

DUGWAY PERMIT

MODULE VII

ATTACHMENT 48

**SOLID WASTE MANAGEMENT UNIT
SWMU 204 (DPG-204)
POST-CLOSURE PLAN**

TABLE OF CONTENTS

	Page No.
1.0 INTRODUCTION.....	1
2.0 FACILITY DESCRIPTION.....	4
2.1 DPG-204 Location and History	4
2.2 Past Operations	4
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	7
3.0 SECURITY REQUIREMENTS	7
4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS.....	7
4.1 Introduction.....	7
4.2 Routine Site Inspections	7
4.2.1 Protective Soil Layer Inspections	8
4.3 Contingency Inspections.....	9
4.3.1 Earthquakes.....	9
4.3.2 Floods or Major Storms	10
4.3.3 Fires	10
4.4 Inspection Follow-Up	10
5.0 SUBMITTALS/REPORTING	11
5.1 Non-Compliance Reporting	11
5.2 Biennial Post-Closure Report	11
5.3 Required Submittals.....	11
6.0 POST-CLOSURE CERTIFICATION	12
7.0 REFERENCES	13

LIST OF TABLES

		Page No.
Table 1	Summary of DPG-204 Post-Closure Information Requirements Under Utah Admin. Code R315-270-28 and R315-270-14	1
Table 2	UDWMRC Library Documents Detailing DPG-204 Investigations	5
Table 3	DPG-204 Post-Closure Inspection Schedule	9
Table 4	Summary Table of Required Submittals.....	11

LIST OF FIGURES

In compliance with Department of Defense physical security directives, figures are not included for public distribution

LIST OF APPENDICES

Appendix A	Copy of Certification of Closure
------------	----------------------------------

1.0 INTRODUCTION

The objective of this Post-Closure Plan is to ensure that Dugway Proving Ground (DPG) complies with the Post-Closure Permit issued by the State of Utah in accordance with Utah Administrative Code (Utah Admin. Code) R315-265 – Title 40 Code of Federal Regulations (CFR) §264.117 incorporated by reference, with respect to post-closure inspection requirements. To meet this objective, this Post-Closure Plan provides detailed information regarding the location, regulatory criteria, and post-closure inspections at Solid Waste Management Unit (SWMU) 204, herein referred to as DPG-204. Post-closure requirements will continue for a minimum of 30 years after closure of DPG-204. The post-closure care period may be extended or shortened, as deemed necessary Utah Admin. Code R315-265 (40 CFR §264.117(a)(2) incorporated by reference).

In accordance with Title 40 CFR §270.28, and Utah Admin. Code R315-270-28, the Post-Closure Plan is required to include specific information for a closed facility. As applicable to DPG-204, 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 information is presented.

Table 1: Summary of DPG-204 Post-Closure Information Requirements Under 40 CFR §270.14 and Utah Admin. Code R315-270-28 and R315-270-14

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR §270.14(b)(1) Utah Admin. Code R315-270-14(b)(1)	General Description of the Facility	Section 2.0
40 CFR §270.14(b)(4) Utah Admin. Code R315-270-14(b)(4)	Description of Security Procedures	Section 3.0
40 CFR §270.14(b)(5) Utah Admin, Code R315-270-14(b)(5)	General Inspection Schedule	Section 6.0 and Form B of Module VII
40 CFR §270.14(b)(6) Utah Admin. Code R315-270-14(b)(6)	Preparedness and Prevention	Section 3.0
40 CFR §§270.14(b)(11)(i-ii, v) Utah Admin. Code R315-270-14(b)(11) (i-ii, v)	Facility Location Information Applicable seismic standard	Section 4.3.1
40 CFR §§270.14(b)(11) (iii-v)	Facility Location Information	Section 4.3.2

Table 1: Summary of DPG-204 Post-Closure Information Requirements Under 40 CFR §270.14 and Utah Admin. Code R315-270-28 and R315-270-14

Regulation Citation	Requirement Description	Location Requirement is Addressed
Utah Admin. Code R315-270-14(b)(11) (iii-v)	100-year floodplain	
40 CFR §270.14(b)(14) Utah Admin. Code R315-270-14(b)(14)	Copy of the Closure Plan	DPG-204 Voluntary Interim Measures Plan was approved by UDEQ June 30, 2011.
40 CFR §270.14(b)(14) Utah Admin. Code R315-270-14(b)(14)	Closure Certification and Notification	Section 2.7 and Appendix A.
40 CFR §270.14(b)(16) Utah Admin. Code R315-270-14(b)(16)	Post-Closure Cost Estimate	Federal Facilities are exempt from this requirement.
40 CFR §270.14(b)(18) Utah Admin. Code R315-270-14(b)(18)	Proof of Financial Coverage	Federal Facilities are exempt from this requirement.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (i)	Topographic Map Map Scale and Date	Figure 1 (1 inch = 1000 feet [ft]).
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (ii)	Topographic Map 100-year floodplain area	DPG-204 is not located within a verified 100-year floodplain area.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (iii)	Topographic Map Surface waters including intermittent streams	Figure 1
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (iv)	Topographic Map Surrounding land uses	DPG-204 is within a military base. There are no nearby operations in the vicinity of DPG-204.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (v)	Topographic Map A wind rose (i.e., prevailing windspeed and direction)	There are no residential populations abutting DPG-204. The closest residential area is English Village (approximately 14 miles away). A wind rose is not deemed necessary for DPG-204.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (vi)	Topographic Map Orientation of Map, North Arrow	Figure 1
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (vii)	Topographic Map Legal boundaries of the hazardous waste management facility.	Figure 1
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (viii)	Topographic Map Access control, fence, gates	Figure 1. The site is not surrounded by a fence.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (ix)	Topographic Map Injection and withdrawal wells	Figure 1
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (xi)	Topographic Map Barriers for drainage or flood control	Figure 1. The DPG-204 cap/cover was designed and built to divert surface water away from the engineered cover. There

Table 1: Summary of DPG-204 Post-Closure Information Requirements Under 40 CFR §270.14 and Utah Admin. Code R315-270-28 and R315-270-14

Regulation Citation	Requirement Description	Location Requirement is Addressed
		are diversion barriers built on both the north and east sides of the project site which are fortified with angular rip-rap to prevent water from impacting the cap.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(1)	Groundwater Monitoring Information Summary of Groundwater Data	Post-closure groundwater monitoring may be required at DPG-204. However, these requirements will be addressed under the Dugway Groundwater Management Area (GMA) program.
40 CFR §270.14(c) Utah Admin Code R315-270-14(c)(2)	Groundwater Monitoring Information Identification of uppermost aquifer	Post-closure groundwater monitoring may be required at DPG-204 and will be addressed under the Dugway GMA program.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(3)	Groundwater Monitoring Information Delineation of the Waste Management Area	Post-closure groundwater monitoring may be required at DPG-204 and will be addressed under the Dugway GMA program.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(4)	Groundwater Monitoring Information Extent of Plume	Post-closure groundwater monitoring may be required at DPG-204 and will be addressed under the Dugway GMA program.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(5)	Groundwater Monitoring Information Detailed Plans/Engineering Report for Proposed Groundwater Program	Post-closure groundwater monitoring may be required at DPG-204 and will be addressed under the Dugway GMA program.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(6)(i)	Groundwater Monitoring Information Proposed List of Parameters	Post-closure groundwater monitoring may be required at DPG-204 and will be addressed under the Dugway GMA program.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(6)(ii)	Groundwater Monitoring Information Proposed Groundwater Monitoring System	Post-closure groundwater monitoring may be required at DPG-204 and will be addressed under the Dugway GMA program.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(6)(iii)	Groundwater Monitoring Information Background Values	Post-closure groundwater monitoring may be required at DPG-204 and will be addressed under the Dugway GMA program.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(6)(iv)	Groundwater Monitoring Information A description of the Proposed Sampling	Post-closure groundwater monitoring may be required at DPG-204 and will be addressed under the Dugway GMA program.

2.0 FACILITY DESCRIPTION

The following provides a general description of DPG-204 as required by Utah Admin. Code R315-270-14(b)(1).

2.1 DPG-204 Location and History

DPG-204 is a demilitarization/disposal area located on the western flank of the southern tip of the Simpson Buttes (Figure 2). DPG-204 is also situated approximately 0.8 mile north of DPG's southern boundary. DPG-204 is accessed by a newly built gravel road which runs north-south along the western toe of Simpson Buttes. Two natural features dominate the topography of the site. The main portion of Simpson Buttes is located just to the east of the site. Also an outcropping of bedrock approximately 50 feet in height (a spur of Simpson Buttes) is located immediately to the north of the site. The western edge of the site is the lowest point and is at an elevation of approximately 4,545 ft above mean sea level (msl). From there the terrain rises at an average slope of 5% in the eastern direction toward the Simpson Buttes. At the easternmost edge of the site the elevation is approximately 4,557 ft above msl. However, the terrain rises much more sharply at the northern edge of the site where the bedrock outcropping delineates the boundary of any possible burial/disposal.

2.2 Past Operations

DPG-204 was operated as a demilitarization area for chemical filled 155 millimeter (mm) and 105 mm projectiles along with chemical filled 4.2 inch mortars. The site was reportedly active beginning in the late 1940s post World War II. Based on site history and investigative activities these projectiles were most likely filled with lewisite and/or sulfur mustard. An archived trip report dated March 2, 1951, indicates that an area referred to as "Area C" located within the southwest corner of the Simpson Buttes was ordered closed and decontaminated. Area C is probably the area that is now referred to as DPG-204. According to the trip report, 1,344 rounds of lewisite and mustard filled artillery munitions were destroyed at the location referred to as Area C. After demilitarization activities were completed, the area was then treated with a "grade 3 bleach slurry" and considered by the author of the trip report to be "thoroughly decontaminated." (Draft Interim Summary Report of Activities and Findings, Phase II RFI Report (Parson, 2007)).

The typical method employed at DPG during this time period for the disposal of lewisite and mustard munitions involved standing the munitions on end, base down with the fuzes removed and the bursters left inside the munitions. The munitions were charged inside the fuze well with a composition C-3 explosive. The munitions were tied in with detonating cord and blasting caps. Cans of grade 3 bleach slurry were then placed around the charged munitions. A charge of 2,4,6-trinitrotoluene was placed beneath each of these cans, which were then tied in together with detonating cord for detonation separate from the charged munitions. The bleach cans were then detonated just slightly before detonation of the munitions. The desired effect of this arrangement was to create a cloud of bleach surrounding the detonating munitions. As indicated in the trip report, this method was believed to neutralize 65 to 75 percent of the contamination. The deformation and tearing seen on the remnants of the cans stockpiled at the site are consistent with the damage that would be caused by detonating them from beneath with an explosive charge. Several of the 4.2-inch mortar casings currently stockpiled show signs of tearing and deformation along the length of the projectile body, which would be consistent with standing the munitions on end and detonating.

2.3 Previous Investigations Documentation

Results of previous soil sampling and closure information are available, for DPG-204, in the Utah Division of Waste Management and Radiation Control (UDWMRC), formerly the Division of Solid and Hazardous Waste (DSHW), public documents listed below in Table 2.

Table 2: UDWMRC Library Documents Detailing DPG-204 Investigations

Document Title	Received Date	UDWMRC Library No.
“Draft Interim Summary Report of Activities and Findings, Phase II RFI Report” (Parson, 2007)	08/07	XXXX
“Quality Assurance Project Plan/Sampling and Analysis Plan, DPG-204, Dugway Proving Ground, Dugway, UT” (Shaw, 2011a)	04/11	XXXX
“Voluntary Interim Measures Plan, DPG-204, Dugway Proving Ground, Dugway, UT” (Shaw, 2011b)”	06/11	XXXX
“Voluntary Interim Measures Report, DPG-204, Dugway Proving Ground, Dugway, UT” (Shaw, <i>pending</i>)”	XX/XX	XXXX

2.4 Closure Activities

In compliance with Utah Admin. Code R315-265; 40 CFR §265.111 incorporated by reference, closure at DPG-204 has been completed with the construction of an engineered cover system consisting of a geomembrane-supported geosynthetic clay liner (GCL) placed over areas impacted by former operations. Approval for the DGP-204 Voluntary Interim Measures Plan (VIM) (Shaw, 2011b) was received in a letter dated June 30, 2011 from Mr. Scott T. Anderson, Executive Secretary, Utah Solid and Hazardous Waste Control Board. Appendix A includes a copy of the DGP-204 Closure Certification signed and stamped by a Utah-licensed Professional Engineer.

The final cover system, as designed and constructed, satisfies the requirements of Utah Admin. Code R315-265 (by reference 40 CFR Part 265, Subpart G, and §265.310) for the closure and post-closure of DPG-204, namely:

- Provide long-term minimization of migration of liquids through the closed landfill;
- Function with minimum maintenance;
- Promote drainage and minimize erosion or abrasion of the cover;
- Accommodate settling and subsidence so that the integrity of the cover is maintained; and
- Achieve a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

In meeting the above performance standards, the major closure activities completed at DPG-204 included:

- Installation of the final engineered cover system;
- Installation of run-on diversion barriers on the north and east sides of the cap consisting of angular rip-rap to divert water around the cap and protect it from erosion;
- Installation of a settlement monument to monitor subsidence over time;
- Installation of warning signs around DPG-204; and,
- Final grading of the site, including enhancement of drainage features, to help mitigate erosion and minimize long-term maintenance requirements during post-closure.

These measures will minimize human contact with the waste and provide protection of groundwater. An inspection checklist designed to insure that these objectives are maintained is presented in Module VII (Form B).

Closure activities performed at DPG-204 are described in detail in the ‘Voluntary Interim Measures Report, DPG-204’ (VIMR) (Shaw, Pending).

2.5 Human Health and Ecological Risk Assessment

According to Utah Admin. Code R315-101-4 ‘The following information shall be collected to characterize the site, and define the site boundaries and Area(s) of Contamination’. Subparagraph (g) states: ‘Location and boundaries of all Area(s) of Contamination, including concentrations, types and extent of hazardous constituents’.

On May 19, 2011 and again on August 9, 2011 surface soil samples were collected by Shaw and analyzed by both DPG and third party laboratories in order to characterize the site. Preliminary results of these sampling events suggest that the Area of Contamination extends further to the west than anticipated therefore the full extent of Area of Contamination has not been characterized. These results are contained in the VIMR. In accordance with the Utah Admin. Code R315-101 no updated risk assessments have been completed for DPG-204.

2.6 Surface Water and Groundwater

Surface water samples have not been collected at DPG-204. No surface water or temporary ponding of water has been observed at this site. A clearly defined drainage channel existed at the site prior to remedial construction. The design of the engineered cap/cover included provisions for diversion of run-on around the cap/cover. Once surface water has passed around the cap it is assumed to flow (downhill) offsite to the valley to the west. No signs of ponding occur there.

Groundwater in the area of DPG-204 has not been studied. Subsurface geology is dominated by Paleozoic carbonates of the Simpson Buttes. The depth to groundwater is unknown but is believed to be greater than 50 ft. There are no water wells within two miles of the site. If groundwater investigation is indicated, then this would be conducted under the guidance of the Final Hydrogeological Assessment and Regional GMA, Volume II, Carr Groundwater Management Area (Parsons, 2007).

If further monitoring is warranted, a GMA Change Request Form will be completed to change the text of the Carr Area GMA and will include new corrective action objectives and monitoring or other requirements as needed.

2.7 Closure Notifications

The Certification of Closure (Appendix A) was received and verified by the Executive Secretary of the Utah Solid and Hazardous Waste Control Board on November 22, 2011.

Federal facilities are exempt from submitting notifications to the local zoning authority as required by Utah Admin. Code R315-264-116 and R315-264-119.

3.0 SECURITY REQUIREMENTS

The following security conditions are applicable to DPG-204:

1. DPG-204 is located within a federal, military installation (DPG). As such, the installation is restricted for the common population.
2. In addition at DPG-204, signs are present warning against unauthorized entry.
3. Security facilities will be maintained and inspected throughout the post-closure care period. The security facilities (i.e., posted signs) to be inspected and the frequency of inspection are listed on the Post-Closure Inspection Schedule. Dugway shall report to the UDWMRC any decrease of Dugway's Base Security, which could affect the security conditions as applicable to DPG-204.
4. Damaged security facilities shall be noted in the general site inspection checklist (Module VII, Form B). Repairs shall be completed as soon as practicable after the problem is discovered, in compliance with R315-264-15(c).

4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS

4.1 Introduction

DPG-204 has been closed under the DPG RCRA part B Permit requirements and specifications of the VIM (Shaw, 2011b). Disturbance of the waste will not be allowed. To ensure that the area is not reused or developed, annual site inspections and a biennial Post-Closure Report shall be required. Removal and reuse of soil from this site will not be allowed unless under an excavation permit approved by the Dugway Proving Ground Environmental Program Office (EPO). Soil excavation at this site must be coordinated through the DPG EPA and the DPG Dig Permit Process (Module VII.F.4).

4.2 Routine Site Inspections

During the post-closure period, general inspections of DPG-204 shall be conducted annually to ensure that the integrity of the engineered cap is maintained. Any modifications to the frequency of inspections will be in accordance with amendments submitted in the form of proposed permit modifications.

Site inspections will consist of a complete walkthrough and visual inspection of the covered areas as well as surface water drainage features. A general site inspection checklist for landfill sites is included in Module VII as Form B. 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:

- No noticeable sliding (slope failure);
- No noticeable damage to the soil covering from burrowing animals;
- No noticeable depressions or ponding water are present;
- No excessive soil erosion is evident on the cap surface or at the cap edges;
- No weeds or trees (with deep taproots) are present that may penetrate the cap;
- Signs are in good condition;
- Presence of ordnance or large pieces of explosives;
- Drainage swales and roads are functioning as planned with no significant erosion or ponding.
- The survey monument is undamaged and there is no significant subsidence of the landfill cap.

4.2.1 Protective Soil Layer Inspections

Maintenance of the protective soil layer is an essential step in ensuring that the integrity of the final cover system is preserved. During each site visit, observations will be made to ensure that the protective soil layer is functioning as designed (i.e., protecting the underlying GCL). Repairs to the protective soil layer may include removal of vegetation species having tap roots greater than 12 inches, re-grading through the placement of fill in areas where a potential for ponding water on the cover exists due to settlement, or repair and stabilization of areas that have been eroded.

If signs of soil erosion are excessive (for example, exposed liner and/or cracks or rills greater than eight inches deep and two inches wide) and continual (recurring in the same area) corrective action may be necessary. Significant cracks or rills that have the potential to impact the functionality of the cover system will be documented on the inspection forms. Corrective action may include filling in the eroded or cracked area, re-grading slopes, establishing vegetation (if soil salinity is favorable) or adding mulch to the soil surface. The final grading and drainage plan, shown on Figure 3, is presented for future reference.

For most routine repairs, corrective action should be initiated as soon as possible after identifying the problem or as directed by DPG. If the corrective action requires substantial effort and/or a technical plan, a brief plan will be prepared to summarize the problem, the potential impacts, and the time-frame in which corrective action will be implemented and the planning involved.

4.2.2 Survey Monument Inspections

During each visit, the survey monument will be inspected to determine if any damage has made its use questionable as a reference point. If missing or badly damaged, it will be replaced as soon as possible after discovery of the problem.

As part of the routine inspection, the survey monument location and elevation should be surveyed at least once per year for the first two years after construction. Once a settlement of 0.1 ft or less has been measured for two consecutive years, surveys can be scaled back to once every five years. The baseline northing, easting, and elevation of the survey monuments (SM-1) will be presented in the first Post-Closure Inspection Report. In addition, the final grading and drainage plan, shown on Figure 3, is presented for future reference.

Table 3 summarizes the Post-Closure Inspection Schedule for DPG-204, 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-204 Post-Closure Inspection Schedule

Inspection / Monitoring Item	Method of Documentation	Frequency of Inspection
Landfill Cap	Inspection Checklist (Module VII, Form B)	Annual, by November 1 st
Survey Monument	Inspection Checklist (Module VII, Form B)	Annual, by November 1 st / 5 year intervals
Signs	Inspection Checklist (Module VII, Form B)	Annual, by November 1 st
Drainage Swales	Inspection Checklist (Module VII, Form B)	Annual, by November 1 st

4.3 Contingency Inspections

This section provides information about emergency response inspection procedures to be implemented in the event of any natural disaster in the DPG area that may affect the final engineered cover at DPG-204. Module VII contains a general site inspection checklist for landfill sites (Form B).

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 phone and a First Aid kit available during inspections.

4.3.1 Earthquakes

DPG is located in Seismic Zone 2 with a maximum acceleration of 0.2 gravity force (Hunt, 1984). DPG-204 is not located within 200 ft of any active faults. Although Utah is tectonically active, most of the earthquake activity occurs about 55 miles to the east along the Wasatch Range Foothills.

A geologic map completed in a 1988 study by the U.S. Geological Survey (USGS) (Barnhard and Dodge, 1988), was used to determine the distribution, relative age, and amount and extent of surface rupture on Quaternary fault scarps, in the area of DPG-204.

The USGS study (Barnhard and Dodge, 1988) concluded that there are no fault scarps associated with the Simpson Buttes. The nearest faults occur in the Simpson Springs mountains located over five miles to the east. These faults were inferred on geophysical evidence; however, there is no evidence of displacement during Holocene time.

In the event of a 6.5-magnitude or higher earthquake centered within 50 miles of the site, qualified personnel will visually inspect the landfill cap for signs of damage as soon as it is safe and practical to do so. Any damage to the landfill cap will be repaired to ensure the integrity of the cap. If the landfill cap has sustained extensive damage, Dugway will implement corrective actions to ensure that contaminants are contained and human health is protected. Post-earthquake site inspection records will be submitted to the Dugway Environmental Department.

Following an earthquake, the landfill and landfill cap will also be inspected for lateral shifting of debris. The survey monument will be resurveyed to determine any horizontal or vertical movement of the cap.

4.3.2 Floods or Major Storms

DPG-204 is not located within a 100-year verified floodplain. The National Flood Insurance Rate Map, identifying the boundary of the 100-year flood, does not include DPG. There are no permanent streams or other surface water bodies on DPG.

Surface water runoff generated from precipitation flows around the cap through drainage swales constructed during the capping of DPG-204. Surface water continues to follow natural drainage pathways to the west downhill into the valley below where it evaporates or percolates into the ground. Like other arid regions, DPG is subject to flash flooding following high-precipitation events. Flash floods have occurred only four times in the history of the installation, in 1944, 1952, 1973, and 1983. The major area affected during flash floods has been the Government Creek drainage channel, which has overflowed and caused minor inundation of roads at the Ditto Technical Center.

In the event of a flood or major storm, Dugway will inspect the landfill caps at DPG-204 to ensure their integrity within 72 business hours of the event. A checklist is included in Module VII (Form B). A major storm is defined in this plan as a storm with one inch of rain or more over a 24-hour period. Any damage to the landfill cap will be repaired as soon as possible to ensure the integrity of the caps.

4.3.3 Fires

In the event of a surface fire near the landfill cap, the Dugway fire department will be notified and the Dugway integrated contingency plan will be implemented. In the event of a landfill fire, if the cap is observed to have been breached, other firefighting methods (such as using foam or smothering with dirt) will be considered and used, as appropriate. Following the incident, Dugway will perform a thorough inspection of the landfill cap using the checklist included in Module VII (Form B), to ensure that the integrity of the soil cover has not been compromised and waste is not exposed. If there is fire damage, Dugway will implement corrective actions to ensure that contaminants are contained and human health is protected.

4.4 Inspection Follow-Up

Copies of completed site inspection checklists (Appendix 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 but no longer than 30 days of discovery. If the corrective action will require more than 30 days, a schedule of the correction will be provided to the Director for approval. If the corrective action requires substantial effort, a technical plan shall be prepared to summarize the problem, illustrate potential impacts, and clarify the proposed plan for action. Routine corrective actions will be recorded on the site inspection form in the comments with the date of the correction. This will ensure proper tracking of the resolution.

5.0 SUBMITTALS/REPORTING

Based on the evaluation presented in the VIM Plan for DPG-204 (Shaw, 2011b), post-closure inspection is required. Groundwater monitoring, if necessary, will be conducted via the GMA Program.

5.1 Non-Compliance Reporting

The conditions at DPG-204 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 conditions VII.C.5.

5.2 Biennial Post-Closure Report

In accordance with Utah Admin. Code R315-270-30(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-204 shall be due by March, 2012. Specifically for DPG-204, the Biennial Post-Closure Report shall include, at a minimum, the following:

- General site description and conditions,
- Areas of cap repair, and
- Inspection records.

5.3 Required Submittals

Table 4 summarizes the requirements for the Biennial Post-Closure Report for DPG-204 and reporting for any non-compliance issues.

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 Waste Management and Radiation Control no later than March, of the year the report is due. Reporting years are even numbered years beginning with March 2012, 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 Director may waive the 5-day notice, in favor of a 15-day notice Written notification for information concerning the non-compliance, which does not endanger human health or the environment.	30 days advance notice of any change which may result in noncompliance Orally within 24 hours of discovery Within 5 days of discovery 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 Director, 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

- Barnhard, T.P. and R.L. Dodge, 1988, Map of Fault Scarps Formed on Unconsolidated Sediments, Tooele 1° x 2° quadrangle, Northwestern Utah, United States Geological Survey.
- Hunt, Roy E., 1984, Geotechnical Engineering Investigation Manual, McGraw-Hill Book Company, New York.
- Parsons Engineering Science, Inc., 2007a, Final Hydrogeological Assessment and Regional Groundwater Management Plan, Volume II, Carr Groundwater Management Area, Dugway Proving Ground, Dugway, Utah.
- Parsons Engineering Science, Inc., 2007b, Draft, Interim Summary Report of Activities and Findings, Phase II RFI Report, DPG-204, Dugway Proving Ground, Dugway, Utah.
- Shaw, 2011a, Quality Assurance Project Plan/Sampling and Analysis Plan, DPG-204, Dugway Proving Ground, Dugway, Utah
- Shaw, 2011b, Voluntary Interim Measures Plan, DPG-204, Dugway Proving Ground, Dugway, Utah
- Shaw, Voluntary Interim Measures Report, DPG-204, Dugway Proving Ground, Dugway, Utah
- Utah Division of Solid and Hazardous Waste, 2001, Administrative Rules for Cleanup Action and Risk-Based Closure Standards, Utah Department of Environmental Quality, R315-101, Utah Administrative Code.
- Utah Division of Water Quality, 2002, Administrative Rules for Ground Water Quality Protection, Utah Department of Environmental Quality, R317-6, Utah Administrative Code.

APPENDIX A

**COPY OF
CERTIFICATION OF CLOSURE**

CERTIFICATION OF CLOSURE

The Closure Certification Report for DPG-204 at Dugway Proving Ground, Utah has been prepared by Shaw Environmental in accordance with the closure requirements specified under the DPG Part B RCRA Permit and the VIM Plan. The site has been managed in accordance with the specifications in the approved VIM Plan.

In accordance with the DPG Part B RCRA Permit, the signature and seal certify that a licensed professional has reviewed the Corrective Measures Implementation Report in accordance with the above referenced regulatory requirements.

Respectfully submitted,

Jeffrey Carter
Directorate of Environmental Programs
Dugway Proving Ground

Sunil Kishnani, P.E.
Utah Registered Civil Engineer No. 6027103
Shaw Environmental, Inc.