

DUGWAY PERMIT

MODULE VII

ATTACHMENT 31

**SWMU 172
POST-CLOSURE PLAN**

TABLE OF CONTENTS

	Page No.
LIST OF TABLES	ii
LIST OF FIGURES	ii
LIST OF APPENDICES	ii
LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS	iii
1.0 INTRODUCTION	1
2.0 FACILITY DESCRIPTION	4
2.1 DPG-172 LOCATION AND HISTORY	4
2.2 PAST OPERATIONS	5
2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION	5
2.4 CLOSURE ACTIVITIES	5
2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT	6
2.6 SURFACE WATER AND GROUNDWATER	6
2.7 CLOSURE NOTIFICATIONS	6
3.0 SECURITY REQUIREMENTS	7
4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS	7
4.1 INTRODUCTION	7
4.2 ROUTINE SITE INSPECTIONS	7
4.3 INSPECTION FOLLOW-UP	8
5.0 SUBMITTALS/REPORTING	8
5.1 NON-COMPLIANCE REPORTING	8
5.2 BIENNIAL POST-CLOSURE REPORT	8
5.3 REQUIRED SUBMITTALS	9
6.0 POST-CLOSURE CERTIFICATION	9
7.0 REFERENCES	10

LIST OF TABLES

		Page No.
Table 1	Summary of DPG-172 Post-Closure Information Requirements Under 40 CFR §270.14 and UAC R315-3-2.5	1
Table 2	DSHW Library Documents Detailing DPG-172 Investigations	5
Table 3	DPG-172 Post-Closure Inspection Schedule	8
Table 4	Summary Table of Required Submittals	9

LIST OF FIGURES

Figure 1	DPG-172 Location Map
Figure 2	DPG-172 Regional Topography
Figure 3	DPG-172 Site Map

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

bgs	below ground surface
CFR	Code of Federal Regulations
CMS	Corrective Measures Study
CWM	Chemical Warfare Materiel
DPG	Dugway Proving Ground
DSHW	Divisions of Solid and Hazardous Waste
DWQ	Division of Water Quality
ft	feet
HI	Hazard Index
HRA	Health Risk Assessment
NFA	No Further Action
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SWMU	Solid Waste Management Unit
UAC	Utah Administrative Code
UXO	Unexploded Ordnance
yd ³	cubic yards

1.0 INTRODUCTION

The objectives of this Post-Closure Plan (PCP) are to ensure that Dugway Proving Ground (DPG or Dugway) complies with the Post-Closure Permit issued by the State of Utah in accordance with Title 40 Code of Federal Regulations (CFR) §265.117, with respect to post-closure inspection requirements and to document tracking and inspections to ensure industrial site use. To meet these objectives, this PCP provides detailed information regarding the location, regulatory criteria, and post-closure inspections at Solid Waste Management Unit (SWMU) 172. Post-closure requirements will continue for a minimum of 30 years after closure of SWMU 172. The post-closure care period may be extended or shortened, as deemed necessary (40 CFR §265.117(a)(2)).

Based on the approved Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) there are no uncontrolled sources of contamination (R315-101-2 and 3) present at DPG-172. The nature and extent of potential contamination has been characterized in soil in accordance with R315-101-4 and the site risks have been assessed in accordance with R315-101-5. Surface and subsurface soil do not qualify for no further action (NFA) based on hypothetical residential use. However, potential exposures to soil are below R315-101-6 industrial screening levels. Soil-to-groundwater analysis indicates that potential future impacts to groundwater from soil are not expected at DPG-172. Corrective measures for soil are not required. Future site management is based on the characterization in the approved RFI.

In accordance with Title 40 CFR §270.28 and Utah Administrative Code (UAC) R315-3-2.19, the Post-Closure Plan is required to include specific information for a closed facility. As applicable to DPG-172, the information requirements include:

- General description of the facility,
- Description of security procedures,
- General inspection schedule,
- Preparedness and Prevention Plan,
- Facility location information (including seismic and flood plain considerations),
- Closure Plan or Closure Proposal,
- Certificate of Closure,
- Topographic map, with specific scale,
- Summary of groundwater monitoring data, and
- Identification of uppermost aquifer and interconnected aquifers.

Table 1 provides the regulatory citations for the general information requirements and the specific locations in this Post-Closure Plan where the specific information is presented.

**Table 1: Summary of DPG-172 Post-Closure Information Requirements
 Under 40 CFR §270.14 and UAC R315-3-2.5**

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR §270.14(b)(1) UAC R315-3-2.5(b)(1)	General Description of the Facility	Section 2.0.
40 CFR §270.14(b)(4) UAC R315-3-2.5(b)(4)	Description of Security Procedures	Section 3.0.
40 CFR §270.14(b)(5) UAC R315-3-2.5(b)(5)	General Inspection Schedule	Section 4.0 and Module VII (Form A).
40 CFR §270.14(b)(6)	Preparedness and Prevention	Section 3.0.

**Table 1: Summary of DPG-172 Post-Closure Information Requirements
Under 40 CFR §270.14 and UAC R315-3-2.5**

Regulation Citation	Requirement Description	Location Requirement is Addressed
UAC R315-3-2.5(b)(6)		
40 CFR §270.14(b)(11)(i-ii, v) UAC R315-3-2.5(b)(11) (i-ii, v)	Facility Location Information Applicable seismic standard	Section 4.3.1.
40 CFR §270.14(b)(11) (iii-v) UAC R315-3-2.5(b)(11) (iii-v)	Facility Location Information 100-year floodplain	Section 4.3.2.
40CFR §270.14(b)(13) UAC R315-3-2.5(b)(13)	Copy of the Closure Proposal	Final Phase II RFI was issued in July 2003 and approved on 10/15/2003. No public comments were received.
40 CFR §270.14(b)(14) UAC R315-3-2.5(b)(14)	Closure Certification and Notification	Section 2.7.
40 CFR §270.14(b)(16) UAC R315-3-2.5(b)(16)	Post-Closure Cost Estimate	Federal Facilities are exempt from this requirement.
40 CFR §270.14(b)(18) UAC R315-3-2.5(b)(18)	Proof of Financial Coverage	Federal Facilities are exempt from this requirement.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (i)	Topographic Map Map Scale and Date	Figure 2 (1 inch = 1000 feet (ft)).
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ii)	Topographic Map 100-year floodplain area	Section 4.0; DPG-172 is not located within a verified 100-year floodplain area.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (iii)	Topographic Map Surface waters including intermittent streams	Figure 2.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (iv)	Topographic Map Surrounding land uses	DPG-172 is within a military base. Nearby operations in the vicinity of DPG-172 include flight operations at the Michael Army Airfield.

**Table 1: Summary of DPG-172 Post-Closure Information Requirements
Under 40 CFR 270.14 and UAC R315-3-2.5
(Continued)**

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (v)	Topographic Map A wind rose (i.e., prevailing windspeed and direction)	There are no residential populations abutting DPG-172. The closest residential area is English Village (approximately 10 miles away). A wind rose is not deemed necessary for DPG-172.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (vi)	Topographic Map Orientation of Map, North Arrow	Figure 2.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (vii)	Topographic Map Legal boundaries of the hazardous waste management facility	Figure 2.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (viii)	Topographic Map Access control, fence, gates	Figure 2.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ix)	Topographic Map Injection and withdrawal wells	Figure 2.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (xi)	Topographic Map Barriers for drainage or flood control	Figure 2. There are no barriers to drainage or flood control.
40 CFR §270.14(c) UAC R315-3-2.5(c)(1)	Groundwater Monitoring Information Summary of Groundwater Data	Final Phase II RFI Report, Section 2.2.4.
40 CFR §270.14(c) UAC R315-3-2.5(c)(2)	Groundwater Monitoring Information Identification of uppermost aquifer	Final Phase II RFI Report, Section 2.2.1.
40 CFR §270.14(c) UAC R315-3-2.5(c)(3)	Groundwater Monitoring Information Delineation of the Waste Management Area	Figure 3.
40 CFR §270.14(c) UAC R315-3-2.5(c)(4)	Groundwater Monitoring Information Extent of Plume	Final Phase II RFI Report, Section 2.2.4.
40 CFR §270.14(c) UAC R315-3-2.5(c)(5)	Groundwater Monitoring Information Detailed Plans/Engineering Report for Proposed Groundwater Program	Post-closure groundwater monitoring at DPG-172 is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(i)	Groundwater Monitoring Information Proposed List of Parameters	Post-closure groundwater monitoring at DPG-172 is not required.
40 CFR §270.14(c)	Groundwater Monitoring	Post-closure groundwater

**Table 1: Summary of DPG-172 Post-Closure Information Requirements
Under 40 CFR 270.14 and UAC R315-3-2.5
(Continued)**

Regulation Citation	Requirement Description	Location Requirement is Addressed
UAC R315-3-2.5(c)(6)(ii)	Information Proposed Groundwater Monitoring System	monitoring at DPG-172 is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iii)	Groundwater Monitoring Information Background Values	Post-closure groundwater monitoring at DPG-172 is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iv)	Groundwater Monitoring Information A description of the Proposed Sampling	Post-closure groundwater monitoring at DPG-172 is not required.

2.0 FACILITY DESCRIPTION

The following provides a general description of DPG-172, as required by UAC R315-3-2.5(b)(1) (Figures 1 and 2).

2.1 DPG-172 LOCATION AND HISTORY

DPG-172 consists of Building 1006 and the surrounding vicinity located in the Avery portion of the Ditto area. The site covers an affected area of approximately 0.05 acre. A layer of asphalt, above which a thin veneer of surface soil is present, underlies the area adjacent to the building. Railroad tracks enter the northeastern side of the structure.

Building 1006 was formerly used for processing and recharging nickel-cadmium batteries. This structure was originally used in the 1950s as a decontamination building associated with the radiological testing program. An underground retention tank, formerly part of the wastewater treatment system, is present on the southeast side of the building. Investigation of this tank is included in DPG-41 activities, and the associated temporary wells and other sampling locations are therefore not considered part of DPG-172.

In the early 1960s, the decontamination building was converted to a battery shop where nickel-cadmium batteries were processed. According to DPG personnel, lead acid batteries were not processed or managed here. Some wastes from the battery shop were discharged into floor drains and conveyed to the Ditto Imhoff tank via sewer lines. Waste caustics containing nickel and cadmium were reportedly disposed on the ground beside the bend in the railroad tracks just northeast of the building (Utah Department of Environmental Quality [UDEQ] Division of Solid Hazardous Waste [DSHW], 1992); however, Phase I sampling did not indicate any evidence of contamination. A small area of brown-colored soil observed closer to Building 1006 along the fence line at the southeastern perimeter of the site was determined to be a more probable disposal location. A subsurface soil sample collected at the start of Phase I indicated that elevated concentrations of lead were present in the brown-colored soil. Elevated lead concentrations detected in surface soil at DPG-172 may be related to the battery wastes or other operations that occurred in this structure. No additional historical information is available regarding battery waste handling, including the amount of waste disposed.

A voluntary removal action was conducted at the brown-colored area at this site during the Phase I field program based on the results of this preliminary sample. Approximately three cubic yards (yd³) of soil were excavated during the removal action, which included the entire brown-colored area and the surrounding soil from ground surface to a total depth of four inches where asphalt was encountered (Parsons, 2003).

2.2 PAST OPERATIONS

Available site history does not indicate that unexploded ordnance (UXO) and/or chemical warfare materiel (CWM) was used or disposed at this site; therefore, these materials are not expected to be present at this location. No evidence of UXO and/or CWM was observed or detected during field operations. Disposal of metal impacted waste to surface soil may have occurred.

2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION

The detailed results of previous soil sampling and closure information including the risk assessment are available for DPG-172 in the DSHW public documents listed below in Table 2 (UAC R315-3-2.5(b)(13)).

Table 2: DSHW Library Documents Detailing DPG-172 Investigations

Document Title	Received Date	DSHW Library No.
Parsons, 1999. <i>Final Phase I RCRA Facility Investigation, Investigation Report, Revision 1</i> . September.	09/99	DPG0007
Parsons, 2003. <i>Final Phase II RCRA Facility Investigation Report, SWMU-172 Addendum</i> . July.	07/03	

2.4 CLOSURE ACTIVITIES

Documentation in the approved RFI Report indicates that conditions at DPG-172 meet the closure performance standards under UAC R315-7-14 (by reference 40 CFR Part 265, Subpart G, §265.111). Risks and hazards associated with potential exposure to soil at DPG-172, while not qualifying for NFA, are less than industrial screening levels. Land use controls are required to prevent residential use of the site.

The major closure activities completed at DPG-172 included:

- Removal of 3 cubic yards of lead impacted soil; and
- Demonstrating that degradation of groundwater was unlikely based on the soil-to-groundwater screening analysis.

These measures indicate that human contact with waste and degradation of groundwater is not likely in the vicinity of DPG-172. An inspection checklist for industrial use sites designed to insure that these objectives are maintained is presented in Module VII, Form a.

2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Phase I and II investigation results were used to perform a human health risk assessment (HRA). The results of the HRA indicated that the site currently does not qualify for NFA because estimates for the hypothetical resident exceeded UAC R315-101 (DSHW, 2001) target cumulative cancer risk and noncancer HI target levels. There were no Chemicals of Potential Concern (COPCs) identified under current and/or future industrial land use that need to be considered during a Corrective Measures Study (CMS). Because the soil at DPG-0172 does not meet NFA standards, future property development is limited to industrial use. There are no complete exposure pathways for ecological receptors (and therefore, no potential for ecological risk). A CMS is not required for DPG-172.

2.6 SURFACE WATER AND GROUNDWATER

There are no defined surface water features within or near DPG-172. No defined drainage patterns are evident due to the low precipitation; however, intermittent surface water flow occurs in Government Creek located approximately 0.5 miles southwest of this site. The general direction of surface water drainage in the area surrounding this unit is to the northwest, towards the axis of Dugway Valley.

Groundwater data from nearby DPG-041 (Parsons, 1999) indicate that the shallow nonpotable water-bearing zone is present at approximately 22 ft below ground surface (bgs). Regionally, groundwater in the shallow water-bearing zone flows to the west-northwest. Data from nearby Ditto monitoring wells at DPG-041 and DPG-097 also suggest that the average water quality in the shallow nonpotable groundwater at DPG-172 is class IV (saline quality), per UAC R317-6-3 (Division Water Quality [DWQ], 2002). Groundwater in the shallow water-bearing zone is highly saline, and therefore, is not used for drinking water, irrigation, or other purposes.

Active water wells WW3, WW28, and WW31 are located in the Ditto area approximately 0.6 miles southwest of DPG-172. These wells are screened in the deep potable aquifer under confined conditions at depths ranging from 235 to 333 ft bgs. The shallow water-bearing zone does not appear to be hydraulically connected to the underlying, deeper potable aquifer in the vicinity of the site, as evidenced by lithology and water quality data (Parsons, 2004).

2.7 CLOSURE NOTIFICATIONS

Federal facilities are exempt from submitting notifications to the local zoning authority as required by 40 CFR §264.116 and §264.119, which are incorporated by reference in UAC R315-8-7.

3.0 SECURITY REQUIREMENTS

The following security conditions are applicable to DPG-172:

1. DPG-172 is located within a federal, military installation (DPG). As such, the installation is restricted for the common population; and
2. Access to the runway and surrounding aprons is authorized by Michael Army Airfield (MAAF) tower.

The Dugway Emergency Response and Contingency Plan (Part B Permit), where applicable to this site, shall be used to announce and respond to emergency conditions. At a minimum, the site inspector should have a radio or cell phone and a First Aid kit available during inspections.

4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS

4.1 INTRODUCTION

DPG-172 has been closed under a continued industrial use scenario, which prohibits residential use in the area formerly occupied by the site. The site has been closed under the DPG RCRA part B Permit requirements. To ensure that the area is not reused or developed, annual site inspections and a biennial post-closure report shall be required.

4.2 ROUTINE SITE INSPECTIONS

During its Post-Closure period, general inspections of the former DPG-172 site shall be conducted annually by November 1st to ensure that the former site remains under industrial use and to ensure the Dugway Dig Permit Process (Module VII.I) has been followed. The frequency of inspections can be modified in accordance with amendments submitted in the form of proposed permit modifications.

Site inspections will consist of a complete walk through and visual inspection of the site. A general site inspection checklist for industrial use sites is included in Module VII (Form A). Completed inspection forms shall be filed with the Dugway Environmental Office.

At a minimum the site shall be visually inspected to ensure the following conditions are maintained at the site:

1. There is no evidence of land use other than for industrial purposes within the former site boundary; and
2. There is no evidence of soil disturbance.

Table 3 summarizes the Post-Closure Inspection Schedule for DPG-172, and lists the items to be inspected and potential problems. Inspection personnel shall note any problems found and shall inform appropriate Dugway representatives.

Table 3: DPG-172 Post-Closure Inspection Schedule

Inspection/ Monitoring Item	Method of Documentation	Frequency of Inspection
Land Use	Industrial Use Inspection Checklist (Module VII, Form A)	Annual inspections shall be conducted before <u>November 1st</u> , of each year.
Soil Disturbance	Industrial Use Inspection Checklist (Module VII, Form A)	Annual inspections shall be conducted before <u>November 1st</u> , of each year.

4.3 INSPECTION FOLLOW-UP

Copies of completed site inspection checklists (Module VII, Form A) shall be forwarded to the Dugway Environmental Office. The Point-of-Contact for the Dugway Environmental Office is as follows:

Environmental Programs Compliance Representative
 Dugway Proving Ground Environmental Program Office
 Dugway Proving Ground, UT 84022
 Telephone: (435) 831-3560

The Dugway Environmental Office shall notify the appropriate personnel to implement corrective action as needed.

Corrective action shall be initiated as soon as practical after identifying the problem, or as directed by Dugway. If the corrective action requires substantial effort, a technical plan shall be prepared to summarize the problem, the potential impacts, the proposed plan for action, and the time-frame in which corrective action will be implemented as required under this Permit. This plan shall be approved by the Executive Secretary prior to implementing corrective action.

5.0 SUBMITTALS/REPORTING

Based on the evaluation presented in the RFI for DPG-172 (Parsons, 2003), post-closure inspection is required.

5.1 NON-COMPLIANCE REPORTING

The conditions at DPG-172 are such that the impact to human health and the environment is very unlikely. Hazardous wastes are no longer managed at the site. Nonetheless, if there is any type of non-compliance with any condition of this Permit, notifications shall be submitted per permit condition VII.C.5.

5.2 BIENNIAL POST-CLOSURE REPORT

In accordance with UAC R315-3-3.1(l)(9), a Biennial Post-Closure Report shall be prepared for all Dugway closed Hazardous Waste Management Units (HWMUs) and SWMUs undergoing post-closure care by March 1, of the reporting year. The first Post-Closure report for DPG-172 shall be due no later than March 1, 2010. Specifically for DPG-172, the Biennial Post-Closure Report shall include, at a minimum, the following:

- General site description and conditions; and
- Inspection records.

5.3 REQUIRED SUBMITTALS

Table 4 summarizes the requirements for the Biennial Post-Closure Report for DPG-172 and reporting of any non-compliance.

Table 4: Summary Table of Required Submittals

Required Submittals	Frequency and Submittal Date
<u>Biennial Post-Closure Report</u>	Post-Closure Reports shall be submitted to the Division of Solid and Hazardous Waste no later than March, of the year the report is due. Reporting years are even numbered years beginning with March 2010, for the duration of the Post-Closure Monitoring Period.
<u>Non-Compliance Reporting</u> Anticipated Non-Compliance 24-hour Notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment. Five-day written notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment including evidence of groundwater contamination, significant data quality issues, or a request for reduced monitoring frequency. The Executive Secretary may waive the 5-day notice, in favor of a 15-day notice.	30 days advance notice of any change which may result in noncompliance. Orally within 24 hours of discovery. Within 5 days of discovery.
Written notification for information concerning the non-compliance, which does not endanger human health or the environment.	Submitted when the Biennial Post Closure Reports are submitted.

6.0 POST-CLOSURE CERTIFICATION

No later than 60 days after post-closure activities are completed and approved by the Executive Secretary, Dugway representatives shall submit a certification to the Board, signed by Dugway and an independent professional engineer registered in the State of Utah, stating why post-closure care is no longer needed.

7.0 REFERENCES

Division of Solid and Hazardous Waste (DSHW), 2001. *Administrative Rules for Cleanup Action and Risk-Based Closure Standards*. Utah Department of Environmental Quality. R315-101, Utah Administrative Code.

Division of Water Quality (DWQ), 2002. *Division of Water Quality Administrative Rules for Groundwater Quality Protection R317-6 Utah Administrative Code*.

Parsons Engineering Science, Inc. (Parsons), 1999. *Final Phase I RCRA Facility Investigation Report Addendum and Voluntary Cleanup Action*. Parsons, Salt Lake City. September.

Parsons, 2003. *Final Phase II RCRA Facility Investigation Report, SWMU-172 Addendum*. July.

Parsons, 2004. *Hydrogeological Assessment and Regional Groundwater Management Plan, Volume I, Ditto Groundwater Management Area, Dugway Proving Ground, Dugway, Utah*.

Utah Department of Environmental Quality (UDEQ) Division of Solid and Hazardous Waste (DSHW), 1992. *RCRA Facility Assessment of Solid Waste Management Units at Dugway*. September.