

**DUGWAY PERMIT**

**MODULE VII**

**ATTACHMENT 40**

**DPG-199  
POST-CLOSURE PLAN**

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## LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

bgs	below ground surface
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
CMIR	Corrective Measures Implementation Report
DPG	Dugway Proving Ground
DSHW	Division of Solid and Hazardous Waste
EPO	Environmental Program Office
ft	feet
ft <sup>2</sup>	square feet
HHRA	Human Health Risk Assessment
HHRS	Human Health Risk Screening
IRP	Installation Restoration Program
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
mg/L	milligrams per liter
mm	millimeter
NFA	no further action
OB/OD	open burning/open detonation
PES	Parsons Engineering Science
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
Shaw	Shaw Environmental, Inc.
SSL	soil screening level for leaching to groundwater
SWMU	Solid Waste Management Unit
UAC	Utah Administrative Code
USEPA	U.S. Environmental Protection Agency
USGS	United States Geological Survey

## 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 40 Code of Federal Regulations (CFR) §264.117, with respect to post-closure inspection requirements including preventing exposure to munitions and explosives of concern (MEC) on the ground surface. 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) 199, herein referred to as DPG-199. Post-closure requirements will continue for a minimum of 30 years after closure of DPG-199. The post-closure care period may be extended or shortened, as deemed necessary (40 CFR §264.117(a)(2)).

Based on the approved Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI), (Parsons Engineering Science, Inc. [PES], 2005) and the implementation of corrective measures at the site, there are no uncontrolled sources of contamination (R315-101-2 and 3) present at DPG-199, including MEC. The surface sweep conducted during site remedial activities removed MEC and munitions constituents from the ground surface, thus limiting the potential for exposure to explosives via surface water. The nature and extent of potential contamination has been characterized in soil and surface water in accordance with R315-101-4 and the site risks have been assessed in accordance with R315-101-5. Surface and subsurface soil qualify for risk-based closure based on an industrial land-use scenario while soil-to-groundwater analysis indicates that potential future impacts to groundwater from soil are possible at DPG-199, but not expected. Future site management is based on the characterization in the Corrective Measures Implementation Report (Shaw Environmental Inc., [Shaw], 2008), which indicates corrective measures for soil and groundwater are not required. However, limited groundwater monitoring will be required at DPG-199.

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-199, 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-199 Post-Closure Information Requirements  
Under 40 CFR 270.14, UAC R315-3-2.19, and UAC R315-3-2.5**

<b>Regulation Citation</b>	<b>Requirement Description</b>	<b>Location Requirement is Addressed</b>
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 4.2 and Module VII Form B
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	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
40 CFR §270.14(b)(13) UAC R315-3-2.5(b)(13)	Copy of the Closure Plan	The Corrective Measures Implementation Plan Firm Fixed-Price Remediation at DPG-199 was approved on 11/26/07. 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 and Appendix A.
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 4.3.2; DPG-199 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-199 is within a military base. There are no nearby operations in the vicinity of DPG-199.

**Table 1 (Continued): Summary of DPG-199 Post-Closure Information Requirements  
Under 40 CFR 270.14, UAC R315-3-2.19, and UAC R315-3-2.5**

<b>Regulation Citation</b>	<b>Requirement Description</b>	<b>Location Requirement is Addressed</b>
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-199. The closest residential area is English Village (approximately 15 miles away). A wind rose is not deemed necessary for DPG-199.
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 3 shows the access gate and a portion of the fence. The site is surrounded by a fence.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ix)	Topographic Map Injection and Withdrawal Wells	Figure 3.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (xi)	Topographic Map Barriers for Drainage or Flood Control	Figure 3. DPG-199 is graded to drain surface water away from the filled detonation craters following a segment of engineered stream channel. 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	Post-closure groundwater monitoring at DPG-199 will be conducted during the first year of post-closure inspection.
40 CFR §270.14(c) UAC R315-3-2.5(c)(2)	Groundwater Monitoring Information Identification of Uppermost Aquifer	Post-closure groundwater monitoring at DPG-199 will be conducted during the first year of post-closure inspection.
40 CFR §270.14(c) UAC R315-3-2.5(c)(3)	Groundwater Monitoring Information Delineation of The Waste Management Area	Post-closure groundwater monitoring at DPG-199 will be conducted during the first year of post-closure inspection.

**Table 1 (Continued): Summary of DPG-199 Post-Closure Information Requirements Under 40 CFR 270.14, UAC R315-3-2.19, and UAC R315-3-2.5**

<b>Regulation Citation</b>	<b>Requirement Description</b>	<b>Location Requirement is Addressed</b>
40 CFR §270.14(c) UAC R315-3-2.5(c)(4)	Groundwater Monitoring Information Extent of Plume	Post-closure groundwater monitoring at DPG-199 will be conducted during the first year of post-closure inspection.
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-199 will be conducted during the first year of post-closure inspection.
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-199 will be conducted during the first year of post-closure inspection.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(ii)	Groundwater Monitoring Information Proposed Groundwater Monitoring System	Post-closure groundwater monitoring at DPG-199 will be conducted during the first year of post-closure inspection.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iii)	Groundwater Monitoring Information Background Values	Post-closure groundwater monitoring at DPG-199 will be conducted during the first year of post-closure inspection.
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-199 will be conducted during the first year of post-closure inspection.

## **2.0 FACILITY DESCRIPTION**

The following provides a general description of DPG-199 as required by UAC R315-3-2.5(b)(1).

### **2.1 DPG-199 LOCATION AND HISTORY**

DPG-199 is known as the Old Open Burning Open Detonation (OB/OD) Test Area, South Tower Grid (Figure 1). The 100-acre site is located in the South Tower Grid Area adjacent to, and just east of, DPG-017. The average elevation of the site is 4,400 ft above mean sea level, with surface topography sloping to the northwest (Figure 2). The site was investigated as two separate areas: Area 1 and Area 2. Area 1 located just outside the fence line on the north edge of the site near the site monument, contained a trench partially filled with hazardous waste. The waste was removed by Shaw in 2007 and the results of the risk assessment, based on the confirmation sample results and previous data still remaining after excavation, indicated that no further action was required in Area 1 and future use of that portion of the site was unrestricted. The remainder of the site history pertains to Area 2, the bulk of the site.

Twenty-two pits were dug and used to quantify air emissions generated during the destruction of munitions and explosives. The pits became detonation craters (with diameters ranging from 20 ft to 95 ft) following the tests. Several craters were backfilled with soil; however, craters that remained open were anywhere from shallow depressions to 6 ft deep. Several ephemeral drainages were also present at the site, trending from the southeast to the northwest across the site. Most of these drainages flowed together near the center of the former OB/OD area in the vicinity of a large detonation crater to form a larger drainage that exited the site to the northwest (Figure 2). Pondered surface water had been observed in seven of the open detonation craters. This water was derived from precipitation, which occurs seasonally for relatively brief periods of time, and runoff from ephemeral streams following some storms.

Abundant pieces of munitions constituents (MC), munitions and explosives of concern (MEC), and munitions debris (MD) were present in the vicinity of the craters.

Additional site features included:

- A pile of thin-gauge sheet metal lids used as burn pan lids located in the southeastern portion of the site;
- Two pallets of 90-millimeter (mm) rounds, one located at the southern end and the other at the northern end of the site;
- Two concrete pads (one was 10 square feet [ft<sup>2</sup>], and the other was 6 ft<sup>2</sup>) located at the northern end of the site. The location of these pads suggested that they were associated with the former base of operations for activities at nearby DPG-017 and may have been the foundations of former buildings;
- A communication bunker was located near the concrete pads; and
- A fence surrounds the site.

## **2.2 PAST OPERATIONS**

Open Burning Open Detonation operations were conducted at this site to identify and quantify air emissions from the destruction of munitions and explosives. These activities are believed to have occurred during the late 1950s and early 1960s; however, exact dates are unknown. Based on the surface sweep for explosives conducted in 2007, the most common munition used in these exercises was the 90 millimeter projectile. Other munitions used include M55 rockets and 3.5" HEAT warheads. During the late 1970s, the site was also used as a base of operations for demilitarization activities at the nearby DPG-017, Agent Disposal Site at South Tower Grid. A change house, security building, and related temporary structures associated with these operations were formerly located on the road loop near the DPG-199 monument (United States Army Test and Evaluation Command [USATECOM], 1978). No other activities associated with DPG-017 demilitarization operations occurred at this site, and there is no history of burning or detonation of chemical warfare materiel at DPG-199 according to DPG personnel (PES, 2005).

## **2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION**

The detailed results of previous soil sampling and closure information are available for DPG-199 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-199 Investigations**

Document Title	Received Date	DSHW Library No.
Parsons Engineering Science, Inc (PES), 1999. <i>Final Phase I RCRA Facility Investigation Report, Revision 1.</i>	09/99	
PES, 2005. <i>Final Phase II RCRA Facility Investigation Report, SWMU-199 Addendum Revision 01.</i> January.	01/05	
Shaw Environmental, Inc. (Shaw), 2007a. <i>Corrective Measures Study (CMS) Report for Solid Waste Management Units (SWMUs) 180, 197, 199 and RCRA Closure Plans for Hazardous Waste Management Units (HWMUs) 55 and 58, Dugway Proving Ground, Dugway, Utah.</i> April.	04/07	
Shaw, 2007b. <i>Final Corrective Measures Implementation (CMI) Plan, Firm Fixed-Price Remediation, at DPG-199, Dugway Proving Ground, Dugway, Utah.</i> November.	11/07	
Shaw, 2008. <i>Corrective Measures Implementation Report for DPG-199, Dugway Proving Ground, Utah.</i> June.	06/08	

## 2.4 CLOSURE ACTIVITIES

In compliance with UAC R315-7-14 and the Corrective Measures Implementation (CMI) Plan (Shaw, 2007b), closure at DPG-199 has been completed by: removal of debris from the Area 1 Trench and removal of MC, MD, and MEC from Area 2; destruction of MEC and MC by detonation and burning, respectively; burial of MD in crater DC-13 under 36 inches of cover; backfilling the detonation craters; and rerouting the surface drainage away from the craters in Area 2 completed the closure activities. Approval for the DPG-199 Corrective Measures Implementation Report (CMIR) (Shaw, 2008) was received in a letter dated August 12, 2009, from Mr. Dennis R. Downs, Utah Solid and Hazardous Waste Control Board. Appendix A includes a copy of the DPG-199 Closure Certification that will be signed and stamped by a Utah-licensed Professional Engineer following submission of the final CMIR.

In meeting the above performance standards, the major closure activities completed at DPG-199 included:

- Backfilling and crowning the craters with compacted clean fill, graded to drain;
- Restoration of ground surface;
- Relocation of surface drainage away from the craters; and
- Completion of an as-built site survey.

These measures indicate that no waste is present at the site. The potential for surface water retention and contamination is minimal. The corrective action results indicate that impacts to groundwater are unlikely. However, Dugway will monitor groundwater during the first year of post-closure inspections. Form B inspection checklist (contained in Module VII of the DPG RCRA Part B Permit) is designed to insure that these objectives are maintained. The investigative and closure activities performed at DPG-199 are described in detail in the CMIR (Shaw, 2008).

## **2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT**

Human health and ecological risk assessments evaluating the extent of residual contamination at DPG-199 and its potential impact on the environment were previously published in the RFI Report (PES, 2005). The human health risk assessment (HHRA) indicated that soil at Area 1 qualifies for NFA and that risk levels exceeded at Area 2 primarily were due to the presence of 2,4,6-trinitrotoluene (98 percent of the risk) associated with the presence of bulk explosives.

The corrective action completed at DPG-199 and the results of the Human Health Risk Screening (HHRS) for Area 1 support a risk-based closure with no further action in Area 1.

With the corrective action complete at Area 2, the surface MC and Materials Potentially Presenting an Explosive Hazard have been removed, the craters filled with clean soil, and the surface water drainage rerouted away from the craters; potential ecological impacts at DPG-199 are reduced from the potential impacts predicted by the Environmental Risk Assessment published in the RFI (PES, 2005). Area 2 closure has also been achieved by implementing corrective actions designed to meet the Corrective Action Objectives. Exposure to explosive debris has been reduced to acceptable levels. Impacts to the spadefoot toad due to chemicals of potential concern in ponded water have been eliminated. Post-closure management is required to ensure that the crater fills and engineered stream channels continue to perform their designated functions.

Groundwater impacts for leaching from soil were assessed during the RFI (PES, 2005) by comparing site concentrations to generic or derived soil screening levels (SSLs) for leaching to groundwater. The SSL evaluation indicated that the potential to impact groundwater was minimal. In addition, removal of bulk explosives, filling craters with soil, and rerouting surface drainage away from the craters has reduced the potential for groundwater impact.

## **2.6 SURFACE WATER AND GROUNDWATER**

Most of the precipitation at DPG either infiltrates only the upper few inches of soil or ponds briefly before it is lost to evaporation. Only a fraction of the precipitation becomes runoff. The area around DPG-199 is gently sloping to the northwest with several ephemeral drainages present at the site, trending from the southeast to the northwest. The general direction of surface water drainage in the area surrounding this unit is to the north and northwest. The stream flow gradient was approximately 6.5 ft of fall per 1,000 ft of run or 0.0065 ft/ft during the RFI (PES, 2005).

Groundwater data from nearby DPG-017 indicate that the first water present is approximately 60 ft below ground surface (bgs). Data from DPG-017 suggest that groundwater at DPG-199 is likely class III, limited use, per UAC R317-6-3 (UAC, 2002) with total dissolved solids ranging from 2,980 to 5,350 milligrams per liter (mg/L). The approved RFI for DPG-199 (PES, 2005) concludes that groundwater contamination is not suspected based on an evaluation of site-specific SSLs (U.S. Environmental Protection Agency [USEPA], 1996a, b). Groundwater in the vicinity of DPG-199 is not used for drinking water, irrigation, or other purposes.

No active water wells are present in the Tower Grid Area. The closest inactive wells are 2.5 miles to the northeast (WW7) and northwest (WW8). These wells are screened into the deeper, potable aquifer with screen intervals ranging from 120 to 230 ft bgs.

## **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 in the fall of 2007.

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 Permittee shall comply with the following security conditions as applicable to DPG-199:

1. DPG-199 is located within a federal, military installation (DPG). As such, the installation is restricted for the common population.
2. At DPG-199, signs are present warning against unauthorized entry and a fence surrounds the site.
3. Security facilities are to 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 in Table 3 (below). DPG shall report to the DSHW any decrease of Dugway's Base Security, which could affect the security conditions as applicable to DPG-199.
4. Damaged security facilities shall be noted in the inspection checklist. Repairs shall be completed as soon as practicable after the problem is discovered, in compliance with R315-8-2.6(c).

## **4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS**

### **4.1 INTRODUCTION**

DPG-199 has been closed under the requirements of the DPG RCRA Part B Permit. To ensure that the area is not reused or developed and to ensure the Dig Permit Process (Module VII.I) has been followed, periodic site inspections and a biennial post-closure report shall be required. DPG-199 is no longer receiving waste and there are no structures or other equipment at the site. 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 Dugway EPO using Form E of the DPG RCRA Part B Permit.

### **4.2 ROUTINE SITE INSPECTIONS**

During its post-closure period, general inspections of the former DPG-199 site shall be conducted annually by November 1st to ensure that the integrity of the completed closure activities remain protective to human health and the environment and to ensure that the DPG Dig Permit Process (Module VII.F.4) has been followed. 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 backfilled craters as well as surface water drainage features. An appropriate Inspection checklist (Module VII Form B) shall be completed and filed with the Dugway EPO.

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

- No noticeable depressions or ponding water are present on the surface or at the edges of the crater fills;
- No excessive soil erosion is evident on the surface or at the edges of the crater fills;
- No surface exposure of MEC;
- No damage to the rerouted stream channel;
- Signs are in good condition; and
- Drainage patterns and roads are functioning as planned with no significant erosion or ponding.

Table 3 summarizes the Post-Closure Inspection Schedule for DPG-199, and lists site-specific items to be inspected and potential problems. Inspection personnel shall note any problems found and shall inform appropriate DPG representatives.

**Table 3: DPG-199 Post-Closure Inspection Schedule**

<b>Inspection/Monitoring Item</b>	<b>Method of Documentation</b>	<b>Frequency of Inspection</b>
Crater fills	Module VII, Form B	Annual, By November 1 <sup>st</sup>
Signs	Module VII, Form B	Annual, By November 1 <sup>st</sup>
Drainage	Module VII, Form B	Annual, By November 1 <sup>st</sup>
MEC exposure at the surface	Module VII, Form B	Annual, By November 1 <sup>st</sup>
Rerouted stream channel	Module VII, Form B	Annual, By November 1 <sup>st</sup>

**4.2.1 Crater Fills**

If signs of soil erosion are excessive (for example, ponding of surface water, cracks or rills greater than two inches wide) or 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 fill will be documented on the inspection forms. Corrective action may include filling in the eroded or cracked area, regrading slopes, establishing vegetation (if soil salinity is favorable), or adding mulch to the soil surface. Any munitions exposed by erosion will have its location marked in the field and the DPG Installation Restoration Program (IRP) will be notified.

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.

**4.3 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 filled craters and engineered stream segment at DPG-199.

The DPG 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 peak ground acceleration of 0.2 gravity force (Hunt, 1984). DPG-199 is not located within 200 ft of any active faults. Although Utah is tectonically active, most of the earthquake activity occurs about 65 miles to the east along the Wasatch Range Foothills.

A geologic map, completed in a 1988 study by the United States 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-199.

The USGS study (Barnhard and Dodge, 1988) concluded that morphologic and geologic data collected along the fault scarps in the area indicate that all were formed during the later Pleistocene era and there is not any clear evidence of Holocene surface rupture. Several faults inferred on geophysical evidence are located at DPG; however, there is no evidence of displacement during Holocene time.

In the event of a magnitude 6.5 or higher earthquake centered within 50 miles of the site, qualified personnel will visually inspect the crater fills and engineered stream segment for signs of damage as soon as it is safe and practical to do so. Any damage to the crater fills or engineered stream segment will be repaired to ensure the integrity of the remedy. If the crater fills or engineered stream segment have sustained extensive damage, DPG will implement corrective actions to ensure that human and ecological health is protected. Post-earthquake site inspection records will be submitted to the Dugway Environmental Department.

Following an earthquake, the crater fills will also be inspected for lateral shifting of soil.

#### **4.3.2 Floods or Major Storms**

DPG-199 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.

During the corrective action at DPG-199, the drainage was rerouted to flow away from the craters. The engineered channel was designed to carry surface water away from the site and tie in with the natural drainage channels. Most of the surface water evaporates and does not infiltrate 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, DPG will inspect the crater fills and engineered stream channel to ensure their integrity within 72 hours of the event. A major storm is defined in this plan as a storm with one inch of precipitation or more over a 24-hour period. Any damage to the crater fills or engineered stream segment will be repaired as soon as possible to ensure the integrity of the remedy.

### **4.3.3 Fire**

In the event of a surface fire near the site, the Dugway Fire Department will be notified and the DPG integrated contingency plan will be implemented. Following the incident, DPG will perform a thorough inspection of DPG-199 Form B to ensure that the integrity of the remedy has not been compromised. If there is fire damage, DPG will implement corrective actions to ensure that human health is protected.

### **4.4 INSPECTION FOLLOW-UP**

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

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

The Dugway EPO 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 DPG. 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 shall be implemented as required under this Permit. This plan shall be approved through the Executive Secretary and shall be submitted within 30 days of Dugway's decision to implement corrective action.

### **5.0 SUBMITTALS/REPORTING**

Based on the evaluation presented in the Final Closure Certification Report for DPG-199, post closure inspection is required for DPG-199. Groundwater monitoring will be implemented through the Carr Groundwater Management Area Plan.

### **5.1 NON-COMPLIANCE REPORTING**

The conditions at DPG-199 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 UAC R315-3-3.1(1)(9), a Biennial Post-Closure Report shall be prepared for all DPG closed HWMUs and SWMUs undergoing post-closure care by March 1, of the reporting year.

### **5.3 REQUIRED SUBMITTALS**

Table 4 summarizes the requirements for the Biennial Post-Closure Report for DPG-199 and reporting for 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  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 Executive Secretary, DPG representatives shall submit a certification to the Board, signed by DPG 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.* New York: McGraw-Hill.

Parsons Engineering Science, Inc. (PES), 2005. *Final Phase II RCRA Facility Investigation Report, SWMU-199 Addendum Revision 01.* January.

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United States Army Test and Evaluation Command (USATECOM), 1978. *Demilitarization of M139 and E139 Bomblets at DPG (Phase II Demilitarization)*.

U.S. Environmental Protection Agency (USEPA), 1996a. *Soil Screening Guidance: Technical Background Document*. EPA/540/R-95/128. Washington, D.C. July.

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Utah Administrative Code, 2002. *Ground Water Quality Protection*. R317-6. April.

**APPENDIX A**  
**CERTIFICATION OF CLOSURE**

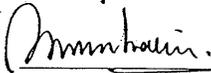
## CERTIFICATION OF CLOSURE

The Corrective Measures Implementation Report for DPG-199 at Dugway Proving Ground, Utah has been prepared by Shaw Environmental in accordance with the closure requirements specified under the DPG RCRA Part B Permit and the CMI Plan. The requirements of UAC R315-101 form the basis for the risk-based criteria in the closure of DPG-199. The site has been managed in accordance with the specifications in the approved CMI Plan.

In accordance with the DPG RCRA Part B 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 S. Carter  
Directorate of Environmental Programs  
Dugway Proving Ground

  
\_\_\_\_\_  
Sunil Kishnani, P.E. . .  
Utah Registered Civil Engineer No. 6027103

