

DUGWAY PERMIT

MODULE VII

ATTACHMENT 42

**SWMU 061
POST-CLOSURE PLAN**

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

bgs	below ground surface
BZ	Incapacitating Agents
CFR	Code of Federal Regulations
COPC	Chemical of Potential Concern
COPEC	Chemicals of Potential Ecological Concern
DPG	Dugway Proving Ground
DSHW	Divisions of Solid and Hazardous Waste
DWQ	Division of Water Quality
ft	feet
GC	Gas Chromatograph
GMA	Groundwater Management Area
HD	Sulfur Mustard
HI	Hazard Index
HQ	Hazard Quotient
HWMU	Hazardous Waste Management Unit
µg/g	microgram per gram
mg/L	milligrams per liter
MS	Mass Spectrometer
MSL	Mean Sea Level
NFA	No Further Action
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SLHQ	Screening-level hazard quotient
SWMU	Solid Waste Management Unit
TDS	Total Dissolved Solids
UAC	Utah Administrative Code
VOC	Volatile Organic Compound
yd ³	cubic yards

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) 061, herein referred to as DPG-061. Post-closure requirements will continue for a minimum of 30 years after closure of DPG-061. 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) there are no uncontrolled sources of contamination (Utah Administrative Code (UAC) R315-101-2 and 3) present at DPG-061. The nature and extent of potential contamination has been characterized in soil, soil vapor, and groundwater in accordance with UAC R315-101-4 and the site risks have been assessed in accordance with UAC R315-101-5. Surface and subsurface soil do not qualify for no further action (NFA) based on hypothetical residential use; however, risks are below industrial use levels. Groundwater does not qualify for NFA; however, potential exposures to groundwater are below UAC R315-101-6 industrial screening levels. Soil-to-groundwater analysis indicates that potential future impacts to groundwater from soil are not expected at DPG-061. Corrective measures for groundwater are not required. However, future monitoring of the mappable plumes to track vertical migration of the contamination at SWMU 61 will be conducted under the Carr Regional Groundwater Management Area (GMA) Plan.

In accordance with Title 40 CFR §270.28 and UAC R315-3-2.19, the Post-Closure Plan is required to include specific information for a closed facility. As applicable to DPG-061, 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 PCP where the specific information is presented.

**Table 1: Summary of DPG-061 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 Appendix 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-061.
40 CFR §270.14(b)(11) (iii-v) UAC R315-3-2.5(b)(11) (iii-v)	Facility Location Information 100-year floodplain	DPG-061 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	The Final Phase II RFI was issued in October 2009 and approved on December 2, 2009. 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	DPG-061 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-061. The closest residential area is English Village (approximately 12 miles away). A wind rose is not deemed necessary for DPG-061.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (vi)	Topographic Map Orientation of Map, North Arrow	Figure 2

**Table 1: Summary of DPG-061 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)(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 in the vicinity of DPG-061.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (iv)	Topographic Map Surrounding land uses	DPG-061 is within a military base. There are no nearby operations in the vicinity of DPG-061.
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-061 will be managed under the Carr GMA
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-061 will be managed under the Carr GMA
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-061 will be managed under the Carr GMA

Table 1: Summary of DPG-061 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(c) UAC R315-3-2.5(c)(6)(iii)	Groundwater Monitoring Information Background Values	Post-closure groundwater monitoring at DPG-061 will be managed under the Carr GMA
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-061 will be managed under the Carr GMA

2.0 FACILITY DESCRIPTION

The following provides a general description of DPG-061, as required by UAC R315-3-2.5(b)(1) (Figures 1 and 2).

2.1 DPG-061 LOCATION AND HISTORY

DPG-061 is the location of a former disposal area in the vicinity of Buildings 3244 and 3242 within the fenced perimeter of the Carr Facility. The site was discovered in 1986 during the construction of a parking lot for Buildings 3244 and 3242 (AEHA, 1986). Prior to the construction of the parking lot, the soil excavated to place sub-base as part of the foundation construction for Buildings 3244 and 3242 did not contain waste debris and was not stained or discolored. Early in the parking area construction, a military munition was found (4.2 inch mortar smoke round). Discolored soil with some rags, wood, glassware, and other debris was also unearthed. Following the discovery of contaminated soil, but prior to construction of the parking lot, extensive studies of the contaminated soil and materials from the excavation were conducted by DPG (ESE, 1988).

Point source geophysical surveys performed over the parking lot and surrounding area identified six anomalies indicative of buried metal. These six geophysical anomalies were excavated using an armored backhoe. Four of the areas that had geophysical anomalies were found to contain some unidentified pieces of metal, two of which were also associated with discolored soil and contained other miscellaneous debris including rags and wood. Later during the excavation of the soil, two sealed, unbroken amber bottles were found that contained liquid (approximately 3 liters) confirmed to be 55-percent HD (sulfur mustard).

Exploratory trenches at the outer edge of the proposed construction site were excavated to a depth of 10 ft below ground surface (bgs) to ensure that the horizontal extent of the stained soil had been identified. The area enclosed within the trenches was excavated to a depth of at least 5 ft bgs, and to a depth of approximately 8 ft bgs where discolored and/or stained soil was observed. This excavation measured approximately 30 ft wide by 130 ft long in size and varied in total depth from 5 to 8 ft bgs depending on the presence of debris, waste, or stained soil. All of the areas that contained buried metal, red stained soil, wood, agent-filled bottles, and other miscellaneous debris were excavated, and the debris was removed.

After the removal of debris and all visually contaminated soil, subsurface soil samples were collected:

- Along the trench walls (84 samples) from 5 ft bgs at a 5-ft spacing interval;
- Along the edge of the foundations (54 samples) for Buildings 3244 and 3242 from 3 ft bgs at a 10-ft spacing interval;
- From the area between Building 3244 and 3242 (69 samples);
- From 3 ft bgs at a 10-ft spacing interval; and
- From the base of the excavation (596 samples) along a sample grid with a 2.5-ft spacing interval.

A total of 803 subsurface soil samples were analyzed by the DPG laboratory for mustard, incapacitating agents (BZ), and nerve agents with detection limits of 0.5, 0.1, and 0.1 micrograms per gram ($\mu\text{g/g}$), respectively. A single detection of mustard agent ($2 \mu\text{g/g}$) was encountered in one sample collected from the bottom of the excavation, but a confirmation sample collected from the same location had results below detection limits. Other samples had gas chromatograph (GC) peaks of mustard and other polysulfides, but those were not confirmed by GC/mass spectrometer (MS). Approximately 700 cubic yards (yd^3) of soil was excavated and disposed of at Hazardous Waste Management Unit (HWMU) 059 located northeast of the Carr Facility. The excavation was backfilled with clean soil, and the parking lot subsequently constructed over the site.

Areas underlying the entire parking lot that were not suspected of containing stained or contaminated soil were excavated to a total depth of 3 ft bgs. Following this removal action, it was presumed that all the contaminated and stained soil was removed from the site. However, it is not known whether chemicals other than mustard agent were disposed of at the disposal area. Therefore, additional assessment under the RFI program was performed.

A dry well was shown to be present at DPG-061 based on a 1950s blueprint plan of the Carr Facility sewer system. These sewer plans show the location of a dry well connected to a disposal drainline from a former chemical laboratory (Building 3040), which was located northwest of Building 3242 (Figure 3). The location identified in the 1950s sewer blueprint for this dry well is near the western corner of Building 3242. However, based on the Phase II screening and confirmation sample results, the location shown on the sewer blueprint is believed to be incorrect. The suspected location of this dry well is more likely to be the location of the discolored soil and the associated wood, rags, and other debris, which was located further from the laboratory building in the excavated area southwest of Buildings 3242 and 3244, as shown on Figure 3. The former chemical laboratory building was reportedly demolished in the mid 1960s but the foundation is still present. Based on the reported types of debris excavated, it is suspected that the dry well was removed during the excavation of the red stained soil in 1986.

Approximately 16 deteriorating concrete foundations, located north of Buildings 3242 and 3244, were reportedly used as ammunition storage points (USATHAMA, 1979).

The SWMU area and its associated contaminant groundwater plume occupy approximately 2.2 acres and is flat, with an average elevation of 4360 ft above mean sea level (MSL). Because debris was excavated prior to Phase I field activities during the removal action, the exact size and location of the suspected disposal area is not known; however, as all of the visibly stained soil has been removed, the disposal area is believed to have been removed.

2.2 PAST OPERATIONS

Previous reports have categorized this site as a landfill; however, based on site history and review of existing reports, this site can be more accurately described as a disposal area. The potential that the observed discolored soil and miscellaneous debris (wood and rags) is associated with the location of the dry well is high.

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-061 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-061 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	DPG00007
Parsons, 2009. <i>Final Phase II RCRA Facility Investigation Report, SWMU-61 Addendum</i> . October.	10/09	

2.4 CLOSURE ACTIVITIES

Documentation in the approved RFI Report indicates that conditions at DPG-061 meet the closure performance standards under UAC R315-7-14 (by reference 40 CFR Part 265, Subpart G, §265.111). The soil qualifies for industrial closure. Risks and hazards associated with potential exposure to groundwater, while not qualifying for NFA, are less than industrial screening levels. Land use controls are required to prevent residential use of the site.

In meeting the above performance standards, the major closure activities completed at DPG-061 included:

- Removal of 700 yd³ of waste and impacted soil in the presumed source area for the groundwater plume;
- Collection of 803 confirmation samples and analyzing them for chemical warfare agents;
- Backfilling the excavation with clean fill;
- Paving the site to construct a parking lot;
- Conducting groundwater monitoring; and
- Demonstrating that further degradation of groundwater was unlikely based on the soil-to-groundwater screening analysis.

These measures indicate that no waste is present, thus preventing human contact with waste. These measures also indicate that protection of groundwater by monitoring using a regional approach will prevent further degradation. A general industrial use site inspection checklist designed to insure that these objectives are maintained is presented in Module VII, Form A.

2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

The results of the human health risk assessment performed per UAC R315-101 (DSHW, 2001) for DPG-061 indicate that: 1) adverse health effects to industrial workers associated with potential exposures to constituents of potential concern (COPCs) in the soil and indoor air at DPG-061 are not expected; and 2) adverse health effects to industrial workers associated with exposure to groundwater are not expected. Soil-to-groundwater analysis indicates future impacts to groundwater from COPCs in soil are a potential threat; however, future impacts to groundwater will be monitoring under a regional groundwater monitoring program. The results of the ecological risk assessment indicate that COPCs in soil are not expected to pose unacceptable hazards to small mammals and bird populations.

A Corrective Measures Study is not required for DPG-061. Contaminated groundwater will be managed under a regional groundwater management approach. Specifics of the monitoring are provided in the Carr Regional GMA Plan.

2.6 SURFACE WATER AND GROUNDWATER

The only surface water feature in the vicinity of DPG-061 is an ephemeral tributary of Government Creek located approximately 1,000 ft south of the site.

Groundwater data from the vicinity of DPG-061 indicate that the shallow non-potable water-bearing zone is present at approximately 30 ft bgs, with an average horizontal hydraulic gradient of 0.0004 feet per foot (ft/ft). This very flat hydraulic gradient at DPG-061 presents difficulty in correctly determining the direction of groundwater flow in the area. Multiple three-point calculations based on data yield results for groundwater flow directions that vary widely depending on the wells chosen for the calculation. Regionally in the Carr area, the direction of groundwater flow is generally toward the south-southwest. Monitoring well and temporary well sampling indicates that average shallow groundwater quality at DPG-061 is Class IV (saline) per UAC R317-6-3 (Division of Water Quality [DWQ], 2002), with total dissolved solids (TDS) values ranging from 1,260 milligrams per liter (mg/L) to 35,100 mg/L, with an average groundwater concentration of 11,000 mg/L. Groundwater in the shallow water-bearing zone is therefore highly saline and is not used for drinking water, irrigation, or other purposes.

Potable water in the vicinity of DPG-061 is obtained from WW5 located inside the Carr Facility approximately 500 ft south of DPG-061 (Figure 2). WW4, also present in the Carr Facility, has been abandoned. WW5 is screened in the deep aquifer under confined conditions at a depth of 325-355 ft bgs. There has been no contamination identified in groundwater sampled from WW5. The shallow water-bearing zone does not appear to be hydraulically connected to the underlying deeper potable aquifer at this site, as indicated by lithology (i.e., the clay confining layer) and water quality data (Parsons, 2005).

WW33 was installed in May 2003 west of the Carr Facility, and is located approximately 0.5 mile southwest of DPG-061. WW33 is also screened in the confined deep aquifer from 290 to 390 ft bgs. No contamination has been identified in groundwater sampled from WW33 (Kleinfelder, 2003).

DPG has developed a regional GMA Plan for the Carr Area to ensure continuity of monitoring requirements.

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

DPG-061 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-061 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 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.

4.2 ROUTINE SITE INSPECTIONS

During its Post-Closure period, general inspections of the former DPG-061 site shall be conducted annually by November 1st to ensure that the former 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 the site. A general site inspection checklist is included 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-061, 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-061 Post-Closure Inspection Schedule

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

4.3 INSPECTION FOLLOW-UP

Copies of completed site inspection checklists (Form A of Module VII) 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-061 (Parsons, 2009), post-closure inspection is required. Groundwater monitoring for DPG-061 will be managed on a regional basis as part of the Carr GMA.

5.1 NON-COMPLIANCE REPORTING

The conditions at DPG-061 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-061 shall be due no later than March 1, 2010. Specifically for DPG-061, 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-061 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.
<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>
<p><u>Non-Compliance Reporting</u></p> <p>Anticipated Non-Compliance</p> <p>24-hour Notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment.</p>	<p>30 days advance notice of any change which may result in noncompliance</p> <p>Orally within 24 hours of discovery</p>

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

Army Environmental Hygiene Association (AEHA), 1986. *Evaluation of Potential Health Hazards at Construction Sites, Carr Facility, Dugway Proving Ground, UT*. AMCS-S (40-5F) (HSHB-MO-O/29 Dec 86).

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*.

Environmental Science and Engineering (ESE), 1988. *Update of the Initial Installation Assessment of DPG*. Prepared for USATHAMA. Contact No. DAAA15-85-0017.

Kleinfelder, 2003. *Well Construction Report Well 33 Dugway Carr Facility*. Kleinfelder, Salt Lake City. July.

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United States Army Toxic and Hazardous Materials Agency (USATHAMA), 1979. *Installation Assessment of Dugway Proving Ground. Report No. 140*.