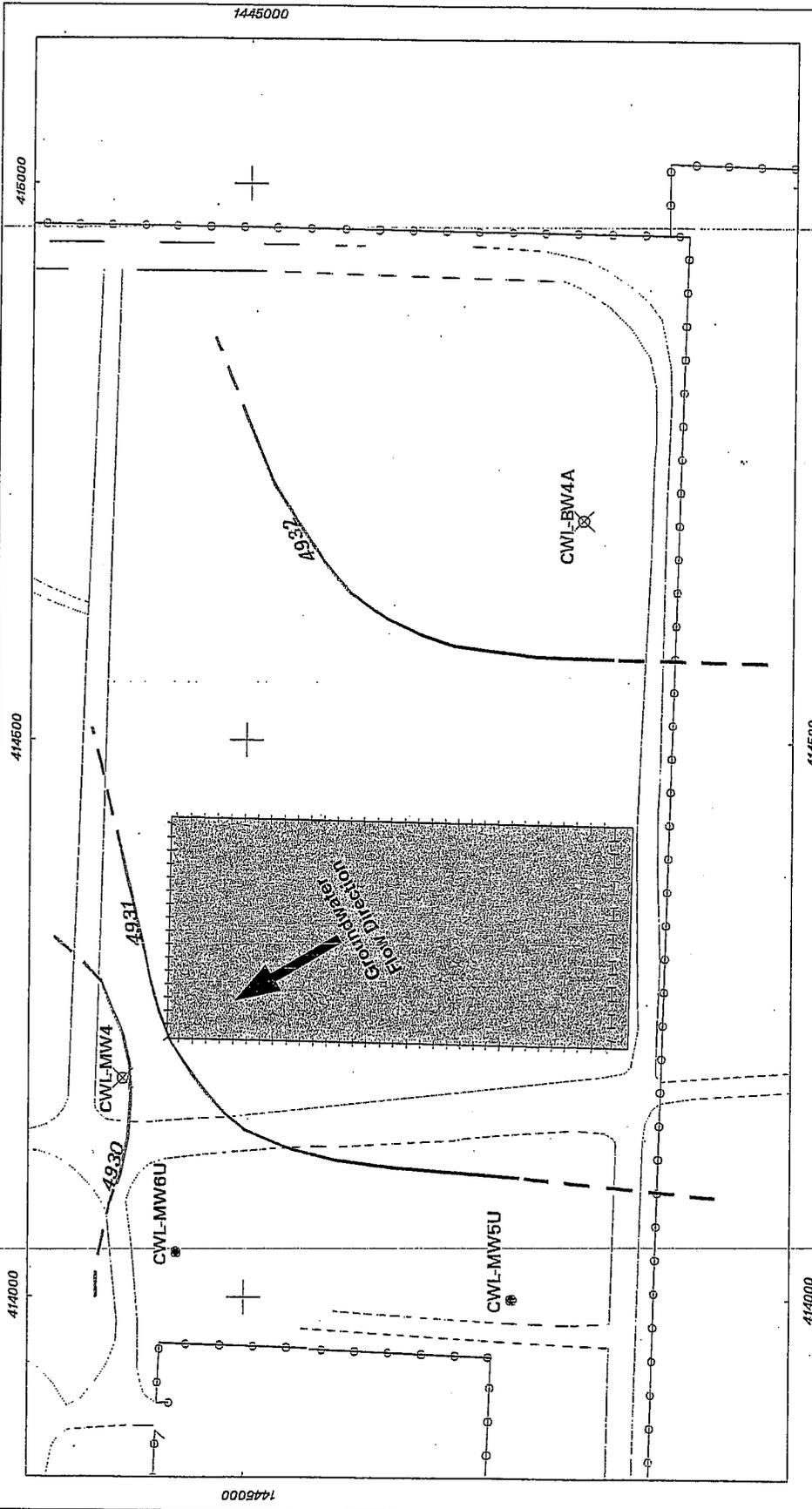
Groundwater monitoring shall be performed to ensure the protection of groundwater during the compliance and post-closure care periods. The monitoring network shall include the following monitoring wells that are shown in Figures 6 and 9.

- One hydraulically upgradient well—CWL-BW4A
- Three hydraulically down gradient wells—CWL-MW4, MW5U, and MW6U

Sampling frequency and additional analytical requirements are addressed in Section 1.8.1 of this Permit Attachment. If any of the compliance wells listed above cannot be sampled during the compliance or post-closure care periods due to the declining water table or other reasons, the Permittees shall apply for a permit modification to change this Permit (see Permit Part 1, Section 1.6.2). Any well that is part of the monitoring network that cannot be sampled shall be replaced.

Well completion diagrams for all compliance and post-closure care groundwater monitoring wells are provided in Attachment 2 of this Permit. All of these wells are constructed with polyvinyl chloride screens installed across the water table, except for CWL-MW4, which has a stainless steel screen.

The Chemical Waste Landfill is subject to 40 C.F.R. § 264.90(a)(1) and is a “regulated unit” as defined in 40 C.F.R. § 264.90(a)(2). Thus, the Permittees must comply with the requirements of 40



Sandia National Laboratories, New Mexico  
Environmental Geographic Information System

### Figure 9 Potentiometric Surface of the Upper Aquifer and Post-Closure Groundwater Monitoring Wells

**Legend**

- Groundwater Monitoring Well
- Multiple Completion Groundwater Monitoring Well
- Perimeter Security Fence
- Paved / Unpaved Road
- Tech Area III Fence
- Groundwater Elevation (in Feet Above Mean Sea Level) as of Jan. 2003 (Inferred where dashed)

**Footprint of  
Chemical Waste Landfill**

Scale in Feet: 0, 75, 150

Scale in Meters: 0, 18, 36

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C.F.R. §§ 264.91 through 264.100 in lieu of § 264.101 for purposes of detecting, characterizing and responding to releases to the uppermost aquifer. Among these applicable provisions is the groundwater protection standard at 40 C.F.R. § 264.92.

In accordance with 40 C.F.R. § 264.95, the point of compliance at which the groundwater protection standard at 40 C.F.R. § 264.92 applies and at which monitoring must be conducted is hereby established as the western and southern boundaries of the landfill. (The point of compliance is a vertical surface located at the hydraulically down gradient limit of the waste management area that extends down into the uppermost aquifer.) For the purpose of complying with the requirements of this Permit and 40 C.F.R. Part 264 Subpart F, the background well for the CWL shall be CWL-BW4A, and the compliance wells (located at the point of compliance) shall be CWL-MW4, CWL-MW5U, and CWL-MW6U (see Figure 6).

In accordance with 40 C.F.R. § 264.93, the hazardous constituents<sup>1</sup> to which the groundwater protection standard at 40 C.F.R. § 264.92 applies are hereby specified to be trichloroethene (TCE), chromium (Cr), and nickel (Ni). In accordance with 40 C.F.R. § 264.94, the concentration limits in the groundwater for these hazardous constituents are as specified in Table 1-2:

**TABLE 1-2**  
**Concentration Limits for Three Hazardous Constituents**

<b>Hazardous Constituent</b>	<b>Concentration Limit</b>	<b>Basis of Concentration Limit</b>
Trichloroethene	0.005 mg/L	EPA MCL, 40 C.F.R. § 264.94(b)
Chromium	0.050 mg/L	Table 1, 40 C.F.R. § 264.94(a)(2)
Nickel	0.028 mg/L	Background level, 40 C.F.R. § 264.94(a)(1)

mg/L = milligrams per liter

40 C.F.R. § 264.91(a)(1) requires that whenever hazardous constituents (under 40 C.F.R. § 264.93) from a regulated unit are detected at a compliance point (under 40 C.F.R. § 265.95), the owner or operator must institute a compliance monitoring program under 40 C.F.R. § 264.99. Hazardous constituents, especially TCE, have long been known to be present in the groundwater at the CWL. Therefore, the Permittees shall institute a compliance monitoring program at the CWL that meets the requirements of 40 C.F.R. § 264.99.

In accordance with 40 C.F.R. § 264.96, the compliance period during which the groundwater protection standard of 40 C.F.R. § 264.92 applies is hereby established as 45 years. (The compliance period is the number of years equal to the active life of the waste management area, including the closure period. The CWL was established in 1962; thus, the compliance period for the CWL is 45 years.) In accordance with 40 C.F.R. § 264.96(b), the compliance period begins when the Permittees initiate a compliance monitoring program meeting the requirements of 40 C.F.R. § 264.99.

The Permittees shall comply with the general groundwater monitoring requirements at 40 C.F.R. §

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<sup>1</sup> Hazardous constituents are constituents identified in Appendix VIII of Part 261 that have been detected in the groundwater in the uppermost aquifer underlying a regulated unit and that are reasonably expected to be in or derived from waste contained in the unit.

264.97. The Permittees shall also discharge the responsibilities under 40 C.F.R. § 264.99 for a compliance monitoring program.

In order to comply with 40 C.F.R. § 264.97(h) for the hazardous constituents specified above (TCE, Cr, Ni), the Permittees shall evaluate ground-water monitoring data by conducting an analysis of variance assuming that the distribution of each of the hazardous constituents are appropriately modeled as a normal or log-normal distribution. This analysis shall comply with the performance standards outlined in 40 C.F.R. § 264.97(i)(1-6), as appropriate. If it is later determined that any of the hazardous constituents are not found to be normally or log-normally distributed, the Permittees shall propose another statistical method by applying for a permit modification.

The current status and final use/disposition of all former groundwater monitoring wells and former VE system wells at the CWL are summarized in Table 1-3. All wells that do not have a defined future purpose for compliance monitoring/post-closure care shall be properly plugged and abandoned.

In accordance with 40 C.F.R. § 264.99(j), the Permittees shall submit an application for a permit modification if they determine that the compliance monitoring program no longer satisfies the requirements of 40 C.F.R. § 264.99 within 90 days of that determination.

**TABLE 1-3**  
**Final Use/Disposition Summary**  
**Chemical Waste Landfill Groundwater Monitoring and Vapor Extraction Well Inventory**

Well Name	Current Status	Future Status/Comments
<b>Compliance and Post-Closure Care Groundwater Monitoring Wells</b>		
BW4A	Compliance and Post-closure care upgradient groundwater monitoring well (background well)	Plug and abandon following completion of compliance and post-closure care groundwater monitoring. Replace if well goes dry.
MW4	Compliance and Post-closure care down gradient groundwater monitoring well with stainless steel screen	Plug and abandon following completion of compliance and post-closure care groundwater monitoring. Replace if well goes dry.
MW5U	Compliance and Post-closure care down gradient groundwater monitoring well	Plug and abandon following completion of compliance and post-closure care groundwater monitoring. Replace if well goes dry.
MW6U	Compliance and Post-closure care down gradient groundwater monitoring well	Plug and abandon following completion of compliance and post-closure care groundwater monitoring. Replace if well goes dry.
<b>Post-Closure Care Soil-Gas Monitoring Wells</b>		
UI-1 and UI-2	Former VE system wells with dedicated sampling ports for soil-gas monitoring (shallow ports only)	Plug and abandon following completion of post-closure care VOC soil-gas monitoring (potential future VE well)
D-1, D-2, and D-3	Former VE system wells with dedicated sampling ports for soil-gas monitoring (shallow and deep ports)	Plug and abandon following completion of post-closure care VOC soil-gas monitoring (potential future VE well)

Well Name	Current Status	Future Status/Comments
<b>Wells for Potential Future Use</b>		
VMW1	Former VE system well with multiple screen sections	Retain for potential future use (VE)–plug and abandon based upon post-closure care monitoring results
MW5L	Information only: nested groundwater well completed in same borehole as MW5U	Plug and abandon when MW5U is plugged and abandoned following completion of post-closure care groundwater monitoring
MW6L	Information only: nested groundwater well completed in same borehole as MW6U	Plug and abandon when MW6U is plugged and abandoned following completion of post-closure care groundwater monitoring
<b>Wells for Plug and Abandonment</b>		
MW2BU/2BL	Nested well pair located ~70 ft south of former MW2A location	Plug and abandon. MW2BU suitable for low-flow sampling only. MW2BL screen section is below water table surface. Both wells represent potential VOC soil-gas conduits.
MW1A and MW3A	Wells not suited for monitoring due to sediment in well screen and lack of water	Plug and abandon–potential VOC soil-gas conduits
UI3	Shallow former VE well located east of CWL and away from VOC soil-gas plume core	Well not needed for future use–plug and abandon
BW3	Well is located 20 ft away from BW-4A–background well with stainless steel screen	Well not needed for future use–plug and abandon
<b>Deep Regional Aquifer Monitoring Wells for Chromium Evaluation</b>		
MW7 and MW8	Deep regional wells installed in March 2003	Wells not needed for future use–screen intervals too deep for monitoring of upper aquifer–plug and abandon
<b>Previously Plugged and Abandoned Wells</b>		
BW1	Plugged and abandoned in 2004	NA
BW-2	Plugged and abandoned in 2003	NA
BW-4	Plugged and abandoned in 1994	NA
MW-1	Plugged and abandoned in 1997	NA

BW = Background Well.  
 D = VE System Well.  
 ft = Foot (feet).  
 MW = Monitoring Well.  
 NA = Not applicable.  
 UI = VE System Well.  
 VE = Vapor extraction.  
 VMW = VE System Well.  
 VOC = Volatile organic compound.

### **1.4.2. Soil-Gas Monitoring System**

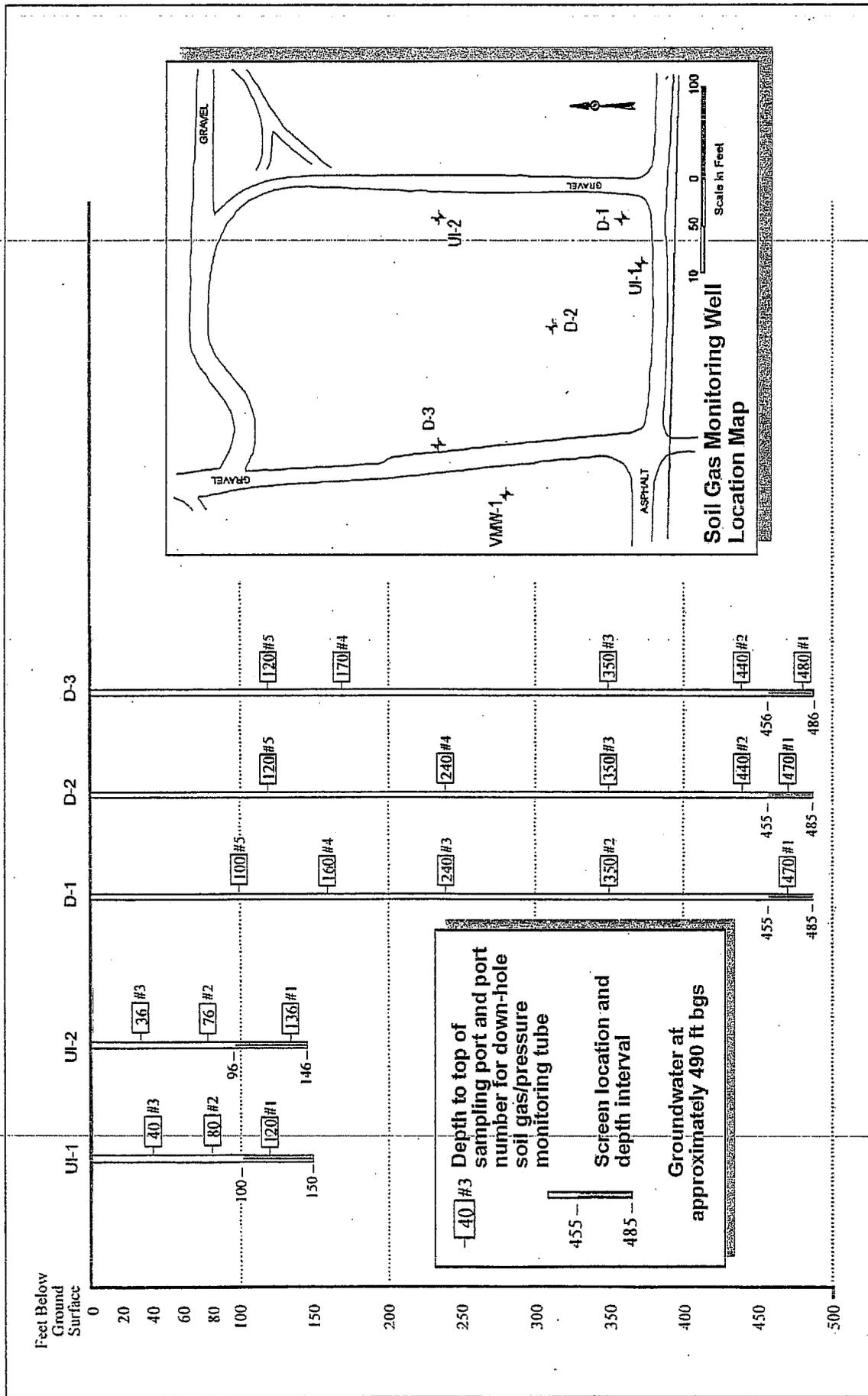
The post-closure care soil-gas monitoring program is designed to ensure the protection of groundwater quality by providing data to be used to analyze whether the VOC soil-gas plume has the potential to contaminate groundwater. The VOC soil-gas monitoring system shall include a network of five former VE/injection wells designed to monitor the vadose zone at various depths beneath the CWL in the area most contaminated by past disposal of organic liquid waste. The monitoring network shall include the following wells that are shown in Figures 6 and 10. Depth-specific sampling ports are shown in Figure 10 and are also indicated as follows for each soil-gas monitoring well:

- D1—Sampling Ports at 100, 160, 240, 350, and 470 feet bgs (5 ports)
- D2—Sampling Ports at 120, 240, 350, 440, and 470 feet bgs (5 ports)
- D3—Sampling Ports at 120, 170, 350, 440, and 480 feet bgs (5 ports)
- UI1—Sampling Ports at 40, 80, and 120 feet bgs (3 ports)
- UI2—Sampling Ports at 36, 76, and 136 feet bgs (3 ports)

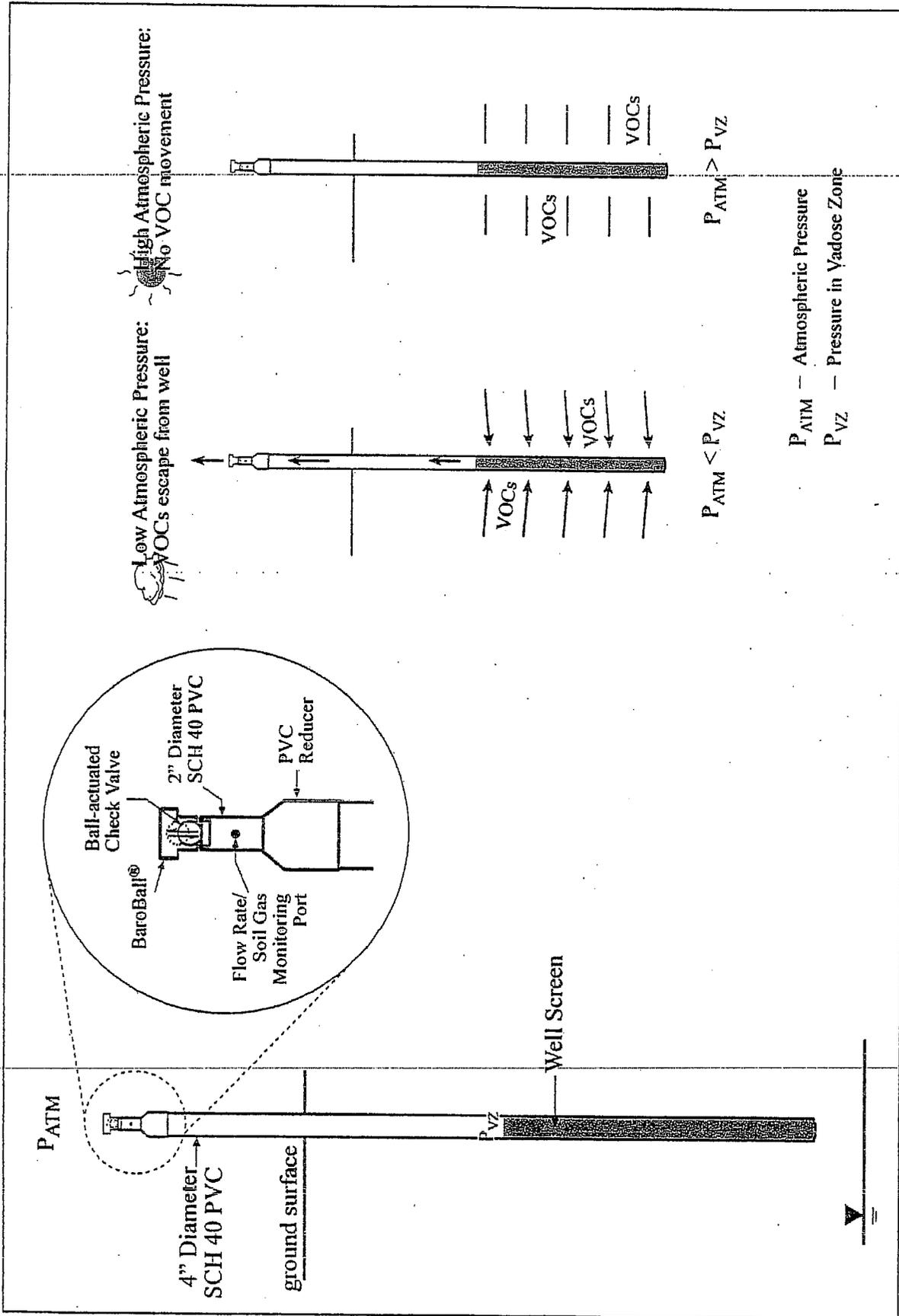
Well completion diagrams for all of the soil-gas monitoring wells are provided in Attachment 3 of this Permit. BaroBalls™ shall be maintained on all soil-gas monitoring wells, except for CWL-D3, to facilitate passive venting during the post-closure care period. CWL-D3 is being used to field-test various organic sensors and is equipped with wiring that prohibits the installation of a BaroBall™. The BaroBall™ allows controlled, passive soil-gas venting to the atmosphere and helps prevent the downward migration of VOC soil gas in the well casing. These devices seal on the top of the well casing to allow soil gas to vent to the atmosphere during periods of low barometric pressure and prevent soil gas from being driven downward during periods of high atmospheric pressure. Figure 11 shows how the BaroBall™ device works.

### **1.5. DESCRIPTION OF STORM-WATER DIVERSION STRUCTURES**

The function of the storm-water diversion features associated with the CWL shall be to prevent storm-water run-on and run-off from eroding the cover and to reduce the amount of water that could potentially infiltrate into the cover. Drainage features designed to control surface-water run-on and run-off are shown in Figure 12. A culvert at the southeastern corner of the CWL diverts the existing road ditch drainage from the east (north side of the road) under the asphalt road and to the south. This diversion prevents surface water coming from the east from flowing over the southern footprint of the CWL (Figures 6 and 12). Existing and new road ditches and swales channel surface water along the southern, western, and northern sides of the cover to the north and west, respectively, away from the cover (Figures 6 and 12). The revegetated, gently sloping topography (approximately 3-percent grade from east to west) and slight northeast and southeast inflection to the east of the landfill will prevent significant run-on by directing the upgradient surface water toward the northern and southern boundary swales (Figure 12). Surface water that falls directly on the cover shall be diverted toward the boundary swales that intersect at the northwestern and southwestern corners of the site.



**Figure 10**  
Soil-Gas Monitoring Wells and Depth-Specific Sampling Ports  
Chemical Waste Landfill



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Figure 11  
Schematic of Passive Soil-Gas Venting Well Equipped with a BaroBall™ Device  
Chemical Waste Landfill



## **1.6. DESCRIPTION OF SECURITY FENCES**

The CWL is located about 100 yards southeast of the Corrective Action Management Unit (CAMU) and approximately 150 yards due east of the Radioactive and Mixed Waste Management Unit inside Technical Area III (TA-III), which is controlled by fences, security patrols, and limited access through security gates. TA-III access control procedures are designed to assure that only properly identified personnel with appropriate Facility issued access badges and identification, and authorized persons, vehicles, or escorted visitors, are allowed access to the CWL.

The perimeter boundary of the Chemical Waste Landfill is illustrated on Figures 6 and 12 of this Permit Attachment. A four-strand, barbed-wire fence with two main gates delineates this boundary.

The gates shall remain locked except when inspections, maintenance, and monitoring activities are occurring, and only authorized personnel shall control the keys to the locks. Warning signs stating “*Danger—Unauthorized Personnel Keep Out*” in both Spanish and English shall be posted on all sides of the CWL fence at 100-foot intervals, at the main gate, and at the emergency exit. The warning signs shall be legible from a distance of at least 25 feet and visible from any approach to the CWL.

## **1.7. POST-CLOSURE CARE**

The Permittees shall comply with all applicable post-closure requirements contained in 40 C.F.R. §§ 264.117 through 264.120. This section outlines procedures necessary to protect human health and the environment, including monitoring and maintenance activities, and the frequency with which such activities shall be performed to ensure the integrity and proper functioning of the final cover and the groundwater and soil-gas monitoring networks. Among the other requirements in this Permit, the Permittees shall conduct the following activities to protect human health and the environment.

1. Maintain the integrity and effectiveness of the cover by making repairs necessary to correct the effects of settling, subsidence, erosion, animal intrusion, or other events that compromise the cover;
2. Maintain surface water controls to prevent run-on and run-off from eroding or otherwise damaging the cover;
3. Perform groundwater and VOC soil-gas monitoring as specified herein;
4. Conduct corrective action as necessary to protect human health and the environment;
5. Maintain fencing, security signs, and locks (i.e., site-specific access controls);
6. Maintain training, operating, inspection, and monitoring, and other required records; and
7. Submit an annual report to the Department providing the results of the required inspections, sampling results, and a summary of any needed repairs and whether the repairs were effective.

## **1.8. MONITORING PROCESS**

Monitoring of environmental media shall consist of groundwater and soil-gas monitoring. The compliance groundwater monitoring program is designed to monitor water quality to ensure the

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protection of groundwater by addressing the requirements of 40 C.F.R. Part 264 Subpart F.

Soil-gas data, including that for TCE, shall be acquired and evaluated in a manner that is consistent with historic soil-gas monitoring data so that results obtained during post-closure can be compared with the historic data to determine if any significant changes in soil-gas concentrations have occurred. Soil-gas constituents of concern (COCs) include numerous VOCs, which are to be analyzed for by Compendium Method TO-14 (EPA January 1999).

A summary of groundwater and soil-gas monitoring frequency, parameters, and analytical methods is presented in Table 1-4 of this Permit Attachment. If changes to the monitoring program are warranted, the Permittees shall initiate a permit modification request to modify this Permit.

**TABLE 1-4**

**Chemical Waste Landfill  
 Groundwater and Soil-Gas Monitoring Frequency, Parameters, and Methods**

<b>Monitoring System</b>	<b>Monitoring Frequency</b>	<b>Monitoring Parameters/Constituents of Concern</b>	<b>Monitoring Method</b>
Groundwater	Semi-Annually <sup>c</sup>	TCE by EPA Method 8260 <sup>a</sup> and Cr and Ni by EPA Methods 6020 <sup>a</sup>	Sampling and Analysis as per Attachment 2
Soil Gas	Annually	Compendium Method TO-14 VOCs <sup>b</sup>	Sampling and Analysis as per Attachment 3

<sup>a</sup>EPA November 1986.

<sup>b</sup>EPA January 1999.

<sup>c</sup>Semi-Annually: All 40 C.F.R. Part 264 Appendix IX constituents must be analyzed on an annual basis.

EPA = U.S. Environmental Protection Agency.

TO-14 = EPA Method TO-14.

VOCs = Volatile organic compounds.

Additionally, in accordance with 40 C.F.R. § 264.99(g), the Permittees shall collect water samples at least annually from wells located at the point of compliance and analyze them for all constituents contained in Appendix IX of 40 C.F.R. Part 264.

**1.8.1. Groundwater Monitoring Process**

*1.8.1.1. Frequency*

The groundwater monitoring network defined in Section 1.4.1 of this Permit Attachment shall be sampled according to the Groundwater Sampling and Analysis Plan (SAP) provided in Attachment 2 of this Permit. The Groundwater SAP describes the procedures, methods, and analytical protocols for collecting and analyzing groundwater samples that shall be followed.

In accordance with 40 C.F.R. § 264.97(f), the Permittees shall determine the groundwater surface elevation each time groundwater is sampled. Additionally, in accordance with 40 C.F.R. §

264.99(e), the Permittees shall determine the groundwater flow rate, hydraulic gradient, and flow direction at least annually.

In accordance with 40 C.F.R. § 264.99(f), the Permittees shall collect and analyze at least four samples from each well (background and compliance wells) at least semi-annually during the compliance period. The Permittees shall also collect groundwater samples at least annually from wells located at the point of compliance and analyze them for all constituents contained in Appendix IX of 40 C.F.R. Part 264.

*1.8.1.2. Assessment*

The Permittees shall monitor the groundwater for the hazardous constituents listed in Table 1-2 of this Permit Attachment semi-annually (twice each year), and annually for 40 C.F.R. Part 264 Appendix IX constituents, to determine whether the groundwater beneath the CWL is in compliance with the groundwater protection standard under 40 C.F.R. § 264.92. The Permittees shall also record the groundwater data for the determination of statistical significance under 40 C.F.R. § 264.97(h) for the compliance period, pursuant to 40 C.F.R. § 269.99(c).

In accordance with 40 C.F.R. § 264.99(g), if the Permittees find 40 C.F.R. Part 264 Appendix IX constituents in the groundwater that are not already identified in the Permit, the Permittees may resample within one month and repeat the Appendix IX analysis. If the second analysis confirms the presence of new constituents, the Permittees must report the concentrations of the new constituents to the Department within seven days of receipt of the results of the second analysis and add them to the monitoring list (See Table 1-2). If the Permittees choose not to resample, then the Permittees must report the concentrations of the new constituents to the Department within seven days of receipt of the results of the analysis and add them to the monitoring list (Table 1-2).

In accordance with 40 C.F.R. § 264.99(d), the Permittees must determine after each semi-annual sampling event whether there is statistically significant evidence of increased contamination for each of the hazardous constituents specified in Table 1-2. The Permittees shall compare the data collected at the compliance points to the concentration limits specified in Table 1-2 using the method specified in Table 1-4 of this Permit Attachment.

In accordance with 40 C.F.R. § 264.99(h), the Permittees shall notify the Department in writing within seven days if any concentration limits (Table 1-2) are being exceeded at any monitoring well at the point of compliance. The notification must indicate what concentration limits have been exceeded. Within 180 days of the determination that a concentration limit has been exceeded, the Permittees must submit to the Department an application for a permit modification to establish a corrective action program for the CWL meeting the requirements of 40 C.F.R. § 264.100. The application at a minimum shall meet the requirements of 40 C.F.R. § 264.99(h)(2)(i-ii).

Regulations at 40 C.F.R. § 264.99(i) allow the Permittees the opportunity to demonstrate that sampling or analysis error or a source other than the CWL caused a concentration limit (Table 1-2) to be exceeded. In making such a demonstration, the Permittees must notify the Department in writing within seven days that the Permittees wish to make a demonstration under 40 C.F.R. § 264.99(i). The Permittees shall also meet the requirements of 40 C.F.R. § 264.99(i)(1-4), including the requirement to submit a report to the Department within 90 days, which demonstrates that error

or another source caused the concentration limit to be exceeded.

## **1.8.2. Soil-Gas Monitoring Process**

### *1.8.2.1. Frequency*

The soil-gas monitoring network defined in Section 1.4.2 of this Permit Attachment shall be sampled annually in accordance with the Soil-Gas SAP provided in Attachment 3 of this Permit. The SAP describes the procedures, methods, and analytical protocols for collecting and analyzing soil-gas samples that shall be followed during the post-closure care period.

### *1.8.2.2. Assessment*

The soil-gas monitoring network shall be used to document VOC soil-gas plume conditions over time and to determine whether the plume may potentially contaminate groundwater such that a maximum contaminant level (MCL) or State of New Mexico water quality standard is exceeded. The five soil-gas monitoring well depth-specific sampling ports shall be sampled annually for Compendium Method TO-14 VOCs (EPA January 1999). Table 1-5 of this Permit Attachment presents the analyte list for Compendium Method TO-14. If a sample result for one or more of the deepest sampling ports (Port 1) from CWL-D1 through D3 exceeds the trigger level of 20 parts per million volume basis (ppmv) TCE or for any other compound listed in Table 1-5, the Permittees shall immediately confirm the results by collecting and analyzing additional samples. If the results confirm that the trigger level of 20 ppmv has been exceeded, the Permittees shall conduct corrective action. If the second analysis confirms that the trigger level has been exceeded, the Permittees must notify the Department in writing within seven days after receipt of the second analysis, confirming that the trigger level has been exceeded.

**TABLE 1-5**  
**Chemical Waste Landfill Post-Closure Care Soil-Gas Monitoring**  
**EPA Compendium Method TO-14 Analyte List<sup>a</sup>**

<b>Compound</b>	<b>Compound</b>
Acetone	1,2-Dichloropropane
Benzene	cis-1,3-Dichloropropene
Benzyl chloride	trans-1,3-Dichloropropene
Bromodichloromethane	Ethyl benzene
Bromoform	4-Ethyltoluene
Bromomethane	Hexachlorobutadiene
2-Butanone	2-Hexanone
Carbon disulfide	Methylene chloride
Carbon tetrachloride	4-Methyl-2-pentanone
Chlorobenzene	Styrene
Chloroethane	1,1,2,2-Tetrachloroethane
Chloroform	Tetrachloroethene
Chloromethane	Toluene
Dibromochloromethane	1,1,2-Trichloro-1,2,2-trifluoroethane
1,2-Dibromoethane	1,2,4-Trichlorobenzene
1,2-Dichloro-1,1,2,2-tetrafluoroethane	1,1,1-Trichloroethane
1,2-Dichlorobenzene	1,1,2-Trichloroethane
1,3-Dichlorobenzene	Trichloroethene
1,4-Dichlorobenzene	Trichlorofluoromethane
Dichlorodifluoromethane	1,2,4-Trimethylbenzene
1,1-Dichloroethane	1,3,5-Trimethylbenzene
1,2-Dichloroethane	Vinyl acetate
1,1-Dichloroethene	Vinyl chloride
cis-1,2-Dichloroethene	m-, p-Xylene
trans-1,2-Dichloroethene	o-Xylene

<sup>a</sup>EPA January 1999.

### **1.8.3. Corrective Action**

Pursuant to Section 3004(u) and (v) of RCRA, 42 U.S.C. § 6924(u) and (v); NMSA 1978, § 74-4-4.2(B) and 40 C.F.R. Part 264, Subparts F and G, the Permittees shall implement corrective action as necessary to protect human health and the environment from all releases of hazardous waste or hazardous constituents from operating or closed units, and from any releases of hazardous wastes or hazardous constituents from any SWMU or AOC at the Facility.

If corrective action is underway at the end of the post-closure care period, the post-closure care period may be extended by the Department in accordance with 40 C.F.R. § 264.117(a)(2)(ii). If the Permittees are engaged in a corrective action program at the end of the compliance period, the compliance period shall be extended until the Permittees can demonstrate that the groundwater protection standard of 40 C.F.R. § 264.92 has not been exceeded for a period of three consecutive years in accordance with 40 C.F.R. § 264.96(c).

### **1.9. INSPECTION/MAINTENANCE/REPAIR ACTIVITIES AND FREQUENCIES**

Systems associated with the CWL shall be routinely inspected during the compliance monitoring and post-closure care periods. The CWL systems that shall require inspection and maintenance/ repair include: 1) the cover; 2) surface-water diversion structures; 3) groundwater and soil-gas monitoring networks; and 4) the perimeter security fence, security signs, gate locks and survey benchmarks and monuments. Inspection, maintenance and repair of these systems shall be performed throughout the compliance monitoring and post-closure care periods on a regularly scheduled basis to ensure the integrity and proper functioning of the cover, the monitoring networks, the surface-water diversion structures, the perimeter fence, security signs, gates, locks (i.e., access controls), and monuments. These routines are described in more detail in the following sections.

#### **Criteria for Successful Re-Vegetation**

In addition to routine inspection and maintenance/ repair, the cover shall be monitored to ensure the re-vegetation effort is successful, a critical element in the long-term performance of the cover.

The following information summarizes a climax plant community typical of the undisturbed east mesa ecosystem of TA-III (Peace et al. November 2004, Table 1-5).

- Total percent foliar coverage equals 22.5 percent (i.e., 22.5 percent of the land surface is covered with living plants versus 77.5 percent bare surface area);
- Of the 22.5 percent of total foliar coverage, 19.2 percent is comprised of native perennial species and 3.3 percent is comprised of annual species, which includes native annual species and non-native, transitory (or invasive) plant species; and
- Considering only the total percentage of foliar coverage, 85.3 percent consists of native perennial species, and 14.67 percent comprises annual species (the majority of the annual species are non-native, transitory species).

Based upon this information, the operational criteria for achieving successful re-vegetation for the CWL cover are presented as follows.

- Total percent foliar coverage equals 25 percent (i.e., 25 percent of the land surface is covered with living plants versus 75 percent bare surface area);
- Of the 25 percent total foliar coverage, 50 percent or greater comprises native perennial species, and 50 percent or less comprises annual species; and
- No contiguous bare spots greater than 200 square feet (approximately 14 by 14 feet) are present.

If these criteria are met, it shall be concluded that the native community is successfully re-established.

Successful re-vegetation is projected to take three to five years. The cover monitoring, inspection, and maintenance/repair activities described in Section 1.9.1 of this Permit Attachment shall document the cover re-vegetation effort and whether or not the criteria are met. Local climate trends will have an impact on plant growth and health and shall be documented, evaluated, and summarized along with vegetation survey results in the annual CWL post-closure care reports.

### **1.9.1. Final Cover System Inspection/Maintenance/Repair**

#### *1.9.1.1. Vegetation Inspection and Monitoring*

Cover vegetation monitoring shall be accomplished in a two-phase approach. The first phase shall concentrate on establishing the vegetation on the cover from seed to a mature plant community. This phase is anticipated to take from three to five years, but shall not exceed 5 years. Normal succession processes should occur and continue once native flora has been established over greater than 50% of the cover area. During this period, a staff biologist shall inspect and document the inventory of the main flora populating the cover on a quarterly basis, inspect the cover for contiguous areas lacking vegetation in excess of 200 square feet, and recommend soil augmentations, surface scarification, reseeding, or other corrective actions as deemed appropriate to establish a long-term sustainable native plant community. During this monitoring period, the staff biologist shall also be responsible for noting and interpreting signs of animal intrusion. These inspections shall be documented on the Biology Checklist for the CWL Cover inspection form (Attachment 4 of this Permit). At the end of the fourth quarter of each year, the staff biologist shall compile the results of the quarterly inspections in a summary report that shall be included in the annual CWL post-closure care report submitted to the Department.

Once native flora has been established in a self-sustaining manner on the cover, the second phase of monitoring shall begin. Cover vegetation monitoring by the staff biologist shall transition to an annual frequency to assess the overall health of the cover vegetation. Based upon those observations, the staff biologist shall recommend in writing any soil augmentation, surface scarification, and reseeding as necessary to meet the criteria for successful re-vegetation as defined in Section 1.9 of this Permit Attachment. The Permittees shall implement corrective actions in consideration of the staff biologist's recommendations within 60 days of receipt of the recommendations. The results of the staff biologist's inspections shall be reported in each of the annual post-closure care reports to be submitted to the Department.

### *1.9.1.2. Cover Inspection*

A qualified technician shall perform cover inspections on a quarterly basis. Settlement of the cover surface in excess of 6 inches, erosion of the cover soil in excess of 6 inches deep, areas of ponding water, animal intrusion burrows in excess of 4 inches in diameter, contiguous areas lacking vegetation in excess of 200 square feet, and any other conditions that may impact the cover's integrity shall be noted on the Cover Inspection Checklist (Attachment 4 of this Permit). Documentation of animal intrusion burrows in excess of 4 inches in diameter and contiguous areas lacking vegetation in excess of 200 square feet may be noted quarterly on the Biology Checklist for the CWL Cover (Attachment 4 of this Permit) instead of the Cover Inspection Checklist.

### *1.9.1.3. Maintenance/Repair*

The Permittees shall perform soil augmentations, surface scarification, reseeding, or other vegetation maintenance/repair as necessary. Damage to cover vegetation that exceeds the above mentioned criteria shall be repaired within 60 days to a condition that meets or exceeds the original design. Repairs to the cover shall be done using materials consistent with the cover installation specifications, according to soil classification and gradation specifications in the RAP (SNL/NM December 2004). Repair specifications include, but are not limited to, the following.

- Soil augmentations, surface scarification, reseeding, or other corrective actions for areas lacking vegetation in excess of 200 square feet and re-establishing the topsoil layer to provide a suitable seedbed; and
- Backfilling and compacting settlement areas, areas of ponding water, animal intrusion burrows, and areas of erosion in excess of 6 inches deep using either stockpiled clean soil from the cover installation or locally derived clean fill with properties identical to the soil used to construct the CWL cover.

## **1.9.2. Storm-Water Diversion Structure Inspection/Maintenance/Repair**

### *1.9.2.1. Inspection*

The function of storm-water diversion structures associated with the cover shall be to prevent storm-water run-on and run-off from eroding the cover and to reduce the amount of water that could potentially infiltrate the cover. The storm-water diversion structures shall be inspected on a quarterly basis to verify structural integrity and to ensure adequate performance. Inspections shall document erosion of the channels or sidewalls in excess of 6 inches deep and accumulations of silt greater than 6 inches deep or debris that block more than one-third of the channel width.

### *1.9.2.2. Maintenance/Repair*

Based upon the results from the storm-water diversion structure inspections, erosion or other damage that exceeds the above mentioned criteria shall be repaired within 60 days to a condition that meets or exceeds the original design. Silt and debris accumulations that exceed these limits shall be removed within 60 days. Reseeding of the surface drainage features shall also be performed to facilitate re-vegetation and erosion resistance, if needed.

### **1.9.3. Monitoring Well Network Inspection/Maintenance/Repair**

#### *1.9.3.1. Inspection*

Monitoring wells shall be inspected during all groundwater and soil-gas monitoring events. The inspection shall note the condition of the components including protective casings and bollards, wellhead covers/caps/locks, soil-gas sampling ports, well identification markings, and passive venting BaroBalls™. Groundwater pumps and sample tubing shall be inspected during each sampling event (pumps are not dedicated to the wells). Pump replacement and maintenance/repair and tubing replacement shall be performed on an as-needed basis based upon pump and tubing performance, inspections, and review of analytical sampling results.

#### *1.9.3.2. Maintenance/Repair*

The monitoring well components shall be maintained/repared/replaced as needed within 60 days of discovery of any needed repairs. Maintenance/repair activities shall also include ensuring that all monitoring well components are protected from the weather.

### **1.9.4. Security Fence Inspection/Maintenance/Repair**

#### *1.9.4.1. Inspection*

The fence, gates, locks, and warning signs at the CWL shall be inspected on a quarterly basis. The inspections shall document in writing the condition of the fence, including fence wires, posts, gates, gate locks, and warning signs, and note excessive accumulations of wind-blown plants and debris that would obscure warning signs, block access to the CWL, or interfere with any of the groundwater or soil-gas monitoring network components, or any sampling using said components. Local survey benchmarks and/or monuments shall also be inspected.

Inspection of the TA-III perimeter fence shall be performed by routine security patrols.

#### *1.9.4.2. Maintenance/Repair*

The fence, gates, locks, warning signs, and survey benchmarks and monuments shall be maintained/repared within 60 days of discovery by routine inspections. Activities may include, but are not limited to, removing excessive accumulations of wind-blown plants and debris, repairing broken wire sections and posts, repairing and oiling gates, cleaning or replacing locks, repairing or replacing warning signs, and removing excess soil and/or vegetation covering survey monuments. Maintenance records shall be maintained with the PCIFs.

The Permittees shall also perform repair and maintenance of the TA-III perimeter fence.

### **1.10. INSPECTION SCHEDULE, CORRECTIVE ACTIONS, AND RECORDED RESULTS**

A schedule for implementing inspections and prescribed maintenance of the CWL cover, surface-water drainage features, monitoring network, and access controls is provided in Table 1-6. Inspection results for the CWL monitoring systems shall be recorded on the Post-Closure Inspection

Forms (PCIFs) included in Attachment 4 of this Permit. Copies of completed forms shall be provided and summarized in the annual CWL post-closure care report. The completed forms shall document in writing the inspector, a notation of the observations made, and the date and nature of any repairs or other corrective actions taken. Incomplete inspection forms shall be considered representative of incomplete inspections, and shall constitute a violation of this Permit.

Repairs and maintenance shall be undertaken to ensure protection of human health and the environment and mitigate any potential hazards. If an inspection of the CWL reveals that a non-emergency problem has developed, the needed repairs, maintenance, or replacement shall be initiated within three days, unless circumstances beyond the control of the Permittees cause further delay. The Permittees shall limit any such delays to as short a time period as reasonably possible. Repairs shall not take longer than 60 days to complete. If a hazard appears imminent or a hazardous situation already exists, remedial action shall be initiated immediately. Any action taken pursuant to an inspection shall be noted on the CWL PCIF. If any identified hazard meets the definition of an emergency, as specified in Section 1.14 of this Permit Attachment, the Facility's Contingency Plan for the CWL shall be implemented by the Permittees, and required notification procedures shall be followed. The Permittees shall report to the Department any remedial activities related to an emergency within one (1) business day.

#### **1.11. PERSONNEL TRAINING**

The personnel training program for inspection, monitoring, maintenance and repair of the CWL during the compliance monitoring and post-closure care periods is included in this Permit as Attachment 5. All personnel working at the CWL shall be trained, at a minimum, in accordance with the requirements of this Permit.

**TABLE 1-6**  
**Chemical Waste Landfill**  
**Post-Closure Inspection and Maintenance/Repair Schedules and Prescribed**  
**Maintenance/Repairs of the CWL and Associated Systems**

<b>System to be Inspected</b>	<b>Inspection Parameters</b>	<b>Inspection Frequency</b>	<b>Maintenance Implementation</b>	<b>Maintenance/Repair Frequency<sup>a</sup></b>
Final Cover Surface	Vegetation Inventory	Quarterly for 3 to 5 years, annually thereafter by a qualified staff biologist <sup>b</sup>	Soil augmentations and/or reseeding	Within 60 days of discovery of needed repairs
	Contiguous areas of no vegetation >200 ft <sup>2</sup>		Revegetate barren areas that exceed prescribed limits	
	Animal intrusion burrows in excess of 4 inches in diameter		Repair cover system damage that exceeds prescribed limits	
Final Cover Surface	Settlement of cover surface in excess of 6 inches	Quarterly by a qualified field technician	Repair cover system damage that exceeds prescribed limits	Within 60 days of discovery of needed repairs
	Erosion of cover soil in excess of 6 inches deep			Within 60 days of discovery of needed repairs
	Animal intrusion burrows in excess of 4 inches in diameter			Within 60 days of discovery of needed repairs
	Contiguous areas of no vegetation >200 ft <sup>2</sup>		Revegetate barren areas that exceed prescribed limits	Within 60 days of discovery of needed repairs
Storm-Water Diversion Structures	Channel or sidewall erosion in excess of 6 inches deep	Quarterly by a qualified field technician	Repair erosion that exceeds prescribed limits	Within 60 days of discovery of needed repairs
	Accumulations of silt in excess of 6 inches deep or debris that blocks more than 1/3 of the channel width		Remove silt and debris accumulations that exceed prescribed limits	
Soil-Gas and Groundwater Monitoring Wells	Concrete pads, bollards, and protective casings	Groundwater Network Components: semi-annually by a qualified field technician during sampling events	Maintain, clean, repair, replace, relabel, as appropriate	Within 60 days of discovery of needed repairs
	Well cover caps and Swagelok® (or equivalent) dust caps			
	Passive venting BaroBalls™			
	Monitoring wells and soil-gas sample port labels	Soil-Gas Network Components: annually by a qualified field technician during		
	Locks			

System to be Inspected	Inspection Parameters	Inspection Frequency	Maintenance Implementation	Maintenance/Repair Frequency <sup>a</sup>
	Sampling pumps and tubing	sampling events		
Security Fence	Presence of wind-blown plants and debris	Quarterly by a qualified field technician	Remove wind-blown plants and debris	Within 60 days of discovery of needed repairs
	Condition of fence wires, posts, gates, gate locks, warning signs, and survey monuments in the local area		Repair broken wire sections and posts, repair/oil gates, clean/replace locks, repair/replace warning signs, clear dirt/debris from monuments	
Emergency Equipment	See Attachment 6, CWL Site-Specific Contingency Plan	Quarterly by a qualified field technician	Repair/replace as needed	Within 60 days of discovery of needed repairs/replacement

<sup>a</sup>Maintenance/repairs shall be performed as necessary, based upon the results of inspections.

<sup>b</sup>As explained in Section 1.9.1 of this Permit Attachment, the transition from quarterly to annual inspections by a staff biologist is based upon the establishment of native flora in a self-sustaining manner as determined by the staff biologist.

ft<sup>2</sup> = Square feet.

### 1.12. RECORD KEEPING AND REPORTING

The following records shall be maintained at the Corrective Action Management Unit (CAMU) administration trailer and at the Facility's Environmental Safety and Health (ES&H) and Security Records Center.

1. Current and complete copy of this Permit, including all Attachments;
2. Written current versions of operating procedures (administrative, standard, and laboratory) and related guidance referenced in this Permit;
3. Personnel training records required by this Permit for current personnel covering the past 12 months;
4. A written Operating Record that includes:
  - a. All completed inspection forms,
  - b. Post-closure care annual reports for the last three years, and
  - c. All waste management documentation for the last three years;
  - d. Emergency or incident response records and reports
5. Site-specific health and safety plan (current version).

The following records shall be maintained at the ES&H and Security Records Center:

1. All correspondence and other documents from the Department and any other governmental agencies related to compliance monitoring and post-closure care;
2. All training records for current employees and training records for any former employee for a minimum of three years from the last date the employee worked at the CWL;
3. All completed post-closure care annual reports;
4. All groundwater monitoring results and records, including full laboratory data packages/reports;
5. All soil-gas monitoring results and records, including full laboratory data packages/reports; and
6. All records of actions taken to prevent or mitigate releases of hazardous waste or hazardous constituents to the environment.

The Permittees shall comply with the record-keeping provisions of 40 C.F.R. § 264.74, concerning the availability, retention, and disposition of records.

During the compliance monitoring and post-closure care periods, the Permittees shall submit a CWL post-closure care report to the Department on an annual basis. The report shall:

1. Summarize inspection, maintenance, and repair activities, and indicate whether any implemented repairs were effective and met the original specifications;
2. Provide groundwater and VOC soil-gas monitoring results;
3. Indicate whether trigger levels for soil gas were exceeded;
4. Indicate whether there has been any statistically significant increase in the concentration of a hazardous constituent in groundwater in any of the wells at the point of compliance;
5. Indicate whether any hazardous constituents exceeded their corresponding concentration limits;
6. Indicate whether any new hazardous constituents (40 C.F.R. Part 261 Appendix VIII) were identified and whether they were added to the monitoring list; and
7. Summarize any problems that either endangered or presented significant potential to endanger human health and the environment for the reporting period and what was done to mitigate such problems.

The annual reports are due by March 31 of each calendar year.

### **1.13. POTENTIAL FOR EXPOSURE**

The cover provides a barrier between the surface environment and contaminated soil beneath the cover. The following measures have been implemented to reduce the risk of exposure from contaminants at the CWL:

1. The engineered cover is designed to minimize the potential for the migration of liquid into the former CWL and the transport of liquid from the CWL into the surrounding environment;

2. Monitoring of the groundwater and VOC soil-gas plume shall be conducted to determine whether contaminants are being released that pose a threat to groundwater;
3. Security measures shall maintain restricted access to the area;
4. Land-use designation shall prevent inappropriate use of the CWL site; and
5. Inspections, maintenance, and repairs shall be performed as needed, on a regular scheduled basis, and in accordance with this Permit.

#### **1.14. POTENTIAL FOR EMERGENCY**

Due to the current conditions of the CWL, the potential for fire, explosion, or unplanned sudden or gradual release of RCRA-regulated hazardous waste or hazardous waste constituents that would significantly threaten human health or the environment is low. However, the Facility's Contingency Plan shall be maintained in the CAMU administrative trailer in the event of an incident or emergency. The Facility's Emergency Operations Center also provides coordination/resources and appropriate emergency equipment on a Facility-wide basis.

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## **PERMIT ATTACHMENT 2: GROUNDWATER SAMPLING AND ANALYSIS PLAN**

### **2.0 INTRODUCTION**

This Sampling and Analysis Plan (SAP) provides additional requirements that shall be adhered to by the Permittees for the collection and analysis of water samples from groundwater monitoring wells located at the Chemical Waste Landfill (CWL) during the post-closure care and compliance monitoring periods. The post-closure care and compliance groundwater monitoring program is designed to address the requirements of 40 C.F.R. Part 264 Subpart F.

The Permittees must comply with the groundwater protection standard at 40 C.F.R. § 264.92. The hazardous constituents that shall be monitored in accordance with 40 C.F.R. § 264.93 are trichloroethene, chromium, and nickel. Additionally, in accordance with 40 C.F.R. § 264.99(g), the Permittees shall collect and analyze water samples for all constituents contained in Appendix IX of 40 C.F.R. Part 264 at least annually from wells located at the point of compliance and the background well.

The purpose of this SAP is to document procedures for the collection and reporting of consistent, reliable, defensible, and comparable groundwater sampling results. This SAP provides additional instructions for sample collection, data management, and reporting of data that shall be adhered to during the post-closure care and compliance periods. Other instructions are provided in Sandia National Laboratories/NM (SNL/NM) Field Operating Procedures (FOPs), SNL/NM Administrative Operating Procedures (AOPs), and the SNL/NM Statement of Work (SOW) for Analytical Laboratories; however, the requirements of this SAP and the CWL Post-Closure Care Permit (Permit) shall take precedence over any FOPs, AOPs, or SOWs. Table 2-1 summarizes documents that are referenced in this SAP, which can be obtained from the SNL/NM Environmental Safety and Health (ES&H) and Security Records Center. The most current versions of these documents shall be consulted for the purpose of conducting groundwater sampling.

The Permittees shall provide to the New Mexico Environment Department (the Department) within 60 days of the effective date of this Permit in hard copy and electronic format the current versions of the FOPs and AOPs listed above. The Permittees shall provide the Department with any updated versions of the FOPs/AOPs within 30 days of their acceptance by the Permittees. All procedures contained within the FOPs and AOPs concerning sampling and analysis are subject to approval by the Department.

#### **2.1. DATA QUALITY OBJECTIVES AND QUALITY CONTROL**

The data quality objective (DQO) for groundwater monitoring is to collect accurate and defensible data of high quality to assess the concentrations of hazardous constituents in the groundwater in the uppermost aquifer underlying the CWL such that they can be compared to the concentration limits in Table 1-2 in Permit Attachment 1, as it may be amended. The Permittees shall evaluate accuracy, precision, representativeness, completeness, and comparability of the groundwater data to verify that data are of high quality and ensure that the DQO is met. Quality control (QC) procedures discussed in Section 2.20 of this Permit Attachment shall also be used to determine whether the DQO has been attained. QC samples generated in both the field and the laboratory shall be analyzed and evaluated. Laboratory measurements shall comply with SNL/NM Sample Management Office (SMO)

procedures and protocols listed in Table 2-1, including qualification or validation of laboratory

**TABLE 2-1**  
**Reference Documentation**  
**CWL Groundwater Monitoring**

<b>Document Number</b>	<b>Document Title</b>
AOP 00-03	Data Validation Procedure for Chemical and Radiochemical Data
AOP 95-16	Sample Management and Custody
FOP 05-01	Groundwater Monitoring Well Sampling and Field Analytical Measurements
FOP 05-02	Groundwater Monitoring Equipment Field Check For Water Quality Measurements
FOP 05-03	Groundwater Sampling Equipment Decontamination
FOP 05-04	Groundwater Monitoring Waste Management
LOP 94-03	Sample Handling, Packaging, and Shipping
PLA 05-09	Groundwater Health and Safety Plan
SMO 05-03	Procedure for Completing the Contract Verification Review
Not Applicable	SNL/NM Statement of work for Analytical Laboratories
Not Applicable	Quality Assurance Project Plan for the Sample Management Office

**Sandia National Lab's Offices and Documents:**

- AOP = Administrative Operating Procedure.
- FOP = Field Operating Procedure.
- LOP = Laboratory Operating Procedure.
- SMO = Sample Management Office.

analytical data, and shall also comply with this Permit. This procedure for determining the quality and usability of analytical data acquired during groundwater sampling shall be summarized in data validation reports regarding the overall quality of the data and the resulting data qualifiers. All associated data validation reports shall be submitted to the Department in the post-closure care annual report along with the results for each monitoring event. Data not meeting DQO requirements are subject to corrective action(s) as discussed in SNL/NM SMO procedures and protocol and as discussed in Section 2.22 of this Permit Attachment.

## 2.2. ACCURACY

Accuracy is the agreement between a measured value and an accepted reference value. When applied to a set of observed values, accuracy is influenced by a combination of a random component and a systematic bias. Accuracy shall be maintained and evaluated through referenced calibration standards, laboratory control samples (LCS), matrix spike (MS) samples, and surrogate spike samples. The bias component shall be evaluated and expressed as percent recovery (% R), as indicated in the equation below:

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

The acceptable range for %R shall be 50-130% for volatile organic compounds (VOCs), 10-130% for semi-volatile organics (SVOCs), and 75-125% for metals.

## 2.3. PRECISION

Precision is the agreement among a set of replicate measurements. Precision data shall be derived from field and laboratory duplicate samples. Precision shall be reported as relative percent difference (RPD), which is calculated as follows:

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

The acceptable range for RPD is 20% for VOCs, 25% for SVOCs, and 35% for metals.

## 2.4. COMPLETENESS

Completeness is defined as a measure of the amount of usable data compared to the total amount of data required. Examples of events that reduce the amount of usable data include improperly collected and preserved samples, missed holding times, sample container breakage, and operating outside prescribed QC limits. The completeness objective is 100 % for compliance data. If the completeness objective is not met and sufficient sample material remains for re-analysis, and if still appropriate, the laboratory shall repeat the analysis. Otherwise, the incomplete portion of the sampling shall be made complete by repeating the sampling and analysis as necessary. Percent completeness is expressed in the equation below:

$$\%Completeness = \frac{\text{number of useable data points}}{\text{total number of samples required}} \times 100\%$$

**2.5. DATA REPRESENTATIVENESS**

Data representativeness is the degree to which samples represent the media they are intended to represent. To help ensure that samples are representative of formation water, the Permittees shall implement the procedures in this Permit and regulatory guidance for groundwater purging and sampling found in Section IX of the Compliance Order on Consent (NMED April 2004). Monitoring wells shall be adequately purged and stability of field parameters achieved prior to the collection of water samples.

**2.6. COMPARABILITY**

Comparability is the extent to which one data set or value can be related to another. Comparability between data sets shall be achieved through the collection and analysis of samples using consistent methods and QC criteria.

**2.7. SAMPLING LOCATIONS AND FREQUENCY**

The compliance and post-closure care groundwater monitoring network at the CWL consists of four monitoring wells. The monitoring well network shall include one upgradient and three downgradient wells located near the CWL. These wells are identified as background well CWL-BW4A, and downgradient compliance monitoring wells CWL-MW4, MW5U, and MW6U. Table 2-2 summarizes the monitoring well network and groundwater sampling frequency. Well completion diagrams for these wells are provided in Appendix 2-1 of this Permit Attachment.

In accordance with 40 C.F.R. § 264.97(g)(1), a sequence of at least four duplicate water samples shall be collected from each well (background and compliance wells) during each of two semi-annual sampling events and shall be analyzed for trichloroethene (TCE), chromium (Cr), and nickel (Ni). Additionally, in accordance with 40 C.F.R. § 264.99(g), the Permittees shall collect and analyze water samples at least annually from wells located at the point of compliance for all constituents contained in Appendix IX of 40 C.F.R. Part 264.

The Permittees shall conduct semi-annual (twice each year) and annual groundwater sampling for the entire compliance and post-closure care-periods. Aqueous samples shall be reported in units of milligrams per liter (mg/L) or micrograms (µg)/L.

**TABLE 2-2  
 CWL Groundwater Monitoring Wells and Sampling Frequency**

Well Number	Installation Year	Semi-Annual Sampling		Comments
		TCE	Cr, Ni	
CWL-BW4A	1994	X	X	Upgradient well.
CWL-MW4	1990	X	X	Downgradient well with stainless steel screen.
CWL-MW5U	1994	X	X	Downgradient well.
CWL-MW6U	1994	X	X	Downgradient well.

Note: Refer to Table 2-3 for specific information regarding analytical methods and constituents.

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**APPENDIX 2-1**

**CWL GROUNDWATER MONITORING WELL NETWORK  
WELL COMPLETION DIAGRAMS**

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# VAPOR WELL DATABASE SUMMARY SHEET

Project Name: CHEM WASTE LANDFILL	Geo Location: TA-III
ER ADS #: 1267	Well Completion Date: 16-MAY-94
Well Name: CWL-BW4A	Completion Zone: CLAYEY SAND/FINE SAND
Owner Name: SNL	Formation of Completion: SANTA FE GROUP
Date Drilling Started: 10-MAY-94	Well Comment: SAMPLED QUARTERLY. WATER LEVEL MEASURED 8/2/96
Drilling Contractor: WATER DEVELOPMENT	
Drilling Method: AIR ROTARY/STRATEX	
Borehole Depth: 511	
Casing Depth: 510	

**Survey Data**

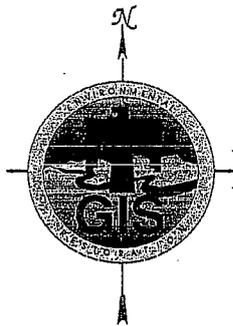
Survey Date: 20-JUL-94  
 Surveyed By: GREINER

**State Plane Coordinates**

(X) Easting: 414699.161  
 (Y) Northing: 1444697.69

**Surveyed Elevations (FAMSL)**

Protective Casing: 5432.16  
 Top of Inner Well Casing: 5431.36  
 Concrete Pad: 5429.24  
 Ground Surface: 5429.235



**Calculated Depths and Elevations**

Initial Water Elevation: 4936.96 (FAMSL)  
 Initial Depth To Water: 492.4 (FBGS)

Last measured water level was measured on FASL

Date Updated: 14-MAR-00  
 Date Printed: 11-AUG-05

**Completion Data Measured Depths (FBGS)**



Interval	Start	Stop
Casing Stickup: 2		
GROUT/BACKFILL	0'	449'
VOLCLAY		
Interval	Start	Stop
CASING	0'	510'
PVC	I.D. 4.77"	O.D. 5.56"
Interval	Start	Stop
BOREHOLE	0'	511'
		O.D. 12.5"
Interval	Start	Stop
SEAL	449'	479'
VOLCLAY		
Interval	Start	Stop
SECONDARY PACK	479'	481'
60 SILICA		
Interval	Start	Stop
PRIMARY PACK	481'	507'
40/60 SAND		
Interval	Start	Stop
SCREEN	485'	505'
CARBON STEEL		
	Slot Size	.01"
Interval	Start	Stop
SUMP	505'	510'
Interval	Start	Stop
PLUG BACK	507'	511'
60 SILICA		

# WELL DATABASE SUMMARY SHEET

<b>Project Name:</b> CHEM WASTE LANDFILL <b>ER ADS #:</b> 1267 <b>Well Name:</b> CWL-MW4 <b>Owner Name:</b> SNL <b>Date Drilling Started:</b> <b>Drilling Contractor:</b> <b>Drilling Method:</b> AUGER/MUD ROTARY <b>Borehole Depth:</b> 505 <b>Casing Depth:</b> 480	<b>Geo Location:</b> TA-III <b>Well Completion Date:</b> 04-MAY-90 <b>Completion Zone:</b> COARSE SAND <b>Formation of Completion:</b> SANTA FE GROUP <b>Well Comment:</b> AUGER TO 261' - MUD ROTARY TO TD - WATER LEVEL MEASURED 12-AUG-91
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**Survey Data**

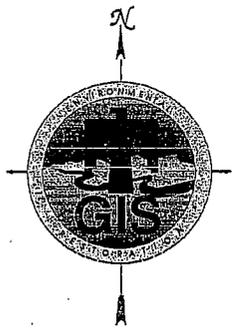
**Survey Date:**  
**Surveyed By:**

**State Plane Coordinates**

**(X) Easting:** 414195.17  
**(Y) Northing:** 1445111.6

**Surveyed Elevations (FAMSL)**

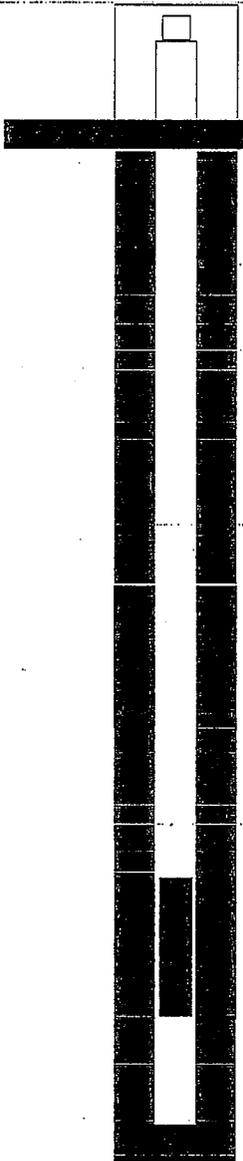
**Protective Casing:** 5421.35  
**Top of Inner Well Casing:** 5420.33  
**Concrete Pad:** 5418.39  
**Ground Surface:** 5418.38



**Calculated Depths and Elevations**

**Initial Water Elevation:** 4935.88 (FAMSL)  
**Initial Depth To Water:** 484.45 (FBGS)

**Completion Data-Measured Depths (FBGS)**



<b>Casing Stickup:</b> 1:94	
<b>Interval</b>	<b>Start      Stop</b>
GROUT/BACKFILL	0'      458'
BENTONITE/CEMENT	
<b>Interval</b>	<b>Start      Stop</b>
CASING	0'      480'
SCH 80 PVC/SS	I.D.    3.8" O.D.    4.5'
<b>Interval</b>	<b>Start      Stop</b>
BOREHOLE	0'      505'
	O.D.    8.75'
<b>Interval</b>	<b>Start      Stop</b>
SEAL	458'      468'
BENTONITE	
<b>Interval</b>	<b>Start      Stop</b>
PRIMARY PACK	468'      505'
20/40 MESH SILICA	
<b>Interval</b>	<b>Start      Stop</b>
SCREEN	478'      498'
304 SS	
	Slot Size    .01"
<b>Interval</b>	<b>Start      Stop</b>
SUMP	498'      503'

Last measured water level was 4932.18 FASL  
 measured on 02-AUG-96

**Date Updated:** 14-MAR-00      **Date Printed:** 11-AUG-05

# WELL DATABASE SUMMARY SHEET

Project Name:	CHEM WASTE LANDFILL	Geo Location:	TA-III
ER ADS #:	1267	Well Completion Date:	19-APR-94
Well Name:	CWL-MW5U	Completion Zone:	SILTY CLAYEY SAND
Owner Name:	SNL	Formation of Completion:	SANTA FE GROUP
Date Drilling Started:	29-MAR-94	Well Comment:	
Drilling Contractor:	WATER DEVELOPMENT		
Drilling Method:	AIR ROTARY/STRATEX		
Borehole Depth:	558		
Casing Depth:	502		

**Survey Data**

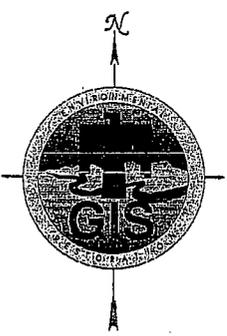
Survey Date: 20-JUL-94  
 Surveyed By: GREINER

**State Plane Coordinates**

(X) Easting: 413999.191  
 (Y) Northing: 1444759.335

**Surveyed Elevations (FAMSL)**

Protective Casing: 5416.53  
 Top of Inner Well Casing: 5416.01  
 Concrete Pad: 5414.02  
 Ground Surface: 5414.02

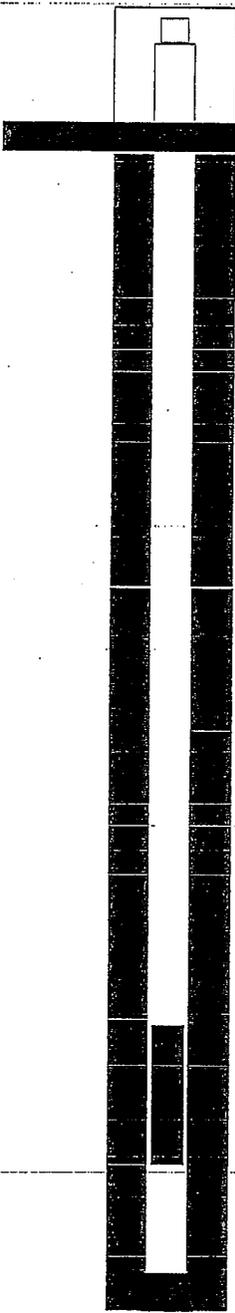


**Calculated Depths and Elevations**

Initial Water Elevation: (FAMSL)  
 Initial Depth To Water: (FBGS)  
 Last measured water level was 4934.08 FASL measured on 06-AUG-96

Date Updated: 14-MAR-00  
 Date Printed: 11-AUG-05

**Completion Data Measured Depths (FBGS)**



Casing Stickup:		1.93	
Interval	Start	Stop	
GROUT/BACKFILL	0'	440'	
VOLCLAY			
Interval		Start	Stop
CASING	0'	502'	
PVC	I.D. 4.77"	O.D. 5.56"	
Interval		Start	Stop
BOREHOLE	0'	558'	
		O.D. 12.5"	
Interval		Start	Stop
SEAL	440'	470'	
VOLCLAY/BENTONITE			
Interval		Start	Stop
SECONDARY PACK	470'	473'	
60 SILICA			
Interval		Start	Stop
PRIMARY PACK	473'	504'	
40/60 SAND			
Interval		Start	Stop
SCREEN	477'	497'	
PVC			
		Slot Size .01"	
Interval		Start	Stop
SUMP	497'	502'	

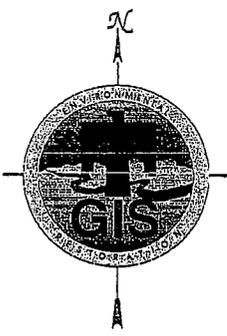
# WELL DATABASE SUMMARY SHEET

Project Name:	CHEM WASTE LANDFILL	Geo Location:	TA-III
ER ADS #:	1267	Well Completion Date:	04-MAY-94
Well Name:	CWL-MW6U	Completion Zone:	SANDY SILT
Owner Name:	SNL	Formation of Completion:	SANTA FE GROUP
Date Drilling Started:	19-APR-94	Well Comment:	SAMPLED QUARTERLY. WATER LEVEL MEASURED ON 8/2/96
Drilling Contractor:	WATER DEVELOPMENT		
Drilling Method:	AIR ROTARY/STRATEX		
Borehole Depth:	564		
Casing Depth:	502		

**Survey Data**  
 Survey Date: 20-JUL-94  
 Surveyed By: GREINER

**State Plane Coordinates**  
 (X) Easting: 414039.868  
 (Y) Northing: 1445061.065

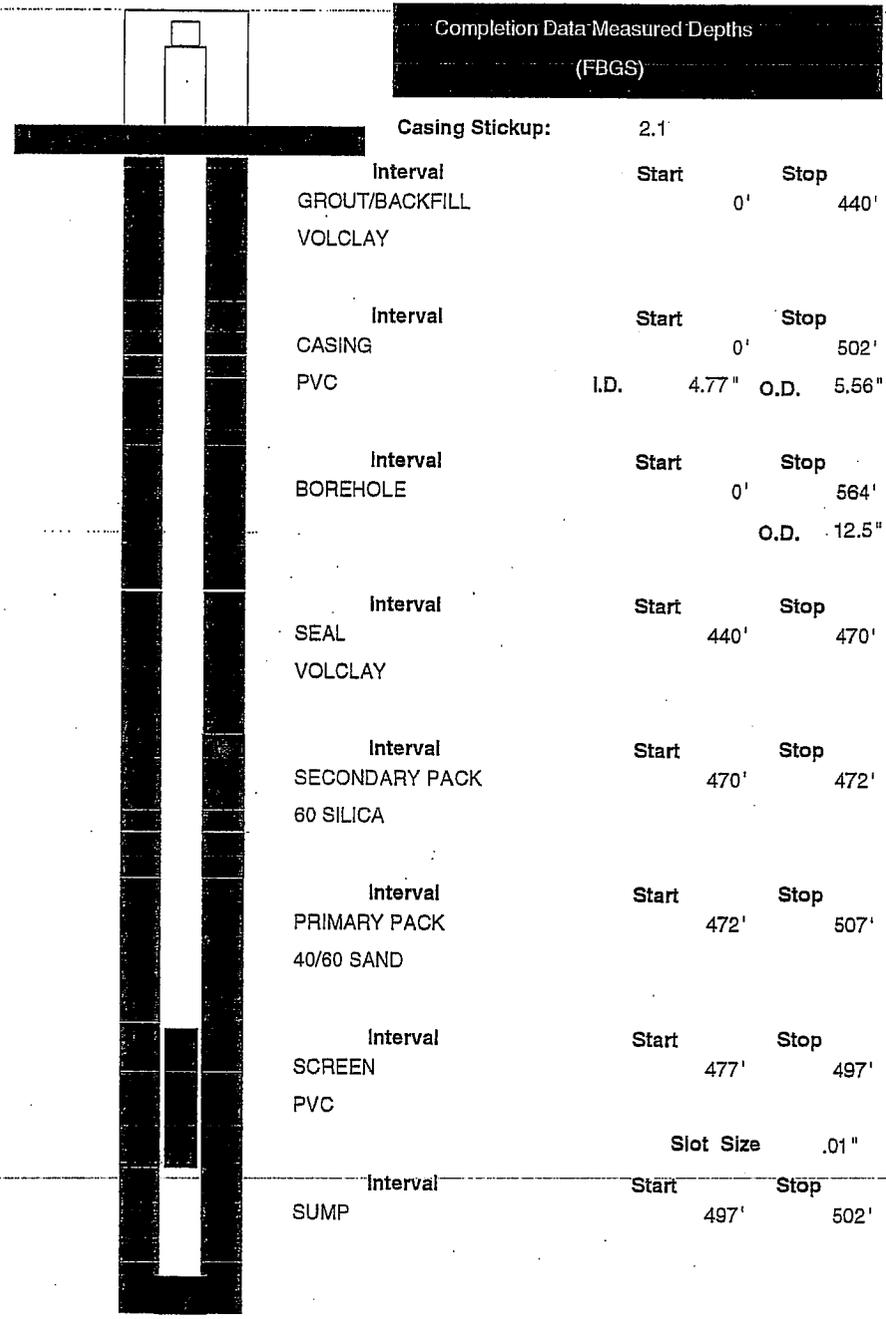
**Surveyed Elevations (FAMSL)**  
 Protective Casing: 5417.86  
 Top of Inner Well Casing: 5416.78  
 Concrete Pad: 5414.65  
 Ground Surface: 5414.648



**Calculated Depths and Elevations**  
 Initial Water Elevation: 4934 (FAMSL)  
 Initial Depth To Water: 482.78 (FBGS)

Last measured water level was 4933.99 FASL  
 measured on 02-AUG-96

Date Updated: 14-MAR-00  
 Date Printed: 11-AUG-05



## **2.8. FIELD OPERATIONS**

Groundwater sampling shall be conducted in accordance with this SAP and this Permit to ensure accurate, precise, representative, complete, and comparable groundwater sampling results. Other groundwater monitoring activities shall include the measurement of water levels and calculating the direction and gradient of groundwater flow, the decontamination of equipment, inspection of monitoring equipment, monitoring field water quality parameters, collecting and handling samples, and managing waste.

## **2.9. SAFETY**

Field operations shall be conducted in a manner that protects the health and safety of field personnel. Every team member has the authority and responsibility to stop operations if an unsafe condition develops or is observed. All groundwater monitoring personnel shall perform field activities safely in accordance with the SNL/NM Groundwater Health and Safety Plan, PLA 05-09.

## **2.10. WATER LEVEL MEASUREMENTS**

Water level information is used to calculate the volume of water in a well casing and the minimum amount required for purging. It is also used to determine the direction and gradient of groundwater flow, as required by 40 C.F.R. § 264.99(e). Measurements shall be referenced to a surveyed mark of known elevation at the top of each well casing. The static water level shall be measured in each well prior to purging or obtaining a sample, and measurements shall be taken to the nearest 0.01-foot using a water level indicator. Other requirements for water level measurements are provided in SNL/NM FOP 05-01. Water levels in all compliance wells shall be measured during every sampling event.

## **2.11. FIELD WATER QUALITY PARAMETERS**

Field water quality parameters shall be collected during purging in accordance with SNL/NM FOP 05-01 and this Permit Attachment. Measurements taken shall include potential of hydrogen (pH), specific conductance (SC), temperature, and turbidity. Additional field water quality parameters shall include dissolved oxygen (DO) and oxidation-reduction potential (ORP). Field water quality parameters are as follows.

**DO** – The DO content of the water in percent saturation or in mg/L.

**SC** – The ability of a cubic centimeter of water to conduct electricity. It varies directly with the amount of ionized minerals in the water and is measured in micro-mhos per centimeter at 25 degrees Celsius (°C).

**pH** – A measure of the acidity or alkalinity of a solution. Numerically equal to 7 for neutral solutions, increasing with increasing alkalinity and decreasing with increasing acidity.

**ORP** – Potential for an oxidation (loss of electrons to another atom or molecule) or reduction (gain of electrons from another atom or molecule) reaction in millivolts.

**Temperature** - The temperature of the water in °C.

**Turbidity (nephelometric)** - The cloudiness in water due to suspended and colloidal organic and

inorganic material. Water turbidity is measured in Nephelometric Turbidity Units (NTUs).

## **2.12. SAMPLE COLLECTION**

Sample collection procedures are provided in SNL/NM FOP 05-01 and this Permit Attachment. Groundwater monitoring shall be performed using conventional sampling methods. The Permittees shall purge monitoring wells with a portable Bennett™ submersible pump system or equivalent. The pump intake shall be set at or near the bottom of the screened interval. The maximum purge rate shall not exceed 12 liters per minute. The pump discharge rate shall not exceed 0.1 liter per minute during the collection of VOC and SVOC samples. Each monitoring well shall be purged a minimum of one borehole volume (a borehole volume is the volume of all static water in the well plus the volume of water in the primary and secondary filter packs), unless the well is purged dry. Prior to the collection of groundwater samples, purging shall continue beyond one well borehole volume until four stable measurements are obtained for turbidity, pH, temperature, and SC. Groundwater stability shall be considered acceptable when measurements are less than 5 NTU for turbidity,  $\pm 0.1$  pH units for pH,  $\pm 1.0$  °C for temperature, and  $\pm 5\%$  for SC. If a monitoring well is purged dry prior to meeting the above purging and stability requirements, then sampling shall be conducted once the well has recovered such that the volume of water available in the well is the minimum necessary to collect the required water samples.

Samples shall be placed into clean laboratory-supplied containers. Groundwater samples shall be collected for VOC and metals analyses, in that order, from each well. Samples collected for other analytical parameters shall be collected after those obtained for analysis of VOCs and metals. Samples shall not be filtered. Sample documentation and custody shall be performed in accordance with SNL/NM SMO procedures and protocols (AOP 95-16 and LOP [Laboratory Operating Procedure] 94-03) and this Permit. Samples shall be delivered to the shipping facility for repackaging in shipping coolers in accordance with appropriate U.S. Department of Transportation shipping regulations (49 C.F.R. Parts 170–179).

## **2.13. MONITORING EQUIPMENT FIELD CHECKS**

Monitoring instruments used to measure field water quality parameters shall be calibrated where appropriate or function-checked prior to sampling activities. Calibration and field-check instructions are presented in FOP 05-02.

## **2.14. EQUIPMENT DECONTAMINATION**

All equipment that would come into contact with a sample, the interior of a well, or groundwater shall be decontaminated prior to entering any well or contacting any sample to prevent cross-contamination. Equipment and materials (including chemicals and protective clothing), decontamination procedures, and waste management procedures are presented in the FOPs 05-01, 05-02, 05-3, and 05-04.

## **2.15. WASTE MANAGEMENT**

All waste generated during groundwater sampling activities shall be managed in accordance with federal, state, and local regulations. All purge and decontamination water shall be managed as listed hazardous waste. Analytical data from sampling events shall be compared to discharge and disposal

criteria. The anticipated disposal path for purge water and decontamination water is discharge to the sanitary sewer. If the City of Albuquerque discharge standards are not met, purge and decontamination water shall be managed appropriately through the Facility's Hazardous Waste Management Unit. Personal protective equipment that comes into contact with groundwater shall be managed as listed hazardous waste and disposed of through the Hazardous Waste Management Unit. Waste management activities associated with groundwater monitoring are discussed in FOP 05-04.

#### **2.16. SAMPLE DOCUMENTATION AND CUSTODY**

To ensure the integrity of samples from the time of collection through the reporting of analytical results, sample collection, handling, and custody shall be documented in writing. Primary elements in the documentation of samples are: sample identification numbers, sample labels, custody tape, and Analysis Request/Chain of Custody (AR/COC) forms. Standardized forms shall be used to document sample information. Sample custody and documentation procedures for sampling activities are outlined in SNL/NM AOP 95-16 and LOP 94-03. These procedures, and the procedures in this Permit Attachment, shall be followed throughout each groundwater-sampling event.

#### **2.17. SAMPLE SHIPMENT**

Samples shall be shipped to the analytical laboratory in accordance with SMO procedures detailed in LOP 94-03. Prior to shipment, sample collection documentation shall be verified. Any error shall be noted in writing and corrected. Samples shall be packaged and shipped in accordance with LOP 94-03.

#### **2.18. LABORATORY ANALYTICAL PROCEDURES**

The Permittees shall ensure that the analytical laboratory analyzes samples using EPA-approved analytical methods. The analytical laboratory shall provide appropriate sample containers prepared with the required preservative. The analytical laboratory shall prepare and submit to the Permittees an analysis data report as described in Section 1.10.3 of the SOW for Analytical Laboratories and as required by the conditions of this Permit. Table 2-3 summarizes EPA Methods (EPA, November 1986), container types and preservation methods applicable to groundwater sampling at the CWL.

#### **2.19. ANALYTICAL LABORATORY**

The Permittees shall ensure that the analytical laboratory performs the analyses in accordance with this SAP, this Permit, and regulatory requirements. The laboratory shall maintain written documentation of sample handling and custody, analytical results, and internal QC data. The laboratory shall analyze QC samples in accordance with this SAP and its own internal QC program. The Permittees shall direct the laboratory to investigate and if necessary conduct corrective action where data are found to be outside quality acceptance limits.

Two types of additional analytical laboratory audits shall be performed as part of the sampling program: system audits and performance audits. A system audit determines whether appropriate project systems (i.e., equipment, procedures) are in place. Performance audits indicate whether the projects systems are functioning properly and are capable of meeting project DQOs. These audits shall be completed as required by SMO procedures and protocols.

**TABLE 2-3  
 LABORATORY ANALYTICAL METHODS, CONTAINER TYPES AND  
 PRESERVATIVES  
 CWL GROUNDWATER SAMPLING**

<b>Analysis</b>	<b>SW-846 EPA Method<sup>a</sup></b>	<b>Volume and Container Type/Preservation</b>
VOCs, including TCE	8260	3 x 40 mL glass/HCL, 4°C
Metals <sup>b</sup> , including Cr, and Ni	6020/7191/7421/7470	1 x 500 mL polyethylene/HNO <sub>3</sub> , 4°C
SVOCs	8270	2 x 1L glass /unpreserved, 4°C
Acrolein, Acrylonitrile, Acetonitrile	8030	1 x 1L glass /unpreserved, 4°C
Phenols	8040	1 x 1L glass /unpreserved, 4°C
Phthalate Esters	8060	1 x 1L glass /unpreserved, 4°C
Organochlorine Pesticides and PCBs	8080	2 x 1L glass /unpreserved, 4°C
Nitroaromatics and Cyclic Ketones	8090	2 x 1L glass /unpreserved, 4°C
Chlorinated Hydrocarbons	8120	1 x 1L glass /unpreserved, 4°C
Organophosphorus Pesticides	8140	1 x 1L glass /unpreserved, 4°C
Chlorinated Herbicides	8150	1 x 1L glass /unpreserved, 4°C
Polynuclear Aromatic Hydrocarbons	8310	1 x 1L amber glass /unpreserved, 4°C
Cyanide	9010	1 x 4 ounce plastic/2mL 1.5N NaOH
Sulfide	9030	1 x 4 ounce plastic/6 drops 2N zinc acetate and 8 drops 16N NaOH

<sup>a</sup>U.S. Environmental Protection Agency, 1986 (and updates), *“Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,”* SW-846, 3rd Edition, U.S. Environmental Protection Agency, Washington, D.C.

- <sup>b</sup>metals = including chromium and nickel  
 CWL = Chemical Waste Landfill  
 °C = Degrees Celsius  
 EPA = U.S. Environmental Protection Agency  
 HCL = Hydrochloric acid  
 HNO<sub>3</sub> = Nitric acid  
 L = Liter  
 mL = Milliliter(s)  
 NaOH = sodium hydroxide  
 PCBs = polychlorinated biphenyls  
 SVOCs = Semi-volatile organic compounds  
 SW = Solid waste  
 TCE = trichloroethene  
 VOCs = Volatile organic compounds, including TCE

## **2.20. QUALITY CONTROL**

Quality Control (QC) samples shall be collected in the field and prepared in the laboratory to ensure that the data generated meet the DQO. QC shall be achieved through adherence to requirements and procedures listed and described in Section 2.1 of this Permit Attachment. Mandatory QC samples are identified in the following sections.

### **2.20.1. Field Quality Control**

Field QC samples are used to document data quality and identify errors that may be introduced by field conditions, in sample collection, storage, transportation, and equipment decontamination. Field QC samples submitted to the analytical laboratory shall be handled and analyzed in an identical manner as environmental samples. The Permittees shall collect and analyze the following Field QC sample types: equipment blanks, duplicates, field blanks, and trip blanks.

Equipment blanks demonstrate the effectiveness of equipment decontamination and monitor the cleanliness of the sampling system. After sampling equipment decontamination has been completed, an equipment blank is produced by pouring de-ionized water over the sampling equipment and collecting a sample of this water. Equipment blanks shall be collected at a frequency of 10 percent (minimum of one per CWL sampling event) and shall be analyzed for all of the constituents required by this Permit.

Duplicate environmental samples are collected in the field and analyzed to document the precision of the sampling and analysis process. The duplicate samples shall be collected immediately after the original environmental sample in order to reduce variability caused by time and/or the sampling process. Duplicates shall be collected and analyzed at a frequency of at least 10 percent. At least one duplicate groundwater sample shall be collected and analyzed per sampling event for each of the constituents required by this Permit.

Field blanks are collected for VOCs (including TCE) to assess whether any contamination of the samples was caused by ambient field conditions. The field blanks shall be prepared by pouring deionized water into sample containers at wellheads to simulate the transfer of environmental samples from the sampling system to the sample container. Field blank samples shall be collected and analyzed at a frequency of 10 percent (minimum of one per sampling event).

Trip blanks (TBs) are used to assess the potential for cross-contamination between environmental samples during sample handling and shipping activities. The TBs are to be analyzed for VOCs (including TCE) only. Each batch of groundwater samples to be analyzed for VOCs shall be accompanied by at least one TB during shipping. The Analytical Laboratory shall prepare the TB by filling a VOC-sample vial with deionized water and using the same sample preservation method designated for VOC environmental samples. Each vial shall be sealed with custody tape and dated when it is prepared. The TBs shall accompany the empty sample containers when they are shipped to the field supervisor prior to the start of sample collection. The TBs shall be taken into the field during sample collection and shall be included in the shipment of environmental samples to the laboratory. The TBs must remain sealed during this entire cycle and may be opened only for analysis on return to the analytical laboratory.

## **2.20.2. Laboratory Quality Control**

The analytical laboratory must have established procedures that demonstrate the analytical process is always in control during each sample analysis step. The procedures include Laboratory Control Samples (LCSs), method blank samples, and Matrix Spike (MS) samples.

A LCS consists of a control matrix (e.g., deionized water) spiked with known concentrations of analytes representative of the target analytes. LCSs shall be prepared and analyzed for each analytical procedure performed. LCSs shall be analyzed with each analytical batch containing environmental samples to determine accuracy of the data. The laboratory shall also evaluate the precision of the data by analyzing twice either the environmental samples or LCSs and calculating the RPD between corresponding results.

Method blank samples shall be used to check for contamination in the laboratory during sample preparation and analysis. Method blank samples shall be concurrently prepared and analyzed with each analytical batch. Method blanks shall be reported in the same units as corresponding environmental samples, and the results shall be included with each analytical report.

Surrogate spike analysis shall be performed for all samples analyzed by Gas Chromatography/ Mass Spectroscopy. The surrogate compounds added to the sample shall be those specified in the applicable EPA analytical method procedure (EPA, November 1986). Recovery values for surrogate compounds that are outside specified control limits require corrective action, which is detailed in the SOW for Analytical Laboratories.

The analytical process shall be systematically evaluated for the effects of indigenous constituents present in the environmental sample matrix. MS/matrix spike duplicate (MSD) analyses shall be performed in accordance with the specified analytical procedures.

## **2.21. DATA VALIDATION, REVIEW, AND REPORTING**

Data validation and review of analytical and field documentation shall be performed. Field and analytical QC data shall be reviewed for conformance to QC acceptance criteria. The entire data package shall be reviewed for completeness, comparability, representativeness, precision, and accuracy to determine whether the DQO has been met. All groundwater monitoring data shall be reported in the CWL post-closure care annual reports for the year for which the data were obtained.

### **2.21.1. Field Water Quality Data and Documentation Review**

Completed field documentation shall be reviewed and checked for errors, completeness, and conformance with the procedures required by this Permit. The review shall occur at the end of each day in the field to allow verification, correction, and retrieval of missing information as appropriate. Field documentation found to be incomplete or to contain questionable data shall be corrected prior to finalizing the field reports. If necessary, measurements of field water quality parameters shall be repeated.

### **2.21.2. Laboratory Data Verification and Validation**

The Permittees shall review laboratory reports for completeness and conformance to the requirements of this Permit and to the performance criteria of the laboratory contract according to

the “Procedure for Completing the Contract Verification Review,” SMO 05-03.

Upon receipt of the analytical results from the Analytical Laboratory, the Permittees shall arrange for the validation of the data. The purpose of the validation is to determine the usability and establish the defensibility of the results in support of environmental and waste management activities. Data qualification shall be based upon review of field and laboratory-supplied QC data, the specific QC criteria identified in the procedures for the EPA-approved analytical methods, and the QC criteria for meeting the DQO identified in this Permit Attachment. Data validation shall be conducted according to the requirements of this Permit and AOP 00-03, “Data Validation Procedure for Chemical and Radiochemical Data.” All associated data validation reports shall be submitted in the CWL post-closure care annual report.

### **2.21.3. Data Reporting**

All groundwater monitoring data shall be reported in the CWL post-closure care annual reports for the year for which the data were obtained. This report shall include a description of sampling activities, field water quality data, laboratory analytical data, a discussion of QC evaluations and data reviews, a description of any project variance or nonconformance, and data validation summaries. Copies of the annual reports and post-closure care groundwater monitoring records shall be maintained in the Facility’s ES&H and Security Records Center.

### **2.21.4. Records Management**

Records associated with groundwater monitoring, including field documentation, chains of custody, laboratory analytical results, data validation reports, post-closure care reports and technical data evaluations shall be maintained at the Facility’s ES&H and Security Records Center. The Permittees shall comply with the record-keeping provisions of 40 C.F.R. § 264.74, concerning the availability, retention, and disposition of records.

## **2.22. NON-CONFORMANCES AND VARIANCES**

Corrective actions must be taken to rectify or prevent a nonconformance or variance that could adversely affect the quality of data generated. Corrective actions must be documented in writing by the persons identifying the need for action.

Any purposeful change to or deviation from the requirements of this SAP and Permit shall take effect only after approval by the Department of a permit modification request.

A nonconformance is any action or condition that does not meet the requirements of this Permit. The analytical laboratory, SMO, groundwater monitoring team members, or the Project Leader may identify a nonconformance. The person noting a nonconformance shall document the nonconformance in writing and suggest an appropriate corrective action. Resolution of the nonconformance shall be documented in writing and acknowledged by the Permittees.

The Permittees and the analytical laboratories shall have systems in place to identify QC issues and initiate corrective actions. In accordance with SMO procedures, the laboratories are required to notify the SMO of QC problems that may affect data quality. The Permittees shall evaluate and determine whether data are comparable to historical values and whether or not corrective action is required based upon the specific issue. Corrective action may include documentation of QC issues

in an analytical laboratory report, data qualifiers, and/or sample re-analysis. In all cases, the DQO in Section 2.1 of this Permit Attachment shall be met.

## **2.23. REFERENCES**

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Sandia National Laboratories/New Mexico (SNL/NM), August 2005. "LTES Groundwater Sampling Health and Safety Plan," PLA 05-09, Sandia National Laboratories, Albuquerque, New Mexico.

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Sandia National Laboratories/New Mexico (SNL/NM), October 1995. "Discharges to the Sanitary Sewer System", NM431001, Issue C, Sandia National Laboratories, Albuquerque, New Mexico.

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U.S. Environmental Protection Agency (EPA), November 1986. "Test Methods for Evaluating Solid Waste," 3rd ed., and all updates, SW-846, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

## **PERMIT ATTACHMENT 3: SOIL-GAS SAMPLING AND ANALYSIS PLAN**

### **3.0 INTRODUCTION**

This Sampling and Analysis Plan (SAP) provides requirements that shall be adhered to for collecting and analyzing volatile organic compound (VOC) soil-gas samples from soil-gas monitoring wells located at the Chemical Waste Landfill (CWL) during the post-closure care period.

Soil-gas monitoring is designed to provide spatial and temporal soil-gas concentration data for the approximately 500-foot-thick vadose zone beneath the former liquid organic disposal areas (southern portion of the inactive CWL) and to utilize existing vapor extraction/injection wells.

#### **3.1. PURPOSE**

The post-closure care soil-gas monitoring program is designed to provide data to determine if soil vapor has the potential to contaminate groundwater. Soil-gas monitoring shall be conducted in conjunction with groundwater monitoring to accomplish this objective. In addition to establishing data quality objectives (DQOs), this SAP presents requirements for field sampling, laboratory analysis, data validation and evaluation, and reporting. The VOC soil-gas trigger level is described in Section 1.8.2 of Attachment 1 to this Permit.

#### **3.2. HISTORICAL SOIL-GAS MONITORING**

Historical soil-gas sampling involved the pneumatic extraction of discrete volumes of soil gas resident within pore spaces of the vadose zone immediately surrounding in situ sampling devices at specified locations and depths. After sample collection, the soil gas was analyzed using on-site (field) and off-site (fixed-base) laboratories to determine the presence and magnitude of VOC contaminants. Specific field and laboratory procedures were followed in an effort to produce representative, defensible, and comparable results. These results were used to delineate concentration trends over time for each sampling location and to delineate overall soil-gas plume trends. This SAP is designed to ensure that post-closure care soil-gas monitoring procedures are consistent with past practices and produce results that can be compared to historical results to establish longer-term soil-gas trends. The ability to evaluate and compare post-closure soil-gas results with historical data and trends is critical for addressing uncertainty regarding the potential future impacts of the remaining VOC soil-gas plume on groundwater.

#### **3.3. POST-CLOSURE CARE SOIL-GAS MONITORING OBJECTIVES**

Soil-gas monitoring is required to detect whether there has been any significant expansion and/or increase in concentration of the soil-gas plume to the extent that human health and the environment will be adversely impacted. The main concern is that trichloroethene (TCE) could exceed the regulatory standard for groundwater (5 micrograms per liter) as a result of the transfer of TCE mass from the soil-gas phase to groundwater. Therefore, the primary focus of soil-gas monitoring is to determine the concentration trends of TCE vapor in the vadose zone capillary fringe (approximately 10 to 20 feet above the water table based upon the deepest soil-gas sampling ports). The soil-gas monitoring program shall also provide VOC data from various depth intervals that will be used to track the concentrations, of constituent contaminants in the VOC plume.

### **3.4. DATA QUALITY OBJECTIVES**

Appropriate sampling locations, depths, number of samples collected per event, and sampling frequency are required to ensure that the data are representative of site conditions and meet the objectives of this SAP. The main Data Quality Objective (DQO) is to produce representative, accurate, defensible, and comparable soil-gas analytical results. This SAP is designed to ensure that post-closure care soil-gas monitoring procedures meet the DQO. The DQO shall be accomplished by implementing standard field methods, analytical procedures/methods, and data validation and evaluation protocols consistent with the historic soil-gas monitoring program.

### **3.5. SAMPLING LOCATIONS AND FREQUENCY**

#### **3.5.1. Sample Locations**

Soil-gas data shall be collected from within the plume core and at various distances laterally and vertically from the core. The plume core is currently located 150 to 250 feet below ground surface beneath the southern half of the CWL. Figure 3-1 shows the configuration of the plume based upon the data set collected in September 2004. The monitoring network shall include five wells equipped with a total of 21 depth-specific sampling ports specifically designed for soil-gas monitoring. Well completion diagrams are presented in Section 3 of this Permit Attachment. The five wells and associated depth-specific sampling ports are listed in Table 3-1 and shown in Figure 3-2. The five soil-gas monitoring wells are spatially located to monitor the area of the vadose zone most affected by past disposal of organic liquid waste. The deepest sampling ports from wells CWL-D1 through D3 (Port 1 in each of these wells) are located in the vadose zone immediately above the capillary fringe zone and water table.

#### **3.5.2. Frequency**

Soil-gas sampling shall be conducted annually during the post-closure care period. All sampling locations shown in Table 3-1 and Figure 3-2 shall be sampled.

**FIGURE 3-1**  
**Post-VE VCM Volatile Organic Compound Soil-Gas Plume – September 2004**

### **FIGURE 3-1**

Figure 3-1 is the same as Figure 4 in Permit Attachment 1 of the draft Permit. Please refer to Figure 4 in Permit Attachment 1 of the Draft Permit.

**TABLE 3-1  
 Soil-Gas Monitoring Ports to be Sampled During CWL Post-Closure Care**

<b>In Situ Monitoring Port</b>	<b>Depth (ft bgs)</b>
<b>Well CWL-UI1</b>	
Port P1	120
Port P2	80
Port P3	40
<b>Well CWL-UI2</b>	
Port P1	136
Port P2	76
Port P3	36
<b>Well CWL-D1</b>	
Port P1 <sup>a</sup>	470
Port P2	350
Port P3	240
Port P4	160
Port P5	100
<b>Well CWL-D2</b>	
Port P1 <sup>a</sup>	470
Port P2	440
Port P3	350
Port P4	240
Port P5	120
<b>Well CWL-D3</b>	
Port P1 <sup>a</sup>	480
Port P2	440
Port P3	350
Port P4	170
Port P5	120

<sup>a</sup>Only sampling ports subject to the VOC soil-gas trigger level as described in Section 1.8.2 of Permit Attachment 1.

bgs = below ground surface.

CWL = Chemical Waste Landfill.

ft = Foot (feet).

PCCP = Post-Closure Care Permit.

VOC = Volatile organic compound.

**FIGURE 3-2**  
**Soil-Gas Monitoring Wells and Depth-Specific Sampling Ports**

Boring ID: UI-1

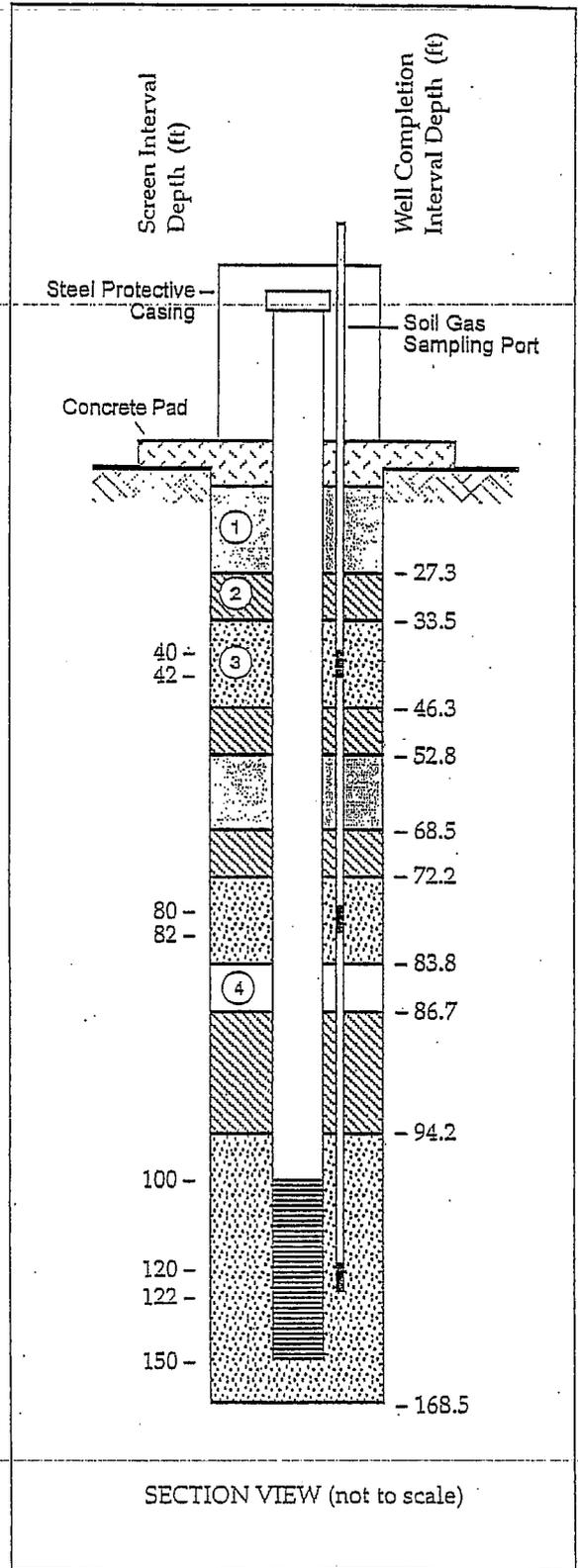
Installation Date: January 23, 1997

**Dimensions:**

Total Boring Depth	168.5 ft
Well Casing Diameter	5 in
Total Well Length	150 ft
Well Screen Length	50 ft
Upper Annular Seal Thickness	27.3 ft

**Materials Data:**

Well Casing	8"-diameter Schedule 80 PVC
Sanitary Seal	① Bentonite grout
Annular Seal	② Granular bentonite
Sand Pack	③ 10/20 Sand; 40/60 sand at top of each filter pack
	④ Formation Material
	⊥ Soil Gas Sampling Port



**Extraction Well UI-1 Construction Diagram**  
**Chemical Waste Landfill, Sandia National Laboratories/New Mexico**



Boring ID: D-1

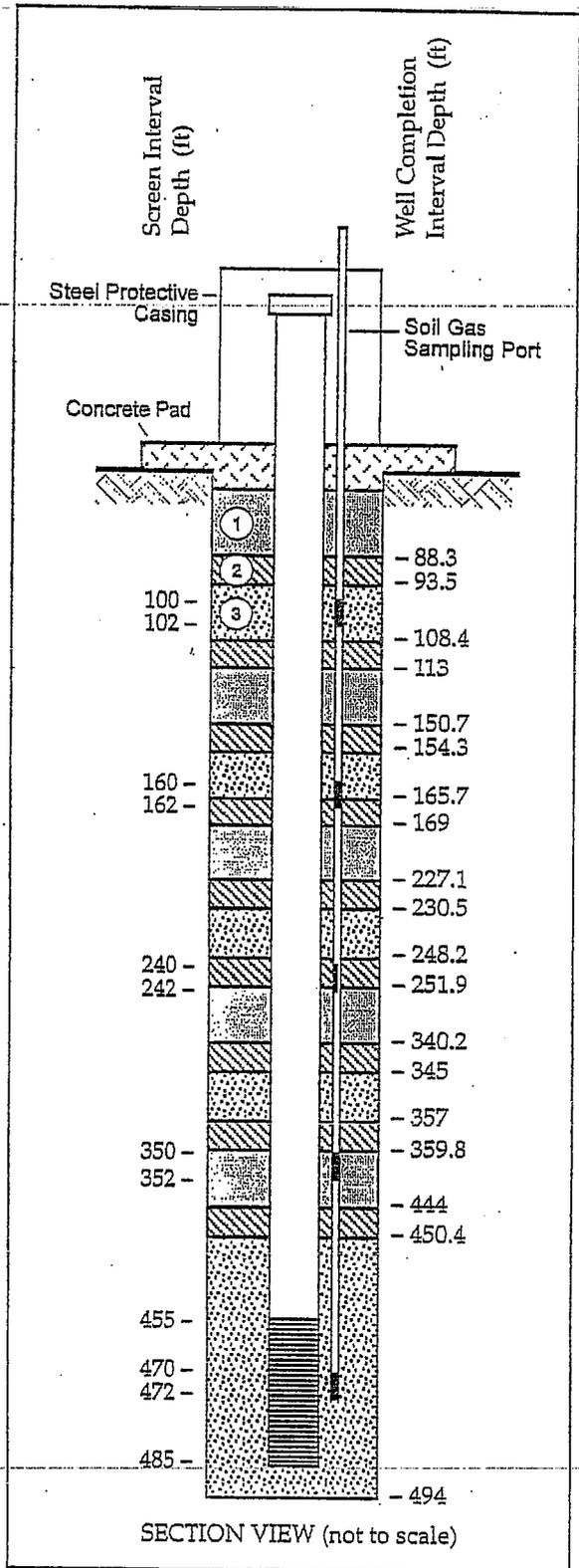
Installation Date: January 16, 1997

**Dimensions:**

Total Boring Depth	494 ft
Well Casing Diameter	5 in
Total Well Length	485 ft
Well Screen Length	30 ft
Upper Annular Seal Thickness	88.3 ft

**Materials Data:**

Well Casing	5 in. I.D. Schedule 80 PVC
Sanitary Seal	① Bentonite grout
Annular Seal	② Granular bentonite
Sand Pack	③ 10/20 Sand; 30/70 sand at top of each filter pack
	┆ Soil Gas Sampling Port





Boring ID: D-3

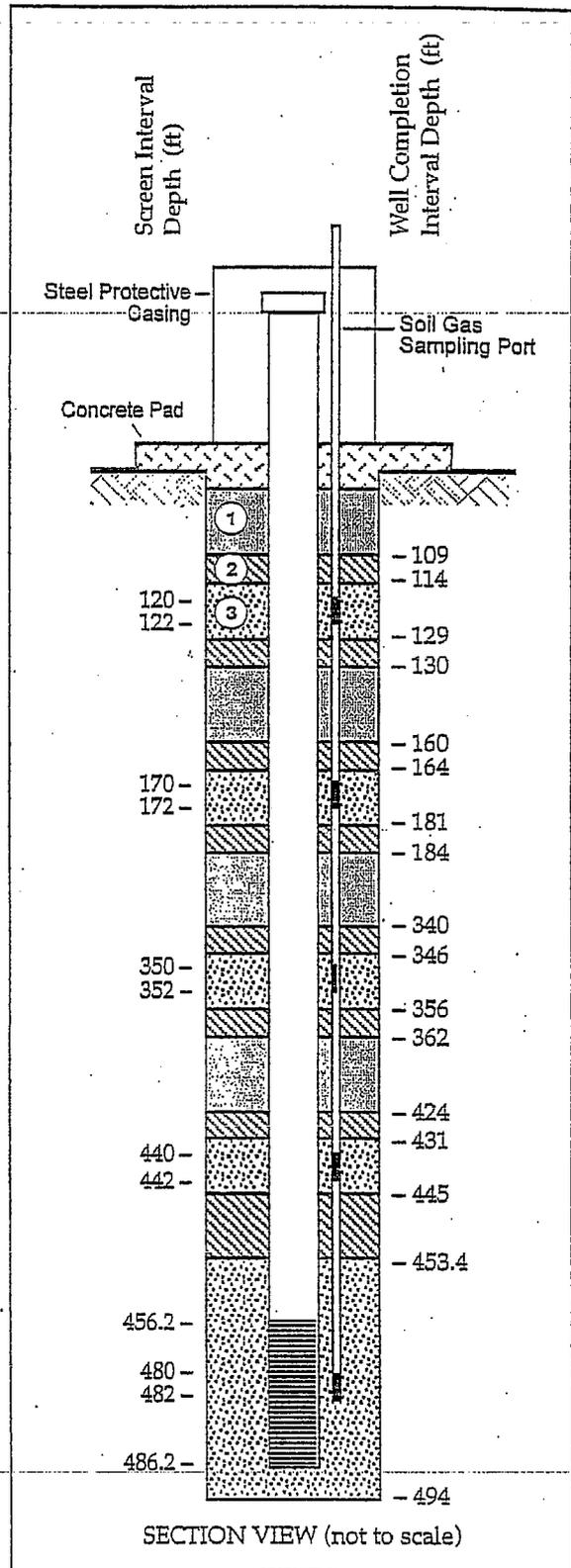
Installation Date: November 12, 1996

**Dimensions:**

Total Boring Depth	494 ft
Well Casing Diameter	5 in
Total Well Length	486.2 ft
Well Screen Length	30 ft
Upper Annular Seal Thickness	109 ft

**Materials Data:**

Well Casing	5 in. I.D. Schedule 80 PVC
Sanitary Seal	① Bentonite grout
Annular Seal	② Granular bentonite
Sand Pack	③ 10/20 Sand; 30/60 sand at top of each filter pack
	┃ Soil Gas Sampling Port



**Extraction Well D-3 Construction Diagram**  
**Chemical Waste Landfill, Sandia National Laboratories/New Mexico**

### **3.6. DATA ACCURACY**

The Permittees shall follow proper sampling procedures, including purging, preparation of sampling containers, and use of quality assurance/quality control (QA/QC) samples. Accurate estimates of contaminant concentrations shall be obtained through use of qualified laboratories, appropriate analytical methods, and effective QA/QC procedures.

A range in deviation from actual (true) concentration of 50-130% (percent recovered or %REC) for each detected VOC shall be considered acceptable.

At least two duplicate samples shall be collected and analyzed during each sampling event. A relative percent difference (RPD) of 20% or less for each detected VOC is considered to be acceptable. The Permittees shall immediately repeat the sampling and analysis for any sample results where the above specified quality control targets (%REC and RPD) are not met.

### **3.7. DATA CONSISTENCY AND COMPARABILITY**

Future soil-gas monitoring results must be comparable with historic VOC soil-gas data sets. The Permittees shall maintain consistency in methods and procedures by conducting sampling and analysis:

- Using consistent field sample collection and management methods;
- Using an off-site contract laboratory that complies with the Facility's Sample Management Office (SMO) analytical laboratory statement of work (SOW) and meeting U.S. Environmental Protection Agency (EPA) standards for quality assurance and quality control (QA/QC);
- Using soil-gas analytical method EPA Compendium Method TO-14 (EPA, January 1999); and
- Using the soil-gas analytical data review and validation procedure in Administrative Operating Procedure (AOP) 00-03.

After soil-gas analytical results are received from the laboratory, the Permittees shall review the laboratory report for completeness and conformance to the performance criteria, and arrange for data validation. If problems are noted that require corrective action during these verification and validation reviews, corrective action shall be implemented. The scope of the data verification and validation process shall address field sample management and custody requirements, as well as adherence to QA/QC requirements by the off-site laboratory performing the analyses. These processes are discussed in more detail in Section 3.10 of this Permit Attachment.

Each new set of soil-gas data shall be compared to the historical soil-gas data presented in Annex D of the Corrective Measures Study Report (SNL/NM, December 2004). This evaluation process is intended to reveal long-term plume trends.

### **3.8. MONITORING ACTIVITIES**

This section describes the field and laboratory procedures that shall be followed to produce soil-gas analytical results that meet the requirements of this Permit.

### **3.9. FIELD SAMPLING**

The methods and procedures used to obtain soil-gas samples for laboratory analysis are described below in Sections 3.9.1 through 3.9.3. Additional measurements beyond those described in this SAP may be obtained to support evaluation of the soil-gas plume.

Activities that shall be conducted by the Permittees in preparation for or during soil-gas sampling include:

- Pre-field work planning;
- Vacuum check of SUMMA<sup>®</sup> canisters;
- Visual inspection of all CWL soil-gas wells and sampling ports;
- Purging and field estimation of total VOC concentration;
- Sample acquisition;
- Sample container documentation and packaging; and
- Sample delivery to laboratory within the method holding time.

The Facility Operating Procedures for these activities, as well as SMO procedures, guidance, and laboratory procedures that apply to the post-closure care soil-gas monitoring program are listed in Table 3-2 and this Permit. All personnel directly involved in field activities related to soil-gas monitoring shall review and abide by these procedures.

The Permittees shall provide to the New Mexico Environment Department (the Department) within sixty (60) days of the effective date of this Permit in hard copy and electronic format the current versions of the FOPs and AOPs listed in Table 3-2. The Permittees shall provide the Department with any updated versions of the FOPs/AOPs within 30 days of their acceptance by the Permittees. All FOPs and AOPs are subject to approval by the Department. The requirements of this SAP take precedence over those of any FOP or AOPs listed in Table 3-2.

#### **3.9.1. Pre-Field Sampling Preparations**

Prior to initiating soil-gas sampling, field personnel shall ensure that all necessary equipment is ready and properly functioning in accordance with applicable FOPs and this Permit and that the necessary arrangements have been made with the SMO and off-site analytical laboratory for sample shipment and analysis. As appropriate, operating procedures shall be reviewed and support personnel notified.

**TABLE 3-2  
 Reference Documentation  
 CWL Post-Closure Care Soil-Gas Monitoring**

FOP or AOP	Title
FOP 94-28	Health and Safety Monitoring of Organic Vapors (FID and PID)
ASSOP 01-04	Activity Specific Standard Operating Procedure For Active Soil-Gas Sampling Using Method TO-14 at the Corrective Action Management Unit and Former CWL
AOP 95-16	Sample Management and Custody
AOP 00-03	Data Validation Procedure for Chemical and Radiochemical Data
LOP 94-03	Sample Handling, Packaging, and Shipping
SMO 05-03	Procedure for Completing the Contract Verification Review
NA	SNL/NM SOW for Analytical Laboratories
NA	Quality Assurance Project Plan for the Sample Management Office

**Sandia National Lab's Offices and Documents:**

- AOP** = Administrative operating procedure.
- ASSOP** = Activity-Specific Standard Operating Procedure.
- FID** = Flame Ionization Detector.
- FOP** = Field operating procedure.
- LOP** = Laboratory operating procedure.
- NA** = Not applicable.
- PID** = Photoionization Detector.
- SMO** = Sample Management Office.
- SOW** = Statement of Work.

**3.9.2. Purging and Field Estimation of Total Concentration of VOCs**

At the wellhead, a vacuum pump connected to the sample tubing via a Swagelok® or equivalent fitting shall be used to purge stagnant and/or pre-existing soil gas from the monitoring ports and sample tubing. The stream of soil gas extracted from the sampling port shall be screened with a photoionization detector (PID) containing an ultraviolet lamp with an ionization potential of 11.8 electron volts. PID measurements shall be monitored during purging and recorded in the fieldbook or on a sampling form. Sample collection shall commence only after at least 30 minutes of purging has taken place and after at least three PID measurements have stabilized to within plus or minus 10 percent.

**3.9.3. Sample Collection**

Soil-gas samples shall be collected in 6-liter SUMMA® canisters for off-site laboratory analysis of VOCs by EPA Compendium Method TO-14 (EPA, January 1999). The SUMMA® canisters shall be shipped from the laboratory under vacuum and connected directly to the sampling ports by Swagelok® fittings or equivalents. Soil gas shall be drawn into the sample container by the pressure differential between the atmosphere and the container interior. After sample collection, the valve shall be closed, and the canister shall be shipped back to the laboratory with an analysis request/chain-of-custody form containing the sample identification number, sample location, date

and time, elevation, and ambient pressure. Field sample management shall follow AOP 95-16 and the requirements of this Permit. A plug Swagelok® or equivalent fitting shall be fastened to the canister opening to ensure that the canister remains airtight during shipment to the laboratory. The canisters require no special preservation during transport and storage.

### **3.10. LABORATORY ANALYSIS AND DATA REVIEW**

All samples shall be submitted to an off-site analytical laboratory. The samples shall be analyzed using EPA Compendium Method TO-14 (EPA, January 1999). The Permittees shall ensure that the off-site laboratory implements the requirements of the method, including analytical method, target analytes for quantification, and internal QA/QC procedures. The target analytes are listed in Table 3-3.

#### **3.10.1. Data Verification**

After soil-gas analytical results are received from the laboratory, the Permittees shall review the laboratory report for completeness and conformance to the performance criteria of the contract according to the "Procedure for Completing the Contract Verification Review," SMO 05-03 and the requirements of this Permit. If problems are noted that require corrective action, the appropriate corrective action shall be implemented.

**TABLE 3-3**  
**EPA Compendium Method TO-14 Analyte List<sup>a</sup>**  
**CWL Post-Closure Care**

Compound	Compound
Acetone	Dichloropropane, 1,2-
Benzene	Dichloropropene, cis-1,3-
Benzyl chloride	Dichloropropene, trans-1,3-
Bromodichloromethane	Ethyl benzene
Bromoform	Ethyltoluene, 4-
Bromomethane	Hexachlorobutadiene
Butanone, 2-	Hexanone, 2-
Carbon disulfide	Methylene chloride
Carbon tetrachloride	Pentanone, 4-methyl-, 2-
Chlorobenzene	Styrene
Chloroethane	Tetrachloroethane, 1,1,2,2-
Chloroform	Tetrachloroethene
Chloromethane	Toluene
Dibromochloromethane	Trichloro-1,2,2-trifluoroethane, 1,1,2-
Dibromoethane, 1,2-	Trichlorobenzene, 1,2,4-
Dichloro-1,1,2,2-tetrafluoroethane, 1,2-	Trichloroethane, 1,1,1-
Dichlorobenzene, 1,2-	Trichloroethane, 1,1,2-
Dichlorobenzene, 1,3-	Trichloroethene
Dichlorobenzene, 1,4-	Trichlorofluoromethane
Dichlorodifluoromethane	Trimethylbenzene, 1,2,4-
Dichloroethane, 1,1-	Trimethylbenzene, 1,3,5-
Dichloroethane, 1,2-	Vinyl acetate
Dichloroethene, 1,1-	Vinyl chloride
Dichloroethene, cis-1,2-	Xylene, m-, p-
Dichloroethene, trans-1,2-	Xylene, o-

<sup>a</sup>EPA, January 1999.

CWL = Chemical Waste Landfill.

EPA = U.S. Environmental Protection Agency.

### **3.10.2. Data Validation**

After the data verification review is completed, the Permittees shall arrange for the validation of the data. The data validation process shall address field sample management and custody requirements, as well as adherence to the analytical method and internal laboratory QA/QC requirements by the off-site laboratory performing the analyses. Data qualification is based upon review of field QC data, laboratory-supplied QC data, the specific QC criteria, and the DQOs identified in the EPA Compendium Method TO-14 procedure (EPA, January 1999), the DQO in Section 3.4 of this Permit Attachment and the requirements of this Permit. Data validation shall be conducted according to the requirements of this Permit and AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data." All associated data validation reports shall be submitted to the Department along with the results for each monitoring event.

### **3.11. DATA MANAGEMENT AND REPORTING**

The following activities comprise data management and reporting tasks, and shall be conducted by the Permittees:

- Program-side QA/QC;
- Technical evaluation; and
- Reporting

Program-side QA/QC involves ensuring QA/QC measures are being implemented across the soil-gas monitoring program according to this SAP and this Permit, including field and laboratory methods, protocol, and procedures. Technical evaluation and reporting activities shall be initiated after data validation is completed.

The following specific data evaluation and reporting steps shall be followed and documented as part of the annual post-closure care report for soil-gas monitoring. Data interpretation and evaluation shall follow the procedures outlined below.

1. Add results (VOC soil-gas concentrations) to existing tabulated summaries in EXCEL and WORD (or equivalent) file formats;
2. Perform an assessment of each data point for reasonableness and comparability against historical data and trends;
3. Add the data to the appropriate graphical charts in EXCEL (or equivalent) format to illustrate concentration versus time trends for specified monitoring ports;
4. Compare detected VOC concentrations for the deepest sampling ports (Port 1) of CWL-D1 through D3 to the trigger level of 20 ppmv;
5. Provide a brief summary discussion of the soil-gas plume trend(s);
6. Provide a summary of the groundwater sampling results as they may relate to the soil-gas results; and
7. Plot selected soil-gas concentrations (e.g., TCE) on a site map and/or profiles to show spatial relationships both laterally and vertically.

### **3.12. RECORDS MANAGEMENT**

Records associated with soil-gas monitoring include this Permit and SAP, personnel training, field documentation, laboratory analytical results, data validation reports, and post-closure care reports and technical data evaluations. These records shall be maintained at the Facility's Environmental Safety & Health and Security Records Center and comply with the record-keeping provisions of 40 C.F.R. § 264.74, concerning the availability, retention, and disposition of records.

### **3.13. REFERENCES**

Kieling, J. E. (New Mexico Environment Department), December 2003. Letter to K.L. Boardman (U.S. Department of Energy) and P.B. Davies (Sandia Corporation), "Chemical Waste Landfill, Corrective Measures Study, May 2003, Sandia National Laboratories NM5890110518, HWB SNL-03-013." December 12, 2003.

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Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-14A,” Center for Environmental Research Information, Office of Research and Development, US EPA, Cincinnati, Ohio.

**PERMIT ATTACHMENT 4: INSPECTION FORMS**

## **BIOLOGY CHECKLIST FOR CWL COVER**

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Biology Inspection Checklist for the CWL Cover**

<b><u>Mandatory requirement:</u></b>	
The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: ( <i>Inspector must initial box before proceeding with the inspection.</i> )	<input type="checkbox"/>
Date read _____	

Approximate vegetative coverage (actively photosynthesizing): \_\_\_\_\_%

Approximate percent native vegetation of the total vegetative cover: \_\_\_\_\_%

Listed below are the main plant species identified growing on the CWL cover and the approximate percent cover for each species.

<u>Scientific Name</u>	<u>Common Name (optional)</u>	<u>% Total cover photosynthesizing</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**Chemical Waste Landfill  
Biology Inspection Checklist for the CWL Cover (Continued)**

Are there any contiguous areas of no vegetation greater than 200 square feet? (Approximately 14 x14 ft.): \_\_\_\_\_

If "Yes," mark such areas on a map and attach to this checklist, and improve such area(s) with native vegetation via soil augmentation, scarification, and/or reseeding.

Are there any very deeply rooted (roots greater than 8 feet deep at maturity) plant species present on the cover? \_\_\_\_\_

If "Yes," mark such areas on a map and attach to this checklist, and remove plant(s) from the cover.

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Inspection for animal burrow intrusion into CWL cover**

Are any burrows present on the cover? \_\_\_\_\_

Does any burrow(s) appear to be active? \_\_\_\_\_

Does any active burrow(s) appear to be that of a species that is able to burrow 6 feet deep or greater? \_\_\_\_\_

If any of the active burrows appear to be that of a species that is able to burrow 6 feet or greater, mark such burrow(s) on a map and attach at the end of this checklist, and take appropriate actions as necessary to prevent damage to the cover.

Notes: \_\_\_\_\_

\_\_\_\_\_

**Biological Aspects Map – [note: sketch map to locate specific features will be attached]**

Survey Biologist Name: \_\_\_\_\_ Date: \_\_\_\_\_

Original to: Chemical Waste Landfill Operating Record

**CHEMICAL WASTE LANDFILL  
INSPECTION CHECKLIST**

## Chemical Waste Landfill Post-Closure Inspection Form Inspection Checklist

1. Date of Inspection \_\_\_\_\_
2. Time of Inspection \_\_\_\_\_
3. Name of Inspector \_\_\_\_\_

<p><b><u>Mandatory requirement:</u></b></p> <p>The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: (<i>Inspector must initial box before proceeding with the inspection.</i>)</p> <p style="text-align: right;">Date read _____</p>	<input style="width: 100%; height: 100%;" type="checkbox"/>
---	---

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. COVER SYSTEM [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected</i> (Yes or No)	<i>Action Required</i> (Yes or No)	<i>Note Number</i>
A. Visible settlement of the soil cover in excess of 6 inches.			
B. Erosion of the soil cover in excess of 6 inches deep.			
C. Evidence of water ponding.			
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.			
E. Contiguous areas of no vegetation greater than 200 ft <sup>2</sup> . Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.			
<b>II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected</i> (Yes or No)	<i>Action Required</i> (Yes or No)	<i>Note Number</i>
A. Channel or sidewall erosion in excess of 6 inches deep.			
B. Channel sediment accumulation in excess of 6 inches deep.			
C. Debris that blocks more than 1/3 of the channel width.			

## Chemical Waste Landfill Inspection Checklist (Continued)

<b>III. SECURITY FENCE [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Accumulation of wind-blown plants and debris.			
B. Fence wires and posts in need of repair/maintenance.			
C. Gates in need of oiling/repair/maintenance.			
D. Locks in need of cleaning or replacement.			
E. Warning signs in need of repair or replacement.			
F. Survey monuments in vicinity of CWL visible.			

<b>IV. SOIL-GAS AND GROUNDWATER MONITORING WELLS [Semi-Annually]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.			
B. Well cover caps and Swagelok <sup>®</sup> dust caps in need of repair/maintenance.			
C. Passive venting Baroballs <sup>™</sup> , soil-gas sampling ports, pumps and tubing in need of repair/maintenance.			
C. Monitoring wells and soil-gas sample port locations properly labeled.			
D. Locks in need of cleaning or replacement.			

<b>V. PREVIOUS DEFICIENCIES [Quarterly]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Uncorrected/undocumented previous deficiencies.			





## **PERMIT ATTACHMENT 5: PERSONNEL TRAINING PROGRAM**

### **5.0 INTRODUCTION**

In accordance with 40 C.F.R. § 264.16, this Permit Attachment describes the personnel-training program that shall be adhered to for conducting safe operations, inspection, monitoring, and maintenance of the Chemical Waste Landfill (CWL) final cover system, access controls, and monitoring systems. The objective of this training program is to prepare CWL personnel to perform job duties in a safe, environmentally sound, and technically competent manner. To achieve this objective, the program provides all employees with training relevant to their positions. CWL personnel receive classroom and on-the-job training designed specifically to teach them how to perform their duties safely and in conformance with this Permit. CWL personnel shall receive all required training before being allowed to work in unsupervised positions.

The same personnel may be performing post-closure care work at both the CWL and adjacent Corrective Action Management Unit (CAMU); therefore, the training programs detailed in this Permit Attachment may be tailored to address both CWL and CAMU activities. Training records shall be maintained at the CAMU administration trailer for both CWL and CAMU personnel, along with the CWL Contingency Plan, emergency response procedures, and emergency response equipment.

#### **5.1. RELEVANCE OF TRAINING TO JOB POSITION**

This training program shall provide employees with training relevant to their positions and training necessary to safely perform their actual job tasks. Personnel shall be trained in operations specific to their job duties, and, where applicable, CAMU and CWL training will be integrated.

#### **5.2. IMPLEMENTATION OF TRAINING PROGRAM**

The training program shall be implemented to ensure that all CWL personnel receive the appropriate training in a timely manner. Personnel shall not work in unsupervised positions unless and until they successfully complete the indicated training requirements. Personnel must complete the training program described herein within six months of their assignment to the CWL.

#### **5.3. OUTLINE OF THE TRAINING PROGRAM**

#### **5.4. JOB TITLE/JOB DESCRIPTION**

Job titles, descriptions, and qualifications are provided in Figures 5-1, 5-2, and 5-3. The job descriptions include job duties and required education, skills, and experience.

**FIGURE 5-1**  
**Job Title, Description, and Qualifications**  
**CWL Project Leader/Operations Coordinator**

**Job Title:** Chemical Waste Landfill (CWL) Project Leader/Operations Coordinator

**Job Description:** To provide ongoing oversight, supervision, and coordination at the CWL during the compliance and post-closure care periods for monitoring, inspection, and maintenance of the final cover system; groundwater and soil-gas monitoring; and access control, inspection, and maintenance in compliance with this Permit. Duties include, but are not limited to:

Coordinate and implement final cover system and access controls, monitoring, inspection and maintenance activities.

Coordinate and implement groundwater and soil-gas monitoring activities with the Facility's Sample Management Office (SMO) and off-site analytical laboratory.

Compile and archive groundwater and soil-gas monitoring data into the Facility's Environmental Restoration Data Management System and ES&H and Security Record Center.

Produce monitoring, inspection, and maintenance reports.

Maintain and revise sampling and analysis plans and associated operating/field procedures for post-closure care groundwater and soil-gas monitoring, as necessary.

Coordinate and oversee waste management activities associated with groundwater and soil-gas monitoring activities.

Assure the maintenance of records, such as training records, inspection and maintenance records, and data reports, as specified in this Permit.

Supervise the inventory, maintenance, and repair of all tools, supplies, equipment, and vehicles (i.e., ensure that they are in good working order) used for monitoring and maintenance operations.

Provide oversight of CWL Field Technicians.

**Required Education, Skill, and/or Experience:**

Bachelor's degree in chemistry, biology, physical science, engineering, environmental science, or

Minimum of 5 years experience in waste management operations and/or environmental restoration, and

Project management experience.

**FIGURE 5-2**  
**Job Title, Description, and Qualifications**  
**CWL Field Technician**

**Job Title:** Chemical Waste Landfill (CWL) Field Technician

**Job Description:** To perform compliance and post-closure monitoring, inspection, and maintenance activities as instructed by the CWL Project Leader/Operations Coordinator.

Perform groundwater and soil-gas monitoring activities.

Perform inspection, maintenance, and repair activities.

Implement waste management associated with groundwater and soil-gas monitoring activities.

Assist CWL Project Leader/Operations Coordinator with waste management documentation and reporting activities.

**Required Education, Skill, and/or Experience:**

High school diploma or equivalent (e.g., General Education Development [GED])

Sufficient prior work experience related to duties.

**FIGURE 5-3**  
**Job Title, Description, and Qualifications**  
**CWL Staff Biologist**

**Job Title:** Chemical Waste Landfill (CWL) Staff Biologist

**Job Description:** To perform post-closure final cover system vegetation monitoring and inspection activities as instructed by the CWL Project Leader/Operations Coordinator.

Perform cover biology inspections.

Assist CWL Project Leader/Operations Coordinator with goal of establishing a self-sustaining community of native plants, addressing undesirable animal and plant disturbances/intrusions, documenting successful revegetation, and associated reporting.

**Required Education, Skill, and/or Experience:**

Bachelor's degree in biology, physical science, or environmental science, or

Sufficient prior work experience related to duties.

## **5.5. TRAINING CONTENT, FREQUENCY, AND TECHNIQUES**

The Permittees' Department Manager responsible for CWL operations, or designee, will function as the Training Director. The Manager maintains responsibility for ensuring that all CWL-specific required training is obtained. The Manager/Training Director shall be knowledgeable about the applicable hazardous waste management regulations and specific RCRA-regulated waste management operations employed at the CWL. The Manager/Training Director determines the content and duration of training required for individual employees to ensure compliance with the training requirements of this Permit. The training program shall be administered by the Training Director, who is responsible for identifying and coordinating training required by the Post-Closure Care Permit, hazardous waste regulations, and Facility requirements. In accordance with 40 C.F.R. § 264.16(a)(2), the Training Director shall be a person trained in hazardous waste management procedures. The Training Director must complete the CWL Operating Procedures and Refresher Training outlined in Table 5-1 before discharging his/her duties.

Training is required at the frequencies shown in Table 5-1. The Occupational Safety and Health Administration (OSHA) Hazardous Waste Worker Training and a minimum of 24 hours of initial OSHA Hazardous Waste Worker Training are required of all personnel that will work on-site at the CWL. All on-site personnel shall participate in a minimum of eight hours of annual refresher training. The CWL Operating Procedures and Refresher Training are function-specific so that an employee is provided training that is appropriate for his job function. A minimum of two hours of initial CWL Operating Procedures and Refresher Training and a minimum of two hours annual refresher training are required of all on-site CWL personnel.

## **5.6. EMERGENCY TRAINING**

All personnel assigned to work at both the CWL and the adjacent CAMU are required to participate in unit-specific emergency training to ensure that they are able to respond effectively in an emergency situation. The training consists primarily of classroom training and on-site exercises. Topics covered shall include, at a minimum:

1. Emergency or incident notification procedures
2. Response to incidents or emergencies, including fires and releases of hazardous wastes
3. Procedures for using, inspecting, maintaining, and replacing emergency/ monitoring/spill cleanup equipment
4. Procedures for shutdown operations (if any)
5. Procedures for evacuation
6. Post-emergency/incident reports and actions
7. CWL Contingency Plan

**TABLE 5-1**  
**Training Content**

**Occupational Safety and Health Administration  
Hazardous Waste Worker Training and Refresher**

Duration: 24-40 hours initial, 8-hour annual refresher  
Frequency: Initial and annual  
Method: Classroom  
Required CWL Attendees: Project Leader/Operations Coordinator, Field Technician, and Staff Biologist

**Minimum Content:**

Proper use of personal protective equipment  
Overview of federal regulations related to hazardous materials and hazardous waste management  
Guidelines for safe practices while managing hazardous waste  
Overview of hazardous materials (i.e., properties, compatibility, toxicology)

---

**CWL**

**Operating Procedures and Refresher**

Duration: 2-24 hours initial, 2-8 hours annual refresher  
Frequency: Initial and annual  
Method: Procedure review, on-the-job training  
Required CWL Attendees: Project Leader/Operations Coordinator; Field Technician; Staff Biologist; Training Director

Minimum Content: This training is function-specific, divided into sections or modules. Each employee must participate in the sections that apply to his specific job function. Example sections include, but are not limited to, the following:

- Post-Closure Care Permit and associated training requirements
- Post-closure inspection requirements, frequency, and documentation (i.e., forms)
- Written standard operating procedures
- Post-Closure Care and Compliance Groundwater and Soil-Gas Sampling and Analysis Plans
- Referenced operating procedures and SMO guidance/procedures
- Groundwater Monitoring Waste Management Plan (FOP 05-04)
- Groundwater Health and Safety Plan (PLA 05-09)
- Security, site entry, and site control at the CWL and adjacent CAMU
- Operation, maintenance, and inspection of CWL monitoring equipment
- Record keeping and maintenance
- Review of the CWL Contingency Plan and emergency response procedures
- RCRA facility or operating permit Module IV requirements
- Review of emergency procedures, emergency equipment, and emergency systems

CAMU = Corrective Action Management Unit.  
CWL = Chemical Waste Landfill.  
FOP = Field Operating Procedure  
PLA = Plan  
RCRA = Resource Conservation and Recovery Act.  
SMO = Sample Management Office.

## **5.7. TRAINING RECORDS**

In accordance with 40 C.F.R. § 264.16(d) training records shall be kept to document the type, amount, and dates of training received for each assigned employee. Contents of these records shall include the following, at a minimum:

- The name of the employee
- Job title and a written job description
- Training requirements for each job position
- Records that document training received, such as amount, dates, and certificates; attendance or signature lists; memoranda of training; or reports from computerized training databases

Training records for current employees shall be kept until the end of the post-closure care period. Training records for any former employee shall be kept for a minimum of three years from the last date the employee worked at the CWL. A current approved training program and training records for personnel for the previous 12 months shall be maintained at the CAMU administration trailer for both CWL and CAMU personnel. All other training records and documentation shall be maintained by the CWL Project Leader/Operations Coordinator or designee at the Environmental Safety and Health (ES&H) and Security Records Center.

## **PERMIT ATTACHMENT 6: CONTINGENCY PLAN**

### **6.0 INTRODUCTION**

The Permittees shall comply with the requirements at 40 C.F.R. Part 264 Subpart D, “Contingency Plan and Emergency Procedures,” and 40 C.F.R. § 270.14(b)(7). Information specific to the Chemical Waste Landfill (CWL) is included in this Permit Attachment. Current copies of this Contingency Plan shall be maintained at both the Corrective Action Management Unit (CAMU) administrative trailer and the Facility’s Emergency Operations Center (EOC). The CAMU is a RCRA-regulated remediation-waste management unit that is located about 100 yards northwest of the CWL. Emergency response resources for the CAMU are shared with the CWL.

The inactive CWL is a 1.9-acre hazardous waste landfill located in the southeastern corner of Technical Area (TA)-III (TA-III). A map that shows the locations of the Facility’s TAs and the location of the CWL is presented on Figure 1 in Attachment 1 of this Permit. A more detailed map of the CWL area is presented.

Table 6-4 lists the emergency equipment that shall be maintained at the CAMU for use at the CWL. This equipment shall be tested on a quarterly basis and be shall maintained as necessary to ensure proper operation. Table 6-5 lists the emergency coordinators.

#### **Waste Types**

Hazardous waste generated at the CWL includes purge water derived from the sampling of groundwater monitoring wells, and personal protective equipment (PPE) waste generated during the sampling and management of purge water and the sampling of soil gas. Hazardous constituents may include, but are not limited to, volatile organic compounds and toxic and heavy metals. Waste generated at the CWL will be stored and managed at the CAMU less-than-90-day waste accumulation area or another established less-than-90-day waste accumulation area.

#### **Purge Water Management**

Purge water shall be collected and managed during groundwater monitoring activities by personnel who have received training in hazardous waste management. Whenever purge water is being pumped, poured, or otherwise handled, all personnel involved in the operation shall have access to a phone or radio to contact Facility and Kirtland Air Force Base (KAFB) emergency personnel, if necessary.

Facility personnel shall clean up spills immediately, and shall make the notifications as required by Section 6.4 of this Contingency Plan. At least two samples shall be collected and analyzed to ensure complete cleanup has been achieved. Additional samples may be required by the New Mexico Environment Department (the Department) depending on the magnitude and character of the spill. The samples shall be analyzed for the same parameters as those required in this Permit for groundwater sampling. Field quality control samples, consisting of at least one field and one trip blank and one duplicate (for all analytes) shall also be collected and analyzed in a laboratory for each sampling event associated with a spill.

#### **Container Management**

Typical containers used to store waste generated during post-closure care monitoring activities at the CWL include 55-gallon drums that shall be managed in accordance with applicable provisions of 40

C.F.R. Part 262 and 40 C.F.R. Part 264 Subpart I.

### **6.1. DISTRIBUTION OF CONTINGENCY PLAN AND AMENDMENTS**

Copies of this Contingency Plan shall be maintained at: 1) The CAMU, 2) The Facility EOC, and 3) The Facility Records Center. The Permittees shall also provide copies of this Plan and any amendments and updates of this Plan to the KAFB Fire Department and the Department.

The Permittees' EC(s) and the Facility emergency response organization (ERO) personnel shall periodically review this Contingency Plan. The Plan shall be amended, if necessary, whenever one or more of the following occurs:

1. Applicable regulations or Permit conditions are revised;
2. There is a significant change in Facility or Unit design, construction, maintenance, operation, or other circumstance that increases the potential for emergencies or changes the response necessary in an emergency;
3. The list of designated emergency coordinators changes;
4. The list of required emergency equipment changes; or
5. The Plan fails during an incident or an emergency.

### **6.2. EMERGENCY RESPONSE RESOURCES**

Resources are available at the Facility, within KAFB, and in Albuquerque as described in this section.

#### **6.2.1. Emergency Coordinator (EC) and Responsibilities**

The EC and alternate ECs shall be thoroughly familiar with this Contingency Plan, the layout of the CWL, sampling and monitoring operations, the location of records, and the emergency equipment and supplies. The EC shall have the authority to commit the necessary resources (including personnel, materials, and funds) to respond to any incident or emergency at the CWL.

During an incident or emergency at the CWL, or until the Facility emergency response Incident Commander (**IC**) arrives, the EC has three primary responsibilities:

1. **Assess the Situation.** By observing the scene, interviewing personnel, and/or reviewing records, the EC must gather information relevant to the response, such as the type of event, quantity and type of released material, and actual or potential hazards to human health or the environment.
2. **Protect Personnel.** The EC shall take any reasonable measures to ensure the safety of personnel, such as activating the fire alarm, accounting for personnel, attending to injuries, or coordinating the evacuation of personnel, if necessary. If evacuation is indicated for other personnel, the IC must be informed.
3. **Contain or Mitigate the Hazards.** The EC shall take reasonable measures to ensure that fires, explosions, or releases do not occur, recur, or spread.

After an incident or emergency, the EC shall ensure that the CWL and equipment are cleaned, waste is properly managed and disposed of, the CWL is safe, and all information necessary for notifications and reports is provided to Facility personnel, as outlined in Section 6.6.

In the event that the EC is not on site or immediately available during an incident or emergency, an alternate EC shall be contacted. The names, addresses, and phone numbers of the primary and alternate ECs for the CWL are included in Table 6-5. The EC or alternate EC shall be on site or immediately available during sampling and analysis events.

#### **6.2.2. Emergency Response Groups**

The Facility ERO consists of two response groups that respond to an emergency situation: (1) a field response group led by an IC under the Incident Command System (**ICS**) and (2) an EOC cadre. The ICS also includes Facility Security, the KAFB Fire Department, and the Facility personnel with relevant technical skills. An IC shall be on site at the Facility at all times (24 hours per day, 7 days per week). Facility security and the KAFB Fire Department personnel shall also be available at all times. Facility technical personnel are available on site from 8:00 am to 4:30 pm Monday through Friday and are on call the rest of the time. Facility EOC staff shall include an Emergency Director and a staff of Sandia Corporation and Department of Energy (DOE) personnel who are responsible for management decisions and notifications to outside parties that are required during an emergency response. EOC staff personnel shall be available on site at the Facility from 8:00 am to 4:30 pm, Monday through Friday, and shall be on call the rest of the time.

In the field, the IC shall maintain overall management and control of response operations during an emergency. The IC shall work in a unified command with the KAFB Fire Department and in concert with safety personnel, CWL personnel, and other emergency responders to develop and execute response plans, including on-site protective actions and recommendations for off-site protective actions. The ICS system shall be implemented at the time an emergency occurs and shall be expanded to control the emergency as needs arise, and shall remain in effect until the need for emergency management no longer exists.

#### **6.2.3. Emergency Chain of Command**

When the EC is notified of an incident, he shall first determine if the procedures for emergencies should be implemented. If an incident is an emergency, the EC shall manage the emergency response until the IC arrives at the CWL, then the EC will relinquish control to the IC. If possible, the EC shall maintain communication with the IC by telephone or radio before the IC arrives at the

CWL. The EC shall remain at the CWL and assist in the emergency response as directed by the IC. The EC shall advise the IC, as needed, on CWL operations, CWL layout, characteristics of hazardous waste on site, location of records, radio and cellular communication systems, and other information as necessary to respond to the emergency.

The Facility IC is the liaison for communications with other emergency response organizations and functions, including medical and fire protection support. The EC can request both medical and fire protection services, if necessary, at the same time that he/she notifies the IC of an emergency.

**6.2.4. Support Agreements and Coordination with Outside Agencies**

The Facility shall maintain sufficient response resources to handle most emergencies arising from hazardous waste management activities as described in this Contingency Plan. These response resources include personnel, emergency equipment, medical facilities, and communications systems. The Facility has also established mutual aid agreements and memoranda of understanding with several off-site agencies and facilities for additional response capabilities for the Facility. These agencies and facilities include the establishments listed in Table 6-1.

**TABLE 6-1**

**Agreements and Memoranda of Understanding for Emergency Response**

<b>Agency or Facility</b>	<b>Type of Service</b>
The New Mexico Department of Public Safety	Mutual aid involving an actual or potential emergency, assistance in training and emergency response for local and tribal governments.
The 377th Air Base Wing, Kirtland Air Force Base	Various types of support, including fire protection, police services, communications, and utilities.
The U.S. Forest Service	Cooperative fire fighting arrangement between the USFS and KAFB for wild land fires.
The City of Albuquerque	Mutual support and responsibilities during a potential or actual emergency requiring the combined resources of DOE and the City of Albuquerque.
The University of New Mexico Medical Center	Mutual cooperation and assistance in providing timely and effective emergency medical services.
Lovelace Medical Center	Mutual cooperation and assistance in providing timely and effective emergency medical services.
Presbyterian Health Care Services	Mutual cooperation and assistance in providing timely and effective emergency medical services.

**6.3. EMERGENCY EQUIPMENT**

A list of equipment available through the Facility emergency response system is provided in Table 6-2. A list of emergency equipment to be maintained at the Corrective Action Management Unit for use at the CWL is presented in Table 6-4.

## **6.4. CONTINGENCY PLAN IMPLEMENTATION**

Facility personnel who become aware of an incident or emergency shall contact the EC immediately. If the incident is an emergency, personnel shall implement evacuation procedures identified in Section 6.4.2. Personnel shall also immediately notify the EC or alternate EC of the incident or emergency. The EC shall then assess the situation and determine whether the incident is an emergency.

If the EC determines that an emergency situation exists at the CWL, he shall immediately notify the EOC. The methods for contacting emergency response representatives are listed in Table 6-3.

### **6.4.1. Emergencies**

In the event of an emergency, the EC, a designee, or CWL personnel shall immediately telephone the EOC (by calling 911 or 844-0911) or notify them in some other way. The EC shall relinquish authority to the IC upon arrival. The EC and the IC shall:

1. Determine the extent of the emergency;
2. Identify the character, source, amount, and extent of released materials by observation, records reviews, or chemical analysis;
3. Assess possible resulting hazards to human health or the environment, considering both direct and indirect effects;
4. Take all reasonable measures necessary to ensure fires, explosions, and releases do not occur, recur, or spread to other hazardous waste at the CWL, including collecting and containing released waste, and removing or isolating containers; and
5. Monitor for leaks, pressure buildup, gas generation, and ruptures in equipment.

**TABLE 6-2  
 Chemical Waste Landfill Emergency Response Equipment Inventory**

<b>Item or Equipment</b>	<b>Description/Telephone</b>
<b>Emergency Vehicles (owned by the Facility unless noted)</b>	
Emergency Response Vehicle	Mobile Command Post equipped with communications equipment, typically located at SNL EOC <sup>a</sup> the Facility Emergency Response System — Call 911 or (505) 844-0911
Ambulance	Typically located at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Security Vehicles	Vans and trucks equipped with communications equipment and utilized for transportation of personnel and equipment, typically located throughout SNL. SNL Emergency Response System — Call 911 or (505) 844-0911
Fire Trucks (owned by KAFB Fire Department)	Fire-fighting vehicles outfitted with equipment for fighting fires, typically located at KAFB fire stations. SNL Emergency Response System — Call 911 or (505) 844-0911
<b>Medical Supplies</b>	
Stretchers/Stokes Litter	Equipment for movement of injured personnel. Stokes litter will immobilize personnel so they may be moved vertically. Typically located in ambulance or at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Blankets	Normal blankets, typically located in ambulance or at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Medical Kits	Emergency first-aid supplies, typically located in ambulance or at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
<b>Safety Supplies</b>	
Air Packs	Self-contained breathing apparatus for use by personnel entering hazardous atmospheres, typically located in ambulance or response vehicle. SNL Emergency Response System — Call 911 or (505) 844-0911
Monitoring Instruments	Typically located in ambulance or emergency response vehicle. SNL Emergency Response System — Call 911 or (505) 844-0911

<sup>a</sup> The Facility EOC is located at Technical Area I (TA-I).

**TABLE 6-3**  
**Facility Emergency Response System Notification**

<b>Method</b>	<b>Emergency Number</b>
Telephone	911
Mobile Telephone	(505) 844-0911

**Note:** Any person is authorized to implement the evacuation procedures, notify the EC or alternate EC, and/or contact the emergency response representatives in the unlikely event that the EC or alternate EC cannot be contacted or respond in a timely manner.

*6.4.1.1. Fire*

The following steps shall be implemented as needed in the event of an emergency involving an imminent or existing fire.

1. All non-essential personnel shall evacuate following the evacuation route described in this Permit Attachment or to an alternate assembly location as directed by the EC. All personnel shall evacuate as soon as possible if it becomes necessary to ensure their health and safety.
2. The EC (or Unit personnel) shall immediately notify the Facility ERO and KAFB Fire Department by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and the Facility ERO shall also be notified by activation of an automatic fire alarm.
3. CWL personnel may consider taking action to put out a fire or minimize its spread ONLY if safe to do so. These actions may be taken only after the IC and KAFB Fire Department have been notified. Personnel must not jeopardize their own safety or the safety of other personnel.
4. If a fire is small and the fuel source is small, portable fire extinguishers may be used to put out the fire.
5. Fire extinguishers shall only be used by personnel trained in their use, and only for very small fires.
6. Flammable materials shall be removed from the area of a fire if safe to do so.
7. If the fire spreads or increases in intensity, all remaining personnel must evacuate.
8. The EC shall remain near the CWL, but at a safe distance, so he can advise personnel responding to a fire of the known hazards.
9. Upon arrival at a fire, the KAFB Fire Department officer-in-charge shall be in command of fire fighting. He shall accept and evaluate the advice of the CWL and emergency response personnel, but he retains the responsibility of selecting the fire-fighting methods and tactics.
10. The IC shall be in overall control of the Facility emergency response efforts until the emergency is terminated.
11. Hazardous wastes involved in a fire can be identified in the following ways: The location of the container may indicate the contents. If the location does not indicate its contents, the

label number can be used to identify the waste. Records on the contents of each container can be accessed from outside the CWL. If the label has been burned and the container cannot be identified, the waste shall be treated as an unknown.

12. Residues of hazardous wastes may be collected and contained by stabilizing or neutralizing the spilled waste, as appropriate; pouring an absorbent over the spilled waste; and sweeping or shoveling the absorbed waste into drums or other appropriate containers.
13. If needed, affected surfaces shall be cleaned using cleaners appropriate for the chemicals and wastes involved.
14. If possible and safe, responding personnel shall take measures to contain potentially hazardous runoff and keep it away from storm drains and/or sewers. If possible, personnel shall build dikes around storm drains.

#### 6.4.1.2. *Explosion*

The following steps shall be implemented as needed in the event of an emergency involving an imminent or existing explosion.

1. Personnel shall immediately evacuate the area.
2. The EC (or CWL personnel) shall immediately notify the Facility ERO and KAFB Fire Department by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and the ERO shall also be notified by activation of an automatic fire alarm.
3. The EC shall remain near the CWL, but at a safe distance, so that he/she can advise the response personnel of the known hazards involved and the degree and location of the explosion and associated fires.
4. Upon arrival at the site, the KAFB Fire Department officer-in-charge shall be in command of fire fighting. He/she will accept and evaluate the advice of the CWL personnel and emergency response organization members, but retains the responsibility of selecting the fire-fighting methods and tactics.
5. The IC shall be in overall control of Facility emergency response efforts until the emergency is terminated.
6. Residues of hazardous wastes may be collected and contained by stabilizing or neutralizing the spilled waste, as appropriate; pouring an absorbent over the spilled waste; and sweeping or shoveling the absorbed waste into drums or other appropriate containers. If needed, affected surfaces shall be cleaned using cleaners appropriate for the chemicals and wastes involved.
7. If possible, responding personnel will take measures to contain potentially hazardous runoff and keep it away from storm drains and/or sewers, such as building dikes around storm drains.
8. The EC shall secure the CWL once it has been determined to be safe by the IC or a safety officer.

### 6.4.1.3. *Uncontrolled Release*

The following steps shall be implemented as needed in the event of an incident or emergency involving an imminent or existing release of hazardous waste and/or radioactive mixed waste or constituents:

1. Evacuate the immediate area.
2. If it is an emergency, the EC (or CWL personnel) shall immediately notify the ERO and KAFB Fire Department by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and ERO shall also be notified by activation of an automatic fire alarm.
3. Take actions to minimize, contain, and clean up the release only if safe to do so.
4. Review Facility records (e.g., waste inventory database) to determine the identity and chemical nature of the released material.
5. Wear appropriate personal protective equipment to clean up the spill or release.
6. If possible, secure the source of the release.
7. If necessary and possible, build a dike to contain runoff.
8. Take measures to contain potentially hazardous runoff and keep it away from storm drains and/or sewers and if possible, build dikes around the storm drains.
9. Released wastes shall be collected and contained by stabilizing or neutralizing the spilled waste, as appropriate; pouring an absorbent over the spilled waste; and sweeping or shoveling the absorbed waste into drums or other appropriate containers.
10. No waste that may be incompatible with the released material shall be managed at the CWL until the cleanup procedures are completed.
11. After collection of a released waste, soil at the affected site shall be sampled and analyzed. If contamination is found to exist, contaminated soil shall be collected, contained (if appropriate), and removed from the site for disposal at a permitted disposal facility. Depending on the specific conditions, however, the Facility may choose to implement an alternative decontamination method such as surface cleaning or in-situ neutralization or stabilization. Any such alternative shall be approved by the Department prior to implementation.

### 6.4.2. **Evacuation**

During an emergency that threatens the health or safety of CWL personnel, the following steps shall be taken as needed to facilitate safe coordinated evacuation:

1. Stop work.
2. If safe, close containers and shut down equipment or otherwise place it in a safe mode.
3. Alert personnel in the affected area by announcing the evacuation by voice command, "Evacuate the Area."

4. Activate the available evacuation signal consistent with the internal communications and alarm systems.
5. Notify the Facility ERO by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and the ERO shall also be notified by activation of an automatic fire alarm.
6. Check to see whether there is evidence that the designated evacuation route is not safe.
7. If there is no evidence of danger or obstacles, exit the CWL according to the evacuation route.
8. If there is evidence of danger or obstacles, exit the CWL by any safe route available.
9. If safe, check for other personnel in other areas of the CWL.
10. Proceed to the designated assembly area for roll call to be taken by the EC or designee.
11. If the EC and CWL personnel are assembling at an alternate location, proceed to that location.
12. Inform the EC or designee about any other people still believed to be inside the CWL.
13. Do not re-enter the CWL until the IC or EC determines that is safe.

#### **6.4.3. Coordination with Off-Site Parties and Emergency Notification**

The Facility EOC shall notify DOE of all emergencies at the Facility. The Permittees shall notify State and Local agencies if State or Local response resources are needed, if human health or the environment is threatened outside the Facility, or if areas outside the SNL Facility may require protective action. The Facility will verbally inform the City of Albuquerque and Isleta Pueblo as soon as possible, in the unlikely event that residents of Albuquerque or Isleta Pueblo could be affected. The notification shall include available information about the nature and location of the emergency, the waste and materials involved, and the recommended protective actions. The most likely protective actions are expected to include evacuation or sheltering indoors with doors and windows closed and ventilation systems shut off.

In the event of emergency involving injuries that require medical services from one of the hospitals listed in Table 6-1, the Permittees shall provide all available information about the incident and the wastes and materials involved to the responders as soon as possible.

The Permittees shall also notify the National Response Center (1-800-424-8802) if human health or the environment is threatened outside the Facility. The notification shall include the following.

1. Name and telephone number of the responsible official
2. Facility name and address
3. Time and nature of emergency
4. Type and quantities of wastes and materials involved to the extent known
5. Personnel injuries, and
6. Potential hazards to human health, or the environment, outside the Facility.

Further, the Permittees shall also provide this information to the Department in accordance with regulatory requirements, including verbal notification via the 24-hour emergency reporting number (1-505-827-9329) or other emergency notification number designated by the Department.

#### **6.5. POST-EMERGENCY ACTIONS**

Immediately after an emergency, the EC and the IC shall:

1. Continue to monitor for leaks, pressure buildup, gas generation, and ruptures in valves, pipes, or other equipment;
2. Provide for properly treating, storing, or disposing of recovered waste, contaminated soil or other media, or any other material or waste;
3. Ensure that no waste that may be incompatible with released material or waste is managed at the CWL until cleanup procedures are completed; and
4. Ensure that all equipment used in responding to the emergency is cleaned and fit for its intended use before resuming operations at the CWL.

Before resuming operations after an emergency, the Permittees shall notify the Department that incompatible waste will not be managed until cleanup procedures are complete and equipment listed in this Contingency Plan is cleaned and fit for use.

#### **6.6. EMERGENCY RESPONSE RECORDS AND REPORTS**

The time, date, and details of an incident or emergency involving implementation of this Contingency Plan shall be noted in the Operating Record. Within fifteen (15) calendar days following the incident or emergency, a written report shall be submitted to the Department identifying:

1. Name, address, and telephone number of the responsible official;
2. Name, address, and telephone number of the Facility;
3. Date, time, and type of emergency or incident (e.g., fire, explosion, release);
4. Name and quantity of wastes and material(s) involved;
5. Extent of injuries (if any);
6. Assessment of actual or potential hazards to human health or the environment, where applicable; and
7. Estimated quantity and disposition of recovered material and wastes that resulted from the incident or emergency.

**TABLE 6-4**  
**Emergency Equipment for the Chemical Waste Landfill.**  
**(The Equipment is Located at the Corrective Action Management Unit)**

<b>Category</b>	<b>Description</b>	<b>Specific Location at CAMU</b>
Spill Control Equipment	Spill control materials, including sorbent material, brooms and shovels	Leachate Storage Area Shed
Fire Extinguisher	Portable, Multi-Class	One near the Leachate Storage Area and Containment Cell, and one in CAMU Administration Trailer
Communications: (Internal/External)	Cellular Phone or Red Site radio	In the vicinity of the Leachate Storage Area
Water Supply	Fire Hydrant  Ground Hydrant	One outside the southeast entrance to the CAMU  Two near the former Treatment Pad and two near the former Bulk Waste Staging Area
Environmental Safety and Health	Portable eyewash station	Leachate Storage Area Shed (during waste handling activities)
Evacuation	Voice command by on-site personnel or signaled by three blasts of a vehicle warning horn.	Designated Assembly Area (See Figure 2)

CAMU = Corrective Action Management Unit.

**TABLE 6-5**  
**Emergency Coordinator List for the Chemical Waste Landfill**

<b>Emergency Coordinators<sup>a</sup></b>	<b>Home Telephone</b>	<b>Office Telephone</b>	<b>Cellular or Pager</b>
Primary: Franz Lauffer P.O. Box 5800 Environmental Management MS-1042 Albuquerque, NM 87185	867-2043	845-7697	540-5513 (Pager)
1st Alternate: Bruce Reavis P.O. Box 5800 Environmental Management MS-1042 Albuquerque, NM 87185	296-0007	845-8403	250-6388 (Cellular) 530-7538 (Pager)
2nd Alternate: Robert Ziock P.O. Box 5800 Landfills and Test Areas MS-1088 Albuquerque, NM 87185	255-4714	845-0845	None

<sup>a</sup>At least one emergency coordinator must be at the CWL or CAMU unit or on call.