

**RCRA Interim Status Closure Plan for the  
High Bay Waste Storage Facility**

**Sandia National Laboratories/New Mexico  
April 2004**

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**TABLE OF CONTENTS**

LIST OF TABLES ..... ii  
LIST OF FIGURES ..... iii  
ACRONYMS AND ABBREVIATIONS ..... iv  
1.0 INTRODUCTION..... 1  
2.0 SITE DESCRIPTION..... 1  
3.0 WASTE DESCRIPTION, MAXIMUM VOLUME STORED, AND INVENTORY  
ELIMINATION ..... 2  
4.0 CLOSURE METHOD..... 3  
    4.1 Phase I: Data Quality Objective Process ..... 4  
    4.2 Phase II: Decontamination and Verification Procedures ..... 6  
    4.3 Phase III: Closure Certification..... 8  
5.0 SAMPLING AND ANALYSIS ..... 8  
6.0 CLOSURE SCHEDULE..... 8  
7.0 CLOSURE PLAN AMENDMENT ..... 9  
8.0 FINANCIAL REQUIREMENTS ..... 9  
9.0 POST-CLOSURE CARE ..... 9  
10.0 SURVEY PLAT..... 10  
11.0 FINAL CLOSURE REPORT ..... 10  
REFERENCES ..... 10

**LIST OF TABLES**

<b><u>Table No.</u></b>	<b><u>Title</u></b>
3-1	Sandia National Laboratories/New Mexico RCRA-Regulated Wastes Managed in High Bay Waste Storage Facility
6-1	Sandia National Laboratories/New Mexico Closure Schedule for High Bay Waste Storage Facility

## LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>
1-1	Sandia National Laboratories/New Mexico Location of High Bay Waste Storage Facility

## ACRONYMS AND ABBREVIATIONS

20 NMAC 4.1.X00	New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart X
40 CFR 2XX.XX	Code of Federal Regulations, Title 40, Part 2XX, Section 2XX.XX
ASTM	American Society for Testing and Materials
DOE	U.S. Department of Energy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
HBWSF	High Bay Waste Storage Facility
NMED	New Mexico Environment Department
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
Sandia	Sandia Corporation
SNL/NM	Sandia National Laboratories/New Mexico
TSDf	treatment, storage, or disposal facility
Unit	RCRA-regulated waste management unit

## RCRA INTERIM STATUS CLOSURE PLAN FOR THE HIGH BAY WASTE STORAGE FACILITY

### 1.0 INTRODUCTION

This closure plan describes the process to be followed to close the High Bay Waste Storage Facility (HBWSF), a RCRA-regulated storage facility operated by Sandia National Laboratories/New Mexico (SNL/NM) for the U.S. Department of Energy (DOE). The HBWSF is located on Kirtland Air Force Base (KAFB), Albuquerque, New Mexico (Figure 1-1).

The HBWSF was included as a container storage area for RCRA-regulated wastes in a SNL/NM Resource Conservation and Recovery Act (RCRA) General Part A Permit Application submitted to the New Mexico Environment Department (NMED) in 1991. The unit was also included in several revisions of the Part B Permit Application (1993, 1996, 2002, and February 2003). A RCRA Part B permit covering operations at the HBWSF was never issued, and as such, the unit has been operating under the implementing regulations for interim status container storage units found in 20 NMAC 4.1.600/40 CFR 265, Subpart G.

This interim status closure is being conducted to remove the HBWSF from RCRA service, in accordance with the applicable requirements of 20 NMAC 4.1.600/40 CFR 265, Subpart G, "Closure and Post-closure", as applicable.

### 2.0 SITE DESCRIPTION

The HBWSF is located inside Building 6596, approximately 400 feet southeast of the entrance to Technical Area V of SNL/NM. The HBWSF RCRA-regulated waste management area (WMA) is located in the west side of the main wing of Building 6596. Building 6596 is a pre-engineered metal building with a sloped-steel corrugated roof constructed on a concrete slab.

The western, southern, and northern interior walls in Building 6596 are constructed of galvanized sheet metal with a baked enamel finish. The eastern wall is constructed of 8-inch filled concrete block and coated with a chemical-resistant epoxy. The HBWSF WMA floor is sealed with a chemical-resistant epoxy.

The HBWSF WMA is approximately 40 ft by 145 ft with an eave height of 30 ft. It consists of the western section of the main building. In earlier Sandia/DOE Part A and Part B permit applications (1990, 1993, 1996) the WMA is shown as the entire main building. However, the eastern section of the main building has not been used for management of RCRA-regulated wastes. Thus the eastern section is not included in this closure plan.

### 3.0 WASTE DESCRIPTION, MAXIMUM VOLUME STORED, AND INVENTORY ELIMINATION

The HBWSF total storage area is approximately 5,800 square ft with a maximum storage capacity of 100,320 gallons. The estimated maximum volume of RCRA-regulated wastes in storage in the HBWSF at any time during its operations was 250 55-gallon drum equivalents (13,750 gallons). The cumulative volume of RCRA-regulated waste that was stored in the HBWSF over its operating life is 22,300 gallons.

Containers holding RCRA-regulated liquid wastes were stored on portable spill pallets and pans covered with grating. The containers of liquids were typically 5- to 55-gallon capacity, and the pallets were of various sizes and capacities. Each pallet had sufficient capacity to hold the contents of the largest container of liquid stored on it. Building 6596 is also equipped with a system of floor trenches covered with grating, however, these trenches were not used to provide secondary containment.

Waste loading and unloading activities took place just inside or at the roll-up doorway on the south side of the WMA.

Under interim status, the HBWSF WMA was authorized to store any RCRA-regulated wastes bearing those U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers listed in the SNL/NM General Part A (SNL/NM, 1990, 1993, 1996, 2002). However, a review of HBWSF operating records shows that only wastes with the following EPA Hazardous Waste Numbers were stored in the unit:

**Table 3-1**  
**Sandia National Laboratories/New Mexico**  
**RCRA-Regulated Wastes Managed in the High Bay Waste Storage Facility**

RCRA Hazardous Waste Number	Characteristic or Constituents
D001	Ignitability per 40 CFR 261.21
D002	Corrosivity per 40 CFR 261.22
D003	Reactivity per 40 CFR 261.23
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver
F001	Carbon tetrachloride

**Table 3-1 continued**

RCRA Hazardous Waste Number	Characteristic or Constituents
F002	Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, 1,1,2-trichloroethane
F003	Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, methanol
F005	Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane

Currently, all RCRA-regulated wastes have been removed from the HBWSF. Therefore, inventory elimination procedures are not included in this closure plan.

#### 4.0 CLOSURE METHOD

Sandia/DOE plan to clean close the HBWSF in a manner that meets the closure performance standards in 20 NMAC 4.1.600/40 CFR 265.111:

- Minimizes the need for further maintenance,
- Controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground, surface waters, or atmosphere; and
- Complies with the applicable closure and post closure requirements of 20 NMAC 4.1.600/40 CFR 265, Subparts G and I through DD.

Closure methods proposed in this plan are based on the following assumptions about conditions during the operational life of the HBWSF:

- RCRA-regulated wastes were stored in containers (e.g., drums);
- RCRA-regulated wastes were not treated in the HBWSF. Sandia/DOE considered performing treatment in containers, but did not actually do so.
- Containers used to store RCRA-regulated wastes retained their integrity;
- Adequate secondary containment was provided for liquid wastes;
- Releases of RCRA-regulated wastes or RCRA-regulated waste constituents to the environment did not occur within the HBWSF or in the loading/unloading area;
- The HBWSF is clean and in good condition. A small amount of soil is present on the floor.

These assumptions are derived from historical knowledge of waste management practices and policies, applicable written records (i.e., inspection logs and waste inventory reports), interviews with facility operations personnel, and the current physical condition of the WMA.

In order to clean close the HBWSF, the following general activities will occur:

- Phase I: Data Quality Objective Process and Closure Approach (discussed in Section 4.1)
  - The data quality objective (DQO) process will be implemented to ensure the relevance, effectiveness, and quality of information utilized in closure decision-making.
- Phase II: Closure Activities: Decontamination and Verification Procedures (discussed in Section 4.2)
  - Loose material will be swept up and collected.
  - Personnel will wash the floor and lower walls in the HBWSF to remove remaining material.
  - Decontamination rinsate will be collected, sampled, and analyzed to confirm clean closure.
  - Additional decontamination will be performed if necessary in areas where the visual evidence or analytical results indicate RCRA-regulated contamination is present.
- Phase III: Certification of closure (discussed in Section 4.3).
  - Closure will be certified by an independent, registered professional engineer.

Appendix A is the Sampling and Analysis Plan (SAP), which provides information regarding sample locations, sampling methodologies, selection of analytical parameters and methods, and quality assurance procedures.

#### **4.1 Phase I: Data Quality Objective Process and Closure Approach**

The DQO process is designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate for the intended application. DQOs are qualitative and quantitative statements derived from a series of seven planning steps based on the scientific method. DQO statements applied to development of this plan and the closure activities at the HBWSF are summarized below.

*Define the Problem.* The HBWSF is no longer needed for RCRA-regulated waste management activities at SNL/NM and is being closed under applicable closure requirements. Regulatory closure must meet the performance standards found in 20 NMAC 4.1.600/40 CFR 265.111(a) and (b) (see Section 4.0).

*Identify the Decision.* What are the appropriate closure performance standards for the HBWSF, and does the decontamination of meet the standards? If the standards are met, closure certification will be submitted to the Secretary of the NMED. If not, the stated performance standards will be met before closure certification.

Identify Inputs to the Decision. The inputs include the following:

- Information regarding RCRA-regulated constituents in wastes stored in the HBWSF (used to develop the information in Table 3-1).
- Evidence of incidents or activities that may have resulted in RCRA-regulated waste or constituent contamination (used to develop the summary of conditions in Section 4.0).
- Physical condition and features of the WMA in the HBWSF and visual evidence of contamination (summarized in Section 2.0).
- Results of decontamination activities undertaken during closure, including analytical data.
- Established concentrations of constituents of potential concern in the environment (e.g., correspondence from NMED (Robert S. Dinwiddie) to DOE (Michael Zamorski), dated September 24, 1997).

Define the Boundaries. The evaluation will be limited to information that is relevant to activities conducted in the HBWSF and the planned closure activities:

- Information obtained from review of applicable archival RCRA-regulated waste management records of activities during the operating life of the WMA (e.g., inspection logs, operating record, and waste inventory reports).
- Phase II decontamination activities will be limited to the hardened surfaces present in the HBWSF, including concrete floors and walls, and metal walls. Decontamination of walls will be limited to a height of five feet.
- Samples collected during decontamination activities will be analyzed for parameters that are relevant to the operating history, the decontamination activities, and characterization of residual wastes for further management.

Develop the Decision Rule. The decision consists of two parts: 1) defining HBWSF-specific criteria to indicate when the closure performance standard has been achieved, and 2) determining whether the results of the closure activities satisfy the performance standard.

To meet the first part, the information obtained from the records review will be used to select parameters to indicate presence of waste-related constituents. Section A.4 of the SAP describes the rationale for the chemicals of potential concern (COPCs) selected for closure verification sampling.

If analytical results of residues and decontamination rinsate do not contain significantly elevated concentrations of the COPCs, the HBWSF Unit will be considered to be clean closed, and the closure certification step may commence.

Specify Limits on Decision Errors. Because measurement data from sampling and analysis can only estimate true values, there is always a possibility that decisions made based on measurement data will be in error. Decision errors can be attributed to either sampling error (when incorrect sampling fails to adequately represent the true environment) or measurement errors (when the

combination of random and systematic errors in the measurement process inaccurately represent the true values). Precautions taken to minimize either type of decision error when performing regulatory closure are discussed in the SAP.

*Optimize Design.* The results of the first steps will be evaluated and used in developing a resource-effective sampling and analysis strategy. The data will be used to determine whether the closure activities were successful and the HBWSF meets the second part of the decision rule following decontamination.

*Analytical Data Assessment.* Chemical analysis data used to document attainment of the closure performance criteria for the HBWSF will be assessed using Sandia/DOE data verification and validation procedures or equivalent methods.

Quality controls (QCs) for sampling and analysis will be implemented to ensure that measurement data collected meets the information objectives for this investigation. QC will be implemented by adhering to the sampling procedures described in the approved sampling and analysis plan; documenting sampling activities and sample custody; using controlled and standard equipment and materials; and collecting, analyzing, and evaluating field and laboratory QC samples. Quality assurance and quality control procedures are discussed in more detail in the SAP.

## 4.2 Phase II: Decontamination and Verification Procedures

The decontamination procedures described below are designed to satisfy closure performance standards by describing the steps taken to remove or decontaminate all RCRA-regulated waste residues and contaminated containment system components, equipment, and structures during closure. Decontamination techniques apply to the hardened surfaces present in the HBWSF, including concrete floors and walls, and metal walls. These procedures are intended to allow structures and equipment in the HBWSF to be returned to service in the management of non-RCRA regulated materials, and may be revised before or during closure to incorporate new practices or technology.

After the closure criteria have been developed in Phase I, floor and wall surfaces in the HBWSF will be decontaminated using the following procedures:

- Remove gross residual material (soil) from the floor using brooms, mechanical sweepers, or similar equipment.
- Collect a composite grab sample of the floor sweeping residuals to be analyzed for the COPCs (as described in the SAP).
- Inspect surfaces for cracks or gaps prior to decontamination.
- Formulate a wash solution of water and a non-phosphate detergent for decontamination. Prior to use, collect a grab sample to be analyzed for the COPCs (as described in the SAP).
- Wash the floor, concrete apron at the south roll-up door, interior wall surfaces (up to a height of five feet), and non-disposable equipment with mops/sponges and the warm non-phosphate detergent solution. This washing may be done using a hot-water pressure

washer, depending on the degree of contamination or other conditions at the time of closure.

- Use portable berms or other containment structures (e.g., enclosed areas covered with polyethylene sheeting) to contain and collect decontamination wash waters.
- Allow surfaces to air dry.
- Conduct a walk-through visual inspection of all decontaminated surfaces.
- Repeat surface wash and wash-water collection procedures until all visible signs of contamination have been removed. Visible contamination that cannot be removed by washing will be removed by scraping or chipping using appropriate tools and equipment.
- Verify the absence of visible contamination using a site inspection logbook or memo entries and visual documentation (e.g., videotaping, photographing).
- Collect one grab sample of decontamination rinsate from each wall and floor grid to be analyzed for the COPCs (as described in the SAP).

The following general principles apply to decontamination of the HBWSF, as applicable:

- Only those grids that do not meet closure performance standards (based on results from background and rinsate sampling) will require further decontamination and re-sampling.
- Used wash water may be discharged into the City of Albuquerque sewer treatment system, provided the results of sampling and analysis meet the criteria of the discharge permit.
- Most personal protective equipment, plastic sheeting, and sampling equipment used by personnel performing decontamination activities will be disposable. These materials will be placed in containers and characterized to determine whether they are RCRA-regulated wastes in accordance with all applicable requirements of 20 NMAC 4.1.200/40 CFR 261.
- Any RCRA-regulated wastes generated during closure (e.g., decontamination residuals, contaminated PPE, etc.) will be managed in accordance with all applicable requirements of 20 NMAC 4.1.300/40 CFR 262.34, pending transfer to the Hazardous Waste Management Facility (HWMF) or Radioactive and Mixed Waste Management Facility (RMWMF) at SNL/NM. Sandia/DOE operate the HWMF under Permit NM5890110518, issued by the NMED. Sandia/DOE operate the RMWMF under the requirements of 20 NMAC 4.1.600/40 CFR 265 until NMED issues a final operating permit. RCRA-regulated wastes generated during closure of the HBWSF will be stored at either the HWMF or RMWMF pending shipment off-site to a commercial TSD permitted to receive the material. Off-site treatment, storage and disposal facilities that might receive these wastes are listed in Table 4-1.
- Sandia/DOE may propose improved decontamination technologies or an alternative demonstration of decontamination during closure. This information would be submitted to NMED prior to completion of closure in an updated Closure Plan.
- Soil and groundwater have not been impacted by operations at the HBWSF, as it is located inside Building 6596, which provides protection from the weather, and impermeable secondary containment systems were used and regularly inspected and maintained.
- Sandia/DOE will continue the long-standing practice of providing radionuclide data to NMED on a voluntary basis, in accordance with: (1) the joint guidance developed by the National

Association of Attorneys General (NAAG) and the NAAG/DOE Working Group, Sharing of Radionuclide Information with States, dated September 1998; and (2) the data-sharing provisions of the current Agreement-in-Principle between DOE and the State of New Mexico for Environmental Oversight and Monitoring, dated November 29, 2000.

**Table 4-1**  
**Sandia National Laboratories/New Mexico**  
**Facilities That May Receive RCRA-Regulated Wastes**  
**from Closure of High-Bay Waste Storage Facility**

Name	Location	EPA ID Number
Rinchem Company, Inc	6133 Edith Blvd NE, Albuquerque NM 87107	NMD002208627
EnSCO, Inc	309 American Circle, Eldorado AR 71730	ARD069748192
NSSI/ Sources and Services, Inc	5711 Etheridge St, Houston TX 77087	TXD982560294
Waste Control Specialists, LLC	9998 W. Highway 176, Andrews TX 79714	TXD988088464
Envirocare of Utah, Inc	Interstate 80, Exit 49, Clive UT 84101	UTD982598898
Permafix Environmental Services Inc	901 East Bodley, Memphis TN 38106	TND991279480

### 4.3 Phase III: Closure Certification

An independent, registered professional engineer will verify that closure activities followed the approved plan. Upon completion of closure, a letter certifying that the HBWSF was closed according to the approved plan will be prepared. The letter will be dated and signed by the engineer and will be stamped by the engineer with his or her professional seal. The original copy will be submitted to the Secretary of the NMED.

### 5.0 SAMPLING AND ANALYSIS

Sandia/DOE will conduct sampling and analysis for selected hazardous constituents to demonstrate the absence of contamination in the HBWSF WMA. The sampling and analysis will support the attainment of the performance standards outlined in Section 4.0 of this closure plan.

The Sampling and Analysis Plan, presented in Appendix A, provides information regarding RCRA Closure of the HBWSF.

### 6.0 CLOSURE SCHEDULE

The schedule for completion of closure activities is shown in Table 6-1. Closure is expected to take less than 180 days. If unforeseen circumstances that impact this schedule arise during closure, a Closure Plan modification will be requested in accordance with 20 NMAC 4.1.500/40 CFR 264.113(b)(1)(i).

**Table 6-1**  
**Sandia National Laboratories/New Mexico**  
**Closure Schedule for High Bay Waste Storage Facility**

Activity <sup>a</sup>	Schedule <sup>b</sup>
Submit closure plan to NMED	Prior to closure notification
Receive NMED approval of closure plan	Prior to closure
Notify the New Mexico Environment Department (NMED) of closure	Day 0 minus45
Begin closure activities	Day 0
Begin records review and site observations	Day 1
Conduct Phase I DQOs and develop closure criteria	Day 60
Conduct Phase II decontamination activities	Day 100
Verify decontamination through sampling and analysis	Day 145
Complete final closure	Day 180
Submit closure certification to NMED	60 days later

<sup>a</sup> Some activities may be accomplished concurrently with others.

<sup>b</sup> This schedule represents estimated completion time; some activities may be completed earlier than scheduled. Also, the schedule assumes that the closure plan will be approved by NMED prior to notification of closure by Sandia/DOE.

## 7.0 CLOSURE PLAN AMENDMENT

This Closure Plan will be amended if any changes occur in the operating plans or Unit design that affect the plan, such as Unit size or capacity, types of RCRA-regulated waste in the Unit at closure, maximum waste inventory, or the closure schedule. The plan will be amended if, during closure, unexpected events require the plan to be modified. Additionally, the plan will be amended if there are changes in technical considerations such as availability of new technology, changes in requirements, or operating contingencies.

If this Closure Plan requires amendment(s), Sandia/DOE will request authorization from the NMED in writing, in accordance with 20 NMAC 4.1.600/40 CFR 265.112(c).

## 8.0 FINANCIAL REQUIREMENTS

Cost estimates, financial assurance mechanisms, and liability coverage for closure and post-closure activities are not included. Federal facilities are exempt from these requirements, in accordance with 20 NMAC 4.1.600/40 CFR 265.140(c).

## 9.0 POST-CLOSURE CARE

Because Sandia/DOE plan to perform a clean closure of the HBWSF, a post-closure care plan is not required.

## 10.0 SURVEY PLAT

Sandia/DOE plan to clean close the HBWSF, therefore a survey plat is not required.

## 11.0 FINAL CLOSURE REPORT

Upon completion of the closure activities, Sandia/DOE will submit a Final Closure Report to the Secretary of the NMED. The report will contain the following information:

- Certification of closure
- Location and custodian of all closure documentation.
- Discussion of closure activities
- Laboratory analyses/results summaries

Additional information will be available, upon request, in the documentation supporting the independent registered professional engineer's certification in accordance with 20 NMAC 4.1.600/40 CFR 265.115. The supporting documentation will include:

- Original laboratory data package(s)
- Quality assurance (QA)/QC documentation for contract laboratory analyses.

## REFERENCES

SNL/NM, 1990, 1993, 1996, 2001, 2003 Resource Conservation and Recovery Act (RCRA) General Part A Permit Application, Sandia National Laboratories, Albuquerque, NM.

NMED, 1997. Letter from NMED (Robert S.Dinwiddie) to DOE (Michael Zamorski), entitled "Request for Supplemental Information: Background Concentrations Report, SNL/KAFB", dated September 24, 1997.

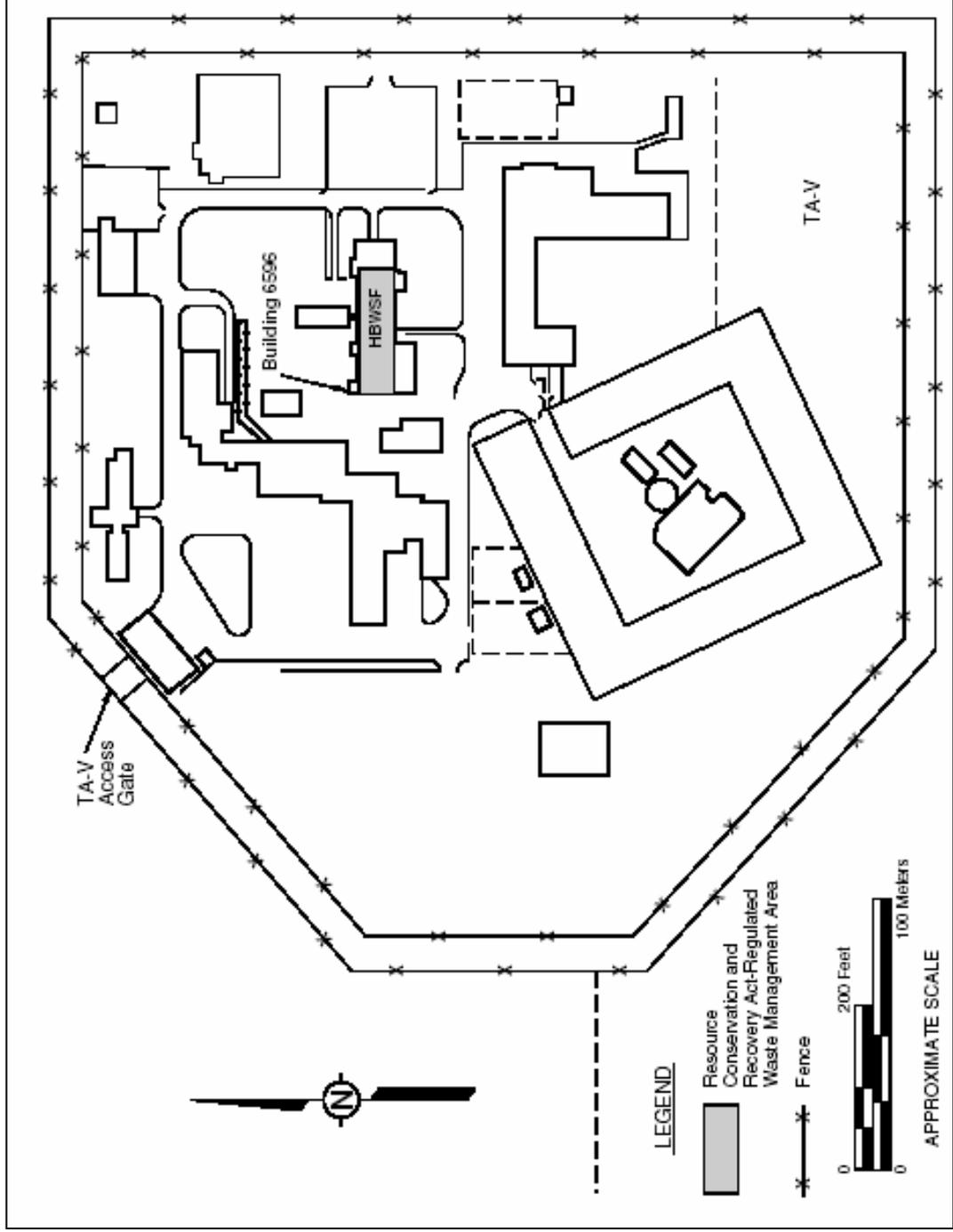


Figure 1-1  
Location of High Bay Waste Storage Facility



**APPENDIX A**

**Sampling and Analysis Plan for RCRA Closure of the  
High Bay Waste Storage Facility**

**Sandia National Laboratories/New Mexico  
April 2004**

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## TABLE OF CONTENTS

LIST OF TABLES .....	ii
LIST OF FIGURES .....	iii
ACRONYMS AND ABBREVIATIONS .....	iv
A.1 INTRODUCTION.....	1
A.2 PROJECT DESCRIPTION .....	1
A.3 SAMPLING METHODOLOGY .....	1
A.3.1 Sample Locations .....	1
A.3.2 Sample Collection and Equipment .....	3
A.3.3 Sample Equipment Decontamination .....	3
A.3.4 Sample Documentation and Custody.....	3
A.3.5 Sample Identification.....	4
A.3.6 Sample Preservation and Holding Time .....	4
A.3.7 Waste Management.....	4
A.4 DEMONSTRATION OF CLEAN CLOSURE .....	5
A.5 QUALITY CONTROL .....	5
A.6 DATA MANAGEMENT AND REPORTING.....	6
REFERENCES .....	6

Document: Sandia HBWSF  
Interim Status Closure Plan  
Sampling and Analysis Plan  
Revision No.: 2.0  
Date: April 2004

## LIST OF TABLES

<u>Table No.</u>	<u>Title</u>
A-1	Summary of Pre-Wash Sampling Program
A-2	Summary of Decontamination Rinsate Sampling Program

Document: Sandia HBWSF  
Interim Status Closure Plan  
Sampling and Analysis Plan  
Revision No.: 2.0  
Date: April 2004

## LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>
A-1	High Bay Waste Storage Facility, Location of Decontamination Grids

## ACRONYMS AND ABBREVIATIONS

20 NMAC 4.1.X00	New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart X
40 CFR 2XX.XX	Code of Federal Regulations, Title 40, Part 2XX, Section 2XX.XX
ASTM	American Society for Testing and Materials
DOE	U.S. Department of Energy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
NMED	New Mexico Environment Department
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
Sandia	Sandia Corporation
SNL/NM	Sandia National Laboratories/New Mexico
TSDf	treatment, storage, or disposal facility
Unit	RCRA-regulated waste management unit
WMA	Waste management area

## A.1 INTRODUCTION

This Sampling and Analysis Plan (SAP) describes the sampling, analysis, and quality assurance methodologies Sandia/DOE will use to demonstrate clean closure of the High Bay Waste Storage Facility in accordance with the requirements of 20 NMAC 4.1.600/40 CFR 265, Subpart G, "Closure and Post-closure", as applicable.

## A.2 PROJECT DESCRIPTION

This SAP presents procedures for the acquisition, analyses, and evaluation of samples of floor sweepings (soil), pre-wash (unused) wash water, and decontamination rinsate from the floor and interior walls of the HBWSF WMA. All the samples will be analyzed to determine concentrations of a set of chemicals of potential concern (COPCs) selected from the range of RCRA-regulated waste constituents managed in the Unit. The COPCs, the rationale for their selection, and the applicable performance standards for clean closure are presented in Section A.4 of this SAP.

This closure will be conducted to support attainment of the performance standards outlined in 40 CFR 265.111(a) and (b), which require that the unit be closed in a manner that:

- Minimizes the need for future maintenance, and
- Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure release of RCRA-regulated wastes, constituents, leachate, contaminated run-off, or decomposition products to the ground or surface waters or to the atmosphere.

Section A.4 of this SAP describes the COPC levels that will be used to verify that clean closure has been achieved.

## A.3 SAMPLING METHODOLOGY

### A.3.1 Sample Locations

A single representative sample will be taken from all of the floor sweepings generated prior to the decontamination step. In addition, one representative sample will be taken from each batch of detergent/water to be used in the decontamination procedure. These samples are summarized in Table A-1.

Decontamination rinsate will be contained in temporary berms or other secondary containment structures. Two representative grab samples of decontamination rinsate will be obtained from each floor grid shown on Figure A-1; one sample from each pair will be filtered upon collection to remove particulates present in the water. One representative grab sample of decontamination rinsate will be obtained from each wall grid shown on Figure A-1. Decontamination rinsate sampling is summarized in Table A-2.

**Table A-1**  
**Summary of Pre-Wash Sampling Program**

Media to be Sampled	Sample Number & Type	Analytical Parameters <sup>1</sup>	Standards for Comparison <sup>2</sup>
Floor sweepings	Single grab from collected material (representative of material removed from entire floor surface)	Barium Cadmium Chromium Lead	130 ppm <1 ppm 17.3 ppm 21.4 ppm
Pre-wash (unused) water	single grab (one from each batch of detergent/water mixture prior to use in decontamination)	Barium Cadmium Chromium Lead	N/A

<sup>1</sup> These metals have been selected as COPCs to demonstrate clean closure at the HBWSF due to their widespread presence in wastes that were stored at the Unit.

<sup>2</sup> Analytical results for COPCs in floor sweepings will be compared to background concentrations in site soils developed by NMED (NMED 1997). Analytical results for COPCs in pre-wash water will be used in evaluating the decontamination rinsate.

**Table A-2**  
**Summary of Decontamination Rinsate Sampling Program**

Area to be Decontaminated	Dimensions of Area to be Decontaminated	Grid Size	Number of Grids	Samples Per Grid <sup>1</sup>	Chemicals of Potential Concern	Closure Standard <sup>3</sup>
Floor	40' x 145'	20' x 48'4"	6	2	Barium Cadmium Chromium Lead	Evaluate with respect to concentrations in sweepings and in pre-wash water
South wall	5' x 145'	5' x 48'4"	3	1	Same as above	Same as above
North wall	5' x 145'	5' x 48'4"	3	1	Same as above	Same as above
West wall	5' x 40'	5' x 40'	1	1	Same as above	Same as above
East wall	5' x 40'	5' x 40'	1	1	Same as above	Same as above

<sup>1</sup> One sample from each pair of floor rinsate samples will be filtered when collected to remove particulates.

<sup>2</sup> These metals have been selected as COPCs to demonstrate clean closure at the HBWSF due to their widespread presence in wastes that were stored at the Unit.

<sup>3</sup> Sandia/DOE will continue the long-standing practice of providing radionuclide data to NMED on a voluntary basis, in accordance with: (1) the joint guidance developed by the National Association of Attorneys General (NAAG) and the NAAG/DOE Working Group, *Sharing of Radionuclide Information with States*, dated September 1998, and (2) the data-

sharing provisions of the current Agreement-in-Principle between DOE and the State of New Mexico for Environmental Oversight and Monitoring, dated November 29, 2000.

### **A.3.2 Sample Collection and Equipment**

Representative samples of floor sweepings, unused wash water, and decontamination rinsate will be collected in pre-cleaned 500-milliliter or 1-liter wide-mouth glass jars with screw-top lids, or other SW-846-approved containers that are appropriate for the analysis. Sample containers to be used for collection of unused wash water and decontamination rinsate will contain preservative (nitric acid).

Two grab samples of the decontamination rinsate from each floor grid will be collected. One sample of each pair will be filtered using a 0.45-micron filter to remove particulates.

Sample documentation and chain-of-custody procedures are described in Section A.3.5 of this SAP, and sample preservation and holding times are described in Section A.3.7.

### **A.3.3 Sample Equipment Decontamination**

Pre-cleaned and prepared sample containers and disposable filtration equipment will be obtained from a commercial supplier or the analytical laboratory selected by Sandia/DOE. Decontamination of sampling equipment is not required for the sampling procedures used in this closure.

If personnel decide during sampling activities that reusable containers are more suitable for sample collection activities, the sampling equipment will be decontaminated using the following steps:

- Wash the equipment with a warm laboratory-grade non-phosphjate detergent solution, scrubbing as needed to remove deposits.
- Rinse the equipment with warm tap water until the residue is removed.
- Rinse with three successive rinses of deionized or distilled water.
- Allow to air dry or dry with a lint-free cloth.

### **A.3.4 Sample Documentation and Custody**

The purpose of custody procedures is to provide a documented, legally defensible record that can be used to follow the possession and handling of a sample from collection through analysis. A sample is in custody if it is:

- In someone's physical possession or view and/or
- Secured to prevent tampering, and/or
- Secured in an area restricted to authorized personnel

Each sample will be assigned a unique identifying number as described in Section A.3.6 of this SAP. Labels will be reformatted or filled in with waterproof ink prior to sample collection to minimize container handling. Sample label and chain-of-custody forms will include the following information:

- Name of sampler
- Date and time of sample collection
- Sample number
- Sample matrix and how collected (i.e., grab, composite)
- Preservation method
- Analysis required

A chain-of-custody record will be completed for each sample container, and the completed chain-of-custody forms are delivered to the laboratory with the respective samples.

### **A.3.5 Sample Identification**

Each sample will be assigned an identification number that will uniquely identify the sampling area (e.g., floor, west wall, etc.), the grid number, the sample type (e.g., decontamination rinsate), and any additional information that may be necessary. As an example, the sample numbered F-02-DECON-01-F would indicate a filtered decontamination rinsate sample taken from Grid #2 on the floor.

### **A.3.6 Sample Preservation and Holding Time**

After samples are collected at the site, they will be placed in a cooler with frozen gel packs to maintain a temperature of approximately 4 degrees Celsius. Samples of unused wash water and decontamination rinsate will be preserved with nitric acid to maintain a pH of 2 or less. Analytical holding times will be observed by the laboratory for samples collected under this SAP (i.e., the recommended maximum holding time for metals analysis is 180 days from sample collection until extraction).

### **A.3.7 Waste Management**

Minimal quantities of waste will be generated through the sampling procedures at the HBWSF, primarily miscellaneous solid, nonhazardous wastes such as cotton gloves, sample container packaging, and label adhesive backing. All wastes generated during closure of the HBWSF will be managed in accordance with 20 NMAC 4.1.300/40 CFR 262.34, pending arrangements for transfer to an SNL/NM Unit or an off-site permitted TSDF, as described in Section 4.2.

## A.4 DEMONSTRATION OF CLEAN CLOSURE

A subset of the RCRA toxicity characteristic metals (consisting of barium, cadmium, chromium, and lead) has been selected for use as COPCs to demonstrate clean closure at the HBWSF, as these constituents were present in many of the wastes stored in the Unit. Other wastes stored in the HBWSF typically were regulated as hazardous waste due to ignitability (D001), corrosivity (D002), reactivity (D003), or to trace amounts of volatile organic solvent constituents (F001-F005 waste codes). Sampling floor sweeping residues or decontamination rinsate is of limited value in determining the presence of D001, D002, or D003 waste residuals. In addition, given their volatility, F001-F005 constituents would not likely be present on building surfaces even if they had been released in the past (and no spills have been documented in the HBWSF). If residual contamination is present on the HBWSF floor and wall surfaces, it is more likely to consist of metal constituents than volatile organics. For these reasons, samples will be analyzed for RCRA metals only, using EPA SW 6010B.

Analytical results from floor sweeping sampling will be compared to the background concentrations that were developed by NMED for site soils (NMED 1997) to establish that the material swept up is soil. Results from decontamination rinsate samples will be compared to the results for the floor sweepings and pre-wash water. If the concentrations of COPCs in the rinsate are consistent with the concentrations in the soil and pre-wash water, the grid area will be considered clean. If the concentrations of COPCs are substantially elevated, surface contamination is indicated, and the grid area represented by the sample will be decontaminated again in accordance with the procedures in Section 4.2 of the Closure Plan. Rinsate samples will be collected and analyzed as discussed in this SAP, and the analytical results will be evaluated as described above.

## A.5 QUALITY CONTROL

Quality control (QC) for sampling at the HBWSF will be implemented to ensure that the data collected provides useful information to document clean closure of the Unit. QC will be implemented by adherence to the sampling procedures outlined in this SAP, documentation of sampling activities and sample custody, use of controlled and standard equipment and materials, and collection, analysis, and evaluation of field and laboratory QC samples. Personnel will collect QC samples at a minimum frequency of five percent:

- Field duplicate: Independent samples which are collected as close as possible to the same point in space and time. They are two samples taken from the same source, stored in separate containers, and analyzed independently. Field duplicates are used for documenting sample precision of the sampling and analytical process.

The analytical laboratory selected will have a written quality assurance plan and standard operating procedures (SOPs) in place to ensure sample preparation and analysis is properly performed and results are of the appropriate and documented quality to ensure that project-specific data quality objectives are met. Sandia/DOE may request both sets of documentation for review and approval prior to submission of field samples. The laboratory will perform the following QC checks with each batch of samples, at a minimum frequency of five percent:

Document: Sandia HBWSF  
Interim Status Closure Plan  
Sampling and Analysis Plan  
Revision No.: 2.0  
Date: April 2004

- Matrix duplicate: Split aliquots of a sample are fortified with identical concentrations of target analytes and analyzed. The results are used to document the precision and bias of a method in the sample matrix.
- Matrix spike: An aliquot of sample is fortified with known concentrations of target analytes, the sample is prepared and analyzed, and the results are compared with the results of a split, non-fortified sample to determine and document the bias of the matrix on the analytical method.

## A.6 DATA MANAGEMENT AND REPORTING

Initial data reduction and validation will be done by the laboratory contracted to analyze the samples. The laboratory will report the data in accordance with their internal quality control requirements. Duplicate laboratory control samples will be analyzed by the laboratory for indicators of bias and precision and will be reported as percent recovery and relative percent difference. Quality control acceptance criteria for bias and precision will be included in the analytical report.

Summary analytical and laboratory QC data will be transmitted to Sandia/DOE by the contractor laboratory. The analytical report will be in electronic and hardcopy formats. The laboratory will archive all raw data, notes, and bench sheets in a manner allowing retrieval upon request by Sandia/DOE. These records shall include instrument tuning and calibration records, batch quality control sample data, sample tracking and control documentation, raw analytical sample data, and analytical results.

## REFERENCES

NMED, 1997. Letter from NMED (Robert S. Dinwiddie) to DOE (Michael Zamorski), entitled "Request for Supplemental Information: Background Concentrations Report, SNL/KAFB", dated September 24, 1997.

US Environmental Protection Agency, Test Methods for Evaluating Solid Waste, SW-846, Third Edition, November 1986 (and updates)

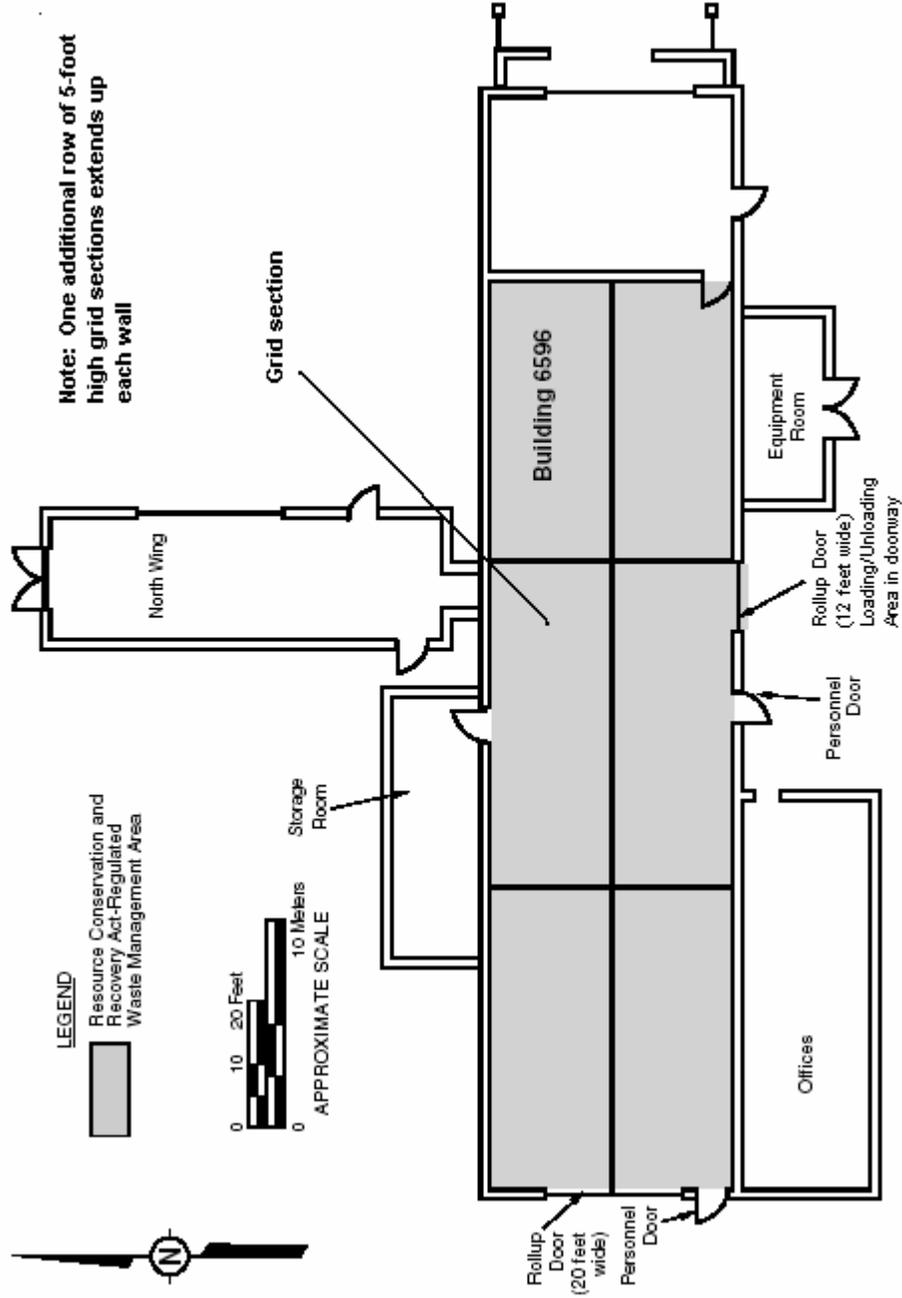


Figure A-1  
 High Bay Waste Storage Facility,  
 Location of Decontamination Grids