

Tooele Army Depot – South Area
Module VII Attachment 1
Open Detonation Operations
March 24, 2020

**TOOELE ARMY DEPOT - SOUTH AREA
(TEAD-S)**

**MODULE VII
ATTACHMENT 1**

OPEN DETONATION OPERATIONS

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LIST OF ACRONYMS AND ABBREVIATIONS

DLADS	Defense Logistics Agency Disposition Services
OD	Open Detonation
TEAD-N	Tooele Army Depot North Area
TEAD-S	Tooele Army Depot South Area
UXO	Unexploded Ordnance

1.0 APPLICABILITY AS A MISCELLANEOUS UNIT

The Permittee conducts thermal treatment of conventional energetic material items at the Open Detonation (OD) Area. The principal work activities at the Tooele Army Depot – South Area (TEAD-S) are the shipping, receiving, maintenance and demilitarization of conventional munitions. The location of the OD Area is shown in Figure 1 and a detailed map showing the OD operations area is shown in Figures 2 and 3. Treatment by OD falls under the miscellaneous units' provision in Utah Admin. Code R315-264-600.

OD is used for treatment of energetic materials because this is the only safe and effective treatment process currently available for most energetic material items. The selection of OD is based on energetic material item-specific information developed by the U.S. Army, based on energetic material type and content, explosion potential, and historical experience. The U.S. Army is continuing to study and evaluate alternative treatment processes that may be used in the future, rather than OD, to treat appropriate energetic materials. The Permittee reports progress in developing alternative technologies as part of the annual waste minimization certification.

Because the OD treatment process is a non-continuous (i.e., batch) process, the facility is not subject to steady-state or “normal” operating conditions. Wastes are treated by the Demilitarization (Demil) Team following all DoD directives regarding explosive safety operations for the OD area and the conditions of this permit.

There are major advantages for using OD disposal practices. These include the following:

- Safety. Safety is the most important consideration. Strict observance of proven OD procedures has resulted in an excellent safety record being earned by the personnel who have helped to treat the many millions of pounds of waste military energetic materials safely over the last four decades at numerous DoD installations.
- Versatility. These types of operations are extremely versatile; large or small quantities of the myriad types of materials can be treated easily and safely.
- Reliability. Because of its inherent simplicity, OD is an extremely reliable process not subject to equipment downtime.
- Treatment Efficiency. OD is a very efficient treatment as demonstrated by testing.

2.0 HAZARDOUS WASTE STORAGE AND VARIANCE

The Permittee shall not treat nonreactive waste at the OD Units other than incidental packaging. A variance to treat solid waste is not needed.

Currently the Permittee only accepts off-site waste from Tooele Army Depot North Area (TEAD-N) for treatment at the OD Units. Munitions shall be treated the same day that they are received at the OD Units. In the case of weather delays, munitions shall be treated as soon as possible (generally within 24 hours). Should treatment be delayed, the munitions shall be stored in place, in accordance with Condition VII.F.1.f., until conditions permit treatment to commence. Weekly inspections for the munitions stored in the OD Units shall be conducted as outlined in Attachment 2, Inspection Plan.

3.0 DESCRIPTION AND OPERATION OF OD UNIT

The OD range is near the southeastern corner of TEAD-S (see Figure 1). Open Detonation will be conducted in pits located within a boxed area delineated by four corners (see Figure 2). The approximate GPS coordinates of the four corners that define the treatment area are as follows:

- 40.274642° N, 112.318203° W, and
- 40.273578° N, 112.323029° W, and
- 40.269579° N, 112.319799° W, and
- 40.269904° N, 112.315006° W.

The location of the operating pits shall be oriented such that they are a safe distance apart from each other. To ensure this, no more than ten pits will be aligned in any one direction within the treatment area. No more than twenty pits will be used for treatment within any permitted hour. The Permittee shall record the location of each pit that is used for OD operations.

OD is conducted in subsurface pits. The amount of earth cover is determined by the quantity of the net explosive weight (NEW) to be treated and, if fragmenting munitions are to be treated, the results of the Buried Explosion Module (BEM). Detonations of 0 to 50 pounds Net Explosive Weight (NEW) (including donor) require no earth cover; detonations of 51 to 5000 pounds NEW shall be covered with a minimum of 7 feet of earth cover. If required, additional earth cover will be added to ensure permissible fragmenting maximum distance as predicted by the BEM. Ammunition that contains submunitions shall be detonated in pits but shall not be buried¹.

There are no engineering plans or cross-sectional drawings of the OD Area because there are no engineered structures used in the OD process. Due to the nature of the OD operations, engineered features could be destroyed by detonation.

Prior to conducting OD, certain time and meteorological conditions must be met:

- OD may only occur April 1st through October 31st of each calendar year,
- OD may not be initiated prior to 11:00 a.m. Mountain Daylight Time,
- OD must be concluded at or before 6:00 p.m. Mountain Daylight Time,
- Sustained wind speeds must be greater than or equal to three (3) miles per hour (mph),
- Sustained wind speeds must be less than or equal to 20 mph,
- No wind gusts greater than 30 mph, and
- Operations must be postponed during or when any electrical storms are approaching within three miles, when there is a 50% chance or greater of a thunder storm or when there is a 75% chance or greater of snowstorms, or other precipitation events.

Meteorological data may be obtained from:

- Salt Lake City National Weather Services (<http://nimbo.wrh.moa.gov/slc>),
- AccuWeather (<http://accuweather.com>), and/or
- On-site meteorological instruments (maintained and calibrated as indicated below).

Weather Tower Meteorological Instruments Maintenance and Calibration Schedule		
Equipment	Requirement	Frequency
AWS310 Data Collection Platform	General inspection and maintenance of components	Annually

	Battery Replacement	Every 3-5 years
WA15 Heated Wind Set	General inspection and maintenance of components	Annually
	Replace Bearings	Annually
	Replace O-rings	Annually
PWD22 Present Weather Detector	General inspection and maintenance of components	Annually
	Calibrate visibility calibration	Every 6 months when in use
CL31 Ceilometer	General inspection and maintenance of components	Annually
SA20M Lightning	General inspection and maintenance of components	Annually

A determination is made prior to detonation whether to cease operations or to continue based on meteorological data. This information is recorded on the Demilitarization Approval Form. The demil operations are determined “GO” or “NO GO” by weather forecasts as described above. When forecasts indicate a “GO” condition, demil operations proceed. However, if the weather conditions deteriorate, as observed by the Demil Team Leader or his/her designated representative, he/she contacts the Demil Planner. A determination is made whether to continue the operation with the ammunition already in the pit or to store the ammunition in the pit and detonate it as soon as permit conditions allow.

The Demil Planner will annotate on the Demilitarization Approval Form that each organization has been notified. The Demil Planner phones the Demil Team Leader to inform whether the mission has been approved/disapproved. The Demil Team Leader phones the Demil Planner to tell when charges have been set and when the team is ready to detonate.

The design elements that are used to provide protection of human health and the environment include: using appropriate soil cover depending on treatment quantity; covering the munitions to appropriate depths; submunition type munitions will not be covered¹; locating the OD unit far from public roads and inhabited housing; only treating appropriate reactive materials; re-treating any unexploded ordnance (UXO); operating only during appropriate weather conditions; and restricting access to the unit by the use of warning signs, gates, and a surveillance team.

Prior to conducting OD operations, dry grass, leaves, and other combustible materials are cleared within a 61 meter (200 ft) radius from the pits.

The placement of the initiating charges and the amount of initiating charge are determined by the amount and nature of material being treated. Munitions are detonated by either non-electrical or electrical methods. The residues generated as a result of OD operations are metallic materials such as shell fragments (shrapnel) and occasionally MPPEH. The OD area shall be inspected for these materials that present an immediate threat following OD operations. The post operational inspection will consist of operators walking or driving along the inspection route indicated on the map in Figure 4 to verify complete treatment of munitions, ensure no low order detonations occurred, and identify any MPPEH posing an immediate threat. MPPEH that is determined safe to move shall be picked up and placed in a pit for the next detonation.

Any MPPEH found that is unsafe to move will be treated-in-place. The Demil leader/foreman will contact the planning division prior to detonating the MPPEH. Should the additional donor material cause

¹ Submunition type munitions are not covered to allow for verification that all the submunitions were detonated.

the permittee to exceed the NEW limit for the day contained in this permit an Emergency Permit shall be obtained from the Director of the Division of Waste Management and Radiation Control (Director). The treatment-in-place of the MPPEH and the additional material shall be documented on the Demil Approval form. Any MPPEH, resulting from OD operations, that is found in SWMU 1 will be removed from the area to a safe location to either treat in a pit or treat-in-place as previously discussed.

Low order detonations can be determined through the blast sound difference and/or post observation of the earth cover remaining on the pit. In the event of a low order detonation, the Demil leader/foreman will notify the Directorate of Ammunition Operations management, Environmental Management Division and the Safety Office. Designated personnel will attempt to determine the reason for the low order detonation. The minimum amount of earth cover shall be cleared away from the area, an assessment shall be conducted and the appropriate remedial actions determined. A request for additional donor material as, needed will be made, and the ammunition detonated. Should the additional donor material cause the permittee to exceed the NEW limit for the day contained in this permit an Emergency Permit shall be obtained from the Director. The additional material will be annotated on the Demil Approval form. The OD area shall remain closed while low order detonations are being uncovered and prepared for detonation.

During the phases of range operations a minimum of three (3) designated personnel will verify the counts from the firing points. All three personnel must have a consensus on the counts or the operations will be treated as a misfire.

A misfire is defined as failure of a component to fire or explode following an intentional attempt to cause an item to do so. A misfire may occur in spite of all precautions. No one will approach a misfire for at least 60 minutes. One qualified person will examine the misfire with a second qualified person acting as a safety backup. The safety backup shall stay clear of the immediate danger area and shall use natural barriers or obstructions for protection, but remain in a position to observe the actions of the person examining the misfire. The safety backup will be prepared to go to the aid of the person examining the misfire if an accident should occur. The OD area shall remain closed while misfires are being uncovered and prepared for detonation.

Analysis of the OD treatment residue is not conducted at TEAD-S. The Permittee periodically recovers scrap metal, casings, fragments, and related items from the OD area as resources allow, and based on the Demil Team Leader's judgment regarding safe operation of the range. The recovered material is disposed of through the Defense Logistics Agency Disposition Services (DLADS). The Demil team will inspect and document the recovered material to ensure it is explosive free. The Ammunition Surveillance Inspector will verify the documentation.

The munitions are on pallets that are transported to the OD pit via forklift. The palletized munitions are positioned to ensure complete detonation.

Upon completion of daily operations, all firing lanes shall be visually inspected. Firing wires shall be inspected for breaks or cuts, old blasting cap wires shall be removed and the lines shall be shunted.

4.0 MONITORING AND MAINTENANCE PLAN

The OD area shall be inspected before and after use. Prior to any detonation operations, the OD pits shall be inspected to ensure that they are:

- Free of water

- Free of glass, wood fragments, metal scraps, and debris, trash, obstacles, or tripping hazards
- Free of plant matter or other potentially combustible material.

As stated earlier, OD is a very efficient method of treatment; very little shrapnel remains in the OD unit. After each day of detonation operations, a search of the surrounding area shall be made for MPPEH as previously described. All MPPEH found must be detonated within two working days of the day they are found, or be stored within the pit(s) until permit conditions allow them to be detonated.

Figure 5 indicates the area adjacent to the OD range that is subject to visual observations during OD treatment operations in accordance with Condition VII.F.1.t. of Module VII. The Permittee shall conduct visual observations of area highlighted in Figure 5 looking for kick out going into these areas from OD treatment operations. Kick out is indicated by objects flying through the air and subsequent puffs of dirt from the ground or just objects flying through the air or puffs of dirt from the ground.

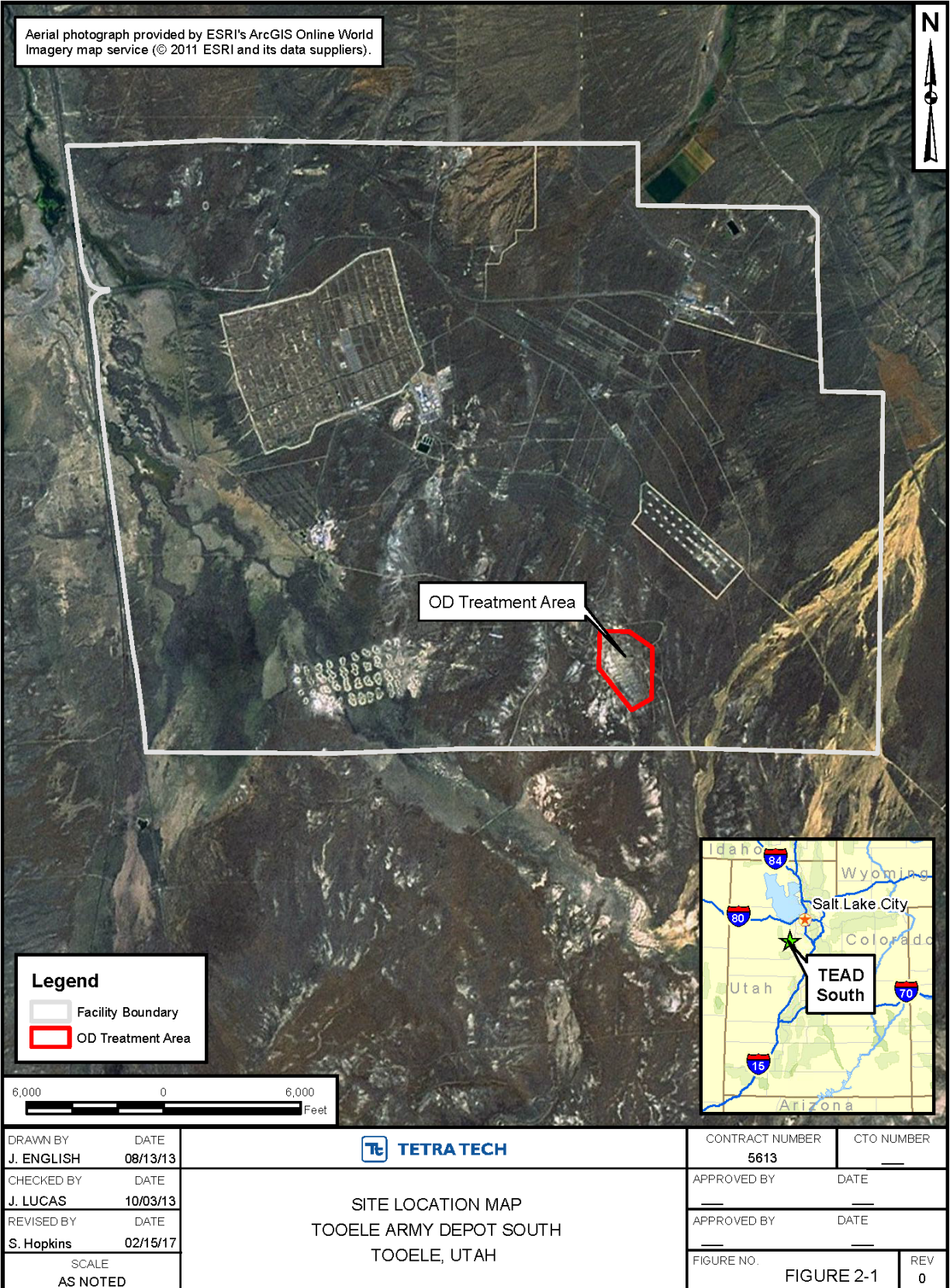
The visual observations shall be conducted for each new munition category type and/or NEW amount, if the NEW amount was increased from previous observation. If the view of the area to be visually observed is obstructed for any reason, an additional visual observation will be conducted during the next scheduled OD treatment operation.

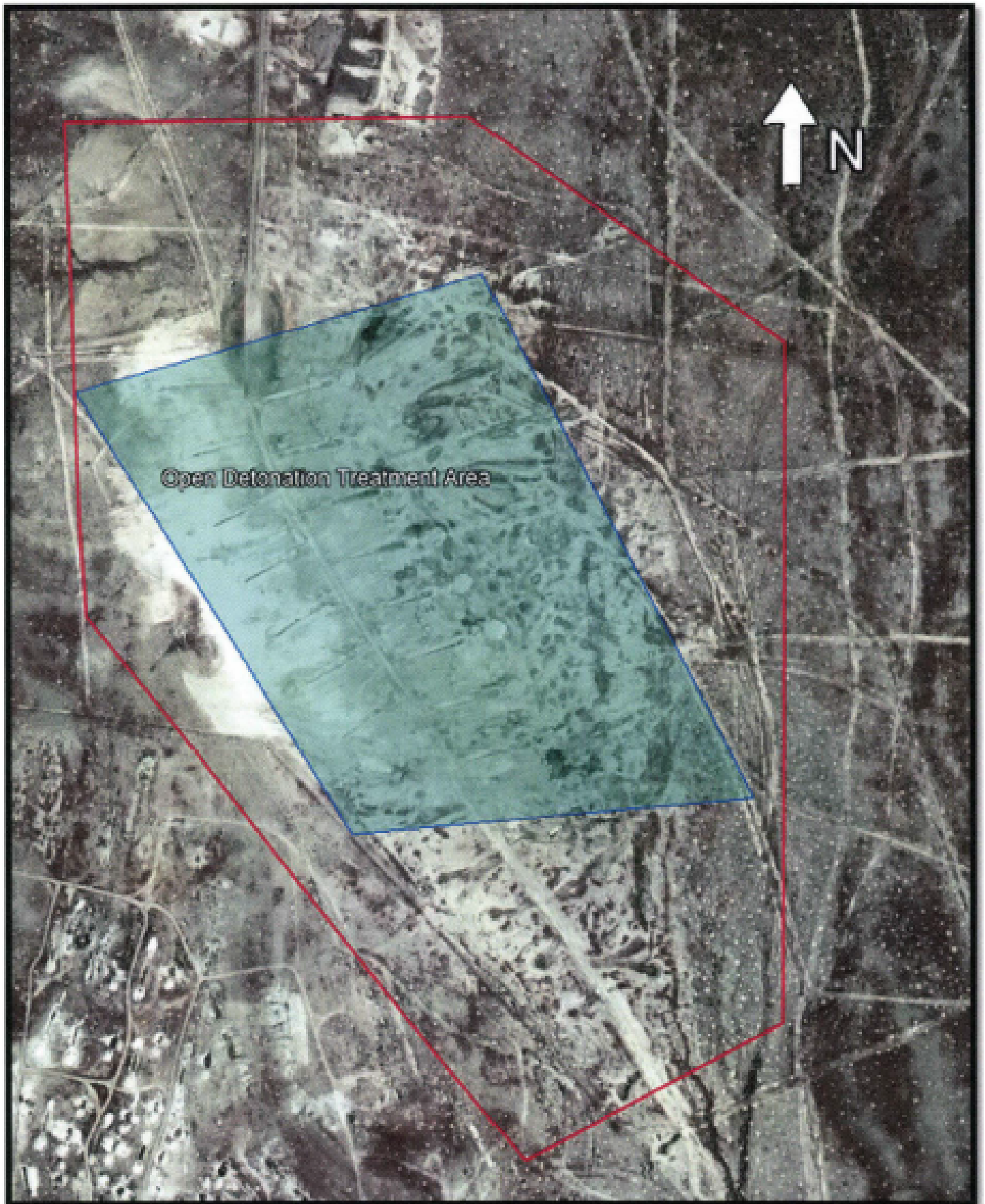
The Permittee shall record the date and time of the visual observation, the location of the visual observation and indicate what areas may have been impacted by kick out and require an inspection. The inspection of areas observed to be impacted shall be conducted upon completion of the operations for the day to check for and treat any untreated munitions.

5.0 RUNON AND RUNOFF MANAGEMENT

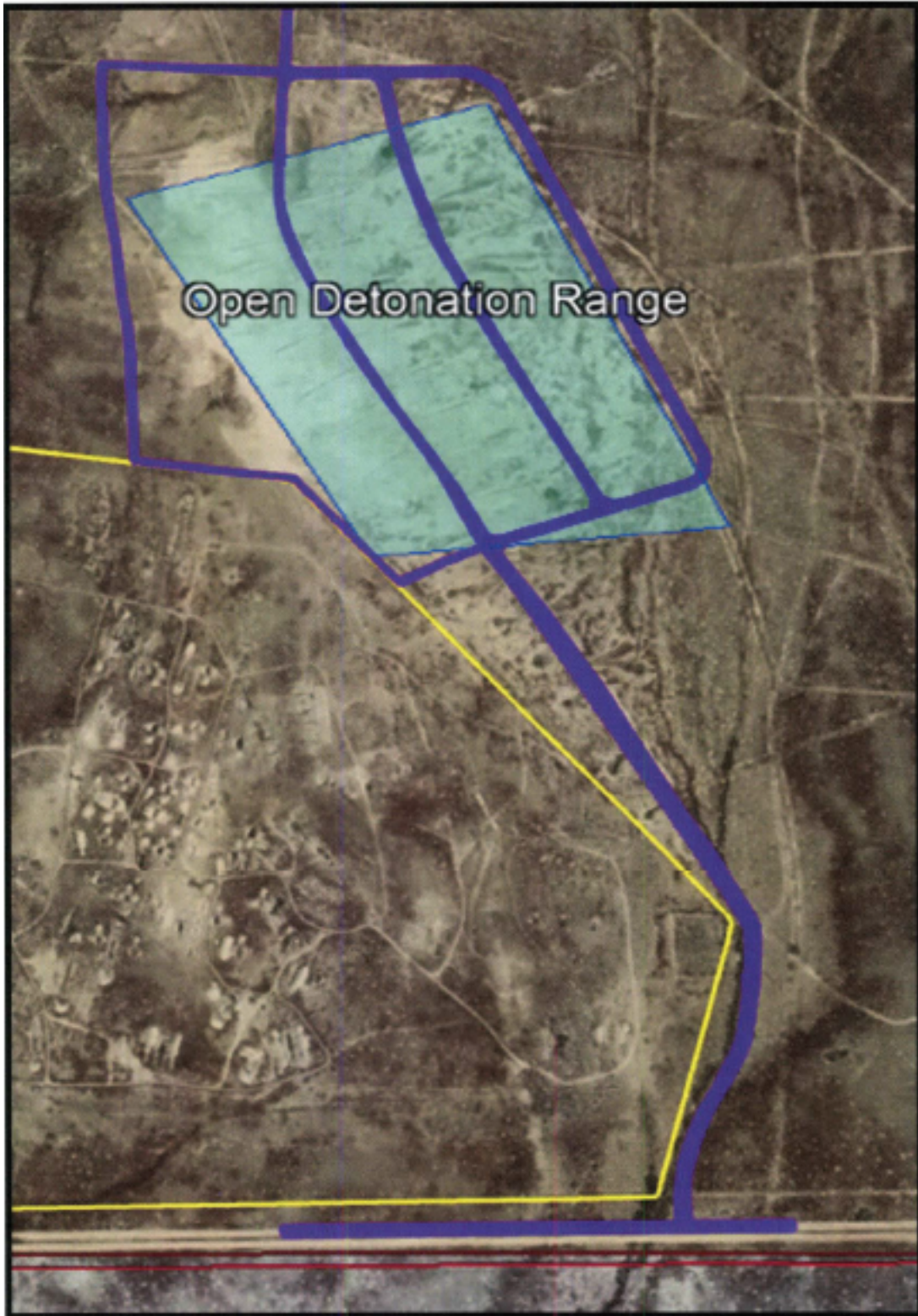
The process of OD disrupts several feet of soil. No perennial streams, rivers, lakes reservoirs, estuaries, or wetlands are located within five miles of the OD unit. Any small drainage channels that could flow through the unit and exit the unit to the south have been eliminated within the OD unit by grading of the site. Outside the boundaries of the unit, the ephemeral drainage channels are very difficult to locate on the ground surface. The OD unit has not been inundated with runon or runoff.

Precipitation should not contact the waste during OD because OD is not conducted during or prior to rain. Should conditions create delays, once the pits have been loaded, munitions will be stored and remain in place until detonations are permitted. After OD, the only remaining material, shrapnel, is visually inspected to make certain it does not contain any UXO. If UXO is found, the material is retreated.









 Inspection Route

Figure 5 –Visual Observation Area

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