

Tooele Army Depot-South Area

Attachment 5 Closure Plan

TEAD-S Closure Plan

- 1.0 Closure Plan Summary and Closure Performance Standard [Utah Admin. Code R315-3-2.5(b)(13), Utah Admin. Code R315-8-7]**
- 1.1 The Tooele Army Depot-South Area (TEAD-S of Facility) stored chemical munitions for U.S. Department of Defense (DOD) agencies and is managed by the Joint Munitions Command (JMC) of the U.S. Army. Hazardous wastes generated through normal operations are stored in the Facility's permitted hazardous waste management units (HWMUs). HWMUs include:
- 1.1.1 Igloos once storing recovered chemical warfare material;
 - 1.1.2 Igloos which store other hazardous waste;
 - 1.1.3 Open Burning/Open Detonation (OB/OD) Conex storing waste propellants and explosives.
- 1.2 A full description of the operational hazardous waste management activities associated with these units is provided in Attachment 12 (Container Management).
- 1.3 Upon completion of operational hazardous waste management activities, the Facility's hazardous waste management units shall be closed in accordance with the requirements of Utah Admin. Code Rule R315-8-7, and in accordance with this closure plan.
- 1.4 Facility HWMUs shall be closed to meet the residential or industrial land use requirements of Utah Admin. Code R315-101. The present inventory of wastes at the Facility shall be sent to a permitted, offsite treatment, storage, and disposal facility (TSDF).
- 1.5 HWMUs managing waste in containers at the Facility, including permitted igloos and the OB/OD Conex, shall be closed in accordance with the requirements of Utah Admin. Code R315-8-9.9 and other conditions described in this attachment.
- 1.6 Closure of the permitted igloos (excluding the OB/OD Conex) to the residential use standards of Utah Admin. Code R315-101 and shall be accomplished in accordance with the following general steps:
- 1). Where required, interior air shall be verified < 1 vapor screening level (VSL) concentration prior to start of closure procedures.
 - 2). All remaining hazardous wastes shall be removed and disposed of.
 - 3). Any residual loose material and debris shall be removed from the structure's floor and characterized.
 - 4). The floors shall be decontaminated using a high-pressure, hot-water/decon solution mixture. Spent cleaning solutions generated will be containerized and screened for chemical agent and pH in accordance Attachment 1(Waste Analysis Plan).
 - 5). Final unventilated air-monitoring inside each structure shall be used to verify agent vapor concentration of less than 1.0 general population level (GPL) for three (3) consecutive (NRT) monitoring cycles.

6). Directed (judgmental) sampling of potentially contaminated soils located underneath storage unit floors shall be conducted in accordance with the Closure Sampling and Analysis Plan(s) that will be submitted at the time of closure.

7). If contamination is detected in soil samples above screening levels listed in Table 5-1, a site-specific risk assessment may be conducted, or the igloo may be remediated under Corrective Action as a HWMU, or monitored under a post-closure permit.

Steps 6 and 7 will only be required for igloos and/or storage units in which there were recorded liquid agent or hazardous waste spill(s) which contacted the floor or in units which have an incomplete record of historical agent or hazardous waste exposure.

The closure approach and procedures specific to the OB/OD conex are outlined in Section 4 of this closure plan.

- 1.7 Monitoring and analytical results shall be evaluated to determine if they meet the closure performance standards presented in Table 5-1, which are protective of human health and the environment. Closure shall follow risk-based closure standards and Table 5-1 presents both residential and industrial levels. The performance standard values presented for chemical agents and EA-2192 are health-based screening levels developed by the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) that follow EPA Region IX risk assessment method, and referred to as the health-based environmental screening levels (HBESLs).

The EPA Regional Screening Levels (RSLs) for risk-based closure are proposed for all other chemicals of potential concern (COPCs). The RSL risk method is a multi-pathway risk-based assessment that considers soil ingestion, inhalation of volatiles released from soil, dermal absorption from soil, and inhalation of airborne particulates.

Analytical results for metals may alternatively be evaluated against measured background levels to meet the performance standard for metals.

- 1.8 A site-specific risk assessment may be conducted to demonstrate closure, as necessary.

Table 5-1: Closure Performance Standards					
COPC^a	Air Monitoring	CHPPM HBESLs^c Industrial (mg/kg)	CHPPM HBESLs^d Residential (mg/kg)	USEPA RSLs^e	
				Residential (mg/kg)	Industrial (mg/kg)
CHEMICAL AGENTS					
HD	< GPL ^b	0.3	0.019	NA	NA
VX	< GPL ^b	1.1	0.0043	NA	NA
GB	< GPL ^b	32	0.14	NA	NA
GA	< GPL ^b	68	0.29	NA	NA
L	< GPL ^b	3.7	0.045	NA	NA
AGENT DEGRADATION PRODUCTS					
EA2192	NA	1.1	0.0047	NA	NA
IMPA	NA	NA	NA	6,100	62,000
EMPA	NA	NA	NA	3,700	37,000
DIMP	NA	NA	NA	6,300	82,000
MPA	NA	NA	NA	3,700	37,000
Thiodiglycol	NA	NA	NA	5,400	68,000
EXPLOSIVES					
2,4,6-Trinitrotoluene	NA	NA	NA	19	79
HMX	NA	NA	NA	3,800	49,000
RDX	NA	NA	NA	5.6	24
Tetryl	NA	NA	NA	240	2500
METALS^g					
Arsenic	NA	NA	NA	0.39	1.6
Barium	NA	NA	NA	15,000	190,000
Cadmium	NA	NA	NA	70	800
Chromium (VI)	NA	NA	NA	0.29	5.6
Lead	NA	NA	NA	400	800
Mercury (elemental)	NA	NA	NA	10	43
Mercuric chloride and other salts	NA	NA	NA	23	310
Selenium	NA	NA	NA	390	5,100
Silver	NA	NA	NA	390	5,100
SVOCs					
As determined	NA	NA	NA	see note ^f	see note ^f
VOCs					
As determined	NA	NA	NA	see note ^f	see note ^f
Notes:					
^a Chemicals of potential concern based on contamination history.					
^b The GPLs are 2x10 ⁻⁵ mg/m ³ for HD, 6x10 ⁻⁷ mg/m ³ for VX, and 1x10 ⁻⁶ mg/m ³ for GA and GB, and 3x10 ⁻³ mg/m ³ for L					
^c From the “Reevaluation of 1999 HBESLs for Chemical Warfare Agents, May 2007” more conservative 1999 industrial levels listed.					
^d Residential 2007 HBESLs have been adjusted to reflect a 1E-06 risk level.					
^e EPA RSLs dated June 2011					
^f SVOCs and VOCs will be determined based on contamination characterization. Performance standards will be based on EPA RSLs.					
^g Background levels for metals may be used as an alternate performance standard.					

2.0 Partial Closure and Final Closure Activities [Utah Admin. Code R315-3-2.5(b)(13)]

- 2.1 HWMU closure activities at the Facility shall include the removal of all hazardous waste and hazardous waste residues from the HWMUs. The permitted recovered chemical warfare material and hazardous waste storage igloos and the OB/OD Conex shall be managed in accordance with Utah Admin. Code R315-8-9 and shall follow the closure requirements of Utah Admin. Code R315-8-9.9.
- 2.2 During closure, several activities required by the Facility's permit will end or phase out as waste operations cease and closure of a HWMU begins. These activities include but may not be limited to the following:
- Resource Conservation and Recovery Act (RCRA) inspections
 - Chemical Surety and Hazardous Waste Training
 - RCRA inventory recordkeeping
 - Agent air monitoring
 - Monitoring instrument calibrations
 - Emergency equipment maintenance
 - Safety requirements
 - Security requirements
 - Signs and placard maintenance

For each HWMU that is not currently in operation, or that is scheduled for closure, a request for terminating the above permit requirements for that HWMU, with specific effective dates, shall be submitted to the Director of the Division of Waste Management and Radiation Control (Director).

- 2.3 **Supporting Documents.** The following documents provide detailed information regarding decontamination, monitoring and sampling activities to be performed during storage unit closure.

(a) **TEAD-S Facilities and Equipment Decontamination Plan** (reference document). The TEAD-S Facilities and Equipment Decontamination Plan (FEDP) outlines the procedures and requirements for the cleaning and decontamination of potentially agent contaminated storage facilities and the GPL unventilated monitoring tests.

(b) **TEAD-S Closure Sampling & Analysis Plan (SAP)** (reference document). TEAD-S Closure SAP describes the procedures for sampling and analysis required to demonstrate that the Facility's permitted storage units meet the closure performance standard.

(c) **TEAD-S Facility Quality Assurance Project Plan (QAPP)** (reference document). The TEAD-S QAPP outlines the Quality Assurance and Quality Control criteria for analysis of samples identified in the SAP.

(d) **TEAD-S Risk Assumptions Document (RAD)**. The RAD describes the risk assessment and natural resource assessment requirements.

3.0 Maximum Waste Inventory [Utah Admin. Code R315-8-7]

- 3.1 The maximum waste inventory for each HWMU is the maximum permitted waste storage capacity for that unit. Maximum waste inventories for the Facility HWMUs are presented in Table 5-2.

Table 5-2: Storage Areas Maximum Waste Inventory			
Hazardous Waste Management Unit	Number of units, containers, boxes etc.	Storage Capacity per Unit	Total Maximum Waste Inventory
Area 10 Igloos	2 igloos	384, 55-gallon drums per igloo	42,240 gallons
OB/OD Conex	1 Building	440 gallons explosives	440 gallons explosives

- 3.2 At final closure, all inventories of hazardous wastes stored in containers in the HWMUs listed in Table 5-2 shall be removed and treated onsite, or transported to a permitted, offsite TSDf for disposal.

4.0 Closure Procedures

The following information provides a description of the steps needed to remove all hazardous waste or hazardous constituents, as well as to decontaminate or remove contaminated containment system components, equipment, structures, and soils during partial and final closure.

4.1 Closure Approach

Following equipment and waste removal from each storage unit, an inspection shall be conducted to determine the condition of the floor.

The available historical documentation shall be reviewed to determine if any liquid agent or hazardous waste leaks occurred which contacted the floor and the estimated quantity of each recorded spill.

4.1.1 Storage Igloos (with no Agent liquid exposure)

Storage igloos which have complete storage/agent exposure records which indicate they have had no history of liquid agent exposure shall be cleaned, decontaminated and monitored to less than 1.0 GPL as required by paragraph 1.6, steps 1 thru 5.

4.1.2 Storage Igloos (with Agent liquid exposure).

Igloos which have historical liquid agent exposure, show evidence of liquid agent exposure, or igloos which have incomplete historical storage/exposure records, shall be subjected to the following tiered sampling strategy. The igloo floor shall be inspected for cracks.

- (a) Suspect areas shall be monitored (such as stains and cracks where known leaks occurred) to < 1 Worker Protection Limit (WPL).

(b) Floor areas shall be decontaminated by steam cleaning. The spent decontamination solution from this process shall be screened for agent and pH in accordance with Attachment 1 (Waste Analysis Plan).

(c) The igloo shall be air monitored (unventilated) to less than 1.0 GPL.

(d) If floor cracks, joints, or other floor damage exists such that agent or other contaminants could have been transmitted beneath the floor, samples of the soil shall be taken from beneath the igloo floor to determine the nature, concentration and extent of contamination. Soil sample concentrations shall be compared to the closure performance standards listed in Table 5-1. If the soil meets risk-based levels, no further sampling will be required.

(e) If soil samples described in (c) are greater than risk-based levels (or background levels for metals), a site-specific risk assessment may be conducted; or the igloo may be remediated under Corrective Action as a HWMU; or subject to the requirements of a post-closure permit. Additional verification samples may be collected to support decision concerning closure or post closure.

4.1.3 OB/OD Conex.

The OB/OD Conex stored only conventional munitions components and propellants prior to OB/OD disposal.

The OB/OD Conex shall be wipe sampled for explosive/propellant constituents. Wipe results shall be compared to risk-based screening levels for surface wipe samples.

4.2 Unit-Specific Closure Activities [Utah Admin. Code R315-8-7]

4.2.1 Closure activities for each of the Facility's permitted hazardous waste management units shall reflect the specific requirements and considerations appropriate for the types of waste stored in the unit. Hazardous waste and liquids shall be removed. Containers, structures, liquids, and soil shall be removed or decontaminated to below the closure performance standards specified in Table 5-1. If the removal or decontamination efforts are unsuccessful or impractical, a site-specific risk assessment based on remaining COPC concentrations may be conducted to demonstrate closure, or the storage unit will be subject to applicable post-closure requirements.

4.3 Permitted Storage Igloo Closure Activities

Removal of waste munitions from permitted storage igloos and transport of those wastes to an onsite disposal facility was performed during the demilitarization process. Treatment and disposal of non-munition, agent-related wastes stored in storage igloos shall be in accordance with Section 1.4. Following removal of all wastes from the storage igloos, closure will be accomplished as described in Sections 1.6 and 4.1.

4.4 OB/OD Conex

4.4.1 The OB/OD Conex is used to store obsolete and discarded conventional munitions, munition components, and propellant awaiting treatment at the Facility OB/OD treatment units. Contamination of the interior of the OB/OD Conex by D003 hazardous waste residues is unlikely because the reactive fillers of munitions and munitions components are solid, and are either

encased in the munition casing itself or placed into ammunition boxes or propellant cans prior to storage. All residual dusts shall be removed from interior of the OB/OD Conex, and shall be collected and properly disposed.

The OB/OD Conex shall be sampled in accordance with an approved plan for explosive and propellant constituents prior to closure.

5.0 Inventory Removal and Disposal [Utah Admin. Code R315-8-7, Utah Admin. Code R315-8-5]

5.1 Wastes and/or residual wastes that remain following the completion of the Facility's hazardous waste management activities shall be removed from permitted units and managed according to the applicable regulatory requirements and as described in Section 4. Hazardous waste shall be treated and disposed of at a permitted TSDF.

5.2 Hazardous waste to be sent to an offsite TSDF for treatment or disposal shall be prepared in accordance with the requirements of Utah Admin. Code R315-8-5 for manifesting and transporting hazardous waste. A manifest shall be prepared in compliance with the requirements of Utah Admin. Code R315-6-2.20. The pre-transport requirements Utah Admin. Code R315-5 will be followed for packaging, labeling, marking, and placarding. The hazardous waste shall be properly packaged in accordance with the Department of Transportation (DOT) regulations in 49 CFR §§ 173, 178, and 179.

6.0 Disposal or Decontamination of Equipment, Structures, and Soils [Utah Admin. Code R315-8-7]

6.1 The Facility's hazardous waste management unit structures and equipment shall be decontaminated in accordance with Sections 1.7 and 4.1. Should it be determined at the time of closure that soil removal or remediation is required; the Closure Plan may be modified to address such issues.

6.2 If, after removing or decontaminating residual materials and making all reasonable efforts to effectively remove or decontaminate contaminated components, sub-soils, structures, and equipment as required by Utah Admin. Code R315-8-9.9 and Utah Admin. Code R315-8-12.6, and the Permittee finds that not all contaminated sub-soils can be practicably removed or decontaminated, then the Permittee shall close the facility and perform post-closure care in accordance with a post-closure plan.

7.0 Closure of Container Storage Units [Utah Admin. Code R315-8-9.9]

7.1 As required by Utah Admin. Code R315-8-9.9, all hazardous wastes and residual hazardous wastes shall be removed from the containment system at closure. Removal of hazardous wastes and residual hazardous wastes shall be performed according to the steps described in Section 4.

7.2 The remaining containers, liners, bases, and soils containing or contaminated with hazardous wastes or residual hazardous wastes shall be decontaminated or removed. Decontamination or removal of the remaining containment system shall be performed according to the steps described in Sections 4 and 6.

8.0 Reserved

9.0 Schedule for Closing [Utah Admin. Code R315-8-7]

- 9.1 In general, commencement of final closure of the container storage HWMUs described in this plan shall follow the completion of its mission.

In accordance with 40 CFR § 264.112(e), TEAD-S personnel may begin removing hazardous wastes and decontaminating or dismantling equipment in accordance with this attachment before notification of final closure.

10.0 Time Allowed For Closure [Utah Admin. Code R315-8-7]

- 10.1 The schedule for closure shall include, at minimum, the total time required to close each permitted hazardous waste management unit and the time required for intervening closure activities that shall allow tracking of the progress of partial and final closure.
- 10.2 For all HWMUs the Permittee shall notify the Director in writing at least 45 days prior to the date on which final closure activities are expected to commence. Notification shall be given to the Director at least 60 days prior to commencement of final closure of the waste pile.
- 10.3 No shipments of hazardous waste shall be received at a specific Facility hazardous waste management unit after the first day of the unit-specific closure period. Within 90 days of commencing closure of a HWMU, all hazardous waste stored in the HWMU undergoing closure shall be sent off site for management at a permitted TSDF. Partial and final closure activities shall be completed within 180 days of commencing closure of each HWMU. Residual materials identified in storage facilities shall be sampled and analyzed within 30 days of the initiation of closure, and shall be disposed of within 90 days.

11.0 Extensions for Closure Time

- 11.1 If it is determined that activities associated with the removal of all hazardous waste will require more than 90 days, a request for an extension to complete this activity shall be made at least 30 days before the initial 90-day time period expires. If partial and final closure activities cannot be completed within 180 days following the commencement of closure, a request for an extension to complete the activities shall be made at least 30 days before expiration of the initial 180 days.

12.0 Certification of Closure [Utah Admin. Code R315-8-7]

- 12.1 Within 60 days of completion of final closure activities and receiving all analytical results for each HWMU, the Permittee shall submit to the Director a closure report including a certification signed by the Depot Commander and an independent registered professional engineer stating that the HWMU was closed in accordance with the Facility's approved closure plan. The certifying engineer shall at a minimum, perform monthly inspections during partial and final closure activities. An inspection log shall be submitted with the closure report.

13.0 Post-Closure & Cost Estimate

- 13.1 Post Closure Plan [Utah Admin. Code R315-3-2.5(b)(13)]

- 13.1.1 If the Permittee or the Division determines that post-closure care is required at any of the HWMUs, the Permittee shall prepare a Post-Closure Plan that meets the requirements of Utah Admin. Code R315-8-7.
- 13.2 A closure cost estimate or financial assurance is not required for the Facility's hazardous waste management units because the federal government is exempted from the financial requirements of R315-8-8.