

DUGWAY PERMIT

MODULE VII

ATTACHMENT 9

HAZARDOUS WASTE MANAGEMENT UNIT

HWMU 47

POST-CLOSURE PLAN

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1.0 INTRODUCTION

There are three objectives of this post closure plan; 1) Ensure Dugway Proving Ground (Dugway or DPG) complies with the post closure permit issued by the State of Utah in accordance with Utah Administrative Code (Utah Admin. Code) R315-265 - Title 40 Code of Federal Regulations (CFR) §264.117 incorporated by reference, with respect to post closure requirements; 2) protection of potable groundwater in the confined aquifer by monitoring horizontal and vertical migration of contamination of groundwater; and 3) inspection and tracking and inspections to ensure industrial site use.

In accordance with Title 40 Code of Federal Regulations (CFR) §270.28 and Utah Admin. Code R315-270-28, the post-closure plan is required to include specific information for a closed facility. As applicable to Hazardous Waste Management Unit (HWMU) 47, the information requirements include:

- General description of the facility;
- Description of security procedures;
- Copy of 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 the Post-Closure Plan where the specific information is presented.

Table 1: Summary of HWMU 47 Post-Closure Information Requirements Under 40 CFR §270.1414 and Utah Admin. Code R315-270-28 and R315-270-14.

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR §270.14(b)(1) Utah Admin. Code R315-270-14(b)(1)	General Description of the Facility	Section 2.0
40 CFR §270.14(b)(4) Utah Admin. Code R315-270-14(b)(4)	Description of Security Procedures	Section 3.0
40 CFR §270.14(b)(5) Utah Admin, Code R315-270-14(b)(5)	General Inspection Schedule	Section 7.2, Module VII Table VII-3, and Module VII Form A
40 CFR §270.14(b)(6) Utah Admin. Code R315-270-14(b)(6)	Preparedness and Prevention	Section 4.0
40 CFR §§270.14(b)(11)(i-ii, v) Utah Admin. Code R315-270-14(b)(11) (i-ii, v)	Facility Location Information Applicable seismic standard	Section 5.0

Table 1: Summary of HWMU 47 Post-Closure Information Requirements Under 40 CFR §270.1414 and Utah Admin. Code R315-270-28 and R315-270-14.

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR §§270.14(b)(11) (iii-v) Utah Admin. Code R315-270-14(b)(11) (iii-v)	Facility Location Information 100-year floodplain	Section 6.0
40 CFR §270.14(b)(13) Utah Admin. Code R315-270-14(b)(13)	Copy of the Closure Plan	Final Closure Certification Report, submitted July 2004 for public comment.
40 CFR §270.14(b)(14) Utah Admin. Code R315-270-14(b)(14)	Closure Certification and Notification	Section 9.0 and Appendix A
40 CFR §270.14(b)(16) Utah Admin. Code R315-270-14(b)(16)	Post-Closure Cost Estimate	Federal Facilities are exempt from this requirement.
40 CFR §270.14(b)(18) Utah Admin. Code R315-270-14(b)(18)	Proof of Financial Coverage	Federal Facilities are exempt from this requirement.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (i)	Topographic Map Map Scale and Date	Figure 2 (1 inch = 1,000 feet).
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (ii)	Topographic Map 100-year floodplain area	Section 6.0; HWMU 47 is not located within a verified 100-year floodplain area; Figure 2.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (iii)	Topographic Map Surface waters including intermittent streams	There are no natural surface waters in the vicinity of HWMU 47.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (iv)	Topographic Map Surrounding land uses	HWMU 47 is within a military base; Figure 2.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (v)	Topographic Map A wind rose (i.e., prevailing windspeed and direction)	There are no residential populations in close vicinity of HWMU 47. The closest residential area is English Village (approximately 2 miles away). A wind rose is not deemed necessary for HWMU 47.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (vi)	Topographic Map Orientation of Map, North Arrow	Figure 2.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (vii)	Topographic Map Legal boundaries of the hazardous waste management facility	Legal boundaries have not been established at DPG for former HWMUs.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (viii)	Topographic Map Access control, fence, gates	Access control for the site was not deemed necessary due to remedial actions undertaken and due to the remote location of HWMU 47; Figure 2.

Table 1: Summary of HWMU 47 Post-Closure Information Requirements Under 40 CFR §270.1414 and Utah Admin. Code R315-270-28 and R315-270-14.

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (ix)	Topographic Map Injection and withdrawal wells	There are no injection or withdrawal wells in the vicinity of HWMU 47.
40 CFR §270.14(b)(19) Utah Admin. Code R315-270-14(b)(19) (xi)	Topographic Map Barriers for drainage or flood control	Drainage barriers present in the vicinity of HWMU 47 are for the control of treated sewage effluent. There are no flood control structures on or in the vicinity of HWMU 47; Figure 2.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(1)	Groundwater Monitoring Information Summary of Groundwater Data	Not applicable. No post-closure groundwater monitoring is required at HWMU 47.
40 CFR §270.14(c) Utah Admin Code R315-270-14(c)(2)	Groundwater Monitoring Information Identification of uppermost aquifer	Not applicable. No post-closure groundwater monitoring is required at HWMU 47.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(3)	Groundwater Monitoring Information Delineation of the Waste Management Area	Not applicable. No post-closure groundwater monitoring is required at HWMU 47.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(4)	Groundwater Monitoring Information Extent of Plume	Not applicable. No post-closure groundwater monitoring is required at HWMU 47.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(5)	Groundwater Monitoring Information Detailed Plans/Engineering Report for Proposed Groundwater Program	Not applicable. No post-closure groundwater monitoring is required at HWMU 47.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(6)(i)	Groundwater Monitoring Information Proposed List of Parameters	Not applicable. No post-closure groundwater monitoring is required at HWMU 47.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(6)(ii)	Groundwater Monitoring Information Proposed Groundwater Monitoring System	Not applicable. No post-closure groundwater monitoring is required at HWMU 47.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(6)(iii)	Groundwater Monitoring Information Background Values	Not applicable. No post-closure groundwater monitoring is required at HWMU 47.
40 CFR §270.14(c) Utah Admin. Code R315-270-14(c)(6)(iv)	Groundwater Monitoring Information A description of the Proposed Sampling	Not applicable. No post-closure groundwater monitoring is required at HWMU 47.

2.0 FACILITY DESCRIPTION

The following provides a general description of Dugway Proving Ground (DPG) and former HWMU 47, also known as the Former English Village Sewage Lagoons at Dugway Proving Ground (Dugway), as required by Utah Admin. Code R315-270-14(b)(1).

2.1 HWMU 47 LOCATION AND HISTORY

The HWMU 47 site is located approximately two miles southwest of English Village, on the eastern side of DPG (Figure 1). HWMU 47 encompassed the former sewage treatment system for English Village and Fries Park. It also included the abandoned portion of the sewage collection piping system commencing at Manhole-EF13 located just opposite Stark Road from Fries Park and proceeding to the two former sewage lagoons (Figure 2). Also included in HWMU 47 were process and flow control equipment such as the flow control boxes, effluent and transfer piping, electrical equipment, enclosures, vaults, a gauging station located south of the lagoons, appurtenances and environmental media associated with the former discharge ditch which runs westward from near the northwest corner of the west lagoon, and the current discharge area which runs westward from the southern end of the lagoons.

2.2 PAST OPERATIONS

The sewage lagoons at the site were in operation from 1963 to 1994. The lagoons received sanitary wastewater from the English Village and Fries Park sanitary sewer systems, where some industrial wastes were reportedly disposed (Ebasco, 1994). The two former lagoons are lined with native clay of varying thickness. The lagoon system discharged during winter and spring to the former discharge area, which consisted of a drainage ditch that flowed to a small pond area.

In 1989 a system upgrade was started but not completed. The western lagoon and the discharge area were closed. The current discharge area began receiving effluent from flow control structures located near the south side of the eastern lagoon. Work proceeded to retrofit the former sewage system with a chlorine contact chamber and additional electrical equipment. However, this work was abandoned prior to placing these structures into service, when the decision was made to construct an entirely new sewage treatment system immediately east of the two former lagoons.

In 1994, the new sewage lagoons were completed, and the eastern lagoon was closed. In 1995, the new lagoons commenced sewage treatment and discharge of treated effluent to the current discharge area.

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 47, in the Utah Division of Waste Management and Radiation Control (UDWMRC), formerly the Division of Solid and Hazardous Waste (DSHW), public documents listed below in Table 2 (Utah Admin. Code R315-270-14(b)(13)).

Table 2: UDWMRC Library Documents Detailing HWMU 47 Investigations and Remediation

Document Title	Received Date	UDWMRC Library No.
Harry Keith and Sons, Inc., 1990. <i>Dugway Proving Ground, Baker/English Village Wastewater Lagoons Sludge Sampling and Analysis Report</i> . June.	6/27/1990	DPG 00036
IT, 2002a. <i>Final Supplemental Field Investigation Report (SFIR) for HWMU 47 Nature and Extent Soil Investigation</i> , Dugway Proving Ground. November.	12/04/2002	DSHW-2002-006567
Shaw Environmental, Inc., 2003. <i>Remedial Action Plan Hazardous Waste Management Unit 47 Former English Village Sewage Lagoons</i> , Dugway Proving Ground, Dugway, Utah. June.	7/25/2003	DSHW-2003-009692
Shaw Environmental, Inc., 2004. <i>Closure Certification Report for HWMU 47 Former English Village Sewage Lagoons</i> , Dugway Proving Ground, Dugway, Utah. July.	8/25/2004	DSHW-2004-001036

2.4 CLOSURE ACTIVITIES

Dugway has completed closure actions for HWMU 47, and the site meets the risk-based closure criteria for future commercial/industrial site use, as specified in Utah Admin. Code R315-101. The remedial activities performed at HWMU 47 are described in detail in the Final Closure Certification Report, Hazardous Waste Management Unit 47, Former English Village Sewage Lagoons, Dugway Proving Ground, Shaw Environmental Inc., July 2004.

The remediation activities completed at HWMU 47 included the removal and disposal of all wastes and the removal of the facilities associated with the former operation of the lagoons. The following wastes were removed and disposed in accordance with the state and federal regulations: (1) 751.5 tons of lagoon sludge disposed as hazardous wastes and (2) 15.5 tons of transite piping. The following lagoon structures and appurtenances were demolished and removed: chlorine contact basin, chlorine contact chamber, aeration equipment and associated electrical controls, flow control structures, electrical vaults, sewer manholes, and influent pipeline system. Demolition of these structures resulted in the generation of nonhazardous wastes, including approximately (1) 1,881 gallons of liquids; (2) 554 tons of concrete debris; and (3) 17.3 tons of miscellaneous construction debris (wood, rebar). These wastes were disposed at DPG Landfill, along with approximately 1.6 tons of metal material that was recycled through the landfill. In addition, 7,326 cubic yards of biosolids certified as non-hazardous by the State of Utah were removed from the HWMU 47 lagoons. The biosolids have been transported to HWMU 43 for use in augmenting the vegetative landfill cover.

2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Human health and ecological risk assessments were conducted and indicated that the remaining residual arsenic contamination in the soil does not pose an unacceptable risk to industrial users as defined in R315-101. The cancer risk is less than 1E-04 and the Hazard Index is less than one. Since the waste has been removed, there is not any potential for escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, surface waters, or to the atmosphere. The residual contamination in the soil is not considered a source of groundwater contamination..

The human and ecological risk assessments are presented in the Final Closure Certification Report for Hazardous Waste Management Unit 47, Dugway Proving Ground, Dugway, Utah (Shaw Environmental, Inc., July 2004).

2.6 SURFACE WATER AND GROUNDWATER

There are no natural surface water bodies in the area of HWMU 47. The active sewer lagoon treatment system located to the east of HWMU 47 currently discharges its treated effluent to an approximately 1,600 foot long unlined ditch that is located south of HWMU 47 (Figure 2). The discharge ditch leads into a discharge pond and wetland area located approximately 1,200 feet (ft) west of HWMU 47.

A groundwater well system meeting the requirements of R315-7-13 was established at HWMU 47 prior to closure. The wells were sampled for a variety of chemicals several times over about a ten (10) year period. The sample and water elevation data are presented in the reports referenced in Section 2.3 above. Based on evaluation of these data, the approved closure report concluded the lagoon did not release contamination to groundwater and, therefore, post closure groundwater monitoring is not required.

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 November 5, 2004.

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

3.0 SECURITY REQUIREMENTS

HWMU 47 is located within a federal, military installation (Dugway Proving Ground). As such, access to the installation is restricted for the common population. Dugway's Base Security (Range Control) shall monitor access to HWMU 47.

4.0 PREPAREDNESS AND PREVENTION MEASURES

All wastes have been removed from HWMU 47. 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.

5.0 SEISMIC STANDARD

HWMU 47 is not located within 200 feet 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 study (1988) by the United States Geological Survey (USGS), Map of Fault Scarps Formed on Unconsolidated Sediments, Tooele 1°x2° Quadrangle, Northwestern Utah. (Compiled by T.P. Barnhard and R.L. Dodge), was used to determine the distribution, relative age, and amount and extent of surface rupture on Quaternary fault scarps, in the area of HWMU 47.

The USGS study (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 Dugway; however, there is no evidence of displacement during Holocene time.

6.0 FLOODPLAIN STANDARD

HWMU 47 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 Dugway. There are no permanent streams or other surface water bodies on Dugway.

Surface water from precipitation flows through well-established drainage channels into the flat plain and evaporates. Like other arid regions, Dugway 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.

7.0 POST-CLOSURE INSPECTIONS

7.1 INTRODUCTION

HWMU 47 has been closed under a continued industrial use scenario, which prohibits residential use in the areas formerly occupied by the site. To ensure that the area is not reused or developed for residential purposes, annual site inspections and a biennial report shall be required.

7.2 ANNUAL INSPECTIONS

General site inspections of the former HWMU 47 site shall be conducted annually before November 1st, to ensure that the former site remains under industrial use and to verify the Dugway Dig Permit process as described in Module VII.I has been followed. The general post-closure site inspection checklist for industrial use sites should be used. This is included as Form A in Module VII. Completed inspection forms shall be filed with the Dugway Environmental Office. 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. Inspect for evidence of soil disturbance.

Table 3 summarizes the Post-Closure Inspection Schedule for HWMU 47, and lists the items to be inspected. Inspection personnel shall note any problems found and shall inform appropriate Dugway representatives.

Table 3: HWMU 47 Post-Closure Inspection and Monitoring Schedule

Inspection/Monitoring Item	Method of Documentation	Frequency of Inspection
Land Use	General Post-Closure Site Inspection Checklist (Module VII Form A)	Annual Inspection conducted before November 1 st .

7.3 INSPECTION FOLLOW-UP

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

Environmental Programs Compliance Representative
Dugway Proving Ground Environmental Program Office
Attn: STEDP-DEP, Bldg. 5330
Dugway, UT 84022
Telephone: (435) 831-3560

The Dugway Environmental Office shall notify the appropriate personnel to implement corrective action as needed.

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

8.0 SUBMITTALS/REPORTING

Based on the evaluation presented in Final Closure Certification Report for HWMU 47, no post closure monitoring, including groundwater monitoring, is required for HWMU 47.

8.1 NON-COMPLIANCE REPORTING

The conditions at HWMU 47 are such that the impact to human health and the environment is very unlikely. All wastes and associated structures have been removed from the site. Hazardous wastes are no longer managed or maintained 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.

8.2 BIENNIAL POST-CLOSURE REPORT

In accordance with Utah Admin. Code R315-270-30(1)(9), a Biennial Post-Closure Report shall be prepared for all closed HWMUs and SWMUs undergoing post-closure care. Post Closure Reports shall be submitted to UDWMRC no later than March 1st, of the following year that the report is due. The first Post-Closure reporting year is 2007 for HWMU 47. The report shall be submitted no later than March 1st of 2008. Specifically for HWMU 47, the Biennial Post-Closure Report shall include, at a minimum, the following:

- General site description and conditions; and
- Inspection records.

8.3 REQUIRED SUBMITTALS

Table 4 summarizes the requirements for the Biennial Post-Closure Report for HWMU 47 and reporting for any non-compliance.

Table 4: Summary Table of Required Submittals

Required Submittals	Frequency and Submittal Date
<p style="text-align: center;"><u>Biennial Post-Closure Report</u></p> <p><u>Non-Compliance Reporting</u></p> <ol style="list-style-type: none"> 1. Anticipated Non-Compliance (VII.C.5) 2. 24-hour Notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment (VII.C.5) 3. Five-day written notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment. The Director may waive the 5-day notice, in favor of a 15-day notice (VII.C.5) 4. Written notification for information concerning the non-compliance, which does not endanger human health or the environment (VII.C.5). 	<p>Post Closure Reports shall be submitted to the Division of Solid and Hazardous Waste no later than March 1st, of the following year that the report is due. Reporting years are odd numbered years beginning with March 1, 2007, for the duration of the Post-Closure Monitoring Period.</p> <ol style="list-style-type: none"> 1. 30 days advance notice of any change which may result in non-compliance. 2. Orally within 24 hours of discovery 3. Within 5 days of discovery 4. Submitted with the Biennial Post Closure Report

9.0 POST-CLOSURE CERTIFICATION

No later than 60 days after post-closure activities are completed and approved by the Director, Dugway 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.

10.0 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, 1994. *Solid Waste Management Unit (SWMU) Closures at Dugway Proving Ground, Interim Report, Preliminary Draft, Volume 2, Appendices*. November.
- Harry Keith and Sons, Inc., 1990. *Dugway Proving Ground, Baker/English Village Wastewater Lagoons Sludge Sampling and Analysis Report*. June.
- IT Corporation (IT), 2002a. *Final Supplemental Field Investigation Report for HWMU 47 Nature and Extent Soil Investigation, Dugway Proving Ground*. November.
- James M. Montgomery Consulting Engineers (JMM, 1990). *Supplemental Sludge Sampling Report, English Village and Baker Lagoons, Dugway Proving Ground, Utah, Contract Number DACA05-89-C-0016*. February.
- Shannon and Wilson, Inc., 1992. *Environmental Study English Village Lagoon, Dugway Proving Ground, Utah*. November.
- Shaw Environmental, Inc. (Shaw), 2003. *Remedial Action Plan Hazardous Waste Management Unit 47 Former English Village Sewage Lagoons, Dugway Proving Ground, Dugway, Utah*. June.
- Shaw, 2004. *Final Closure Certification Report, for HWMU 47, former English Village Sewage Lagoons, Dugway Proving Ground, Utah*. July.

APPENDIX A

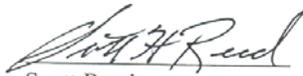
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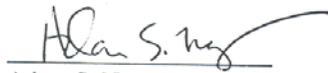
The Closure Certification Report for Hazardous Waste Management Unit (HWMU) 47 at Dugway Proving Ground, Utah has been prepared by Shaw Environmental in accordance with the closure requirements specified under the Utah Administrative Code (UAC) 315-7-14 and 40 Code of Federal Regulations 265, Subparts G and K for closure of HWMU 47. The requirements of UAC 315-101 form the basis for the risk-based criteria in the closure of HWMU 47.

In accordance with 40 CFR 265.115, the signature and seal certify that a licensed professional has reviewed the Closure Report in accordance with the above referenced regulatory requirements.

Respectfully submitted,



Scott Reed
Directorate of Environmental Programs
Dugway Proving Ground



Adam S. Ng, Ph.D., P.E.
Shaw Environmental, Inc.
Utah Registered Civil Engineer No. 4858945-2202

