

ATTACHMENT 8

CLOSURE AND POST-CLOSURE PLAN

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CLOSURE PLANS, POST-CLOSURE PLANS, AND FINANCIAL REQUIREMENTS

1.0 Closure Plans [40 CFR 270.14(b)(13), 270.23(a)(2), and 264.112(a)(1) and (2) and UAC R315-3-5(b)(13), R315-3-6.8(a)(2), R315-8-7]

This plan identifies all steps necessary to achieve closure of the TTU at the end of its operating life. It also includes closure requirements for the temporary storage pads located in the Missile Storage Area (MSA Pads 1 and 2). Copies of the plan will be maintained by 75 CEG/CEV, HAFB, Utah, until closure is completed, certified by the permittee, and signed by an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training. This plan will be updated as necessary in accordance with Section II.P of the Permit.

1.1 Closure Performance Standard [40 CFR 264.111 and UAC R315-8-7]

RCRA closure requirements are intended to protect human health and the environment as well as to minimize the need for post-closure maintenance. These goals can be achieved through either:

- Clean closure - closure to screening or risk-based cleanup standards, accomplished by removing all hazardous wastes and hazardous waste residues from the unit, or
- Non-clean closure - closure where wastes remain in place and specific post-closure care is performed in order to monitor waste containment.

For clean closure, if any contamination in the form of hazardous wastes or constituents contained in soils or groundwater is determined to be the direct result of past operations of the TTU or is shown to be present in concentrations above cleanup goals, background concentrations, or other standards or guidance levels, further study will be done to determine the nature and extent of this contamination and what remediation requirements are needed. If warranted, an appropriate Corrective Action Plan (CAP) will be prepared and submitted to the UDEQ DSHW for approval. Upon approval and modification of the closure plan, the CAP will then be implemented to remedy any identified contamination in soils and/or groundwater.

However, if data suggest clean-closure is not a practicable alternative, the TTU will be closed in accordance with the closure standards for a landfill. The closure activities associated with each closure option are discussed in Section 1.5. The temporary storage pads in the MSA are operated in a manner that is unlikely to allow contamination and will be clean closed.

1.2 Partial Closure and Final Closure Activities [40 CFR 264.112(b)(1) through (b)(7) and UAC R-315-8-7]

Partial closure of the TTU is not planned. For the purposes of determining the maximum extent of operations during the life of the facility, the area of closure will be defined as the TTU described in Attachment 1. This will not only include the current operational areas, but also those areas that may have been impacted by past hazardous waste thermal treatment and/or disposal operations (such as areas used for burial of spent munitions). These areas are now

within the TTU fence. Because closure will be performed for the entire TTU, none of it will remain open.

1.3 Maximum Waste Inventory [40 CFR 264.112(b)(3) and UAC R315-8-7]

The maximum inventory of hazardous waste that was ever on-site at the TTU at one time over the active life of the facility is 340,000 lb¹. This is the maximum quantity of propellant allowed under AF explosive safety rules to be treated at the TTU in a single event by OB. The maximum quantity of high explosives allowed to be treated at the TTU at one time by OD is 149,900 lb NEW. This is also the upper explosive safety limit prescribed by AF explosive safety rules. No hazardous waste treatment processes, other than OB/OD thermal treatment, has ever taken place at the TTU.

1.4 Schedule for Closure [40 CFR 264.112(b)(6) and UAC R315-8-7]

The extent of requirements to fully close the TTU will not be known until closure activities reveal the nature and extent of any contamination in soils and groundwater. However, ongoing soil and ground water sampling will be conducted as discussed in Attachment 9 of this permit.

1.4.1 Time Allowed for Closure [40 CFR 264.112(b)(2) and 264.113(a) and (b) and UAC R315-8-7]

An estimated closure schedule that includes the time needed to complete all required closure activities is provided in Table 1. Should closure activities determine a CAP is required, this closure plan will be modified to include it, together with an appropriate schedule of compliance for such corrective action. This schedule would also include all other activities necessary to complete final closure, including post-closure monitoring. Final closure will be supervised and certified by an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training.

1.4.2 Extensions for Closure Time [40 CFR 264.113(a) and (b) and UAC R315-8-7]

If for any reason closure cannot be completed within the specified time frame outlined in the closure schedule, a request or petition for an extension of the closure time will be submitted to DSHW. This petition will identify the need for the extension, the status of the facility, and the actions required to prevent threats to human health or the environment during the extension period. The written request will include a copy of the amended closure plan.

1.5 Closure Procedures [40 CFR 264.112 and 264.114 and UAC R315-8-7]

Clean closure of the TTU is preferred, but unrecoverable past releases of hazardous waste may make clean closure unachievable. To determine the nature and extent of these past releases, certain actions must be taken. These are described in subsequent sections. Upon completion of all closure activities, the TTU will be deemed closed under RCRA requirements.

¹Munitions are reported in units of pounds NEW. The NEW is the weight of the reactive filler material.

1.5.1 Geophysical Survey

The locations of all areas within the TTU used to treat and/or bury munitions are not precisely identified or mapped. To date, no investigations have been performed to delineate their possible locations, dimensions, or orientations. To assist in identifying and determining the areal boundaries of TTU OB/OD treatment and burial sites, and to protect soil and groundwater sampling teams from encountering any UXO, a geophysical survey will be included as part of closure activities. The geophysical survey may be conducted using a variety of potential technologies, including aerial or ground-based techniques, and may be conducted by either HAFB EOD or contractor personnel. The geophysical survey procedures will be presented in the final closure plan developed in accordance with Section II.P of the Permit.

The survey will be designed to discover munitions debris, consisting of metal fragments and inert munitions casings lying on the surface, partially buried, buried close to the surface, deeply buried by itself, or contained in old burial pits. After locating and excavating them, if required, each item will be inspected by EOD or contractor personnel in accordance with TO 11A-1-60, "Inspection of Reusable Munitions Containers and Scrap Material Generated from Items Exposed to, or Containing Explosives." Items determined to be inert will be certified, collected, and transported to the Oasis Resource, Recovery, and Recycling (R3) yard for further disposition. Any UXO or munitions fragments suspected of still containing reactive components will either be treated in situ or at one of the TTU sites, depending on its type, size, and condition. If the UXO or munitions fragments constitute an imminent threat to human health and the environment, and if it is necessary to treat outside the permitted TTU, such activities will be considered emergency treatment, and an emergency treatment permit will be requested from the Director of the Utah Division of Solid and Hazardous Waste. All inspection, certification, and treatment activities will be conducted only by qualified EOD or contractor personnel.

Once the TTU is cleared of hazardous scrap metal and UXO, soil and groundwater samples can be safely collected for analysis. If a decision is made by the EOD team that an area cannot be safely cleared of UXO, the location of the contaminated soil will be duly noted for future reference. This will result in a non-clean closure of the TTU.

1.5.2 Soil and Groundwater Sampling

Baseline soil and groundwater sampling will be conducted as part of this permit (Attachment 9, SAP). This sampling will establish the extent of surface and subsurface soil and groundwater contamination due to past operations. Closure activities must include similar soil and groundwater sampling. The results of the closure sampling will be used to establish cleanup requirements.

1.5.2.1 Site-specific sampling locations, quantities, sample collection and analytical methods, and QA/QC issues will be addressed and presented in the final closure plan developed in accordance with Section II.P of the Permit . Surface sampling for characterization of potential contamination at the temporary storage pads in the MSA will be included in the plan.Sampling Equipment Decontamination Procedures

All field sampling equipment will be precleaned prior to arrival on-site and decontaminated in accordance with standard procedures. A decontamination area will be established and maintained on-site for all decontamination activities. The site will be selected by the sampling team based on the location's ability to isolate the decontamination area and assist in preventing cross-contamination of sampling equipment.

1.5.2.2 IDW Management

All wastes generated from field sampling and decontamination activities will be treated as contaminated media until data are available to determine their actual characteristics. This material will be drummed and stored at the TTU pending the outcome of sampling analysis. Specifics such as date, time, equipment being decontaminated, and the associated sample identification number for the equipment being decontaminated will be recorded in a field logbook. Liquids will be drummed separately from solids, and the drums will be properly labeled. It is anticipated that investigative-derived waste (IDW) will consist of decontamination fluids and rinsates, contaminated PPE, and soil cuttings.

Segregation, minimization, handling, and labeling of IDW will be performed. Solid IDW will be placed in DOT 17H drums. All groundwater, decontamination fluids, and rinsates will be placed in DOT 17E drums. Each drum will be clearly labeled and dated the day it is filled using indelible ink and have the following source identification:

- Date
- Material contained
- Location
- Number of drums from location
- Possible contaminant

Contaminated media will be managed in accordance with the current Utah and federal hazardous waste rules. For instance, if concentrations of samples collected from decontamination/rinsate fluids exceed the Universal Treatment Standards (UTS) of 40 CFR 268.40 or the maximum contaminant levels (MCLs), whichever is higher, the drummed waste will be considered a hazardous waste and will be managed accordingly. All soils with hazardous constituent concentrations exceeding the UTS or the soil screening levels (SSLs) (i.e., cleanup goals), whichever is higher, are considered hazardous waste and similarly managed. Wastes determined to be hazardous will be picked up by a contractor for transport to a permitted disposal facility.

If the results indicate none of the UTS or SSL/MCL concentrations have been exceeded, wastewater and/or soils are not considered hazardous waste and will be managed in accordance with DSHW-approved BMPs. Such BMPs will be submitted by 75 CEG/CEV prior to initiating any disposal activities at the TTU involving potentially contaminated media.

All sanitary trash and uncontaminated PPE will be discarded in accordance with applicable solid waste regulations.

1.5.2.3 Health and Safety Procedures

Personnel performing sampling will use appropriate PPE deemed necessary to accomplish sampling tasks. The PPE to be used will be specified in the closure Health and Safety Plan. Sampling personnel will be properly trained in hazardous waste sampling procedures and will have appropriate medical monitoring and certification. Sampling personnel will also be briefed by the EOD RSO on the hazards of sampling in a potential explosively-contaminated environment. It should be noted that subsurface UXO can only be reliably detected down to approximately 15 ft, depending on other metallic contamination, soil type, etc. Although no subsurface soil sampling is anticipated below that depth, should additional groundwater sampling and monitoring wells be required, down-hole fluxgate gradiometer checks will be taken at regular intervals to ensure no UXO are encountered by groundwater well drilling crews. If instruments indicate the presence of UXO, the sampling site will be relocated to a nearby, UXO-free location and appropriate annotations made in the sampling logbook.

1.5.3 Determining Cleanup Goals

The analytical results of all soil and groundwater samples taken from the TTU during closure sampling will be compared to background concentrations. Those compounds exceeding background levels will be identified as potential contaminants of concern to be investigated as possible candidates for remediation/removal. For each contaminant of concern, a review of existing standards and guidelines (in terms of soil and groundwater concentrations) will be completed. These screening criteria, which are very conservative by nature, may be used to define the clean closure requirements for the site.

In lieu of the screening criteria, risk-based cleanup levels may be developed in accordance with Utah Admin. Code R315-101. This decision will be driven by the availability of screening criteria for each contaminant of concern, as well as future land use and expected institutional controls. The risk-based criteria will most likely justify a reduction in the extent of remediation/removal actions needed for the site but will still allow the site to achieve clean closure. DSHW must concur with the cleanup levels and remediation strategy HAFB selects for the TTU.

If site investigation results indicate clean closure is not practicable, a non-clean closure option will be considered. Under this option, the wastes will remain in place and strict post-closure monitoring activities (e.g., groundwater monitoring) will be completed to ensure the wastes are not migrating from the site and do not, therefore, pose a risk to human health or the environment.

1.5.4 Site Cleanup

1.5.4.1 Inventory Removal [40 CFR 264.112(b)(3) and UAC R315-8-7]

The TTU hazardous waste inventory may consist of (1) ash residue left over from OB/OD treatment activities; (2) untreated UXO; and (3) soil cuttings, decontamination fluid, and other IDW. Ash will be drummed and managed in accordance with Section 1.5.4.3. UXO and

contaminated scrap will be treated as described in Section 1.5.1. IDW will be managed in accordance with Section 1.5.2.2.

1.5.4.2 Disposal or Decontamination of Equipment and Structures [40 CFR 264.112(b)(4), 264.112(e), and 264.114 and UAC R315-8-7]

To the extent possible, decontamination and disposal will be performed on existing man-made structures at the TTU. These include the burn pan, burn pan cover, and burn pan supporting structure. Additionally, once the final drums of contaminated fluids and soil cuttings are removed from the TTU hazardous waste accumulation facility, this will also be decontaminated and removed. Decontamination activities will be done in such a way as to allow for reuse or recycling of those components suitable for that purpose (e.g., metal structures that could be certified clean).

All components of the burn pan will be visually inspected, and any visible waste and debris will be physically removed. The burn pan concrete pads and support columns will be scrapped and brushed of all loose waste and debris. Upon removal of all loose waste and debris, the burn pan and its cover will be pressure-washed to remove any remaining residue. A bermed decontamination pad constructed of 30 mil plastic and large enough to contain the burn pan and lid will be used to contain all wash water. The decontamination pad will be positioned adjacent to the burn pan.

Following decontamination, rinsate samples and concrete chips will be collected from the burn pan and analyzed for Toxic Characteristic Leaching Procedure metals and explosive compounds to verify their cleanliness. If rinsate of concrete chip analysis indicates additional decontamination is necessary, the decontamination process and accompanying analysis will be repeated until each component is verified as clean. Once the treatment structures are certified clean, they will be either transported to the Oasis R3 yard to be stored until contracted for disposal/recycling or disposed of at the UTTR-North sanitary landfill. All waste generated from the decontamination process will be containerized in drums for characterization and disposal/recycling.

Soils adjacent to each pad will be characterized as part of the subsurface investigation of the TTU. To provide continued protection of unauthorized visitors to the TTU, the fence and gates will remain in place and be routinely maintained as required (see Table 1).

1.5.4.3 Closure of Containers [40 CFR 264.178, 264.112(b)(3), and 270.14(b)(13) and UAC R315-8-9.9, R315-807, and R315-3-5(b)(13)]

All ash and contaminated debris identified as treatment residue, solid IDW, and decontamination fluids and rinsates will be placed in DOT 17E and 17H drums, as previously described. Should sampling analysis determine these to be contaminated, each container will be closed and transported to a hazardous waste disposal facility. Remaining containers will be decontaminated and removed from the facility.

1.5.4.4 Remediation

In the event contamination is detected after HAFB and DSHW agree to pursue clean closure, activities necessary to remediate the site to predetermined cleanup levels will be conducted. These activities will be documented in the CAP as discussed in Section 1.1.

2.0 Closure Certification and Required Notices [40 CFR 264.115 and 264.116 and UAC R315-8-7]

Within 60 days of the completion of closure for the TTU and the MSA temporary storage pads, 75 CEG/CEV will submit in writing (by certified mail) a closure certification to DSHW and the EPA Regional Administrator. The certification will verify that the hazardous waste treatment facility was closed in accordance with the specifications outlined in the closure plan, including the completion of all required corrective action measures. The certification will be signed by an authorized official of the Hill AFB 75th Air Base Wing, and an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training. Documentation supporting the professional engineer's certification will be furnished to the DSHW upon request.

No later than the submission of closure certification, 75 CEG/CEV will also submit to the DSHW and the EPA Regional Administrator a survey plat indicating the location and dimensions of the facility with respect to permanently surveyed benchmarks. The plat will be prepared and certified by a professional land surveyor licensed in Utah.

3.0 Closure Cost Estimate [40 CFR 264.142]

The TTU is a federal government facility, owned and operated by the Hill AFB 75th Air Base Wing for the AF and the DoD. As such, it is exempt from the requirements for closure cost estimates.

4.0 Financial Assurance Mechanism for Closure [40 CFR 264.143]

In accordance with 40 CFR 264.143, "Financial Assurance for Closure," federal facilities are exempt from the requirements for financial assurance.

5.0 Post-Closure Plan [40 CFR 264.14(b)(13), 270.23(a), 264.118, and 264.603 and UAC R315-3-5(b)(13), R315-3-6.8(a), R315-8-7, and R315-8-16]

This plan identifies all necessary activities to be implemented following closure of the TTU. Post-closure care will include all planned monitoring and maintenance activities, as required, along with their respective frequencies. The post-closure plan will be based on the general requirements of 40 CFR 264.118 and the post-closure care requirements of 40 CFR 264.603. Should it be impracticable to remove all contaminated soils or UXO during closure, the treatment units will be monitored in accordance with the groundwater monitoring plan. This plan will be updated as necessary in accordance with Section II.P of the Permit.

5.1 Post-Closure Use of Property

The post-closure use of property following final closure will not be allowed if such use results in a disturbance of the area. This may endanger personnel entering the area or may result in disturbance or damage to the facility's monitoring and/or remediation systems (i.e., groundwater wells) that exist at the TTU. 75 CEG/CEU will maintain the fences and gates while 75 CEG/CEV will maintain monitoring devices. Table 2 describes the TTU inspection and maintenance plan. Post closure use of the MSA temporary storage pads will not be restricted if the area is successfully clean-closed.

5.2 Post-Closure Care [40 CFR 270.23(a)(3) and 264.603 and UAC R315-3-6.8(a)(3) and R315-8-16]

The post-closure care period for the TTU will begin after the completion of closure of the waste management units, including all required corrective action measures, and will continue for a period of time that is dependent on whether the facility can be clean closed. This determination cannot be made until closure activities are completed.

5.3 Post-Closure Security [40 CFR 264.117(b) and UAC R315-8-7]

The TTU is not intended for public access, but is located in an area that may be used for grazing domestic livestock. In addition, the TTU is within the UTTR-North and immediately west of the Helicopter Air-to-Ground (HAG) Range. These are used as munitions testing and training ranges, respectively. Therefore, security requirements will be implemented following closure. Because of the remoteness of the facility, security can be ensured using the existing three or four-strand wire fence and the existing locked gates.

5.4 Post-Closure Contact [40 CFR 264.118(b)(3) and UAC R315-8-7]

Post-closure contact should be with 75 CEG/CEV, HAFB, Utah 84056-5137, until the post-closure care period is completed, certified by the permittee, and signed by an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training.

5.5 Monitoring Plan [40 CFR 264.118(b)(1) and UAC R315-8-7]

Groundwater monitoring will be conducted at the TTU during the post-closure care period (and during the closure period as well) to determine whether any remaining contamination could originate from the TTU (e.g., hazardous wastes or hazardous constituents from any contaminated soils that might remain in place following closure) and impact groundwater quality. Post-closure monitoring will be the same as that described in the SAP (Attachment 9).

5.6 Maintenance and Inspection Requirements [40 CFR 264.118(b) and UAC R315-8-7]

Specific items to be inspected during the post-closure care period, as well as their respective schedules and corrective action responses, are outlined in Table 2. The TTU will be re-seeded, and a final cover of the TTU is not proposed as part of closure activities.

All inspections will be recorded in an inspection log kept by 75 CEG. The inspection log will include the following

- the date and time of the inspection,
- the name of the inspector,
- a notation of observations made regarding:
 - condition of security devices (fencing, gates, locks, legibility of signs)
 - drainage control (areas indicative of degradation, blockage, settlement, etc.)

- detection/monitoring equipment (damaged well casings, protective posts, eroded well pads)
- disturbance of surveyed benchmarks
- the date and nature of any repairs or remedial measures taken to correct the problem.

If an inspection reveals deterioration or breakage of equipment and/or structures, remedial action will be implemented to prevent or mitigate any harm to human health and the environment. When such a hazard is recognized as being an imminent threat, remedial action will be taken immediately.

5.7 Amendment of Post-Closure Plan [40 CFR 264.118(d) and UAC R315-8-7]

An amended post-closure plan will be submitted for review and approval by DSHW if (1) changes in the operating plans or facility design affect the approved post-closure plan, or (2) events occur during the active life of the facility, including partial and final closure, that affect the approved post-closure plan.

The post-closure plan will be amended at least 60 days prior to a proposed change in facility design or operation or no later than 60 days after an unexpected event has occurred that affects the post-closure plan.

5.8 Post-Closure Notices [40 CFR 264.116 and 264.119 and UAC R315-8-7]

If any wastes (determined to be hazardous) remain in place following the completion of closure activities, a record of their type, location, and quantity will be submitted to the authority with jurisdiction over local land use, and to DSHW and/or the EPA Regional Administrator no later than 60 days following closure. Additionally, an Environmental Covenant, as provided for in Utah Code Ann. § 57-25-101, *et seq.*, covering the facility property will be recorded within 60 days of final certification of closure of the first hazardous waste disposal unit and within 60 days of the last hazardous waste disposal unit. This information will include whether (1) the land has been used to manage hazardous wastes and (2) its use is restricted under 40 CFR Subpart G regulations.

A survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each disposal unit at the OB/OD facility will be filed with the authority with jurisdiction over local land use and with DSHW and/or the EPA Regional Administrator. The plat will state 75 CEG's obligation to restrict disturbance of the hazardous waste disposal unit area in accordance with applicable Subpart G regulations.

A certification signed by an authorized official of 75 CEG signifying the deed notation was recorded, including a copy of the document in which the notation was placed, will be submitted to DSHW and/or the EPA Regional Administrator.

5.9 Certification of Completion of Post-Closure Care [40 CFR 264.120 and UAC R315-8-7]

A certification that the post-closure care period for the hazardous waste treatment facility was performed in accordance with the specifications in the approved post-closure plan will be submitted by registered mail to DSHW and/or the EPA Regional Administrator no later than 60

days following completion of the established post-closure care period. The certification will be signed by an authorized official of 75 CEG and an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training. Documentation supporting the professional engineer's certification will be furnished to DSHW and/or the EPA Regional Administrator upon request.

5.10 Financial Requirements for Post-Closure [40 CFR 264.144 and 264.145 and UAC R315-8-7]

UTTR-North facilities are owned and operated by the federal government and, as such, are exempt from the financial requirements for post-closure care. These include 40 CFR 264.144, "Cost Estimate for Post-Closure Care," and 264.145, "Financial Assurance for Post-Closure Care."

Utah Test and Training Range
Attachment 8-Closure and Post-Closure Plan

TABLE 1
Estimated Closure Schedule

Task	Closure Activity	Start Date	Completion Date
1	Mobilize to the field	First day (D-1)	D-3
2	Conduct geophysical survey and remove UXO/scrap	D-3	D-13
3	Sample soil and groundwater	D-14	D-17
4	Decontaminate and dispose of TTU structures	D-17	D-20
5	Demobilize	D-21	D-22
6	Review and validate data	D-23	D-48
7	Write closure report	D-23	D-100
8	Monitor post-closure compliance	D-107	To be determined

TABLE 2
Inspection and Maintenance Plan for TTU

Area/Equipment	Specific Items	Potential Problems	Corrective Action	Inspection-Frequency
Security devices	Facility fence	Broken	Repair immediately, if damaged	Quarterly
	Access gate	Locking mechanism jammed	Repair/replace	Quarterly
	Signs	Illegible	Replace	Quarterly
Detection/monitoring equipment	Monitoring wells	Unlocked well caps, damaged casings, protective posts or well pads	Secure well caps; if damage precludes the use of the well, seal damaged well, and install a replacement well	Quarterly
Benchmarks	N/A	Damage	Replace, if damaged	Quarterly
Soil	Re-seeded vegetation	Erosion	Re-seed; implement soil retention measures	Quarterly