

**DUGWAY PERMIT**

**MODULE VII**

**ATTACHMENT 14**

**HWMU 43  
POST-CLOSURE PLAN**

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Appendix A	HWMU 43 Copy of Certification of Closure
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## LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

bgs	Below Ground Surface
CFR	Code of Federal Regulations
DPG	Dugway Proving Ground
DSHW	Division of Solid and Hazardous Waste
Dugway	Dugway Proving Ground
ft	Feet
FWEC	Foster Wheeler Environmental Corporation
GCL	Geosynthetic Clay Liner
GMA	Groundwater Management Area Plan
HWMU	Hazardous Waste Management Unit
LEL	Lower Explosive Limit
MCL	Maximum Contaminant Level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
msl	Mean Sea Level
PQL	Practical Quantitation Limit
RAP/RD	Remedial Action Plan/Remedial Design
RCRA	Resource Conservation and Recovery Act
Shaw	Shaw Environmental, Inc.
TDS	Total Dissolved Solids
TERC	Total Environmental Restoration Contract
TPHC	Total Petroleum Hydrocarbons
TOC	Total Organic Carbon
TOX	Total Organic Halides
UAC	Utah Administrative Code
µg/L	micrograms per liter
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
VOC	Volatile Organic Compound

**1.0 INTRODUCTION**

The objectives of this Post-Closure Plan are 1) ensure Dugway Proving Ground (Dugway or DPG) 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) prevent expose or contact with cover waste at this landfill site; and 3) monitor groundwater to detect releases from the waste or contaminated soil. To meet this objectives this Post-Closure Plan provides detailed information regarding the location, regulatory criteria, and post-closure inspections at Hazardous Waste Management Unit (HWMU) 43. Post-closure requirements will continue for a minimum of 30 years after closure of HWMU 43. The post-closure care period may be extended or shortened, as deemed necessary (40 CFR §265.117(a)(2)).

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 HWMU 43, 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 HWMU 43 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 7.0, Module VII Table VII-3, Module VII Form B
40 CFR §270.14(b)(6) UAC R315-3-2.5(b)(6)	Preparedness and Prevention	Section 4.0
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 5.0
40 CFR §§270.14(b)(11) (iii-v) UAC R315-3-2.5(b)(11) (iii-v)	Facility Location Information 100-year floodplain	Section 6.0

**Table 1: Summary of HWMU 43 Post-Closure Information Requirements Under 40 CFR §270.14, UAC R315-3-2.19, and UAC R315-3-2.5 (Continued)**

<b>Regulation Citation</b>	<b>Requirement Description</b>	<b>Location Requirement is Addressed</b>
40 CFR §270.14(b)(13) UAC R315-3-2.5(b)(13)	Copy of the Closure Plan	Closure Plan was open for public comment ending on September 17, 2004 with no comments received.
40 CFR §270.14(b)(14) UAC R315-3-2.5(b)(14)	Closure Certification and Notification	Section 8.0 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 3 (1 inch = 1000 feet).
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ii)	Topographic Map 100-year floodplain area	Section 5.0; HWMU 43 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 3.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (iv)	Topographic Map Surrounding land uses	HWMU 43 is within a military base. There are no nearby operations in the vicinity of HWMU 43.
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 HWMU 43. The closest residential area is English Village (approximately 1.5 miles away). A wind rose is not deemed necessary for HWMU 43.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (vi)	Topographic Map Orientation of Map, North Arrow	Figure 3.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (vii)	Topographic Map Legal boundaries of the hazardous waste management facility.	The fenced area is shown in Figures 4 and 5.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (viii)	Topographic Map Access control, fence, gates	The fenced area and access gates are shown in Figures 4 and 5.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ix)	Topographic Map Injection and withdrawal wells	Figures 3 and 4; Water Supply Wells 26, and 27 are located in the vicinity of HWMU 43 (Well 26 is approximately 0.75 mile downgradient from HWMU 43, Well 27 is approximately 0.5 mile downgradient from HWMU 43).

**Table 1: Summary of HWMU 43 Post-Closure Information Requirements Under 40 CFR §270.14, UAC R315-3-2.19, and UAC R315-3-2.5 (Continued)**

<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) (xi)	Topographic Map Barriers for drainage or flood control	Figures 4 and 5. HWMU 43 is graded to drain surface water away from the engineered covers. 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 HWMU 43 will be in compliance with the English Village Groundwater Management Plan.
40 CFR §270.14(c) UAC R315-3-2.5(c)(2)	Groundwater Monitoring Information Identification of uppermost aquifer	Post-closure groundwater monitoring at HWMU 43 will be in compliance with the English Village Groundwater Management Plan.
40 CFR §270.14(c) UAC R315-3-2.5(c)(3)	Groundwater Monitoring Information Delineation of the Waste Management Area	Figure 6; Post-closure groundwater monitoring at HWMU 43 will be in compliance with the English Village Groundwater Management Plan.
40 CFR §270.14(c) UAC R315-3-2.5(c)(4)	Groundwater Monitoring Information Extent of Plume	Post-closure groundwater monitoring at HWMU 43 will be in compliance with the English Village Groundwater Management Plan.
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 HWMU 43 will be in compliance with the English Village Groundwater Management Plan.
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 HWMU 43 will be in compliance with the English Village Groundwater Management Plan.
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 HWMU 43 will be in compliance with the English Village Groundwater Management Plan.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iii)	Groundwater Monitoring Information Background Values	Post-closure groundwater monitoring at HWMU 43 will be in compliance with the English Village Groundwater Management Plan.
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 HWMU 43 will be in compliance with the English Village Groundwater Management Plan.

## **2.0 FACILITY DESCRIPTION**

The following provides a general description of HWMU 43, also known as the Old English Village Landfill at DPG, as required by UAC R315-3-2.5(b)(1) (Figures 1 and 2).

### **2.1 HWMU 43 LOCATION AND HISTORY**

HWMU 43, also known as the former Old English Village Landfill, is located on Manookin Road, south of English Village, about 2,625 feet (ft) south of Stark Road (Figure 2). The elevation in the HWMU 43 area ranges from approximately 4,880 ft above mean sea level (msl) in the southwest and approximately 4860 ft msl in the northeast. Figure 3 presents a topographic map of HWMU43.

Originally, HWMU 43 consisted of a series of east-west trending trenches at the southern end of the unit that were filled with waste and then covered with native soil. Over the years, this unit was expanded to include an area of approximately 70 acres. Ultimately, a complete geophysical survey of the site was used to identify more than 43 trenches throughout HWMU 43 (Appendix C of HWMU 43 Remedial Action Plan/Remedial Design (RAP/RD) [Shaw, 2004]). The majority of these identified trenches were oriented in an east-west direction. Trench lengths varied from 400 to 2,000 ft in total length and were on average 30-35 ft wide. The located trenches were spaced anywhere from a few feet to several hundred feet apart.

### **2.2 PAST OPERATIONS**

HWMU 43 was in operation from the early 1950s to 1987. During its operation, HWMU 43 was used to manage miscellaneous refuse from all DPG areas and was the primary landfill for English Village. Other major waste generators included the Avery, Ditto, and Baker areas, with significant minor contributions from the Carr Facility and Michael Army Airfield (EBASCO, 1993). Major wastes included domestic trash from residents and various offices, service facility refuse (motor pool, pest control, paint shop, and supply); and the U.S. Army Health Clinic (El Dorado Engineering, Incorporated, 1986). Accurate records concerning the total volumes of waste disposed at the site and the sources and nature of these wastes are not available.

### **2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION**

The detailed results of previous material, soil, and groundwater sampling, and closure information including the risk assessment are available, for HWMU 43, in the Utah 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 HWMU 43 Investigations**

<b>Document Title</b>	<b>Received Date</b>	<b>DSHW Library No.</b>
Ebasco Services Incorporated, 1993. <i>Final Nature and Extent Investigation Plan No. 9 – SWMUs 20, 37, 39, 42, and 43.</i> April.	04/93	00044
Foster Wheeler Environmental Corporation (FWEC), 1995. <i>SWMU Closures at Dugway Proving Ground, Interim Report, Volume 4, Appendix F-Results of Data Validation.</i>	1995	00027
FWEC, 1998. <i>Dugway Proving Ground Closure Plan, Module 3, HWMU 43 Final.</i> May.	05/98	00029
Shaw Environmental, Inc., 2004. <i>Final Remedial Action Plan and Remedial Design, Dugway Proving, Dugway, Utah, Revision 0.</i> October.	10/04	00441
Shaw Environmental, Inc., 2005. <i>Final Closure Certification Report For HWMU 43 Old English Village Landfill.</i> September.	09/05	00486

## 2.4 CLOSURE ACTIVITIES

In compliance with UAC R315-7-21, closure at HWMU 43 has been completed with the construction of an engineered cover system consisting of a geomembrane-supported geosynthetic clay liner (GCL) placed over the identified waste trenches. Approval for the HWMU 43 Final Closure Certification Report (Shaw, 2005) was received in a letter dated October 3, 2005, from Mr. Dennis R. Downs, Utah Solid and Hazardous Waste Control Board. Appendix A includes a copy of the HWMU 43 Closure Certification signed and stamped by a Utah-licensed Professional Engineer.

The final cover system as designed and constructed satisfies the requirements of UAC R315-7-14 and R315-7-21 (by reference 40 CFR §265, Subpart N, 265.310) for the closure and post-closure of HWMU 43, 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 HWMU 43 included:

- Installation of the final engineered cover system;
- Installation of a chain-link security fence around the engineered cover system; and
- Final grading of the site, including hydroseeding and enhancement of drainage features, to help control erosion and minimize long-term maintenance requirements.

These measures will prevent human contact with the waste and provide protection of groundwater. A post-closure inspection checklist for landfill sites designed to insure that these objectives are maintained is presented in Module VII, Form B.

Figure 4 and 5 show the final site location with the completed perimeter security fence and all entrance gates.

The investigative and closure activities performed at HWMU 43 are described in detail in the Final Closure Certification Report (Shaw, 2005).

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

Human health and ecological risk assessments were conducted and indicated that the remaining residual contamination detected in soil (outside of the trenches) and in groundwater at HWMU 43 does not pose an unacceptable risk as defined in UAC R315-101. The risk screening was performed for areas outside the cap, but within the fenced area risk, screening did take into consideration airborne particulates. In addition, vegetative cover planted on the cap and other previously disturbed areas will minimize the generation of soil particulates. The industrial cancer risk is less than 1E-04 and the Hazard Index is less than one. Ecological risks are expected to be minimal. The human and ecological risk assessments are presented in the Final Closure Certification Report (Shaw, 2004).

## **2.6 SURFACE WATER AND GROUNDWATER**

No surface water features are evident in the area of HWMU 43. The general direction of surface drainage for the English Village Area is to the northeast, toward Skull Valley. The topography is relatively flat with an average 1.5-ft drop per 100 ft run. Surface drainage in the area immediately surrounding HWMU 43 is likely influenced by manmade features including roads and ditches (FWEC, 1995).

Based on the results of the previous eight years of groundwater sampling, there is no significant groundwater contamination in the vicinity of HWMU 43. However, due to the proximity of the site to the English Village water supply wells, post-closure groundwater monitoring will be conducted in accordance with the English Village Groundwater Management Area Plan (GMA).

## **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 July 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 HWMU 43:

1. HWMU 43 is located within a federal, military installation (DPG). As such, the installation is restricted for the common population.
2. In addition at HWMU 43, a fence is present around the Facility. Signs are present warning against unauthorized entry.

3. Verify that Security facilities are maintained and inspected throughout the post-closure care period. Dugway shall report to the Division of Solid and Hazardous Waste any decrease of Dugway's Base Security, which could affect the security conditions as applicable to HWMU 43.
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).

### **3.1 CONTINGENCY PLAN**

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 soil cover at HWMU 43. Module VII, Form B, provides a post-closure site inspection checklist for landfill sites.

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.

#### **3.1.1 Earthquakes**

Dugway Proving Ground is located in Seismic Zone 2 with a maximum acceleration of 0.2 gravity force (Shaw, 2004). 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. Settlement markers will be resurveyed to determine any horizontal or vertical movement of the cap.

#### **3.1.2 Floods or Major Storms**

In the event of a flood or major storm, Dugway will inspect the landfill cap to ensure its integrity within 72 business hours of the event. A post-closure inspection checklist for landfill sites (Form B) is included in Module VII. A major storm is defined in this plan as a storm with 1 inch of precipitation 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 cap.

#### **3.1.3 Fire**

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 post-closure checklist for landfill sites (Form B) included in Module VII, to ensure that the integrity of the soil cover has not been compromised and waste is not exposed. If there is fire damage, DPG will implement corrective actions to ensure that contaminants are contained and human health is protected.

#### **4.0 SEISMIC STANDARD**

HWMU 43 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 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 HWMU 43.

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.

#### **5.0 FLOODPLAIN STANDARD**

HWMU 43 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 from precipitation flows through drainage swales constructed or enhanced during the capping of HWMU 43. A culvert detail is shown in Figure 7. Most of the surface water evaporates rather than percolating 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.

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

##### **6.1 INTRODUCTION**

HWMU 43 has been closed under the interim status landfill closure requirements. 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.

##### **6.2 GROUNDWATER MONITORING**

Groundwater monitoring procedures will be in accordance with the English Village GMA.

##### **6.3 SITE INSPECTIONS**

General site inspections of the former HWMU 43 site shall be conducted annually by November 1<sup>st</sup> and within 72 business hours after major storm events to ensure that the integrity of the engineered caps is maintained and to verify the Dugway Dig Permit process as described in Module VII.I has been followed. A major storm is defined as one-inch or more of precipitation over a 24-hour period. 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 post-closure site inspection checklist

for landfill sites (Form B) is included in Module VII. Completed inspection forms shall be filed with the Dugway Environmental Office.

For most routine repairs, corrective action should be initiated as soon as possible after identifying the problem or a 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.

#### 6.4 SURVEY MONUMENT INSPECTIONS

During each visit, each of the ten survey monuments installed during remediation (Figures 3 and 4) will be inspected to determine if any damage has made its use questionable for survey. If missing or badly damaged, it will be replaced as soon as possible after discovery of the problem.

As part of the routine inspection, settlement marker (denoted as SM-1 through SM-10 in Table 5) locations and elevations should be surveyed at least once per year for the first two years after construction. Once a settlement of 0.1 foot or less has been measured for two consecutive years, surveys can be scaled back to once every five years. The baseline northings, eastings, and elevations of the settlement markers are summarized below.

**Table 5: HWMU 43 Survey Monument Coordinates**

Survey Monument	Northing (ft)	Easting (ft)	Elevation (ft)
SWMU-43	7242118.28	1294181.32	4884.96
SM-1	7243846.20	1296051.39	4847.37
SM-2	7243436.95	1295391.53	4857.08
SM-3	7243217.63	1294029.64	4867.66
SM-4	7242982.65	1294679.31	4861.87
SM-5	7242582.82	1294591.61	4867.67
SM-6	7242645.59	1295191.11	4864.74
SM-7	7242188.94	1294590.83	4873.54
SM-8	7242275.00	1295392.62	4864.95
SM-9	7241727.53	1294987.12	4878.66
SM-10	7241482.80	1295765.55	4875.16

All surveying will be completed under the direction of a State of Utah-certified land surveyor.

Table 6 summarizes the Post-Closure Inspection Schedule for HWMU 43, and lists the items to be inspected and potential problems. Inspection personnel shall note any problems found and shall inform appropriate Dugway representatives.

**Table 6: HWMU 43 Post-Closure Inspection Schedule**

<b>Inspection/Monitoring Item</b>	<b>Method of Documentation</b>	<b>Frequency of Inspection</b>
Landfill Caps	General Post-Closure Site Inspection Checklist for Landfill Sites(Form B, Module VII)	Annual
Settlement Markers	General Post-Closure Site Inspection Checklist for Landfill Sites(Form B, Module VII)	Annual
Protective vegetation	General Post-Closure Site Inspection Checklist for Landfill Sites(Form B, Module VII)	Annual
Signs and fence	General Post-Closure Site Inspection Checklist for Landfill Sites (Form B, Module VII)	Annual
Drainage Swales	General Post-Closure Site Inspection Checklist for Landfill Sites (Form B, Module VII)	Annual
Monitoring Wells	General Post-Closure Site Inspection Checklist for Landfill Sites (Form B, Module VII)	Annual

**6.5 INSPECTION FOLLOW-UP**

Copies of completed site inspection checklists (Form B, 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 shall be implemented as required under this Permit. This plan shall be approved by the Executive Secretary and shall be submitted within 30 days of Dugway’s decision to implement corrective action.

**7.0 SUBMITTALS/REPORTING**

Based on the evaluation presented in the Final Closure Certification Report for HWMU 43, post-closure inspection is required for HWMU 43. Groundwater monitoring is required. Groundwater elevation measurements and sample results will be provided in Excel spreadsheet format as required in Conditions VII.P.2 and VII.Q.2. A map showing well locations should be provided with the Excel file(s).

Groundwater data will be provided in the Biennial Post-Closure Report. In addition, groundwater data will be provided within 5 days of validation if contamination is detected, significant data quality issues occur, or reduced sample frequency is proposed.

### **7.1 NON-COMPLIANCE REPORTING**

The conditions at HWMU 43 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.

### **7.2 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 HWMU 43 shall be due by March 2007. After this initial period, reporting years shall change to odd numbered years, with subsequent biennial reports due by March 1<sup>st</sup> of even numbered years, beginning in 2008. Specifically for HWMU 43, the Biennial Post-Closure Report shall include, at a minimum, the following:

- General site description and conditions;
- Areas of cap repair or revegetation;
- Inspection records; and
- Groundwater monitoring results.

### **7.3 REQUIRED SUBMITTALS**

Table 7 summarizes the requirements for the Biennial Post-Closure Report for HWMU 43 and reporting for any non-compliance issues.

**Table 7: 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 DSHW no later than March, of the year the report is due. Reporting years are even numbered years beginning with 2006 and odd numbered years beginning 2007 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.

**8.0 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.

**9.0 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.

Ebasco Services Incorporated (Ebasco), 1993. *Final Nature and Extent Investigation Plan No. 9 – SWMUs 20, 37, 39, 42, and 43*. April.

El Dorado Engineering, Incorporated, 1986. *Hazardous Waste Study for Dugway Proving Ground, Volumes I, II, and III*.

Foster Wheeler Environmental Corporation (FWEC), 1995. *SWMU Closures at Dugway Proving Ground, Interim Report, Volume 4, Appendix F-Results of Data Validation.*

FWEC, 1998. *Dugway Proving Ground Closure Plan, Module 3, HWMU 43 Final.* May.

IT Corporation, 2003. *Final Groundwater Monitoring Work Plan & Sampling and Analysis Plan for the Detection and Assessment Monitoring Program, Dugway Proving Ground, Dugway, Utah, Revision 3,* October.

Shaw Environmental, Inc. (Shaw), 2004. *Final Remedial Action Plan and Remedial Design, Dugway Proving Ground, Dugway, Utah, Rev. 0.* October.

Shaw, 2005. *Final Closure Certification Report, for HWMU 43 Old English Village Landfill, Dugway Proving Ground, Utah.* September.

**APPENDIX A**

**COPY OF**

**CERTIFICATION OF CLOSURE**

**Table 4: Aqueous Target Analytes, Practical Quantitation Limits, and  
Regulatory Levels  
HWMU 043; Dugway Proving Ground, Dugway, Utah**

<i>Parameter</i>	<i>Control Analyte</i>	<i>PQL (µg/L)</i>	<i>Utah MCL (µg/L)</i>	<i>RCRA Limits (µg/L)</i>
<b><i>Colorimetric and Potentiometric Procedures by EPA Method 353.2</i></b>				
Nitrate-Nitrite	X	0.5	---	---
<b><i>Colorimetric and Potentiometric Procedures by EPA Method 354.1</i></b>				
Nitrite-N	X	20	1000	---
<b><i>Metals by ICP by EPA Method 6010B/6020</i></b>				
Aluminum		200	---	---
Antimony	X	6	6	---
Arsenic	X	2	10	5000
Barium	X	5	2000	100000
Beryllium		4	4	---
Cadmium		5	5	1000
Calcium		200	---	---
Chromium		10	100	5000
Cobalt		4	---	---
Copper		10	1300	---
Iron		100	---	---
Lead	X	10	15	5000
Magnesium		200	---	---
Manganese		5	---	---
Molybdenum		10	---	---
Nickel	X	20	---	---
Potassium		2000	---	---
Selenium	X	10	50	1000
Silver	X	5	---	5000
Sodium		2000	---	---
Thallium	X	5	2	---
Vanadium	X	5	---	---
Zinc	X	10	---	---
<b><i>Miscellaneous Inorganic Analyses by EPA Method 9060</i></b>				
Total Organic Carbon	X	1000	---	---
<b><i>Speciation by EPA Method 7063M</i></b>				
Arsenic III		2	---	---
Arsenic V		2	---	---
<b><i>Total Organic Halides by EPA Method 9020B</i></b>				
Total Organic Halides	X	50	---	---
<b><i>Volatile Organic Compounds by EPA Method 8260B</i></b>				
1,1,1,2-Tetrachloroethane		1	---	---
1,1,1-Trichloroethane		0.5	200	---
1,1,2,2-Tetrachloroethane		0.5	---	---
1,1,2-Trichloro-1,2,2-trifluoroethane		1	---	---
1,1,2-Trichloroethane		0.5	5	---
1,1-Dichloroethane		0.5	---	---
1,1-Dichloroethene	X	0.5	7	700

**Table 4: Aqueous Target Analytes, Practical Quantitation Limits, and  
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<i>Parameter</i>	<i>Control Analyte</i>	<i>PQL (µg/L)</i>	<i>Utah MCL (µg/L)</i>	<i>RCRA Limits (µg/L)</i>
<b><i>Volatile Organic Compounds by EPA Method 8260B</i></b>				
1,1-Dichloropropene		1	---	---
1,2,3-Trichlorobenzene		1	---	---
1,2,3-Trichloropropane		1	---	---
1,2,4-Trichlorobenzene		1	70	---
1,2,4-Trimethylbenzene		1	---	---
1,2-Dibromo-3-chloropropane		1	0.2	---
1,2-Dibromoethane		1	0.05	---
1,2-Dichlorobenzene		1	600	---
1,2-Dichloroethane		0.5	5	500
1,2-Dichloropropane		0.5	5	---
1,3,5-Trimethylbenzene		1	---	---
1,3-Dichlorobenzene		1	---	---
1,3-Dichloropropane		1	---	---
1,4-Dichlorobenzene	X	1	75	7500
2,2-Dichloropropane		1	---	---
2-Butanone		20	---	200000
2-Chloroethyl vinyl ether		20	---	---
2-Chlorotoluene		1	---	---
2-Hexanone		5	---	---
4-Chlorotoluene		1	---	---
4-Methyl-2-pentanone		20	---	---
Acetone		10	---	---
Benzene	X	0.5	5	500
Bromobenzene		1	---	---
Bromochloromethane		1	---	---
Bromodichloromethane		0.5	100	---
Bromoform		0.5	100	---
Bromomethane		0.5	---	---
Carbon disulfide		1	---	---
Carbon tetrachloride		0.5	5	500
Chlorobenzene	X	0.5	100	100000
Chloroethane		0.5	---	---
Chloroform	X	0.5	100	6000
Chloromethane		1	---	---
cis-1,2-Dichloroethene		0.5	70	---
cis-1,3-Dichloropropene		0.5	---	---
Dibromochloromethane		0.5	100	---
Dibromomethane		1	---	---
Dichlorodifluoromethane		1	---	---
Ethylbenzene		0.5	700	---
Hexachlorobutadiene		1	---	500
Isopropylbenzene		1	---	---

**Table 4: Aqueous Target Analytes, Practical Quantitation Limits, and  
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<i>Parameter</i>	<i>Control Analyte</i>	<i>PQL (µg/L)</i>	<i>Utah MCL (µg/L)</i>	<i>RCRA Limits (µg/L)</i>
<b><i>Volatile Organic Compounds by EPA Method 8260B</i></b>				
m,p-Xylene		0.5	10000	---
Methyl tert-butyl ether		1	---	---
Methylene chloride		5	5	---
n-Butylbenzene		1	---	---
n-Propylbenzene		1	---	---
o-Xylene		0.5	10000	---
p-Isopropyltoluene		1	---	---
sec-Butylbenzene		1	---	---
Styrene		0.5	100	---
tert-Butylbenzene		1	---	---
Tetrachloroethene		1	5	700
Toluene	X	0.5	1000	---
trans-1,2-Dichloroethene		0.5	100	---
trans-1,3-Dichloropropene		0.5	---	---
Trichloroethene	X	0.5	5	500
Trichlorofluoromethane (Freon 11)		1	---	---
Vinyl acetate		5	---	---
Vinyl chloride		0.5	2	200

Circled PQLs are greater than the Utah MCL.

--- = not available  
PQL = Practical Quantitation Limit  
µg/L = micrograms per Liter