MODULE VII
OPEN DETONATION (OD)

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LIST OF ATTACHMENTS

DESCRIPTION **ATTACHMENT NO.**

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MODULE VII
OPEN DETONATION (OD)

VII.A. APPLICABILITY

VII.A.1. The requirements of this permit module pertain to the treatment of waste military munitions at the OD area at the Tooele Army Depot South Area (TEAD-S). The Permittee shall comply with Utah Admin. Code R315-264 and all conditions of this module.

VII.A.2. The permit conditions of this module allow treatment at the OD area, as designed and described in the drawings and specifications in Module VII Attachment 1 Open Detonation Operations. The OD area consists of 20 operational pits.

VII.A.3 OD operations shall be accomplished by trained explosive personnel following all DoD directives regarding explosive safety operations for the OD area and the conditions of this permit.

VII.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

VII.B.1. At the OD unit, the Permittee shall treat only hazardous waste military munitions characterized as D003 and generated from the following general sources or if the material meets the risk threshold criteria of Condition VII.E:

VII.B.1.a. Unserviceable or serviceable excess DoD munitions and explosive materials (e.g. bulk explosives, small arms munitions that cannot be safely treated in the deactivation furnace, projectiles, flares, grenades, sub-munitions, bombs and rocket motors);

VII.B.1.b. Unserviceable or serviceable excess solid propellant components and associated residue generated by a DoD contractor and the contractor requests treatment assistance; and

VII.B.2. The Permittee may only treat hazardous waste military munitions with known classifications and compositions in the Munition Items Disposition Action System (MIDAS) database and in Attachment 1 (Waste Analysis Plan) excluding the items listed in Condition VII.B.2.b., unless an emergency situation exists. If an emergency exists and an item is not in the MIDAS database, all available information will be reviewed to minimize hazards to the Demilitarization team and the environment and an Emergency Permit shall be obtained from the Director of the Division of Waste Management and Radiation Control (Director). Information on the item will be submitted to the Defense Ammunition Center (DAC), for inclusion into the MIDAS database, within 60 days of treatment.

VII.B.2.a. The same information on the item that is provided to the DAC will be provided to the Director, within 60 days of treatment, along with an analysis determining whether or not the introduction of the item to the waste stream impacts *Human Health Risk Assessment* (Tetra Tech, 2017) or the *Ecological Risk Assessment* (Tetra Tech, 2017).

VII.B.2.b. Munitions with any of the following constituents shall not be treated by OD: hexachlorethane (HC), colored smoke, white phosphorus (WP), red phosphorus (RP), depleted uranium (DU) and riot control munitions.

VII.B.3. The Permittee is prohibited from treating wholly inert items and improvised explosive devices (e.g. homemade bombs which are non-military), chemical and nuclear weapons,

their devices and components, and military munitions, propellant or residues that contain free liquids. Items that are believed to be wholly inert items, but cannot be conclusively verified to be inert, may be cracked open with a small explosive charge to expose the interior to verify that no explosives are present. The Permittee shall document in the operating record all treatment and verification activities required by this condition.

VII.B.4. Subject to the prohibitions of Conditions VII.B.1, VI.B.2, and VI.B.3, the Permittee shall not exceed the maximum Net Explosive Weight (NEW) for each day and each calendar year of each Category and specified munition type as listed below:

Category	Description	Annual Quantity[a,b] (NEW lb/ year)
A	High Explosive Cased: Cased munitions with a high explosive filler. Includes cartridges, bombs, and rocket motors.	5,976,000
	High Explosive Donor: Uncased high explosives including bulk explosives.	
	Mines: Items with a common name including the term mine. Generally thin walled. Typical NEWs ranging from 1.4 lbs. to 24 lbs. per item.	
	Grenades: Items with a common name including grenade. Typically weight less than one pound.	
B	Impulse Cartridges: Items with a common name including impulse.	72,000
C	Incendiaries/Tracers: Items used as incendiaries and tracers.	216,000
D	Fuse/Fuze: Items with a common name including fuse/fuze.	216,000
E	Simulators: Items with a common name including the term simulator.	216,000
F	Detonators/Blasting Caps: Items with a common name including blasting cap, detonating cord, percussion primer and used as part of detonation trains. Typically low NEWs/item ratios generally ranging around 0.01 to 0.0001 lbs. NEW/item.	144,000
G	Adapter/Booster: Items with a common name including adapter, booster tape, and booster guided. Typically contain less than 1 lb. NEW per item.	360,000

[a] Maximum pit loading of 5,000 lbs. NEW for 20 pits per day.
[b] See the Open Detonation Risk Management Plan for information on the derivation of these quantities..

VII.B.5. Mitigation of one-hour acute exceedances requires that emissions from all items detonated during a single one-hour treatment event be considered. Daily amounts will be adjusted to account for mixed munition categories and donor. Because the open detonation operation events will include detonation of more than one munition type and/or categories of munitions, the Permittee shall enter the amount of each category type into the Munitions Mix Evaluator spreadsheet during the planning for each detonation. The spreadsheet calculates the total emissions, for chemicals of concern, and compares the emissions to the allowable one-hour threshold. See the Open Detonation Risk Management Plan for details.

VII.B.6. During the planning of each detonation involving fragment producing munitions the Permittee shall input information about each detonation into the Buried Explosion Module which will calculate the maximum distance that fragments from the detonation could travel. The Permittee shall not conduct any detonation operations that could cause fragments to come within 50 feet of the depot boundary fence adjacent to the OD area. See the Open Detonation Risk Management Plan for additional information.

VII.B.7. The Permittee shall conduct all detonations in accordance with this permit.

VII.B.8. The Permittee shall comply with the waste compatibility requirements of Utah Admin. Code R315-264-172.

VII.C. RECEIPT OF OFF-SITE WASTE PROHIBITED

VII.C.1. The Permittee shall not receive hazardous wastes that are generated off-depot except for the following wastes that will be treated at the OD area in accordance with this Module:

VII.C.1.a. Waste conventional munitions generated by TEAD-S during investigation or remediation of sites adjacent to TEAD-S that were contaminated from past TEAD-S operations,

VII.C.1.b. DoD owned waste conventional military munitions,

VII.C.1.c. Waste conventional munitions generated at the Tooele Army Depot North Area (TEAD-N), and

VII.C.1.d. Conventional military or commercial explosive items identified as hazardous waste and collected during emergency response situations and transported by U.S. DoD Explosive Ordnance Disposal (EOD) Personnel.

VII.D. RESERVED

VII.E. RISK THRESHOLDS

VII.E.1. OD operations shall be conducted in a manner that minimizes the risk to human health and the environment. The risk thresholds for operations at the OD area are based on the *Human Health Risk Assessment* (Tetra Tech, 2017), *Ecological Risk Assessment* (Tetra Tech, 2017) and *Risk Management Plan* (Tetra Tech, 2017).

VII.E.2. At the request of the Director or the Permittee, the completeness and accuracy of the OD risk assessment shall be evaluated. At a minimum, the evaluation shall include the following information:

VII.E.2.a. A review of the list of chemical/munition constituents to add additional chemicals and emission factors as a result of updates in the waste characterization databases such as the MIDAS database.

VII.E.2.b. Updated munitions information or results from compliance sampling that would require the addition of chemical compounds.

VII.E.3. The Permittee shall operate the OD area to prevent unacceptable risk of cancer. The cumulative carcinogenic risk to on-site workers shall not exceed 1.0×10^{-4} (one in ten thousand) for the closest potential receptors (on-site OD workers and locations evaluated using the OBOD Model (OBODM) associated with the human health risk assessment). The cumulative non-carcinogenic hazard to the closest on-site potential receptors of a detonation shall not exceed a hazard index of 1.0. The risks and hazards shall be calculated according to the methodology in the *Human Health Risk Assessment* (Tetra Tech, 2017).

VII.E.3.a. Risk management decisions within the OD range will be based on the results of the human health risk assessment for on-site workers. Ecological risks will not be evaluated within the OD range while active. Upon closure of the range, ecological impacts within the OD boundary will be assessed. Hazards to on-site ecological receptors shall not exceed a hazard index of 1.0.

VII.E.4. The cumulative carcinogenic risk to actual or potential off-site human receptors shall not exceed 1.0×10^{-6} (one in a million). The cumulative non-carcinogenic hazard to actual or potential off-site receptors shall not exceed a hazard index of 1.0. Hazards to off-site ecological receptors shall not exceed a hazard index of 1.0. The location of the off-site human and ecological receptors will consist of the area to the south of the OD range to the southern TEAD-S fence line. The risks and hazards shall be calculated according to the methodology in the *Tooele Army Depot South Area Risk Assumption's Document (AQS, 2017)*. The Permittee shall maintain compliance with the environmental performance standards listed in Utah Admin. Code R315-264-600 and review the information in the Open Detonation Risk Management Plan every five years.

VII.E.4.a. Risk management decisions outside of the OD range will be based on the results of the human health and ecological risk assessments for the off-site receptor location.

VII.E.5. If changes need to be made to the OD operating procedures, then the existing OD risk assessments will first be updated with new exposure estimates reflective of the proposed changes to ensure that the revised procedures and the resulting emissions will not present an unacceptable risk to personnel and the environment. The risk standards to be met in these updated risk assessments will be the same as those summarized in VII.E.3 and VII.E.4. Updated risk assessments shall be submitted to the Director for review and approval.

VII.F. GENERAL OPERATING CONDITIONS

VII.F.1. The Permittee shall adhere to the following procedures:

VII.F.1.a. OD operations shall be conducted within the secure area of the OD area with controlled access for humans and livestock. At a minimum, DoD Explosives Safety Standards shall be used to dictate safe separation distances from external receptors. For each operational day, operators shall conduct a visual pre-operational inspection of the pits and 50 feet on both sides of the depot boundary fence adjacent to the OD area to ensure no livestock or people are potentially in harm's way.

VII.F.1.b. The OD area shall be posted with warning signs to keep unauthorized personnel out. Warning flags shall be flown and access roads shall be barricaded and posted during OD operations.

VII.F.1.c. During OD operations, telephone or two-way radio contact shall be available and operational with support personnel, including security and firefighting units.

VII.F.1.d. The integrity of the OD area and support equipment shall be determined through regular inspections in accordance with the inspection plan in Attachment 2 (Inspection Plan). Inspection records shall be maintained at the facility.

VII.F.1.e. Prior to OD, meteorological data including wind speed, approach of storms (including electrical storms), precipitation, cloud cover, visibility and inversions (temperature with altitude) shall be monitored to ensure that OD is not conducted under adverse weather conditions. Meteorological data shall be recorded and maintained for each detonation. The following conditions apply to the OD unit:

VII.F.1.e.i. OD operations shall occur between the hours of 11:00 a.m. and 6:00 p.m. Mountain Daylight Time.

VII.F.1.e.ii. OD operations shall only occur April 1 through October 31 of each calendar year.

VII.F.1.e.iii. The wind speed shall be observed at the time of treatment at the weather instrument near the entrance to the OD area and recorded on the Demilitarization Approval Form. The alternate weather instrument near Building 4554 will be used in the event there are operational problems with the instrument near the OD entrance.

VII.F.1.e.iv. OD operations shall only be initiated when the sustained wind speed is between three (3) miles per hour (mph) and 20 mph. No OD operations shall be initiated with gusts greater than 30 mph.

VII.F.1.e.v. OD operations shall not be initiated when the visibility is less than one mile.

VII.F.1.f. Waste munitions shall be treated within 24 hours of receipt at an OD unit. If treatment of the waste munitions is delayed, after the munitions are received at an OD unit, due to an unforeseen change that creates conditions outside those permitted by Condition VII.F.1.e., the munitions may be stored and remain in place in the unit until conditions allow treatment to be performed.

VII.F.1.g. Prior to OD, waste munitions shall be inspected to ensure that only waste defined in Condition VII.B is detonated.

VII.F.1.h. For each operational day, operators shall conduct a post-operational visual inspection of the pit area, as described in Section 3.0 of Module VII Attachment 1, and 50 feet on both sides of the depot boundary fence adjacent to the OD area to clear all Munitions Potentially Presenting an Explosives Hazard (MPPEH) or any metal fragments that could threaten human health or the environment. Items or material such as lumps of explosives or unfuzed munitions will be recovered and prepared for treatment on the next scheduled day. Fuzed ammunition or other types of munitions that are unsafe to move will be treated in-place. Additionally, MPPEH, non-explosive scrap metal, casings, fragments and related items will be picked-up and cleared from the OD area bi-annually; once in the spring prior to full-scale treatment and once in the fall upon completion of full-scale treatment. Metal waste shall be recycled whenever feasible.

VII.F.1.i. The donor charge and placement geometry for OD operations shall be optimized to minimize the generation of un-detonated waste and residue. All re-detonations shall be recorded in the operating record.

VII.F.1.j. High order detonations shall be conducted using the appropriate amount of initiator to encourage the complete combustion of the energetic material to be treated.

VII.F.1.k. Prior to each OD event, the treatment area shall be inspected to ensure that no livestock are present.

VII.F.1.l. The OD operations shall not generate noise or ground vibration at levels that will have an adverse effect on nearby onsite and offsite receptors. Operations shall not exceed local noise ordinances. Noise complaints shall be recorded in a noise complaint log.

VII.F.1.m. The Permittee shall have a noise management program.

VII.F.1.n. The Permittee shall have available, during each detonation, adequate fire protection equipment and containment measures to assure the confinement and control of any fire resulting from OD operations.

VII.F.1.o. To help prevent ground fires, during operations, litter, packing material, dry grass, leaves and other extraneous combustible material in the amount sufficient to spread fire, shall be removed within fire-break areas (200 foot radius from the pits).

VII.F.1.p. Any fires started from kick out from a detonation shall be extinguished as soon as possible. Uncontrolled fires will be addressed in accordance with Section 27.3 of Attachment 4 (Contingency Plan).

VII.F.1.q. The Permittee shall operate and maintain the detonation unit in the pits in accordance with the plans in Module VII Attachment 1, Open Detonation Operations.

VII.F.1.r. Open detonations shall not occur in more than one pit at one time.

VII.F.1.s. Following each open detonation treatment, inspections of the pits are conducted to ensure no low order detonation resulted. Should the rare event of a low order detonation occur in a pit, the proper amount of donor will be added to the pit and re-detonated the same day for purpose of the Demil Team's safety. Should the additional donor exceed the daily NEW limit, the Permittee will notify the Director within 7 days of the daily NEW limit exceedance. A low order detonation is when items in a pit incompletely detonate, leaving UXO.

VII.F.1.t. The Permittee shall conduct visual observations of sensitive areas adjacent to the OD ranges on the west and south as described in Section 4.0 of Module VII Attachment 1. Should kick out be observed going into these areas the Permittee shall inspect the areas observed to be impacted upon completion of the operations for the day to check for and treat any untreated munitions.

VII.F.2. The Permittee shall record in the OD operating record all unplanned discharges, fires and explosions, including all low order detonations, as specified in Utah Admin. Code R315-264-56(i).

VII.F.3. The Permittee shall record in the OD operating record the location of Material Potentially Presenting an Explosive Hazard (MPPEH) found during searches that is required to be treated in place and the date, time and method of treatment of the MPPEH.

VII.G. INSPECTION SCHEDULES AND PROCEDURES

VII.G.1. The Permittee shall inspect the OD units in accordance with the inspection requirements in Attachment 2 (Inspection Plan). The Permittee shall conduct inspections of the detonation pits each day of treatment.

VII.H. ENVIRONMENTAL MONITORING REQUIREMENTS

VII.H.1. Environmental monitoring requirements are discussed in Module VII Attachment 2, Environmental Performance Standards. Environmental monitoring of soil at the OD area shall be conducted in accordance with the monitoring frequencies, sampling locations, sampling methods, and analytical parameters, analytical methods, and quality control requirements specified in Section 5.0 of Module VII Attachment 2.

VII.I. FACILITY MODIFICATION/EXPANSION

VII.I.1. Modification of the design plans and specifications in Module VII Attachment 1, Open Detonation Operations and construction of additional treatment units shall be allowed only in accordance with Condition I.D.

VII.J. CLOSURE AND POST CLOSURE

VII.J.1. The Permittee shall close the OD units in accordance with the Closure Plan in Module VII Attachment 3 or conduct post-closure monitoring in accordance with Utah Admin. Code R315-264-110.

VII.K. OD OPERATING RECORD

VII.K.1. The Permittee shall maintain an operating record describing the OD activities. Portions of the operating record may be maintained at the area where the report is generated. For example, records of waste treated at the OD units may be maintained by ammunition operations personnel and kept in their office. The record shall include the following information:

VII.K.1.a. The requirements of Utah Admin. Code R315-264-73.

VII.K.1.b. Description and quantity (number and NEW) of each hazardous waste munition, initiators and donors received and treated at the OD units.

VII.K.1.c. Date and time of treatment.

VII.K.1.d. Copies of documents showing the disposition of residues transported off the OD area.

VII.K.1.e. An annual running total of the NEW of all energetics treated at the OD units.

VII.K.1.f. Meteorological conditions during each detonation as listed in Condition VII.F.1.e.

VII.K.1.g. All information to characterize waste. Information to support Condition VII.B.2.

VII.K.1.h. Copies of all completed demilitarization forms for all events.

VII.K.1.i. Output from the Munitions Mix Evaluator spreadsheet for all events, and the Buried Explosion Module for all detonation events involving fragmenting munitions.

VII.K.1.j. Document the results of searches, sweeps and inspections conducted in accordance with Condition VII.F.1.h and Module VII Attachment 1 prior to and following detonations.

VII.L. LAND USE PROVISIONS

VII.L.1. The Permittee shall evaluate the soil sampling data, air emission factors, land use, air modeling protocols and other pertinent inputs/drivers to the risk assessments in the Open Detonation Risk Management Plan, and incorporate any changes into the OD risk assessments, in accordance with the schedule in permit Condition VII.H.