

DUGWAY PERMIT

MODULE VII

ATTACHMENT 36

**SWMU 041
POST-CLOSURE PLAN**

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

bgs	Below Ground Surface
CFR	Code of Federal Regulations
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
DPG	Dugway Proving Ground
Dugway	Dugway Proving Ground
DSHW	Divisions of Solid and Hazardous Waste
ft	Feet
HWMU	Hazardous Waste Management Unit
NFA	No Further Action
NRC	Nuclear Regulatory Commission
PCP	Post Closure Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SWMU	Solid Waste Management Unit
UAC	Utah Administrative Code

1.0 INTRODUCTION

The objectives of this Post-Closure Plan (PCP) are 1) 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; 2) to document tracking and inspections; and 3) 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) 41. Post-closure requirements will continue for a minimum of 30 years after closure of SWMU 41. 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-041. 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-041. 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-041, the information requirements include:

- General description of the facility,
- Description of security procedure,
- 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 locations in this Post-Closure Plan where the specific information is presented.

**Table 1: Summary of DPG-041 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

**Table 1: Summary of DPG-041 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)(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) UAC R315-3-2.5(b)(6)	Preparedness and Prevention	Section 3.0
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	There are no active faults in the vicinity of DPG-041.
40 CFR §270.14(b)(11) (iii-v) UAC R315-3-2.5(b)(11) (iii-v)	Facility Location Information 100-year floodplain	DPG-041 is not located within a verified 100-year floodplain area.
40CFR §270.14(b)(13) UAC R315-3-2.5(b)(13)	Copy of the Closure Proposal	Final Phase II RFI was issued on November 2009 and approved on 08/25/09.
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	DPG-041 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) (v)	Topographic Map A wind rose (i.e., prevailing windspeed and direction)	There are no residential populations abutting DPG-041. The closest residential area approximately 8.6 miles away. A wind rose is not deemed necessary for DPG-041.
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)	Topographic Map	Figure 2. There are no barriers

**Table 1: Summary of DPG-041 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)(19) (xi)	Barriers for drainage or flood control	to drainage or flood control in the vicinity of DPG-041.
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
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
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
40 CFR §270.14(c) UAC R315-3-2.5(c)(5)	Groundwater Monitoring Information Detailed Plans/Engineering Report for Proposed Groundwater Program	Groundwater monitoring is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(i)	Groundwater Monitoring Information Proposed List of Parameters	Groundwater monitoring is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(ii)	Groundwater Monitoring Information Proposed Groundwater Monitoring System	Groundwater monitoring is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iii)	Groundwater Monitoring Information Background Values	Groundwater monitoring is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iv)	Groundwater Monitoring Information Description of the Proposed Sampling	Groundwater monitoring is not required.

2.0 FACILITY DESCRIPTION

The following provides a general description of DPG-041, as required by UAC R315-3-2.5(b)(1) (Figures 1 and 2).

2.1 DPG-041 LOCATION AND HISTORY

DPG-041 is located about 0.25 miles northwest of Ditto in the Avery Area (see Figures 1 and 2). The site was originally thought to be a lined evaporation pond formerly used for the disposal of liquid wastes generated in the Operations Building (1010) and other associated buildings. During the Phase II investigation, DPG-041 was expanded to include the liquid waste disposal and treatment system (Building 1002) and associated treatment tanks and vaults, the Air Filter Building (1004) and related Building 1005, and a pipe chase tunnel containing buried pipes associated with the Operations Building (1010) and Building 1004, in addition to the evaporation pond into which these pipes drained.

DPG-041 was divided into two investigation areas. Area 1 comprised the evaporation pond and associated retention tanks, vaults, and drainage system from Building 1002. Area 2 comprised the remaining buildings (1004 and 1005) and the tunnel. Soil at Area 1 met the conditions for industrial land use. Soil at Area 2 met the requirements for residential land use (NFA). Groundwater at both Areas 1 and 2 met the condition for NFA.

Building 1010 contained offices, laboratories, staff shop, change rooms, boiler and equipment rooms, substation and emergency generators, and a handling and filling cell with monitoring room. It was thought that the handling and filling cell was used to load test munitions with tantalum-182. Tantalum-182 has a short half-life (115 days) and does not persist in the environment. This building may have also been used for irradiation studies using a cobalt-60 sealed source. Waste water was not deemed likely to have been generated from the irradiation studies. Building 1006 may have been used for packaging of radioactive wastes.

Buildings 1010 and 1006 are currently in use for non-radiological activities. Records indicate that all radioactive sources have been removed.

In 2000, the United States Nuclear Regulatory Agency (NRC) performed a limited radiation survey with Buildings 1004, 1006, and 1010 as well as other buildings in Avery. The NRC survey did not result in the identification of any radioactive material from these sites.

2.2 PAST OPERATIONS

Treated wastes were disposed in the evaporation pond may have included tantalum-182 contaminated decontamination water resulting from munitions filling operations that took place from the early 1950s to the mid 1950s. Treated discharge water entered the pond from an open-air pipe on the north side of the pond. Building 1010 continued to be used for irradiation studies until the early 1960s. The irradiation studies involved the use of sealed radiation sources, such as cobalt-60. Explosive and fuse loading did not occur in Building 1010.

2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION

The detailed results of previous soil and groundwater sampling and closure information including the risk assessment are available for DPG-041 in the Division of Solid and Hazardous Waste (DSHW) public documents listed below in Table 2 (UAC R315-3-2.5(b)(13)).

Table 2: DSHW Library Documents Detailing DPG-041 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, 2009. <i>Final Phase II RCRA Facility Investigation Report, SWMU-41 Addendum</i> . December.	11/09	

2.4 CLOSURE ACTIVITIES

Documentation in the approved RFI Report indicates that conditions at DPG-041 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 and indoor air at DPG-041 Area 1, while not qualifying for NFA, are less than industrial screening levels. Land use controls are required to prevent residential use of the site.

Risks and hazards associated with potential exposure to soil and indoor air at DPG-041 Area 2 qualify for NFA (residential levels). No land use controls are required for Area 2.

The major closure activities completed at DPG-041 included:

- Demonstrate that there is no residual radiological contamination and that all levels detected were consistent with natural background;
- Demonstrate potential risk and hazards from exposure to site-related chemicals in surface/subsurface soils will not pose undue risk to human health or the environment;
- Demonstrating that degradation of groundwater was unlikely based on the soil-to-groundwater screening analysis and current concentrations of contaminants in groundwater;
- Prevention of human contact with the waste at Area 1 will be achieved through land use restrictions. An inspection checklist designed to insure that these objectives are maintained is presented in Module VII, Form A; and

2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Results of the HRA and ERA performed per UAC R315-101 (DSHW, 2001) indicate for Area 1: 1) that adverse health effects to industrial workers associated with potential exposures to constituents of potential concern (COPCs) in the soil and indoor air at DPG-041 Area 1 are not expected; and 2) constituents of potential ecological concern (COPECs) are not expected to pose unacceptable hazards to ecological receptors. Therefore, corrective measures are not required for soils under continued industrial land use. The appropriate closure method for DPG-041 Area 1 is to restrict future property use to industrial use only.

Results of the HRA and ERA performed for Area 2 indicate: 1) that adverse health effects to residents associated with potential exposures to COPCs in the soil and indoor air at DPG-041 Area 2 are not expected; and 2) COPECs are not expected to pose unacceptable hazards to ecological receptors. Therefore, corrective measures or land use control measures are not required for Area 2.

2.6 SURFACE WATER AND GROUNDWATER

There are no defined surface water features within or near DPG-041.

DPG-041 lies in the Government Creek Basin. Depth to groundwater at DPG-041 is approximately 22 ft below ground surface (bgs). Groundwater flow is generally to the northwest although flow direction may be influenced by radial flow suspected with a small groundwater mound present locally in the Avery area. The average water quality in the area of DPG-041 is Class IV (saline).

The two nearest sources of potable groundwater are at water wells WW3, WW28, and WW31, located in the Ditto area approximately 4000 ft, 4200 ft, and 3200 ft southwest of DPG-041, respectively. These wells are screening in the deep potable aquifer under confined conditions at depths ranging from 235-333 ft bgs.

Groundwater monitoring for DPG-041 is not required.

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 condition is applicable to DPG-041:

DPG-041 is located within a federal, military installation (DPG). As such, the installation is restricted for the common population.

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-041 Area 1 has been closed under a continued industrial use scenario, which prohibits residential use in the area formerly occupied by the site. Area 1 has been closed under the DPG RCRA Part B Permit requirements. To ensure that the area is not reused or developed and to ensure the Dugway Dig Permit Process (Module VII.I) has been followed, annual site inspections and a biennial post-closure report shall be required.

DPG-041 Area 2 has been closed under NFA. No additional monitoring is required for Area 2.

4.2 ROUTINE SITE INSPECTIONS

During its Post-Closure period, general inspections of the former DPG-041 Area 1 site shall be conducted annually by November 1st to ensure that the former Area 1 site remains under industrial use and that the Dig Permit Process (Module VII.F.4) 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 Area 1. 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 Area 1 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-041 Area 1, and lists the items to be inspected. Inspection personnel shall note any problems found and shall inform appropriate Dugway representatives.

Table 3: DPG-041 Post-Closure Inspection Schedule for Area 1

Inspection/ Monitoring Item	Method of Documentation	Frequency of Inspection
Land Use	Industrial Use Inspection Checklist (Module VII, Form A)	Annual, by November 1 st
Soil Disturbance	Industrial Use Inspection Checklist (Module VII, Form A)	Annual, by November 1 st

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-041 (Parsons, 2009), post-closure inspection is required for Area 1. Groundwater monitoring is not required.

5.1 NON-COMPLIANCE REPORTING

The conditions at DPG-041 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(1)(9), a Biennial Post-Closure Report shall be prepared for all Dugway closed HWMUs and SWMUs undergoing post-closure care by March 1, of the reporting year. The first Post-Closure report for DPG-041 shall be due no later than March 1, 2010. Specifically for DPG-041, 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-041 Area 1 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.	30 days advance notice of any change which may result in noncompliance Orally within 24 hours of discovery

<p>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.</p> <p>Written notification for information concerning the non-compliance, which does not endanger human health or the environment.</p>	<p>Within 5 days of discovery</p> <p>Submitted when the Biennial Post Closure Reports are submitted.</p>
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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 Water Quality (DWQ), 2002. *Division of Water Quality Administrative Rules for Groundwater Quality Protection R317-6 Utah Administrative Code.*

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.

Parsons Environmental Science, Inc. (Parsons), 2009. *Final Phase II RCRA Facility Investigation Report, SWMU-041 Addendum.* November.

Parsons, 1999. *Final Phase I RCRA Facility Investigation, Investigation Report, Revision 1.* September.

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