The Tourtelot OE Remediation Project will investigate, detect, identify, and remove OE, OE scrap, and non-OE metallic debris from the Project Site.

2.0 REASON FOR ORDNANCE AND EXPLOSIVES

OE has either been located or is suspected on the entire Project Site addressed by this submission due to past DOD activities at the former Benicia Arsenal. The known, or suspected, OE contamination within each sector was evaluated during past site studies. Table C-2 presents the reasons for OE for the Project Site to be addressed by this submission.

Table C-2. Reason for OE by Project Area

Project Site Area	Reason for OE
South Valley	The potential exists for the area to contain OE since the site is within range of kick-outs from the suspected former demolition areas (Demolition Sites 1 and 3).
North Valley	The potential exists for the area to contain OE since OE was handled in this area.
Demolition Site 1	The potential exists for the area to contain OE since the site may have been used to explosively destroy ordnance in the 1950s
Demolition Site 3	The potential exists for the area to contain OE since the site was used to explosively destroy ordnance in the 1950s
Flare Site	Debris found prior to the EE/CA investigation indicates that flares were disposed of at this area.
TNT Strips	TNT-affected soil at concentrations greater than 10 percent by weight was found while sampling the unvegetated TNT Strips during the remedial investigation.

EE/CA = environmental evaluation/cost analysis
OE = ordnance and explosives

3.0 AMOUNT AND TYPE OF ORDNANCE AND EXPLOSIVES

The expected amount(s) and type(s) of OE expected for the Project Site are presented in Table C-3. The OE density estimates are based upon data collected during surface and intrusive sampling during the EE/CA, and the expected OE for each area is based on historical research.

Table C-3. OE Density Estimates for the Former Benicia Arsenal

Investigative Area	Minimum Estimated OE Density (OE per Acre)	Maximum Estimated OE Density (OE per acre)	Types of OE Expected
North Valley[a]	0.02	0.41	60mm mortar 40mm anti-aircraft HE
South Valley[b]	0.13	5.55	37mm projectile (fuzed) Expelling charges 76mm antipersonnel HE 40mm anti-aircraft HE 75mm shrapnel HE

Notes: (a) Density based on sampling data for Sector 3A.
(b) Density based on sampling data for Sector 3B.
HE = high explosive
mm = millimeter
OE = ordnance and explosives

Source: Final Former Benicia Arsenal EE/CA Report, 1998.

3.1 Site Description

For quantity distance (Q-D) purposes, 60mm mortar rockets and 37mm projectiles have been identified as the most probable munition (MPM) for the North and South Valleys, respectively, of the Project Site. The MPM is the round with the greatest fragment distance that can reasonably be expected to exist in any particular OE area. For each area of the Project Site, the MPM has been chosen based upon both historical and sampling data. Using the MPM for each area, the Minimum Separation Distance (MSD) has been calculated by USACE, as well as the 1/600 distance for each area. The MPMs, MSDs, and 1/600 Distances for the Project Site are listed in Table C-4. If, during the course of actual removal, it is determined that a different MPM is appropriate, then the MSD and Q-D arcs shall be determined and an amendment to the explosive safety submission shall be submitted for approval. Until the amendment is approved, the specified default distances in DOD 6055.9-STD, chapter 5, Table C5.T.1 will be used. USACE recommendations and calculations are provided in Appendix A. Procedures for the use of the 1/600 distances are discussed in Section 6.0 of this submission.

Table C-4. Tourtelot Remediation Project Site MPM, MSD, and 1/600 Distance

Project Area	MPM	MSD	1/600 Distance
North Valley	60mm mortar	1,080 feet	200 feet
South Valley	37mm projectile	1,181 feet	200 feet

mm = millimeter
MPM = Most Probable Munition
MSD = Minimum Separation Distance

3.2 Maximum Credible Event

TNT-affected soils with TNT concentrations equal to or greater than 10 percent are present in portions of the unvegetated portions of the TNT Strips situated on the north slope of the North Valley. An MSD of 412 feet has been calculated based on blast distance calculations derived from the potential net explosive weight of TNT in the soil. (Net explosive weight of TNT in soil = [soil volume x soil weight x percent TNT in soil]$^{1/3}$. The maximum TNT concentration at the site was 38 percent. Based on sample results, a radius of 2 feet and depth of 2 feet was used to calculate the soil volume. Based on these assumptions, the maximum credible event (MCE) is 10.3 pounds (i.e., maximum amount of TNT in soil). This calculation is based on the procedures included in *Ammunition and Explosive Safety Standards*, Department of the Army Pamphlet PAM 385-64. The calculation is provided in Appendix A.

4.0 START DATE

The projected start date is November 2001.

5.0 FROST LINE

Based upon data collected at the Project Site and presented in the draft final Tourtelot Cleanup RI/FS Report, the frost penetration depth for the Project Site is 0 inches.

6.0 CLEARANCE TECHNIQUES

This paragraph describes the techniques to be used to detect, recover, and destroy OE. These techniques will be implemented in accordance with the Tourtelot Project Site OE RDD.

6.1 Capabilities and Limitations of the Detection Method

An equipment performance verification test plot will be constructed and used to (1) determine the operational limitations of the selected geophysical methods to be used at the Project Site, and (2) define the remedial design depth criteria. The test plot will be used to verify the performance of electromagnetic (EM) instruments that will be deployed on the Project Site. Magnetometer systems have been excluded from consideration based on local geology and topography, and because the Project Site, like all demolition sites, possesses the potential to contain a significant population of nonferrous OE that cannot be detected with magnetometry systems.

The equipment test plot data will be used to generate site-specific detection performance curves. The curves will be used to determine the reliable depth at which the smallest MPM (37mm) will be detected below ground surface. This detection depth will be the design criteria for the remedial action.

6.2 Site Control During Ordnance and Explosives Operations

A fence has been installed to limit public access to the Project Site. A main access point to the Project Site has been established at the corner of McAllister and Rose Drive on the western approach to Panorama Drive (Gate #1), which is controlled by manned security guards. A secondary access gates is available. This gate is visible from the guard shack at the main access point. The second, an existing gate at the end of Kearney Street, will also be used (Gate #4). The Kearney Street gate will be used only by remediation personnel and will remain locked at all times. Access to the North Valley may be gained through private property bordering the Project Site on the east end of the North Valley (Gate #5) (Figure C-6A). There are two gates located along "Sewen Bench Road," Gate #3 at the west end and Gate #6 at the east end.

Signs have been attached at 200-foot intervals on the fencing along the north, east, and south portions of the Project Site boundaries, except along the fence on Rose Drive and Panorama Drive, where signs have been placed on stakes behind the fence. These signs read "Keep Out, Former Military Property, Hazardous Conditions May be Present" in English and Spanish. Signs have also been placed every 100 feet along the perimeter fence around the TNT Strips. These signs read: "Caution: Hazardous Substances Area, Unauthorized Persons Keep Out, Cal. EPA, DTSC – (916) 255-3545" in English and Spanish.

Visitors will be required to attend a safety briefing, sign visitor logs, and be escorted on site. Site-specific training will be conducted for all personnel at the beginning of the project and prior to commencing fieldwork. As new personnel arrive at the site, they will be provided site-specific training prior to commencing fieldwork.

The 1/600 distance (200 feet) will be implemented when performing any subsurface excavations and intrusive OE investigations to keep the community and remediation personnel not directly involved with OE detection and removal activities away from hazardous operations. Because of the proximity of residences to the remediation area, a clearly marked security boundary around each area within the public area bordering the Project Site will be established no later than 8:30 a.m. on the days that withdrawal of residents within the 1/600 distance is required. Roads will be blocked using traffic barricades. Between road access points, the boundary will be marked, as necessary, using yellow caution tape and signs. The marked security boundary will be removed as quickly as possible after completion of the intrusive work on the Project Site, but no later than 5:00 p.m.

A voluntary separation distance will be established for all residents living within the maximum fragmentation distance of the MPM (37mm HE projectile [1,181 feet] or 60mm mortar, [1,080 feet]). Residents, businesses, and schools within the voluntary separation distance will be notified of the OE remediation activities that are taking place on the Project Site and the risks associated with the work.

Notification will be made approximately 60 days prior to clearance activities and will be followed with a second notice approximately 10 days prior to clearance.

6.3 Surface Preparation

The Project Site will be cleared of vegetation to a height of 6 inches or less. If a surface OE or potential OE item is discovered during vegetation removal, the item will be clearly marked for avoidance and will be reported to the Senior UXO Supervisor (SUXOS) and the Project Manager for disposal as soon as they are discovered.

Interior fencing will be removed and disposed of to facilitate unobstructed access within the Project Site. Outer boundary and security fencing will be temporarily removed and reinstalled, as necessary, to allow geophysical mapping crews to map at the boundaries without interference from the fencing. Semipermanent markers (36-inch survey stakes) will be installed such that the entire search area is covered with a 100-foot by 100-foot reference grid mesh.

Thirteen soil/debris stockpiles are present on the Project Site. Construction debris will be inspected by UXO Technicians to ensure that it is free of OE; nonhazardous construction debris will be loaded onto trucks and hauled off site. Stockpiled soil on the Project Site will be geophysically scanned, anomaly locations will be intrusively explored, and the OE and OE scrap will be removed and disposed of as specified in Sections 6.8, 6.9, and 6.11.

6.4 Surface Clearance

UXO crews will clear each grid of any surface OE, OE scrap, or metallic debris, systematically sweeping the area using a 5-foot separation distance and visually inspecting the ground 2.5 feet to either side of each individual.

Hand-held all-metals detector will be used as an aid in locating surface debris, and differentially GPS units will be used to record the track of the sweep teams and for marking the surface location of OE items during the surface clearance. OE encountered during the surface search will be reported to the SUXOS. OE and potential items will be flagged for disposal operations. All OE, OE scrap, and metallic debris that could impact subsurface detection and mapping of potential OE sources will be removed.

To complete the surface clearance in the east (narrower) portion of the South Valley wetlands, the area must be dewatered. This will be accomplished through use of temporary dams with the water being pumped around the area to be surface cleared.

6.5 Subsurface Geophysical Survey

The entire surface area (approximately 220 acres) of the Project Site will be geophysically mapped using a vehicle-towed MTADS or a MPA MTADS to identify the subsurface locations of potential OE. Complete survey coverage will be obtained by ensuring overlap of the MTADS (and MPA MTADS) footprint through control of line spacings. Survey precision will be controlled by requiring replication of a standard geophysical response. GPS positional data will also meet a specified tolerance for replication of position over fixed, known points at the Project Site.

Where the vehicle-towed MTADS cannot be deployed, an MPA MTADS instrument will be used.

The wetlands areas will be divided into sections for geophysical survey operations. In areas where the wetlands are narrower (e.g., the east part of the valley), temporary wooden structures may be placed across the wetlands area to allow the geophysical crew to use the vehicle-towed MTADS to locate anomalies within the wetlands. In the wider areas of the wetlands (e.g., the west part of the valley) where access by the vehicle-towed MTADS would be problematic, an MPA MTADS (man-towed orraft-mounted) will be used. If testing to verify the effectiveness of floating the instruments shows that the method is not effective for detection of surface and subsurface anomalies, then these wetlands will be dewatered and a surface clearance will be accomplished before conducting the subsurface geophysical survey.

6.6 Subsurface Anomaly Excavation and Identification for Point and Areawide Clearance

Point clearance activities will be conducted across the entire Project Site to intrusively investigate all anomaly locations identified during the geophysical mapping to identify the anomaly source, as described in the following procedures. In the unlikely event that an accidental detonation or other emergency occurs, the emergency contingency plan in the OE SSHP will be followed. The Site Safety Officer (SSO) will be the primary contact and coordinator of all emergency activities.

- Anomaly locations will be recovered using an RTK GPS capable of submeter accuracy.

Data describing the anomaly sources discovered during the intrusive investigation process will be recorded and input into the site Geographic Information System (GIS) (database) for consideration in areawide clearance activities. Recorded data will include size, estimated weight, orientation, depth below ground surface, and description of the item excavated.

- Potential OE items will be handled as OE by the OE clearance crew, and potential OE and OE items will be left in place and flagged for further inspection by the demolition team.

- After the recovered items have been removed, the entire site will be scanned a second time for quality control (QC), as described in Section 6.10,

There are three sets of stockpiles on the site, the North Valley (North Valley Stockpiles #1, #2 and #3), the Ridge (Ridge stockpiles #1 through #9), and the D-1 Stockpiles. The Ridge and D-1 stockpiles are composed of dump fill and construction debris. Fill and construction debris were generated during the final phase of development of the adjacent Southampton Development. No OE or OE scrap is suspected to be encountered in these stockpiles. Stockpiles #3 in the North Valley is composed of soil and gravel removed from the Howitzer Test Tunnels. The gravel/debris and soil were screened for OE, and as much as possible were sorted into two stockpiles. One soil stockpile was relatively free of OE scrap; the other had gravel and small fragments of OE scrap. The two stockpiles were eventually consolidated into a single stockpile (Stockpile #3). Stockpiles #1 and #2 in the North Valley consist of asphalt and soil removed from beneath the Ammunition Renovation Area. No OE items were found in the area and none are expected based on the activities conducted in this area.

After removal of debris from the stockpiles, the stockpiles will be graded flat to facilitate geophysical scanning and removal of anomalies. Fill soils are present at the Project Site in Unit D-1 and the bottom of the North Valley. Stockpile and fill soils will be mapped with MPA MTADS or MTADS, and the anomalies will be removed. The cleared soil will be excavated to a depth of 6 inches less than the reliable depth of detection for the geophysical instrument. The process will be repeated until the excavation encounters the bottom of the stockpile or fill material.

Based upon the density of the anomalies within the South Valley wetlands, one of two methods may be used to recover, investigate, and remove anomalies. Water depth in the wetlands ranges from less than 6 inches to approximately 3 feet.

- The first method may require dewatering segments of the wetlands and would be used in areas with high anomaly density. It is anticipated that this method would be required in the east portion of the wetlands adjacent to suspected Demolition Site #1, and Demolition Site #3, and the Flare Site. This would be accomplished through use of temporary dams with the water being pumped around the area to be point cleared. Once the anomalies are recovered, the source will be removed, the area will be remapped, and the process repeated until two complete mapping and anomaly removal cycles have been completed. Segments will be established with a minimum of a 10-foot overlap to ensure detection and removal of anomalies.

- The second method involves use of a rigid, reusable sediment barrier that is approximately 8 feet in diameter. The barrier will be placed around the anomaly location, and the inside will be dewatered. This method will be used in areas with a low density of anomalies; it is anticipated to be used in the west portion of the South Valley wetlands.

After completion of point clearance and prior to the start of the additional OE clearance, an evaluation of the distribution of OE and OE scrap will be performed to assess if it is suspected that soils in an area below the depth of the geophysical scan contain OE. The goals of the evaluation will include:

- Identifying the patterns of OE and OE scrap items found at the Project Site
- Assessing whether areas where OE items were found are or are not considered to be "kicked out" of the demolition site(s)
- Defining the extent of the OE kick-out zone
- Defining other areas where OE was identified that is not associated with the kick-out zone.
- The project will evaluate if soils previously excavated and transported off site contain OE.

To complete the OE remediation, an areawide clearance will be conducted over those portions of the project site where future residential areas coincide with areas in which the site conceptual model indicated that OE/OE scrap may be present. Because open space parcels on the project site will not be subject to areawide clearance and geophysical equipment is not 100 percent reliable in detecting anomalies at depth, there exists the possibility that those areas may have OE/OE scrap present after completion of OE point clearance activities. Therefore, it was determined that institutional controls would be appropriate for the open space parcels. Institutional controls will not be necessary for residential areas because of the added remedial measure of areawide clearance.
Based on these data, DTSC, USACE, the remediation contractor, and Granite will establish kick-out radii for OE and OE scrap, defined as the farthest distance to an item thought to be kicked out in the pattern from the center of the nearest identified demolition site. The OE kick-out radii will incorporate a determination as to how far out an OE item must be beyond the pattern of OE finds to determine that the item is an outlier. If an item is found to be an outlier and meets the criteria for further OE clearance (areawide clearance), then a buffer zone of a 200-foot radius beyond the location of the OE item will be established.

Areawide clearance will be conducted on the Project Site to complete OE remediation. Areawide clearance is the removal of soil that is suspected of containing OE below the depth of the previous OE cleanup activity or that is associated with an outlier and is within a future residential area. The areawide clearance will continue until two consecutive lifts of soil that do not contain OE or OE scrap are removed and no deeper anomalies are detected. A lift of soil ranges from 12 to 18 inches in thickness.

Soil within grids requiring areawide clearance, as determined by the final site conceptual model, will be scanned, point cleared, excavated, and placed in the North Valley as engineered fill. Soil will be excavated in lifts no greater than 6 inches less than the reliable depth established for digital geophysical surveys.

After the first lift is removed, the excavated surface will be scanned using the procedures for real-time surveys and any anomalies will be point cleared. The excavated soil will be scanned in 8-inch lifts as it is being placed as engineered fill in the North Valley. If no OE or OE scrap are found under the excavated surface or within the soil as it is placed in the North Valley, the lift will be considered a clear lift. If two consecutive clear lifts are found, the remaining soil will be removed by grading and deposited in the North Valley as engineered fill without scanning. If OE or OE scrap is found in a lift, then the scanning and excavation will continue until two consecutive clear lifts are found or bedrock is encountered.

6.7 Operations in Populated/Sensitive Areas

OE remediation activities conducted under this submission will be performed in close proximity to populated areas in both sectors (North Valley Sector and South Valley Sector). The populated areas include roadways, residences, and businesses. These populated areas lie within the MSD for the MPM in each sector. Based on the justifications and approval provided in Appendix A, the remediation contractor will use the 1/600 distance as the MSD for each sector and will clear all grids up to the 1/600 distance based on the MPM for each sector. Any grids that require clearance within the 1/600 distance will only be cleared after the withdrawal of all occupied buildings has been conducted. Withdrawals will be coordinated by the remediation contractor with the assistance of public officials and law enforcement.

6.8 Engineering Controls

Engineering controls for demolition of OE will be used as delineated in the CEHNC document *Use of Sand Bags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions* HNC-ED-CS-S 98-7 and approved by the Department of Defense Explosives Safety Board (DDESB) on February 23, 1999. These controls will be applied as necessary to mitigate fragmentation and blast hazards created during open detonation demolition operations, which will be required on site in the event a blast chamber cannot be used (e.g., OE items that are too large to be safely destroyed in the chamber, items that are not safe to move). Additionally, tamping may be used to control fragmentation blast and noise. Tamping will be conducted in accordance with guidance provided by the CEHNC using the *Buried Explosion Module (BEM), A Method for Determining the Effects of Detonation of a Buried Munition* HNC-ED-CS-S 97-7, Rev. 1, and approved by DDESB on November 3, 1998. The UXO Safety Officer (UXOSO) and CEHNC On-site Safety Specialist (OSS) will coordinate and determine the appropriate engineering controls that will be needed during demolition operations. A miniature open front barricade will also be available and may be used for excavation of anomalies (*Miniature Open Front Barricade*, HNC-ED-CS-S 98-8, and approved by DDESB on February 28, 1999).

6.9 Demolition Operations

UXO personnel will dispose of OE that cannot be moved on a daily basis. OE that can be moved will be consolidated in magazines and disposed of at the end of each work week, or as necessary in the event on-site magazines will exceed regulated N.E.W. These OE items will be disposed of in the Donovan T-10 self-contained blast chamber that will be deployed and set up on the Project Site (Figure C-7). Operation of the chamber will be IAW DDESB approval documentation and DEMIL Standard Operation Procedures (Appendix N of the Tourtelot Project Site Ordnance and Explosives Remedial Design Document Benicia, California, 2002). If OE items exceed the capacity (net explosive weight) of the on-site blast chamber, they will be detonated at a designated on-site demolition area. This area will be used only as a contingency, if required. If an OE item cannot be moved, it will be blown in place after authorization has been received to conduct the procedure from DTSC and USACE. If demolition operations can not be conducted at the time the item is located, the item will be secured with sandbags in place and security will be provided 24 hours a day until the item is disposed of.

At a minimum, the OE disposal operations team will consist of three UXO-qualified individuals, including the SSO, UXO Demolition Supervisor, and a UXO Technician. These operations will be performed under the direction and supervision of the SUXOS. All on site personnel have stop work authority in the event they observe an unsafe condition on site. The SSO and OSS will monitor compliance with the safety measures contained in the OE Site-Specific Safety and Health Plan (SSHP). In the event of noncompliance, the SSO will stop or suspend operations until the operations are in compliance. Demolition activities are inherently hazardous and require strict adherence to approved safety and operational procedures. Violations of procedures may result in immediate removal of the violating party from this project. A contingency plan will be implemented for on-site detonation at a constructed demolition site of safe-to-move OE items that are too large to be destroyed in the blast chamber. The designated demolition site will be cleared of any potential OE prior to construction. After explosive disposal of OE, the open demolition site will be tested and treated for toxic substances in accordance with the non-OE RDD. The sites used for BIP demolition of OE will be left unearthed and positively marked for follow-on testing in accordance with the non-OE RDD.

All open demolition operations will be conducted by safely detonating OE items using the Standard Operating Procedures for OE Demolition/Disposal Operations (Appendix B); and Technical Manual (TM) 60A-1-1-31; CEHNC *Safety Concepts and Basic Considerations for Unexploded Ordnance (UXO)*, dated May 22, 2000; and CEHNC-approved engineering controls, as specified in HNC-ED-CS-S-98-7, August 1998, to control/minimize hazards of blast and fragmentation. In all cases, disposal operations will be performed between 9:00 a.m. and 3:00 p.m., Monday through Friday, and will not be conducted during days of low cloud cover or temperature inversions, which could amplify the noise associated with detonations and adversely affect local residences.

After approval from DTSC and USACE, authority to initiate the demolition shot setup and the detonation will rest solely with the SUXOS. Prior to authorizing the detonation of explosive charges, the SUXOS is responsible for ensuring that all personnel have been evacuated from the demolition area, all personnel have been accounted for, all pertinent parties have been notified of an impending demolition shot, and the area is secure. The SUXOS will notify the local fire department of the location and approximate times prior to detonation.

Upon completion of demolition operations, the demolition team will visually inspect each demolition shot. Upon completion of this inspection and assuming there are no residual hazards, the SUXOS will authorize the resumption of site operations.

6.10 Quality Assurance/Quality Control

Pass/fail detection performance criteria for the geophysical systems to be used will be detection of the smallest MPM to the system-reliable depth. This will be tested and verified for each system deployed prior to its use at the Project Site. A QC check of the detection and removal efficiency of the point clearance process will be performed by remapping the entire site along parallel transects, recovering and investigating any newly discovered anomalies, and categorizing the anomaly sources. Remapping will provide coverage of 100 percent of the site. The procedures for this second mapping episode will be exactly those used for the initial mapping. All data will be digitally captured, instrument stations will be recorded in state plan's coordinates using GPS position coincident with the geophysical measurement. These data will be processed, anomalies identified, and each target investigated by intrusive exploration, as described above. Discovery of any OE or OE-like items during the second round of intrusive investigations will require remapping and investigation of the failed grid and the eight surrounding grids. OE-like items are defined as an item with a similar geophysical signature as an OE item. After the mapping/intrusive investigation activities are complete, a QC evaluation will be performed and documented. An independent quality assurance (QA) contractor will oversee all OE operations. The QA contractor will check conformances with the QC Plan by the OE remediation contractor.

6.11 Ordnance and Explosives Scrap Inspection/Disposal

All non-OE scrap and OE scrap, including inert OE items, will be inspected by UXO technicians in accordance with Chapter 4.0 of the OE RDD. All non-OE scrap, OE scrap, and inert OE items will be segregated as it is inspected.

Prior to moving the OE scrap to a secure central collection it will be reinspected by the demolition team and transported to the secure storage.

The SUXOS and the UXO QC Supervisor will perform a final inspection of the OE scrap at the central collection point, place it in secure locked storage containers, and certify it to be free of any explosive hazard. The SUXOS and UXO QC Supervisor will then sign and annotate a Release/Receipt Document with the

following statement: "I certify that the property listed hereon has been inspected by me and, to the best of my knowledge and belief, contains no items of a dangerous nature."

The OE Scrap collected during field activities will be stored in lockable storage containers that will be secured at the end of each work day. Prior to shipment of all OE scrap to a local scrap dealer, the scrap will be inspected on all sides (inside and outside) to ensure that no HE or hazardous materials are present and, if necessary, the item will be rendered such as not to resemble an OE item.

Following the final inspection, the containerized OE scrap will be picked up and delivered to a local scrap dealer for recycling.

6.12 TNT-Affected Soils

Homogenization of TNT-affected soil will be a two-step process. If there is no evidence of metallic OE or OE scrap in the TNT Strips and after the strip has been adequately watered to reduce the explosive potential, the first step will be for a 2-foot layer to be completely turned using a narrow-width deep plow pulled behind a 4-wheel drive, rubber-tired tractor. If the conceptual site model indicates that OE/OE scrap may be present the thickness of the first layer will be 6 inches less than the reliable detection depth of the instrumentation used to clear the site. The goal of this plowing step is to bring the soil at the bottom of the layer to the top surface. The total number of passes of this plowing process for any homogenization zone will be dependent on the actual subsurface conditions encountered in the field, but will likely require multiple passes. Once the soil has been turned, a narrow-width form disc attachment will be used to declamp and fully homogenize the soil to complete the two step process.

The tractor planned to pull the plow and disc implements will have a fully enclosed cab that is air conditioned. The tractor doors and windows will be closed and latched during the homogenization operations. The back window of the tractor or other windows in a direct path of potential soil particles will be equipped with a 4-ply Lexan plate (Underwriters Laboratory listed 752PSA [Level 3]) of an approximate 1.3-inch thickness. The side and front windows not in a direct path of potential fragments will be equipped with Lexan CTG plate (in accordance with ANSI Z87.1989) of approximate 1/8-inch thickness. In addition, air monitoring instrumentation required for personnel safety will be mounted inside the cab and monitored by the OE Contractor or UXO SSO, and placed just outside the MSD at the downwind side of the affected area and monitored by the UXO SSO.

Only essential personnel required to operate the equipment will be inside the MSD during the homogenization operations. The equipment operator will wear a protective vest and helmet during all homogenization operations.
After the initial homogenization activity is completed and the field and laboratory sampling results are below 10 percent TNT concentration by weight, confirmation samples will be obtained. One confirmation soil sample will be collected from each side wall and one from the bottom of the excavation at each 50-foot intervals

following excavation of the first lift. In addition, bottom samples will be taken in the locations previously identified as having TNT concentrations in excess of 10 percent. These samples will be homogenized and screened for TNT by field screening methods and, if less than the excavation action level for TNT (10 percent by weight), sent off site for explosives analysis using EPA Method 8330. If the TNT concentrations in the side wall confirmation and/or bottom samples are below 10 percent, the homogenization process will be halted. Further excavation will be as described in the non-OE RDD for excavation of TNT soil to below the anticipated post-excavation risk assessment clean up levels.

Confirmation samples will be collected in accordance with methods detailed in the non-OE RDD. The procedures for sample collection are summarized as follows:

- Homogenization confirmation samples will be collected using a hand auger. A 0- to 2-foot sample will be collected for field screening and off-site analysis.

- Excavation side wall and bottom samples will be collected using a long-handled sampler from the top of the excavation or will be collected from a excavator bucket.

If OE/OE scrap might have been present, the soils remaining after soils containing 10 percent or more of explosives have been removed will be subject to areawide clearance protocols.

7.0 ALTERNATIVE TECHNIQUES

No other disposal techniques are anticipated for this OE removal action.

8.0 OFF-SITE DESTRUCTION

No off-site destruction of recovered OE is anticipated for this OE removal action. All demolition operations will be conducted in accordance with Section 6.9.

9.0 TECHNICAL SUPPORT

All on-site UXO personnel will meet the training/experience requirements required by USACE, Sacramento District.

No chemical warfare material (CWM) is suspected at the Project Site. Additionally, the OE remediation contractor personnel will positively identify all OE items prior to movement or disposal. If suspected CWM is found, or if an OE item cannot be positively identified, the Sacramento District OSS will request military support from the Technical Escort Unit or the 787th Ordnance Company, Moffit Field, California.

10.0 LAND USE RESTRICTIONS

The City of Benicia Zoning Ordinance establishes permitted land uses for specific properties within the City. Land uses designated for the Project Site are single-family residential, general open space, and parks. The Unit D-1 portion of the site, which is south of the South Valley, has been graded for residential development, with streets and utilities installed. One unoccupied house has been constructed in the Unit D-1 area. The Ridge, a majority of the North Valley, and Unit D-1 areas are planned as a residential development. The South Valley will remain as open space (Figure C-6). Institutional controls will be applied to portions of the Project Site through a Covenant to Restrict Use of Property recorded with Solano County. The institutional controls will affect the paved streets and sidewalks in Unit D-1 and the open space parcels in the North and South Valleys and on the McAllister Drive Land Bridge. The restrictions will permanently apply to the affected areas and will restrict any excavation or other activities that would penetrate the ground. Any planned excavation in the this area will require that notice be provided to the City of Benicia, California Department of Toxic Substance Control (DTSC), and the USACE, Sacramento District, and that the activities would only be conducted using support by UXO technicians. The restrictions will also prevent the owners of the affected areas from obtaining any change in the land use designation or zoning for the North and South Valley open space parcels without written approval of DTSC.

11.0 PUBLIC INVOLVEMENT

The adjoining community and other interested parties will be informed of the activities conducted at the Project Site, in accordance with the Public Participation Plan (PPP) and the final Minimum Separation Area (MSA) Notification and Implementation Plan (MSAP) that has been prepared for the site. Public meetings will be held and fact sheets prepared as major milestones in the OE removal are achieved, in accordance with the PPP for the Project Site (Granite Management Corporation, September 1999).

The process for providing information to the community, including public meetings, is described in the MSAP. Prior to initiation of any proposed activities, businesses and residents near the Project Site will be informed of the proposed project activities. This notification will include information on a 24-hour public information telephone line that will be established and maintained to provide updated information on project activities, including information on planned or accidental detonations of OE, if applicable. The telephone line will also allow residents and businesses to express concerns or ask questions regarding project activities. All appropriate city, county, state, and federal officials will also be kept informed by direct mail and telephone notification.

12.0 QUANTITY DISTANCE

MSDs and 1/600 distance restrictions from the OE areas to non-project personnel will be applied during all intrusive OE investigation and removal operations being conducted. The MSDs and 1/600 distance identified by the CEHNC for each

sector are presented in Table C-4 of this document. During anomaly investigations where an unintentional detonation may occur, the 1/600 distances in Table C-4 will be applied. Preliminary site work (e.g., surveying, laying out grids, surface clearance of construction debris, brush clearance, surface clearance of non OE and OE scrap, geophysical mapping) does not require the establishment of an MSD for Q-D purposes. At any time that an OE item is unexpectedly discovered during a site preparation activity work will stop and the 1/600 distance will be immediately enforced. For intentional detonations, an engineering control such as those described in Section 6.8 of this document will be used. The MSDs for sandbag enclosures for the MPMs (37mm and 60mm) as presented in the MSD calculation sheets in Appendix A will be used. Project personnel are defined as those on-site contractor and DOD personnel required to participate in the OE removal. All other personnel are non-project related and are not authorized to be within the 1/600 distance while work is in progress.

For the OE remediation sites addressed in this ESS, the outer boundaries of the MSD arcs and 1/600 distance arcs shown on the site map were measured from the outer boundaries of each sector (Figure C-7). All QD areas during field activities will be measured from the perimeter of the grids where intrusive work is actually being conducted. The team separation distance at each site will be 200 feet, which is greater that the K50 over pressure for the MPMs listed.

12.1 Ordnance and Explosives Area(s)

The 1/600 distance must be maintained during the excavation of OE-related anomalies. The MSDs for sandbag enclosures for the MPMs as presented in the MSD calculation sheets in Appendix A will be used for the disposal of OE. An MSD of 412 feet must be maintained for homogenization of TNT-affected soils with a TNT concentration of 10 percent or more by weight. Only OE excavation crews, geophysical crews, and other support crews that are essential to the OE remediation on the Project Site will be allowed within the 1/600 distance. However, a safe separation distance of not less than 200 feet must be maintained at all times between the various work crews.

12.2 Magazines

There are two approved BATF Type 2 outdoor storage magazines at the Project Site (see Figure C-7). These will be used by the remediation contractor during this project. The OE remediation contractor will ensure that the proper permitting is maintained throughout the project, and that magazine siting criteria IAW, USACE, EP 1110-1-10, Ordnance and Explosive Response Procedures, and quantity distance requirements established in DOD 6055.9, STD, DOD Ammunition and Explosives Safety Standards are maintained. The on-site magazines are barricaded and have a separation distance from each other of more than 200 feet and are over 600 feet from the closest inhabited building. The remediation contractor will set a limit of not more than 25 pounds per magazine to equal not more than 50 pounds Net Explosive Weight (N.E.W.) on site at any given time. Both of these magazines are designated as a hazard division 1.1. The magazines

are inside a fenced area and are patrolled by a professional security force 24 hours per day, 7 days per week.

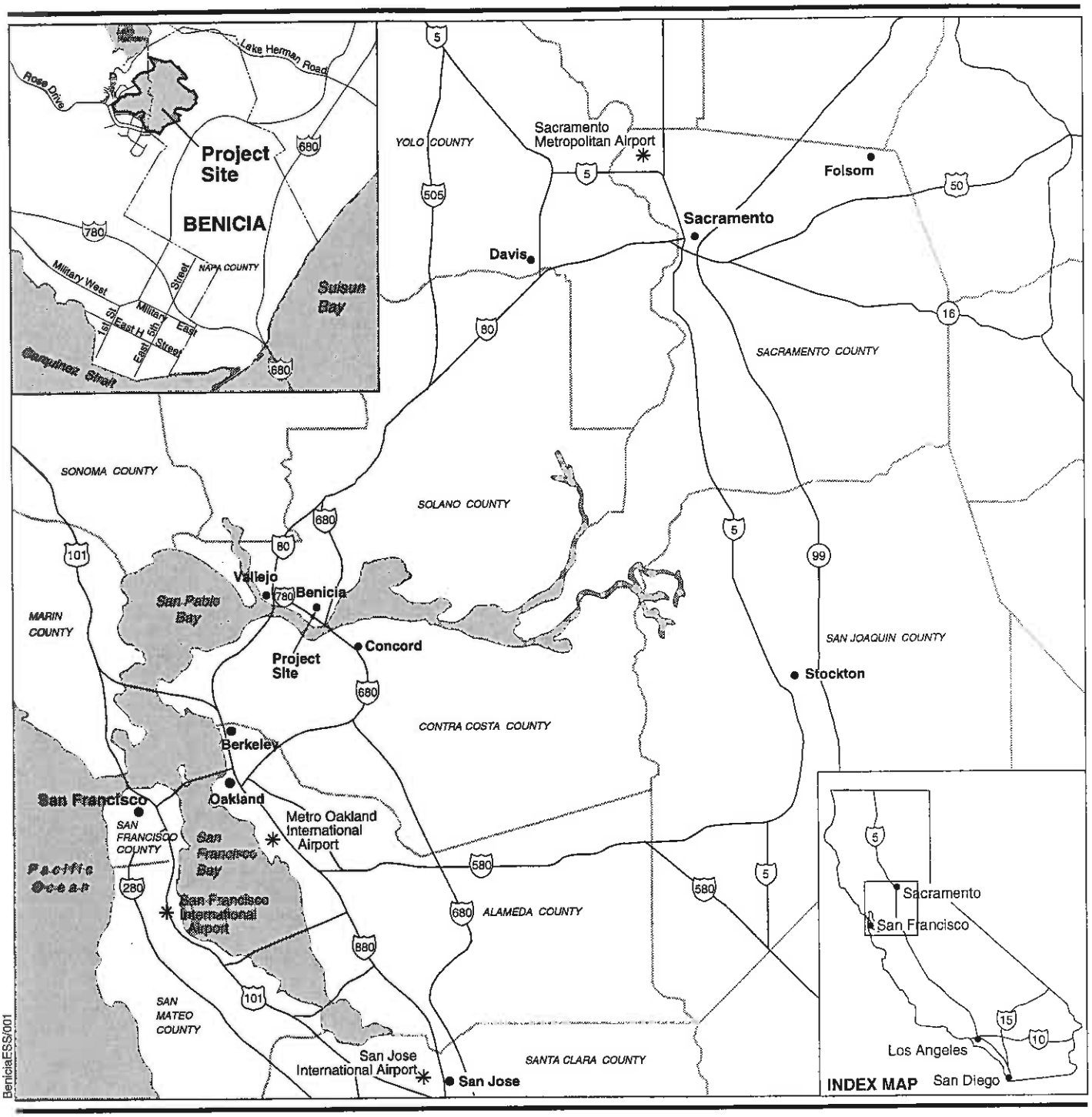
Explosives to be used for demolition will be provided daily as required and will be delivered to the site in day boxes. Under no circumstances will explosive demolition materials be stored on site.

12.3 Planned or Established Demolition Areas

If safe-to-move OE items that are too large to be destroyed in the blast chamber are discovered, a demolition site will be constructed at the site of the former Howitzer Test Facility to allow safe on-site detonation (see Figure C-7). Construction of the demolition site will include a pliable liner under 3 feet of native soil. A berm will be constructed around the area. A hose will be placed at the bottom of the demolition site, leading out of the demolition area, and capped. This hose will be used to pump any water that may collect in the demolition area into 55-gallon drums. A cover will be placed over the demolition area when it is not in use to reduce fugitive dust and to prevent rain water from entering the area. At the completion of the OE Remediation, the soils in the demolition area will be tested for appropriate chemicals and, if the concentrations exceed cleanup goals, the soil will be removed from the Project Site. The sites used for disposal of OE and OE scrap where explosives are used as the disposal method will be tested and treated for toxic substances in accordance with the Non-OE Remedial Design Document. The sites used for BIP demolition of OE will be left unearthed and positively marked for follow-on testing.

12.4 Collection Points

Collection points are areas used to temporarily accumulate OE within a search grid pending destruction in consolidated shots. Consolidating multiple OE for in-grid consolidated shots will not be conducted at the Project Site. OE that is safe to move will be moved to the magazine area for on-site storage for disposal at the end of the work week.



EXPLANATION

- ✱ Airports
- (99) California State Highway
- (101) U.S. Highway
- (280) Interstate Highway
- County Boundary

0 3.5 7 14 Miles

Regional Map

Final

Figure C-1

EXPLANATION

- Single Family Residential
- General Open Space
- Parks
- Light Industrial
- School
- Medium Density Residential
- General Industrial
- Jurisdictional Wetlands
- Project Site Boundary

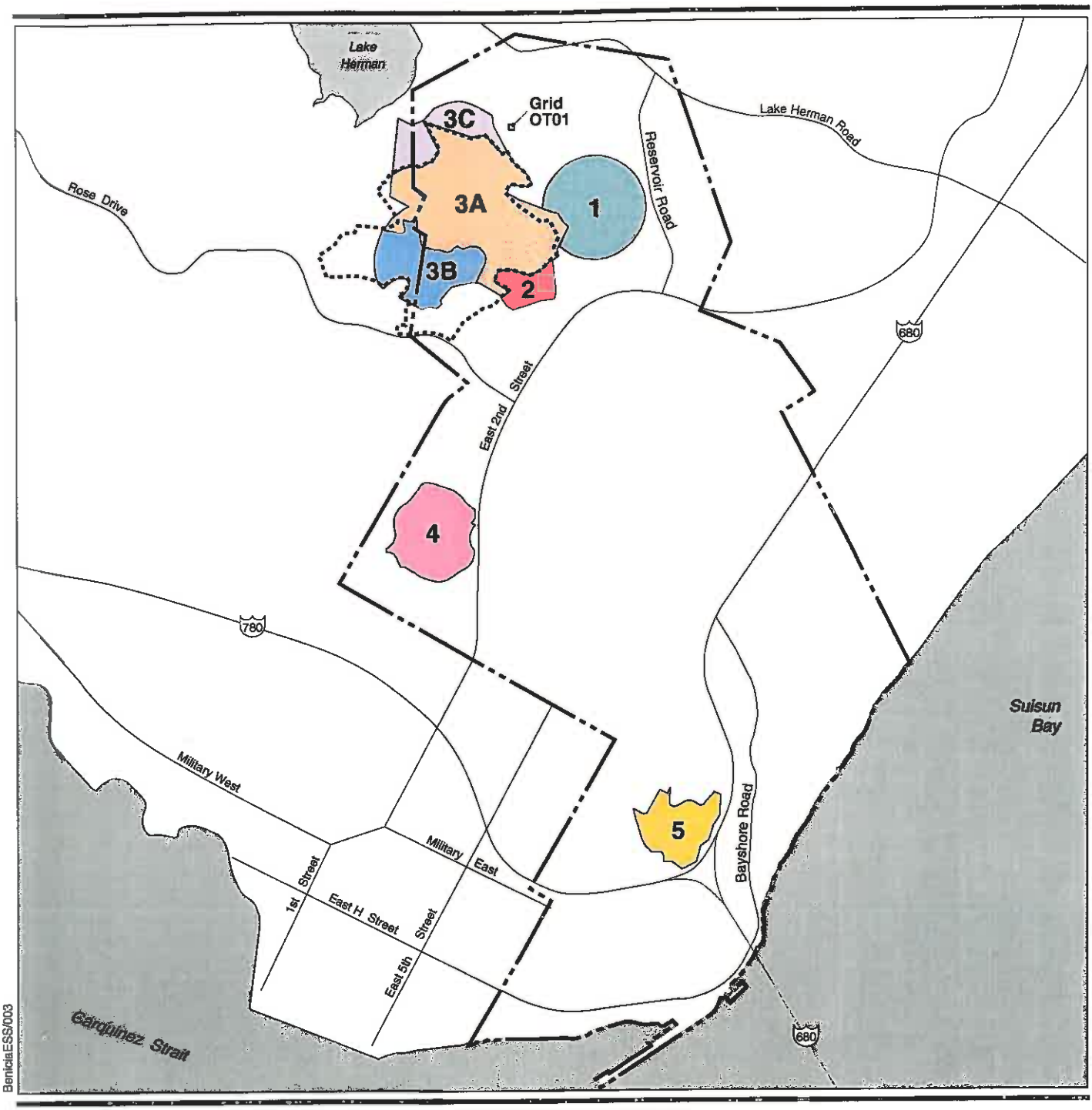
0 250 500 1000 Feet

Note: Contour interval equals 25 feet.

Site Location

Final

Figure C-2



EXPLANATION

- Sector 1 Revetment Area (68 acres)
- Sector 2 Artillery Test Area (15 acres)
- Sector 3A Howitzer Test Area (131 acres)
- Sector 3B Demolition Area (47 acres)
- Sector 3C City Property (34 acres)
- Sector 4 Demolition Site on Exxon Property (54 acres)
- Sector 5 Camel Barn Area (35 acres)
- Grid OT01 Overturned Truck Area (0.23 acre)

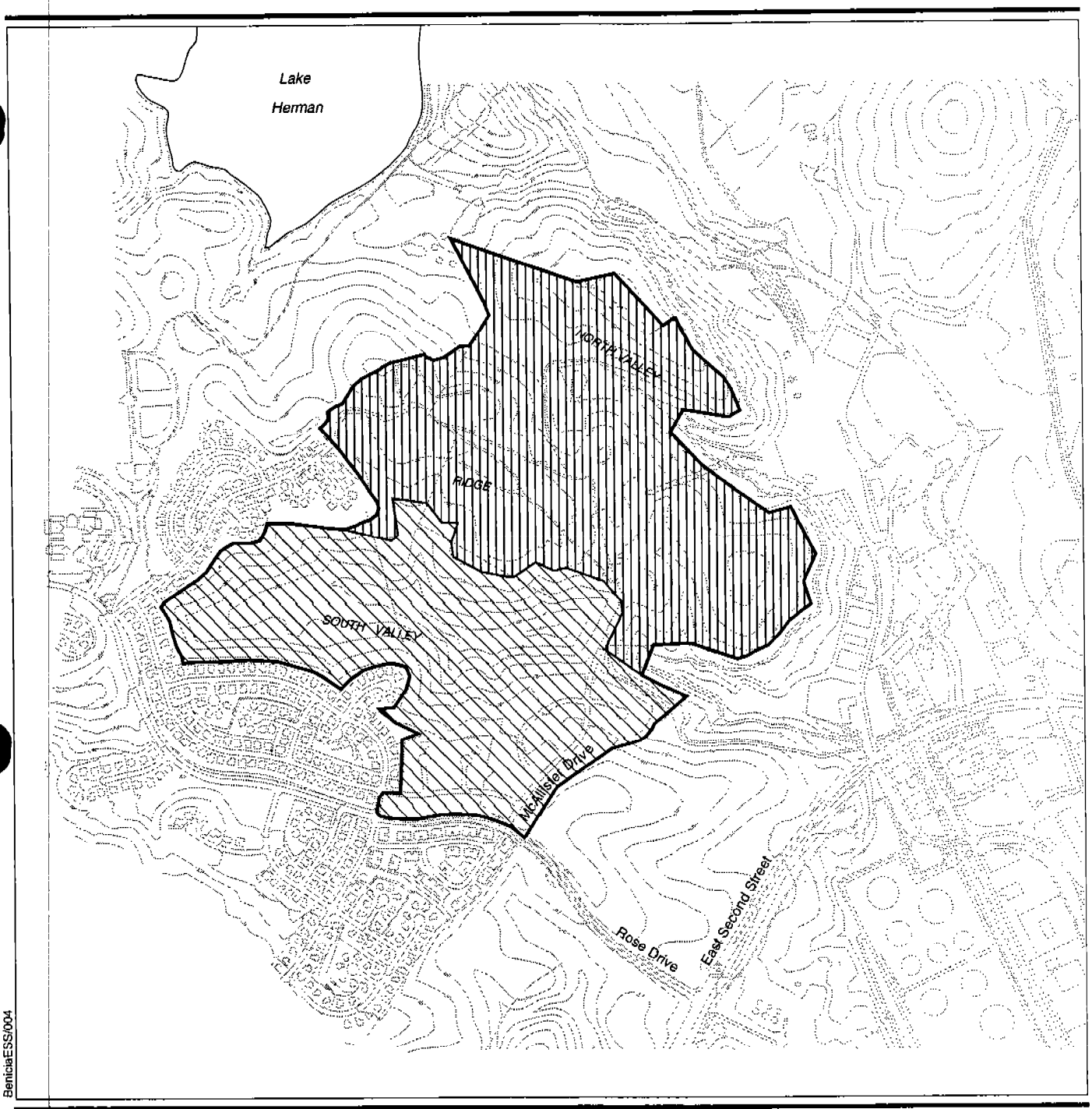
- 680 Interstate Highway
- Former Benicia Arsenal Boundary (estimated)
- Tourtelot Project Boundary

0 .125 .25 .5 Mile

Former Benicia Arsenal Sectors

Final

Figure C-3



BeniciaESS/004

EXPLANATION

- North Valley
- South Valley
- Project Boundary

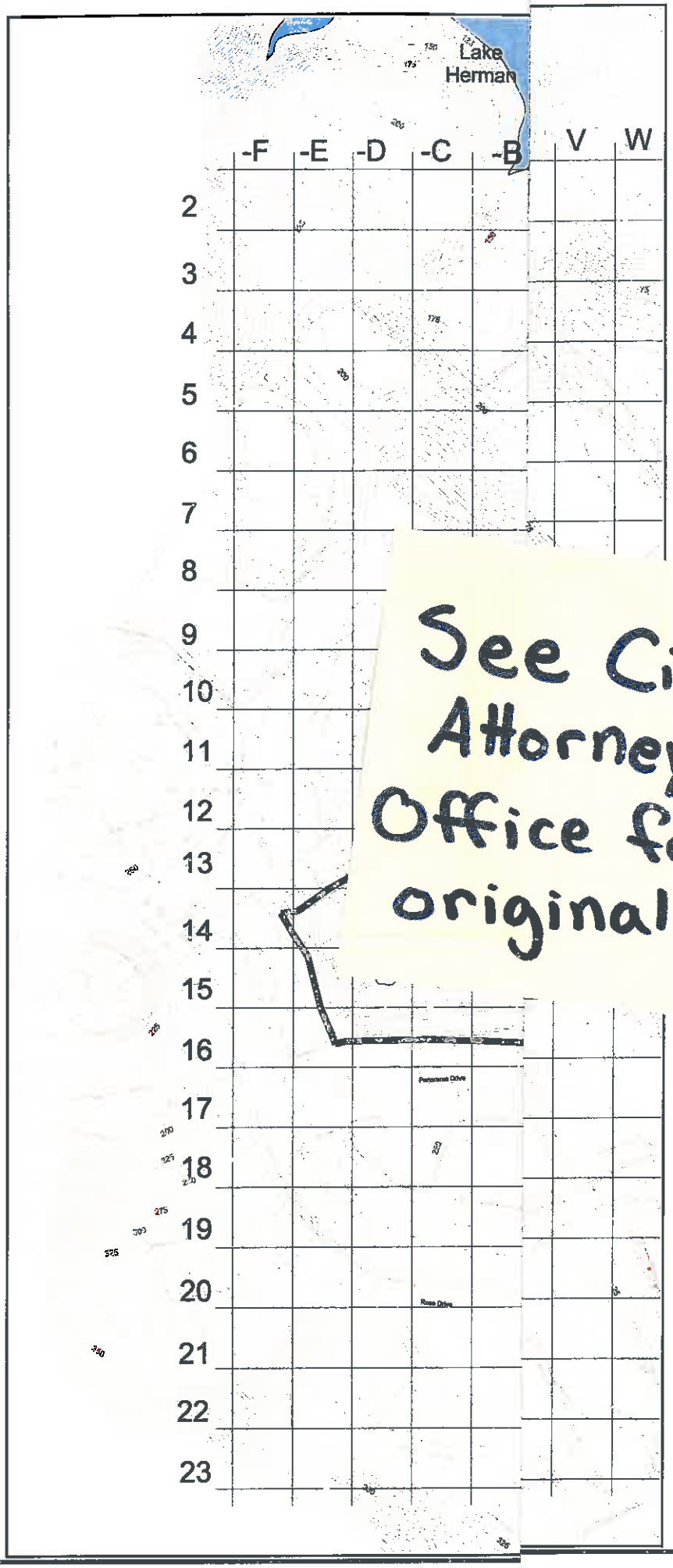
0 250 500 1000 Feet

Note: Contour interval equals 25 feet.

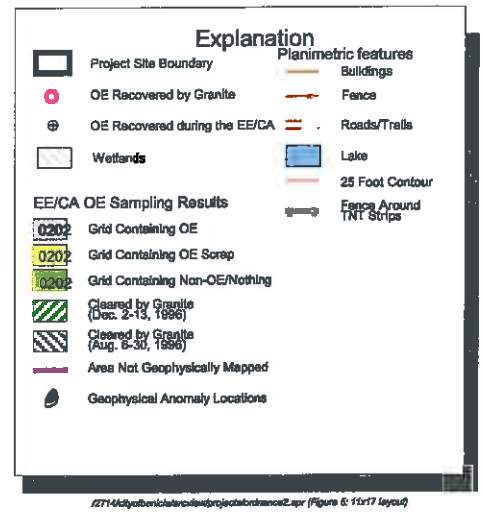
Tourtelot Project Site Sectors

Final

Figure C-4



See City Attorney's Office for original.



Final

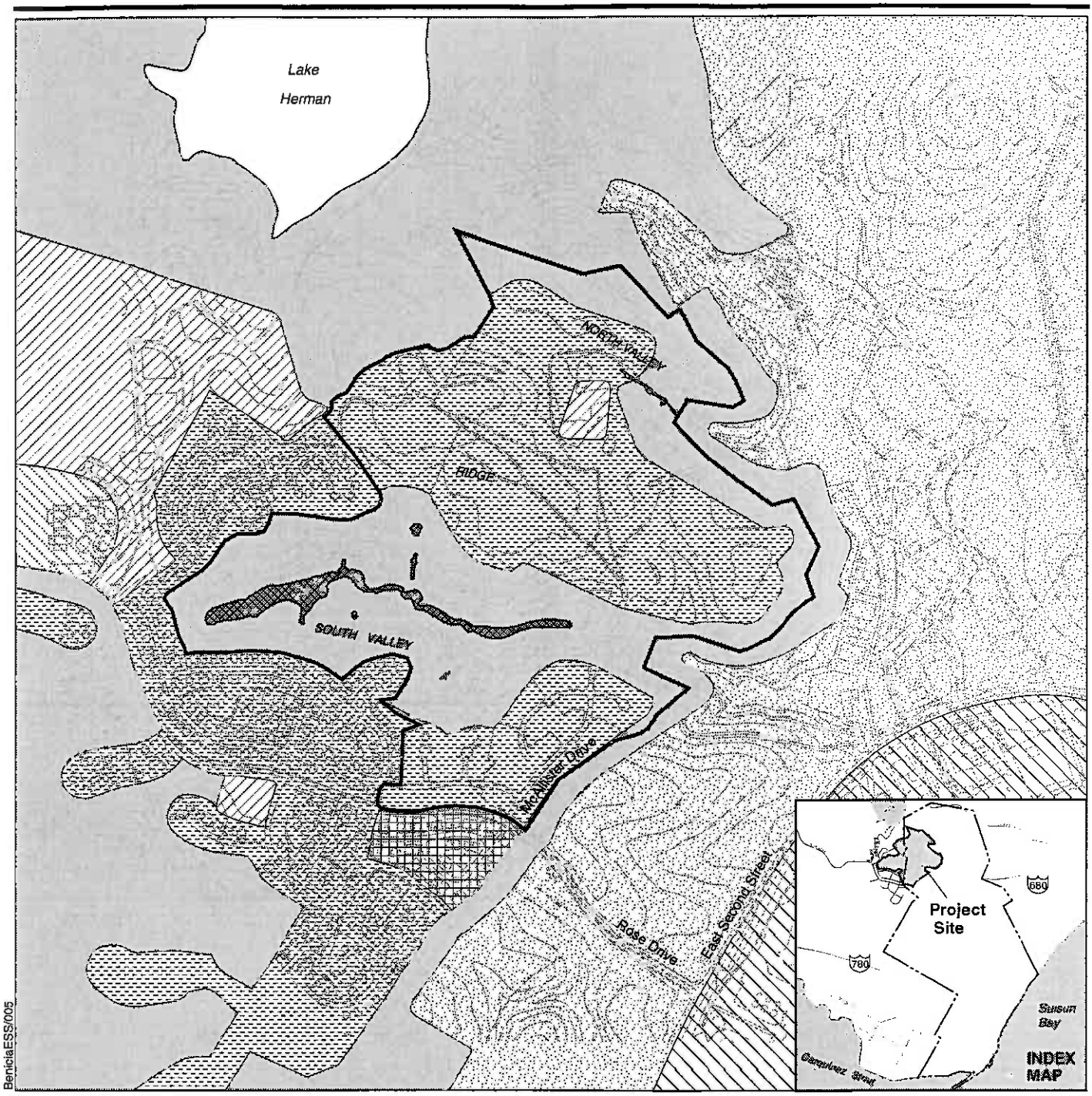
N

250 0 250 500 Feet

FIGURE C-5
Summary of Ordnance Data

Tourtelot Cleanup Project
Benicia, California

FEBRUARY 2002



EXPLANATION

- Single Family Residential
- General Open Space
- Parks
- Light Industrial
- School
- Medium Density Residential
- General Industrial
- Jurisdictional Wetlands
- Project Site Boundary

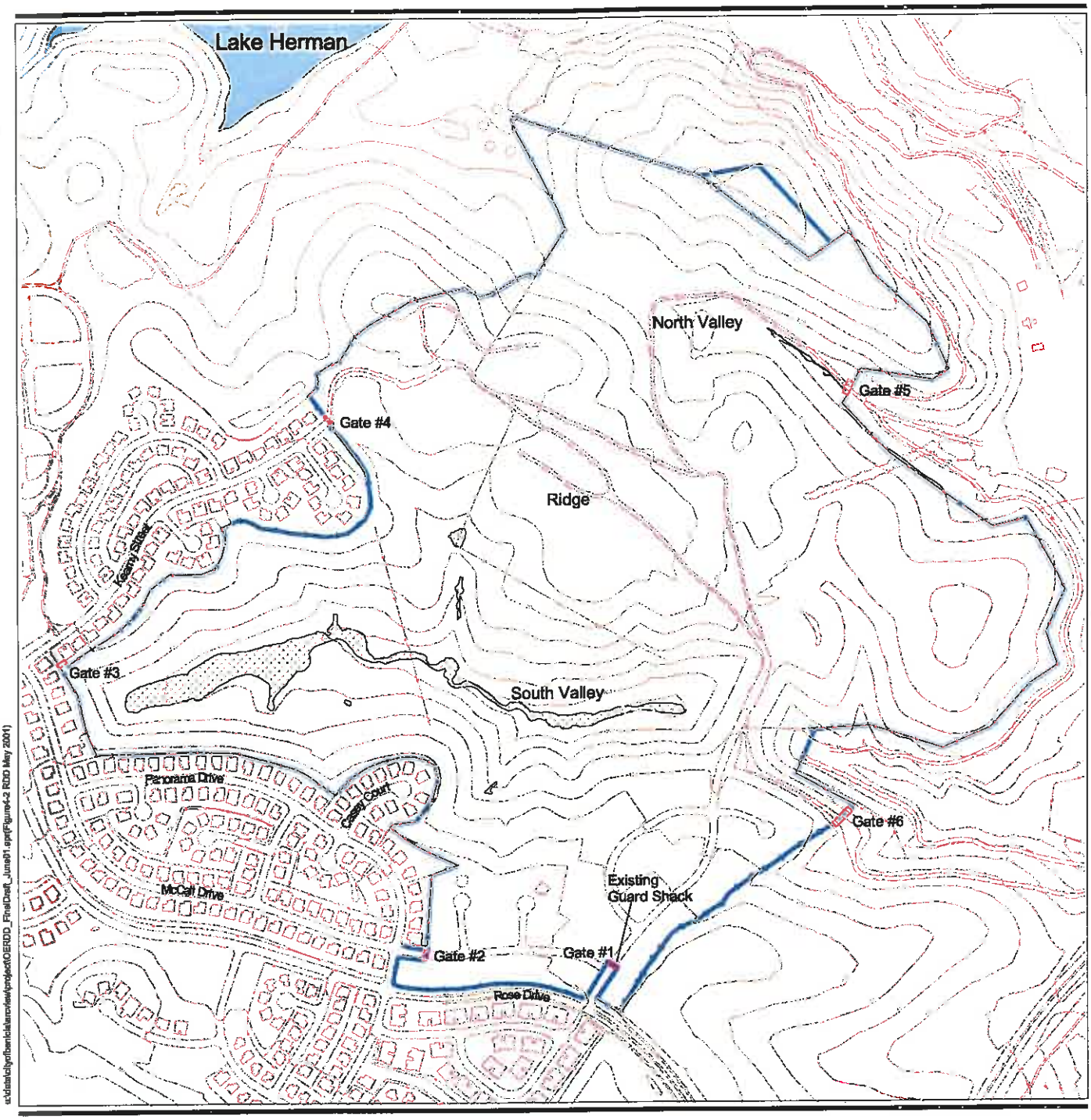
0 250 500 1000 Feet

Note: Contour interval equals 25 feet.

Future Land Use

Final

Figure C-6



EXPLANATION

- Wetlands
- Perimeter Fence
- Gates

Planimetric features

- Buildings
- Fence
- Foundations
- Roads/Trails
- 25 Foot Contour
- Intermittent Stream

350 0 350 700 Feet

Tourtelot Cleanup Project Perimeter Security Fences

Final

Figure C-6A

Final

See City Attorney's Office for original.

FIGURE C-7

Q-D Map

Tourtelot Cleanup Project
Benicia, California

FEBRUARY 2002

APPENDIX C

Attachment A

MINIMUM SEPARATION DISTANCE CALCULATIONS

CESPK-DE

29 September 2000

Memorandum for Record

Subject: Recommendations for Minimum Separation distances (MSD) for Tourtelot OE Removal Action, Former Benicia arsenal.

Summary: A technical evaluation of the Most Probable Munitions (MPM) and Minimum Safe Distance has been completed based on the latest available information, and the guidance that would apply if the Corps of Engineers were conducting the work as a Formerly Used Defense Site (FUDS). Guidance applicable to OE removals at FUDS sites includes guidance from the Department of Defense (DOD), Department of Army (DA), U.S. Army Corps of Engineers (USACE) and Corps Huntsville Center (HNC). The analysis and findings would be applicable to Sectors 3A and 3B that were recommended for a removal action in the Engineering Evaluation/Cost Analysis (EE/CA) prepared by HNC for the FUDS program.

We have identified the appropriate MPM and MSD for each of the work areas within Sectors 3A and 3B that the Corps of Engineers would use if it were executing the removal action. These are based on an un-armed 37 MM projectile and an un-armed 60 MM Mortar.

The City of Benicia is planning to do additional actions outside the areas recommended for removals in the EE/CA. These areas do not fall within the normal Corps of Engineers OE removal categories and the normal MSD definition process would not be applicable.

However, if the removal action in the EE/CA Sector 3A or Sector 3B removal areas resulted in finding live ordnance items at the edge of the planned removal areas, the normal Corps of Engineers procedure would be to incrementally expand the removal action into the adjacent area until no further OE items are located. During the search for OE items in such an expansion area, the MSD for the MPM in the adjacent Sector A or Sector B area would continue to be used.

The role of CESPK in these efforts is limited to that of providing guidance, technical reviews, site support, and advice to the City of Benicia as described in the MOA with the City of Benicia. Approval of work plans and the adoption of appropriate MSD will be up to the authorities responsible for conducting the OE removal and approving the actions.

Technical Evaluation: In Sector 3A, a 60 MM mortar has been identified as the MPM, and would have a fragmentation distance of 1080 feet. Since the munitions are not likely to be fuzed and armed, it would be appropriate to a 1 Hazardous Fragment in 600 Square Feet MSD with a minimum separation distance of 200 feet.

The prior Demolition area portions of Sector 3A Sector 3B is an area that has identified a 37 MM projectile as the MPM. A radius of 1250 feet from the demolition pit has been used to define the potential kick-out area from the pit. The 37 MM projectile has a fragmentation distance of 1181 feet. Since the munitions are not likely to be armed, it would be appropriate to a 1 Hazardous Fragment in 600 Square Feet MSD with a minimum separation distance of 234 feet.

Engineering controls should be employed in these areas to reduce the blast distances from any intentional detonation.

Conclusions and Recommendations:

1. Public safety must be a leading concern for the interested parties and the Corps of Engineers in proceeding with the OE response. Public officials, public safety personnel, UXO workers, and public living and working near the site must be made aware of the hazards and responses being made to reduce them.

2. The maximum fragmentation distance calculations for the 37 MM and 60 MM MPM's (if this were a Corps of Engineers project) would be that of 1181 feet and 1080 feet, respectively. Sectors 3A and 3B would be appropriate for reduction of the MSD to a 1 Hazardous Fragment in 600 Square Feet MSD based on the MPM being unfuzed and unarmed. The reduction to a 1 Hazardous Fragment in 600 Square Feet MSD is an increased risk to the public that must be assumed by those officials approving the adoption of this reduced MSD.

3. We recommend that the public be made aware of the (MSD) and the additional hazards that they may be exposed to in the event of an unintentional detonation when using the 1 Hazardous Fragment in 600 Square Feet MSD.

4. Prior to conducting OE removal actions at this site a detailed OE Removal Work Plan will need to be developed, reviewed and approved by the appropriate agencies. The work plan will need to include a Community Safety Plan that addresses issues of public safety, coordination, notification and measures to deal with planned evacuations for both unintentional and intentional detonations. The work plan also needs to include a Contingency Action Plan to evaluate the potential for additional OE items discovered that would change the recommended MSD based on the present MPM, and for intentional detonations.

5. If at any time a UXO or a larger MPM is discovered, work must be halted and notifications be made to the appropriate authorities, who must reevaluate the MPM, MSD and the appropriateness of using a 1 Hazardous Fragment in 600 Square feet MSD. This evaluation process would establish new MSD based on the new MPM. A new evaluation and approval for a 1 Hazardous Fragment in 600 Square Feet MSD would need to be completed and be in place before any maximum fragment distance could be reduced.

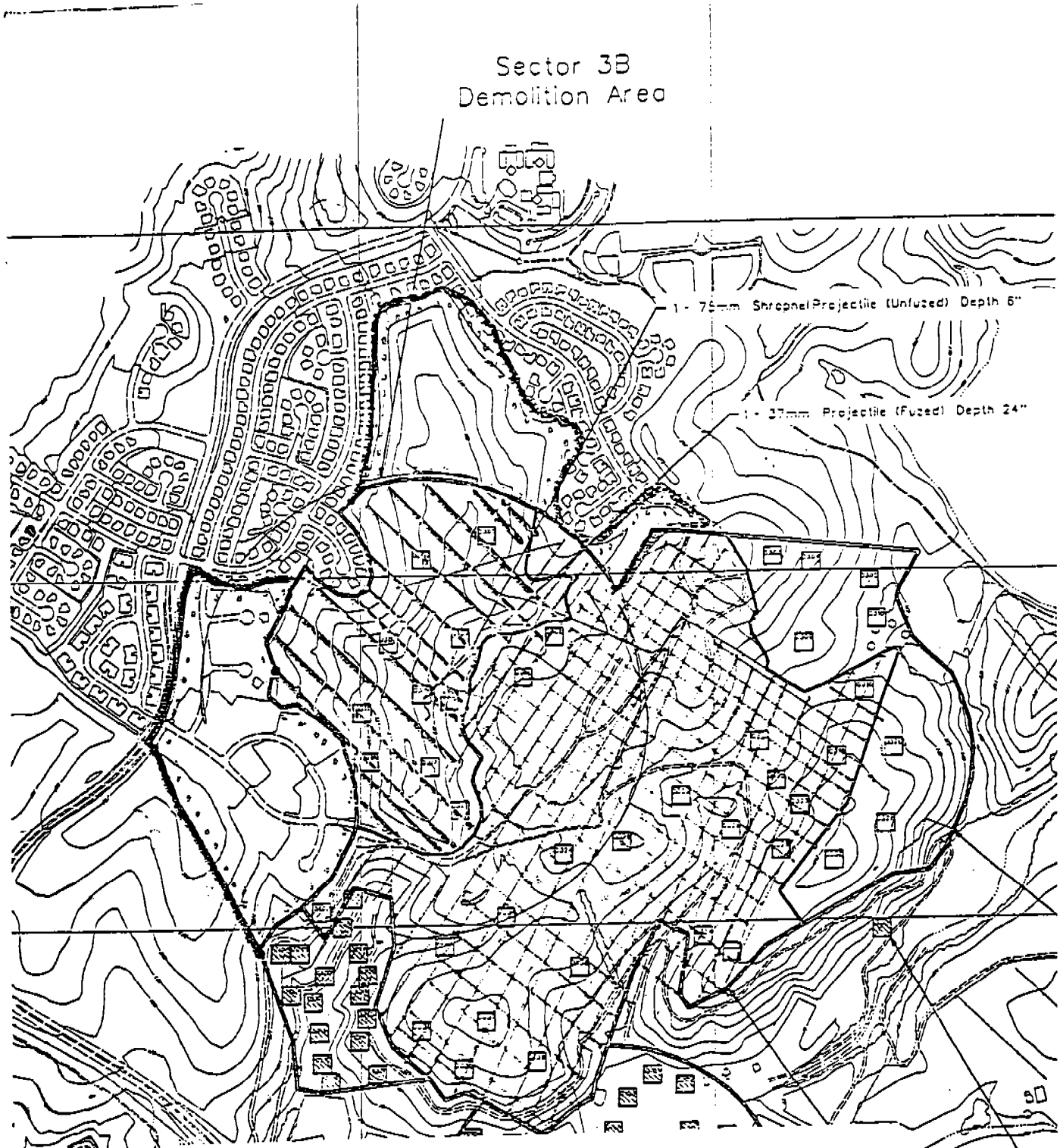


FIGURE 1. Most Probable Munitions (MPM) and Minimum Separation Distance(MSD) for Tourtelot Property, Sectors 3A and 3B.

KEY

...37 MM projectile MPM. 1 Hazardous Fragment in 600 Sq. Feet. MSD = 234 Feet

...60 MM mortar MPM. 1 Hazardous Fragment In 600 square Feet. MSD = 200 Feet

...Additional DTSC Areas, use incremental
OE Expansion from Edge of EE CA Sector with
Live OE at edge MSD same as edge of EE CA Sector

TRANSMITTAL SHEET

US Army Corps
of Engineers
Sacramento District

RECEIVED BY
CITY ATTORNEY'S OFFICE
DEC 20 2000
CITY OF BENICIA

DATE: 18 December 2000

TO: Heather McLaughlin
City of Benicia
250 East L Street
Benicia, CA 94510

PROJECT: Benicia Tourtelot Cleanup Project
CONTRACT NO: NA
INSTALLATION: Benicia Arsenal

THE ENCLOSED DOCUMENTS ARE BEING TRANSMITTED TO YOU FOR:

[X] COORDINATION [X] INCORPORATION [] INFORMATION

DOCUMENTS ENCLOSED:

1. Responses to DTSC's follow-up questions (email dated 18 October 2000) on USACE Memorandum For Record dated 29 September 2000. Subject: Recommendations for Minimum Separation Distance for Benicia Tourtelot OE Removal Action.

REMARKS:

Heather,

Attached are the USACE responses to DTSC's follow-up questions on the 29 September 2000 Memorandum for Record. Subject: Recommendations for Minimum Separation Distances for Tourtelot OE Removal Action. Please note that I have forwarded a copy of the attached Memorandum for Record to Stewart Black of the DTSC. Please forward to any interested parties.

If you have any questions regarding these responses, please call me at (916) 557-7906.

Bruce

cc: John Esparza, Technical Team Lead
Stewart Black, Project Manager, DTSC

If enclosures are not as listed, please notify us at once.

FROM: Bruce Hendel
Project Manager

CESPK-PM-H
1325 J Street
Sacramento, CA 95814-2922
Tel: (916) 557-7906
Fax: (916) 557-7885

CESPK-PM-H (200a) 15 December 2000

MEMORANDUM FOR RECORD

SUBJECT: Response to follow-up questions (transmitted via email on 18 October 2000) on the 29 September 2000 Memorandum for Record, Subject: Recommendations for Minimum Separation Distances (MSD) for Tourtelot OE Removal Action, Former Benicia Arsenal.

1. REFERENCES:

a. DOD 6055.9-STD, DOD Ammunition and Explosives Safety Standards, July 1999.

b. Memorandum of Agreement (MOA) between the City of Benicia and the U.S. Army Corps of Engineers, District, Sacramento, February 1999.

c. HNC-ED-CS-S-98-1, Methods for Predicting Primary Fragmentation Characteristics of Cased Explosives, January 1998.

d. HNC-ED-CS-S-98-2, Method for Calculating Range to No More than One Hazardous Fragment per 600 Square Feet, January 1998.

e. Memorandum of Record, United States Army Corps of Engineers (CESPK-DE), 29 September 2000, subject: Recommendations for Minimum Separation Distances (MSD) for Tourtelot OE Removal Action, Former Benicia Arsenal.

f. Memorandum, United States Army Corps of Engineers (CEHNC-OE-CX), 02 March 2000, subject: Determination of Appropriate Safety Distances on Ordnance and Explosives (OE) Project Sites, OE Center of Expertise (CX) Interim Guidance Document 00-01.

g. Draft Work Plan for the Ordnance and Explosive Removal Actions, Sectors 2, 4 and 5, Former Benicia Arsenal, Benicia, CA, July 2000. Prepared by EODT on behalf of the U.S. Army Engineering & Support Center, Huntsville, Alabama.

h. Draft Remedial Investigation/Feasibility Study, Toutelot Cleanup Project, Benicia, California, November 16, 2000. Prepared by Earth Tech.

2. ATTACHMENTS:

A. United States Army Corps of Engineers, CEHNC-ED-CS-S, calculations of Minimum Separation Distances, 60 mm M49A3, 3 April 2000.

B. United States Army Corps of Engineers, CEHNC-ED-CS-S,

c. Areas of Concern. The analysis and findings originally presented would be applicable to Sectors that were recommended for a removal action by the USACE; Sectors 3A and 3B were recommended for a removal action by the USACE in the Engineering Evaluation/Cost Analysis (EE/CA) prepared under the FUDS program.

It is understood that OE/UXO investigation and removal activities may extend outside of Sector 3A and 3B. Furthermore, as originally outlined in reference (e), and as provided in attachment (e), USACE has established methods and procedures to address expansion (and/or reduction) of the area of concern; during the search of OE items in such an expansion area, the MSD for the MPM in the adjacent Sector A or B area would continue to be used (see figure 3 of attachment (e)). In general however, the minimum separation distance may be reduced to fit the situation but in no case will the minimum separation distance be less than the range to no more than 1 hazardous fragment per 600 square feet, 200 feet, or K50 based on overpressure, whichever is greater (reference (f)).

Under the aforementioned EE/CA, the USACE did not recommend a removal action at the D-1 Area, western portion of the south valley, the entire North Valley, the Ridge areas and/or surrounding community. Theses areas are identified under the on-going OE RI/FS and the USACE are providing recommended MSDs at the request of the City of Benicia (See attachment (e)).

4. POINTS OF CONTACT: If you need additional information, please contact Mr. AR Smith at 916.557.6973 or Mr. Bruce Handel at 916.557.7906, Project Manager, CESPK-PM-H.

cc: Project File

ATTACHMENT A

Minimum Separation Distances
Ft. Ord
60 mm M49A3
3 April 2000

REQUESTED BY: Patti Berry
PREPARED BY: Michelle Crull, PhD, PE

This form shows calculated distances only. It does not constitute approval. Concurrence of CEHNC-OE-S is required to determine the applicable distance for a specific site.

In accordance with (IAW) OE Center of Expertise Interim Guidance Document 98-08, use of the range to no more than 1 hazardous fragment/600 sq ft as the minimum separation distance for accidental detonations requires written justification, a risk analysis, calculation of this distance by CEHNC-ED-CS-S, and concurrence of CEHNC-OE-S.

CALCULATIONS FOR UNINTENTIONAL DETONATIONS

Maximum Fragment Range = 1080 ft
Range to No More Than 1 Hazardous Fragment/600 sq ft = 200 ft
Range to 0.9 psi Overpressure = 42 ft

IAW OE Center of Expertise Interim Guidance Document 98-08, the minimum separation distance for intentional detonations may not be less than the default distance provided in DoD 6055.9-STD or the maximum fragment range or the K328 overpressure distance.

CALCULATIONS FOR INTENTIONAL DETONATIONS

Maximum Fragment Range = 1080 ft
K328 Overpressure Range = 277 ft

The primary fragmentation characteristics used in the calculation of the values listed above were computed IAW CEHNC-ED-CS-S-98-1. The maximum fragment range was calculated using the maximum weight fragment and the initial velocity from these characteristics in the computer software TRAJ. The range to no more than 1 hazardous fragment/500 sq ft was calculated IAW CEHNC-ED-CS-S-98-2.

SIGNATURES:

Michelle Crull 4/3/00
Subject Matter Expert

CEHNC-ED-CS-S Branch Chief

ATTACHMENT 4

Public Withdrawal Distance (PWD)
Camp Beale, California
31 August, 1999

MUNITION: 37 mm MKII
REQUESTED BY: Bill Sargent
PREPARED BY: Douglas E. Grant, P.E.

This form shows calculated distances only. It does not constitute approval. Concurrence of CEHNC-OE-S is required to determine the applicable distance for a specific site.

In accordance with (IAW) OE Center of Expertise Interim Guidance Document 98-08, use of the range to no more than 1 hazardous fragment/600 sq ft as the PWD for accidental detonations requires written justification, a risk analysis, calculation of this distance by CEHNC-ED-CS-S, and concurrence of CEHNC-OE-S.

ACCIDENTAL DETONATIONS

Maximum Fragment Range = 1181 ft
Range to No More Than 1 Hazardous Fragment/600 sq ft = 200 ft
Range to 0.9 psi Overpressure = 43 ft

IAW OE Center of Expertise Interim Guidance Document 98-08, the PWD for intentional detonations may not be less than the default distance provided in DoD 6055.9-STD or the maximum fragment range or the K328 overpressure distance.

INTENTIONAL DETONATIONS

Maximum Fragment Range = 1181 ft
K328 Overpressure Range = 282 ft

The primary fragmentation characteristics used in the calculation of the values listed above were computed IAW CEHNC-ED-CS-S-98-1. The maximum fragment range was calculated using the maximum weight fragment and the initial velocity from these characteristics in the computer software TRAJ. The range to no more than 1 hazardous fragment/600 sq ft was calculated IAW CEHNC-ED-CS-S-98-2.

SIGNATURES:

Douglas E. Grant
Subject Matter Expert

William H. Robert Jr. 1 Sep 99
CEHNC-ED-CS-S Branch Chief

ATTACHMENT C[1]

DATE	PROJECT NAME	17600 DISTANCE	MPM
11 Jan 98	Camp Grant	219	3" Stokes
05 May 98	Castner	341	105 mm
15 Jul 98	Camp Bonneville	341	105 mm
13 Oct 98	Benicia - Ordnance Bunkers	400	MK II Grenade
13 Oct 98	Benicia - Revetment Area	200	37 mm
14 Oct 98	Fort Dix - Correctional Facility	234	81 mm
22 Jan 99	Panama - Ranges 7, 7A, 8 and 10	341	105 mm
19 Feb 99	Duck	302	2.75" rocket
26 Feb 99	Camp Grant	219	3" stokes
04 Mar 99	Spring Valley - OU3	200	75 mm Mk II
29 Apr 99	Jefferson Proving Grounds - Sulfur Area	341	105mm
24 Jun 99	Illinois Ord Plan	200	M1A1 AT Mine
06 Jul 99	Brooksville-Rocket Range	200	2.36" rocket
06 Jul 99	Brooksville- Mortar Range	234	81 mm
10 Sep 99	Mallinckrodt - Stockpile 2	310	100 lb parrot
15 Sep 99	Ft. McClellan - Eastern Bypass	200	60 mm
15 Oct 99	Papohaku	302	2.75" rocket
19 Oct 99	Nansemond - Tidewater Community College	200	No Ordnance
29 Oct 99	Nansemond - Area O	361	4.5" rocket
08 Feb 00	Nansemond-anomaly investigation	200	No Ordnance
11 Feb 00	Camp Ellis - Area B	200	60 mm
14 Mar 00	Conway-Ranges IV & VII	275	20 lb Frag Bomb
16 Mar 00	Guam	299	5"/38 cal
05 Apr 00	Hohenfels	250	90 mm
06 Apr 00	Ft. Benning	400	Mk II Grenade
19 Apr 00	Nansemond - Area O and Kick Out Area	361	4.5" rocket
20 Apr 00	CGS	200	No Ordnance

[1]U.S. Army Corps of Engineers, Ordnance and Explosive (OE) Design Center, Huntsville, CEHNC-OE-DC. Data is current through April 2000.

ATTACHMENT D

Response to Follow up Questions on the U.S. Army Corps of Engineers Recommended Minimum Separation Distance (MSD) for Ordnance and Explosives (OE) Removal Actions at the Tourtelot Site, Benicia, California.

DTSC has reviewed Colonel Walsh's letter and the attached Memorandum for Record and have the following questions and request for additional information:

General Comments/Questions

1. The map contained in the Memorandum for Record is unclear as to which MSD should be used in the areas where Sectors 3a and 3b overlap. Please clarify which MSD should be used in the overlap areas.

Response: To further clarify the MSDs, the single map contained in the 29 September 2000 MFR has been replaced with three separate color-coded maps (figure 1, 2, & 3). The maps reflect a MSD of 200 feet for Sector (3a) and Sector (3b). The original MSD Memorandum For Record (MFR) of 29 September 2000 has been revised by adding the three figures (see attachment (e)).

2. The ACOE has been involved in project meetings and is aware that the proposed OE/UXO scanning and clearance activities for the Tourtelot project extend outside of Sector 3a and 3b. However, the ACOE has not provided an approved MSD for a significant portion of the Tourtelot site targeted for OE/UXO investigation/remediation. Please provide DTSC with the ACOE approved MSD for UXO/OE clearance work to be performed on the entire Tourtelot Site including the D-1 Area, western portion of the south valley, the entire North Valley, the Ridge areas and surrounding community (if needed).

Response: A detailed response has been provided under section 3(c) of the 11 December 2000 MFR.

3. It appears that the MSD for remediation of TNT at the site has not been included in the this evaluation, as previously requested. Please provide this information.

Response: The USACE acknowledges DTSC's previous request for a MSD for remediation of TNT stripe located at the Tourtelot site,

The USACE has recently received the information necessary to calculate the net explosive weight under reference (h). Also, the USACE-SPK has just received the necessary guidance to calculate an MSD for this situation. The calculations are currently being developed and will be provided to the City of Benicia at a later time under separate cover.

4. Please provide DTSC a copy of the color maps (including any necessary revisions as requested in 1, 2 and 3 above) identifying the MSD locations. It is difficult to understand the maps in black and white.

Response: See response to comment number 1 above.

5. It is unclear how the ACOE has established the approved MSD contained in Colonel Walsh's letter. Please provide the supporting documentation and calculations for the use of the "Range to No More Than One Hazardous Fragment per 600 Square Feet" calculation. Please include a list of similar projects which have been successfully completed using an MSD calculated using the reduced "Range to No More Than One Hazardous Fragment per 600 Square Feet" calculation recommended for the Tourtelot site. Also, please include the number of accidents that have occurred when clearing OE on similar sites?

Response: Supporting documentation and associated calculations have been provided (see attachment (A) and (B)). See attachment (C) for projects that have been successfully completed using a reduced 'Range to no more than one hazardous fragment per 600 square feet' MSD.

A survey of reported accidents that have occurred when clearing OE while employing a 'Range to No More Than 1 Hazardous Fragment per 600 square feet' MSD has been completed by U.S. Army Corps of Engineers, Ordnance and Explosives (OE) Design Center, OE Safety Office (CEHNC-OE-S). There have been no reported accidents involving OE clearance operations while employing a 1/600 MSD (see www.hnd.usace.army.mil).

6. Please explain how the recent discovery of a potentially live mortar, tail fin section has been addressed in the MSD calculations. The tail fin was discovered well outside of the 1250' radius suggested by the ACOE. What impact, if any could this discovery have on the calculations and recommendations provided by the ACOE.

Response: Under USACE procedures if during the design stage of a UXO/OE removal or investigation project new information is discovered, this information is assessed and modifications to the design incorporated as required. The process of managing and acting upon new information is further refined during field execution. USACE regulations governing execution of UXO/OE removal or investigation projects, require that information on the number, type and condition of UXO/OE encountered is assessed daily and acted upon immediately if necessary.

On December 5, 2000 the USACE provided a detailed response to Benicia City Attorney concerning the recent discovery of the tail fin. Any questions or concerns posed by the DTSC that are not addressed in the December 5, 2000 response should be addressed in the Tourtelot RI/FS document (reference (h)) as required by the DTSC Order No. I/SE 98/99-011.

Specific Questions

7. Page 1: Under the Summary: section; paragraph 2. Indicates that the appropriate Most Probably Munition (MPM) for Sector 3a and 3b are an un-armed 60 MM mortar and an un-armed 37 MM projectile, respectively. Please provide documentation to confirm that the 60 MM Mortar found in Sector 3a should be classified as un-armed and was not primed, fuzed and/or fired. Information available to DTSC also indicated that the 60 MM mortar that was found was a high explosive (HE) round. Please confirm that a 60 MM HE mortar was used as the MPM to determine an appropriate MSD in Sector 3a. The map contained in the Memorandum for Record indicates that the 37 MM projectile found in Sector 3b was fuzed. Please provide the justification used by the ACOE to classify this ordnance as un-armed when determining the appropriate MSD for Sector 3b.

Response: The key concept that must be understood by all parties is the impact of classifying an item as 'un-armed' versus 'armed' and the use of the 'Range to No More Than 1 Hazardous Fragment per 600 square feet'.

If an item is classified as 'armed', then the use of 'Range to No More Than 1 Hazardous Fragment per 600 square feet' is not an option under Department of Army regulations. If however, the item is classified as 'un-armed' the option to use the 'Range to No More Than 1 Hazardous Fragment per 600 square feet' is still available.
Whether the item is 'fuzed' is not considered when deciding to

assess the 'Range to No More Than 1 Hazardous Fragment per 600 square feet' option. Moreover, the 37 mm projectile has an internal fuze and must be considered 'fuzed' under normal USACE procedures; hence the identification of 'fuzed' in the MFR map.

The USACE, Ordnance and Explosive Design Center, Structural Branch (CEHNC-ED-CS-S) employed 'latest available information' and professional judgment to classify the MPM of a 37 mm projectile and 60 mm mortar as 'un-armed'. The justification to assign this classification is based on:

(a) The item likely originated from a demolition pit and under normal demolition procedures the item would have to be 'un-armed' in order to allow movement of the item to a demolition pit location; and

(b) The lack of historical records to indicate live fire (i.e. range activity) ever occurred at the Benicia Arsenal.

The USACE acknowledges that information about the 60 mm mortar round indicated that it was a high explosive (HE). USACE also confirms the 60 mm mortar HE was used as the MPM for Sector 3a.

Note: See Attachment (A) and (B) and reference (a) for a detailed description of the relationship between 'Maximum Fragment Range', 'Range to No More Than 1 Hazardous Fragment per 600 square feet', 'Range to 0.9 psi Overpressure' and 'K328 overpressure distance'.

8. Page 1: Under the <u>Summary:</u> section; paragraph 5. Please refer to the Imminent and/or Substantial Endangerment Determination and Remedial Action Order issued by DTSC for the Tourtelot Property on June 1, 1999. The United States Department of the Army is jointly and severally responsible for carrying out all actions required by the order. The CESPK has been attending project meetings, providing technical direction and acting as the official representative of the United States Department of the Army on all aspects of the Tourtelot project. In this capacity CESPK has assumed a much broader scope of responsibility in the Tourtelot matter then just advisor to the City of Benicia. This responsibility includes, but is not limited to the safety of personnel working at the site and public safety of area residents.

Response: A question or comment was not provided. If the reviewer intended to pose a question or comment please revise

accordingly. Please note however, the USACE respectively request that any correspondence related to this subject be forwarded directly to the USACE, Sacramento District Legal counsel.

9. MSD - Please provide the supporting calculation for the MSD in both Sectors 3a and 3b. The 200' MSD appears to be a default value.

Response: Again, the reviewer is referred to Attachment (A) and (B) for supporting calculations. As outlined in reference (f), MSDs smaller than 200' are not allowed under USACE regulations, even though calculations may reflect shorter distances (also see reference (a)).

10. Page 1: Under the Technical Evaluation: section; paragraph 2. Please define what you mean by, "A radius of 1250 feet from the demolition pit has been used to define the potential kick-out area from the pit". Specifically what does the phrase "potential kick-out area represent" mean. Also please define why only one pit has been used to defined the 1250' kick-out when four demolition pits have been identified.

Response: The Technical evaluation has been revised by focusing the discussion on the MPM for each Sector rather than sub-areas within a Sector. The 11 December 2000 MFR reflects this change.

Note: the 1,250-foot distance was employed during the approved EE/CA investigation. We knew little about the type of ordnance that was used at the demolition site so we selected the 1250 default distance as a reasonable distance for limiting our Sector size. This may or may not be an appropriate distance for a removal action, but the solution is to expand the clearance area if we're still finding ordnance at the limits of the area.

Potential kick-out area means an area around the demolition pit within which we would expect to find kick-outs of live ordnance from detonations. The analysis focused on the 'worst case' or largest demolition pit; this is consistent with UXO/OE removal operations where 'worst case' areas would be addressed prior to other areas within the Sector. Moreover, the other 4 demolition pits are in close proximity to the primary pit.

11. Page 2: Conclusions and Recommendations: Item number 2. Please define qualitatively and quantitatively the increase risk to the public identified in the statement; "The

reduction to a 1 Hazardous Fragment in 600 Square Feet MSD is an increase risk to the public that must be assumed by those officials approving the adoption of this reduced MSD".

Response: Determining, quantitatively, the risk from unintentional and intentional detonations is a major challenge to the Department of Defense including the Department of Army. Reaching consensus on the methods, procedures and fundamental assumptions of a quantitative risk assessment is an on-going National effort and major focus of the Department of Defense, regulatory agencies and stakeholders. While much progress has been made in this area, a quantitative answer cannot be provided at this time.

Qualitatively, the risk at maximum fragment distance is minimal (less than 1 percent probability), whereas at the 1/600 distance there's a 1 percent probability of a person in the open being struck by a hazardous fragment (see Reference (a) for additional detail).

12. Page 2: <u>Conclusions and Recommendations:</u> Item number 2. Additional information which will be required to understand the increased risk to the public include:
    1. What is the underlying assumption for choosing the 1 hazardous fragment in 600 square feet as an acceptable risk?

Response: As discussed earlier, the use of professional judgment lead to the underlying assumption that the items are unfired and therefore un-armed.

Reference (a) further discusses the development of, and criteria for, a 'Range to No More than 1 Hazardous Fragment per 600 Square Feet (1/600 Distance)'.

    2. Has the Army used this calculation as the basis for an MSD in other cleanup sites near civilian residential areas?

Response: See attachment (C) for projects that have been successfully completed using a reduced 'Range to no more than one hazardous fragment per 600 square feet' MSD.

    3. Please be sure to include a table to illustrate how the risk will vary with change in distance from the detonation point. For example if the MSD is 234' what

is the risk to an individual standing at 235' from the detonation or at 200', 300', 400'...

Response: See response to question 11 and the following table is provided.

Table 1
QUALITATIVE RISK VERSUS
DISTANCE AWAY FROM DETONATION POINT[1]

Detonation Point	1/600 Distance	Maximum Fragment Distance
Point Removal of OE	Increased Risk. A person (6 ft tall, 1 ft wide) taking no evasive action has a 1% probability of being struck by a hazardous fragment	Minimal risk. A person (6 ft tall, 1 ft wide) taking no evasive action has less than a 1% probability (but not zero) of being struck by a hazardous fragment

[1] Source: DOD 6055.9-STD, DOD Ammunition and Explosive Safety Standards, July 1999.

4. Also please provide information on fragment velocity and striking energy at the select distances included in the table. Since these figures will be somewhat technical please provide an example and/or illustration of what each fragment velocity and striking energy means in laymen's terms.

Response: Striking energy is related to fragment mass and velocity ($E=1/2\ mv^2$). Velocity is dependent on distance traveled and the drag coefficient. The drag coefficient is dependent on fragment weight, shape and velocity.

A hazardous fragment is one with a striking energy of 58 ft-lbs. The 58 ft-lbs criteria was approved by DDESB in April 1971 and is based on a report by the Medical Department of the Army using empirical data from WWI, WWII and the Korean war as well as experimental test data (reference (a)).

In laymen's terms, a 20 lb. bowling ball dropped on your foot from 3 feet high will impact with 60 ft-lb of energy and thus deliver the energy of a hazardous fragment. Figures may be developed upon request of the City of Benicia.

13. Page 2: <u>Conclusions and Recommendations:</u> Item number 3. Although a recommendation is made "that the public be made aware of the MSD and the additional hazards." Through our discussions with ACOE representatives it appears the Department of Defense has used the approach of smaller MSD's at other sites. Has the Department of Defense found an effective way to make the public aware of this increased risk. The Arsenal appears to be poised to use the same reduced MSD's. How is the Corps going to make the public aware of the use of the smaller MSD and the associated increase risk to them, including those areas adjacent to highway 680.

Response: For the work the Corps of Engineers is executing under the FUDS program, the method and procedures to inform the public are outlined Section 2.8 of Reference (g). The document is currently under review with DTSC and scheduled to be finalized January 01. In addition, and under the FUDS program, the USACE is developing a Community Ordnance and Explosive Safety Program, which will be presented to the Benicia City Council on 16 January 2001.

The planned method and procedures, augmented by risk communication techniques, have proven to be an effective way to communicate risk to the public.

It is anticipated, for the work executed under the Tourtelot project, the method and procedures to inform the public will be presented in an OE removal Work Plan(s) prepared as part of the RI/FS for the Tourtelot Clean Up Project. See reference (h).

14. Page 2: <u>Conclusions and Recommendations:</u> Item number 4. As discussed, the MSD will be part of the explosive safety submission to Department of Defense Explosives Safety Board (DDESB). The approval of the use of the procedure should be provide as soon as possible. This will make the OE Removal Work Plan, Community Safety Plan and Contingency Action Plan easier to review if the previously reviewed and approved procedures have been provided.

Response: A question or comment was not provided. If the reviewer intended to pose a question or comment please revise accordingly. The USACE supports your recommendation that the ESS is approved and made part of the OE Work Plan.

15. Page 2: <u>Conclusions and Recommendations:</u> Item number 5.

Based on the potential kick-out area and area 3a and 3b boundary lines, there appears to be an overlap of MSD areas around and overlooking Sector 2 and D-1. Should the MSD be revised to reflect the larger of the two MSD's in areas of overlap?

Response: As previously discussed, to further clarify the MSDs, the single map contained in the 29 September 2000 MFR has been replaced with three separate color-coded maps (figure 1, 2, & 3). The maps reflect a MSD of 200 feet for both Sectors so there is no larger MSD. The original MSD Memorandum For Record (MFR) of 29 September 2000 has been revised by adding the three figures (see attachment (e)).

16. Page 3: **Map;** The MSD for the D-1 area, the western portion of the south valley and the northern portion of the South Valley is not clearly understood. Please provide the approved MSD that should be used in these and any other undefined areas on the Tourtelot site.

Response: A detailed response has been provided under section 3(c) of the 11 December 2000 MFR. Also see Figures 1, 2, and 3 of attachment (e).

17. Please provide a discussion of "hazardous fragment."
    1. What is a "hazardous fragment"?
    2. Define what makes up a hazardous fragment?
    3. How hazardous is a "hazardous fragment"?
    4. How large is a "hazardous fragment"?
    5. What is the potential or likely damage to a person hit with a "hazardous fragment"?
    6. At what distance from the uncontrolled detonation does a piece of fragment become a "non-hazardous fragment"?

Response: A hazardous fragment is defined by DOD 6055.9-STD as one having an impact energy of 58 ft-lb or greater. The size of a hazardous fragment may be large or small. Mass and velocity determine the energy, which in turn determines whether it is a hazardous fragment, or not. At velocities achieved during detonation, fragments smaller than ¼ ounce will not be hazardous.

To give an idea of the other end of the scale, a 20 lb. bowling ball dropped on your foot from 3 feet high will impact with 60 ft-lb of energy and thus deliver the energy of a hazardous fragment.

The damage to a person hit by a hazardous fragment depends upon the shape of the fragment, the angle of impact, and whether it strikes a vital organ or not. The 58 ft-lbs is considered by DOD to be an acceptable risk. The number is a result of injury statistics gathered from WWI, WWII, and the Korean War. This is also the NATO definition of hazardous fragment.

A hazardous fragment becomes a non-hazardous fragment when the energy is less than 58 ft-lbs, which is a function of mass and velocity. Distance does not enter into the equation. See response to question 12(4).

18. What is the likely or potential property damage that could occur from frag within the identified MSD and up to the maximum fragment flight distance?

Response: There will probably be property damage, but how much damage is dependent on the size of the detonation, size of fragments, orientation of the round, depth below the surface, and other factors.

19. What is the likelihood that an uncontrolled detonation will occur?

Response: Based on professional judgment, it is very unlikely that a unintentional detonation will occur, otherwise the USACE wouldn't have proposed to reduced the MSD to 1/600.

ATTACHMENT E

CESPK-DE 11 December 2000

Memorandum for Record

Subject: Recommendations for Minimum Separation distances (MSD) for Tourtelot OE Removal Action, Former Benicia arsenal.

Summary: A technical evaluation of the Most Probable Munitions (MPM) and Minimum Safe Distance has been completed based on the latest available information, and the guidance that would apply if the Corps of Engineers were conducting the work as a Formerly Used Defense Site (FUDS). This memorandum updates the memorandum dated 29 September 2000. Guidance applicable to OE removals at FUDS sites includes guidance from the Department of Defense (DOD), Department of Army (DA), U.S. Army Corps of Engineers (USACE) and Corps Huntsville Center (HNC). The analysis and findings would be applicable to Sectors 3A and 3B, including the potential expansion area adjacent to the sectors, that were recommended for a removal action in the Engineering Evaluation/Cost Analysis (EE/CA) prepared by HNC for the FUDS program.

We have identified the appropriate MPM and MSD for each of the work areas within Sectors 3A and 3B that the Corps of Engineers would use if it were executing the removal action. These are based on an un-armed 37 MM projectile and an un-armed 60 MM Mortar.

The City of Benicia is planning to do additional actions outside the areas recommended for removals in the EE/CA. These areas do not fall within the normal Corps of Engineers OE removal categories and the normal MSD definition process would not be applicable.

However, if the removal action in the EE/CA Sector 3A or Sector 3B removal areas resulted in finding live ordnance items at the edge of the planned removal areas, the normal Corps of Engineers procedure would be to incrementally expand the removal action into the adjacent area until no further OE items are located. During the search for OE items in such an expansion area, the MSD for the MPM in the adjacent Sector A or Sector B area would continue to be used.

The MSD for sector 3A, 3B, and the expansion area would be based on a 1 Hazardous Fragment in 600 Square Feet MSD. In all these areas, a 200 feet arc would extend outward from the edge of intrusive work areas. (See map figures 1, 2, and 3)

The role of CESPK in these efforts is limited to that of providing guidance, technical reviews, site support, and advice to the City of Benicia as described in the MOA with the City of Benicia. Approval of work plans and the adoption of appropriate MSD will be up to the authorities responsible for conducting the OE removal and approving the actions.

Technical Evaluation: In Sector 3A, a 60 MM mortar has been identified as the MPM, and would have a fragmentation distance of 1080 feet. Since the munitions are not likely to be armed, it would be appropriate to a 1 Hazardous Fragment in 600 Square Feet MSD with a minimum separation distance of 200 feet.

The sector 3B area has a 37 MM projectile identified as the MPM. The 37 MM projectile has a fragmentation distance of 1181 feet. Since the munition is not likely to be armed, it would be

appropriate to a 1 Hazardous Fragment in 600 Square Feet MSD with a minimum separation distance of 200 feet.

Based on the assumption the an OE expansion protocol were needed adjacent to sector 3A or 3B, and the item located at the edge of the sector was not larger than a 60MM mortar or 37MM projectile used as the MPM for the sectors, a 200 feet MSD should continued to be used for intrusive work in these areas. An appropriate MSD will need to be calculated for intentional detonations. Engineering controls can be employed during intentional detonations to reduce the blast distance.

Conclusions and Recommendations:

1. Public safety must be a leading concern for the interested parties and the Corps of Engineers in proceeding with the OE response. Public officials, public safety personnel, UXO workers, and public living and working near the site must be made aware of the hazards and responses being made to reduce them.

2. The maximum fragmentation distance calculations for the 37 MM and 60 MM MPM's (if this were a Corps of Engineers project) would be that of 1181 feet and 1080 feet, respectively. Sectors 3A and 3B would be appropriate for reduction of the MSD to a 1 Hazardous Fragment in 600 Square Feet MSD based on the MPM being unfuzed and unarmed. The reduction to a 1 Hazardous Fragment in 600 Square Feet MSD is an increased risk to the public that must be assumed by those officials approving the adoption of this reduced MSD.

3. We recommend that the public be made aware of the (MSD) and the additional hazards that they may be exposed to in the event of an unintentional detonation when using the 1 Hazardous Fragment in 600 Square Feet MSD.

4. Prior to conducting OE removal actions at this site a detailed OE Removal Work Plan will need to be developed, reviewed and approved by the appropriate agencies. The work plan will need to include a Community Safety Plan that addresses issues of public safety, coordination, notification and measures to deal with planned evacuations for both unintentional and intentional detonations. The work plan also needs to include a Contingency Action Plan to evaluate the potential for additional OE items discovered that would change the recommended MSD based on the present MPM, and for intentional detonations.

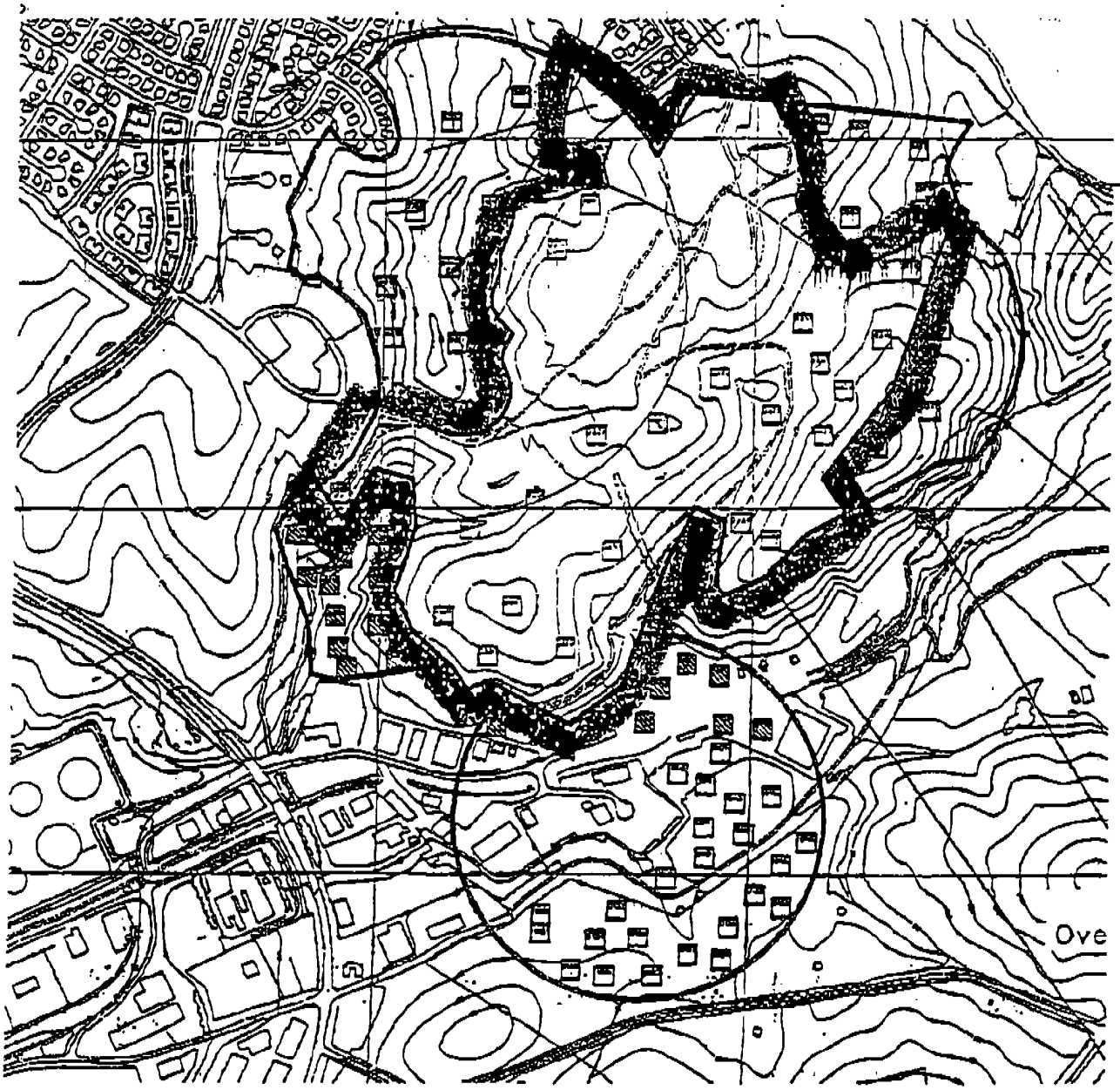
5. If at any time a UXO or a larger MPM is discovered, work must be halted and notifications be made to the appropriate authorities, who must reevaluate the MPM, MSD and the appropriateness of using a 1 Hazardous Fragment in 600 Square feet MSD. This evaluation process would establish new MSD based on the new MPM. A new evaluation and approval for a 1 Hazardous Fragment in 600 Square Feet MSD would need to be completed and be in place before any maximum fragment distance could be reduced.

FIGURE 1. Most Probable Munitions (MPM) and Minimum Separation Distance (MSD) for Sector 3A Tourtelot Property.

KEY

Intrusive Work Areas in Sector 3A.

200-foot MSD Arc around intrusive Work areas In Sector 3A. (MSD based on an unarmed 60 MM Mortar as the MPM, 1 Hazardous Fragment In 600 Sq. Ft. MSD= Arc of 200 Feet.)



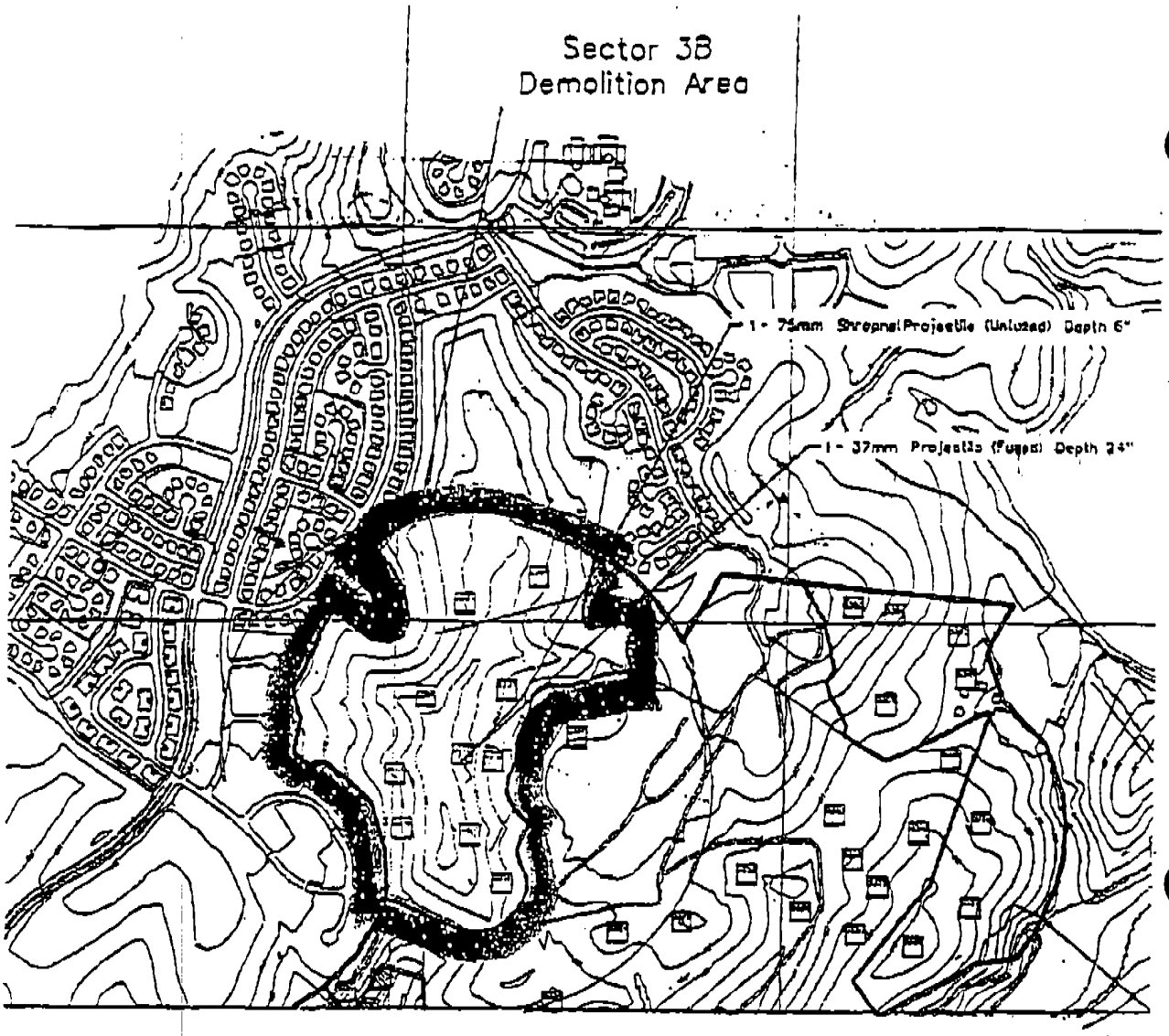


FIGURE 2. Most Probable Munitions (MPM) and Minimum Separation Distance (MSD) for Sector 3B Tourtelot Property.

KEY

Intrusive Work Areas in Sector 3B.

200-foot MSD Arc around intrusive Work areas In Sector 3B. (MSD based on an unarmed 37 MM Projectile As The MPM, 1 Hazardous Fragment In 600 Sq. Ft. MSD= Arc of 200 Feet.)

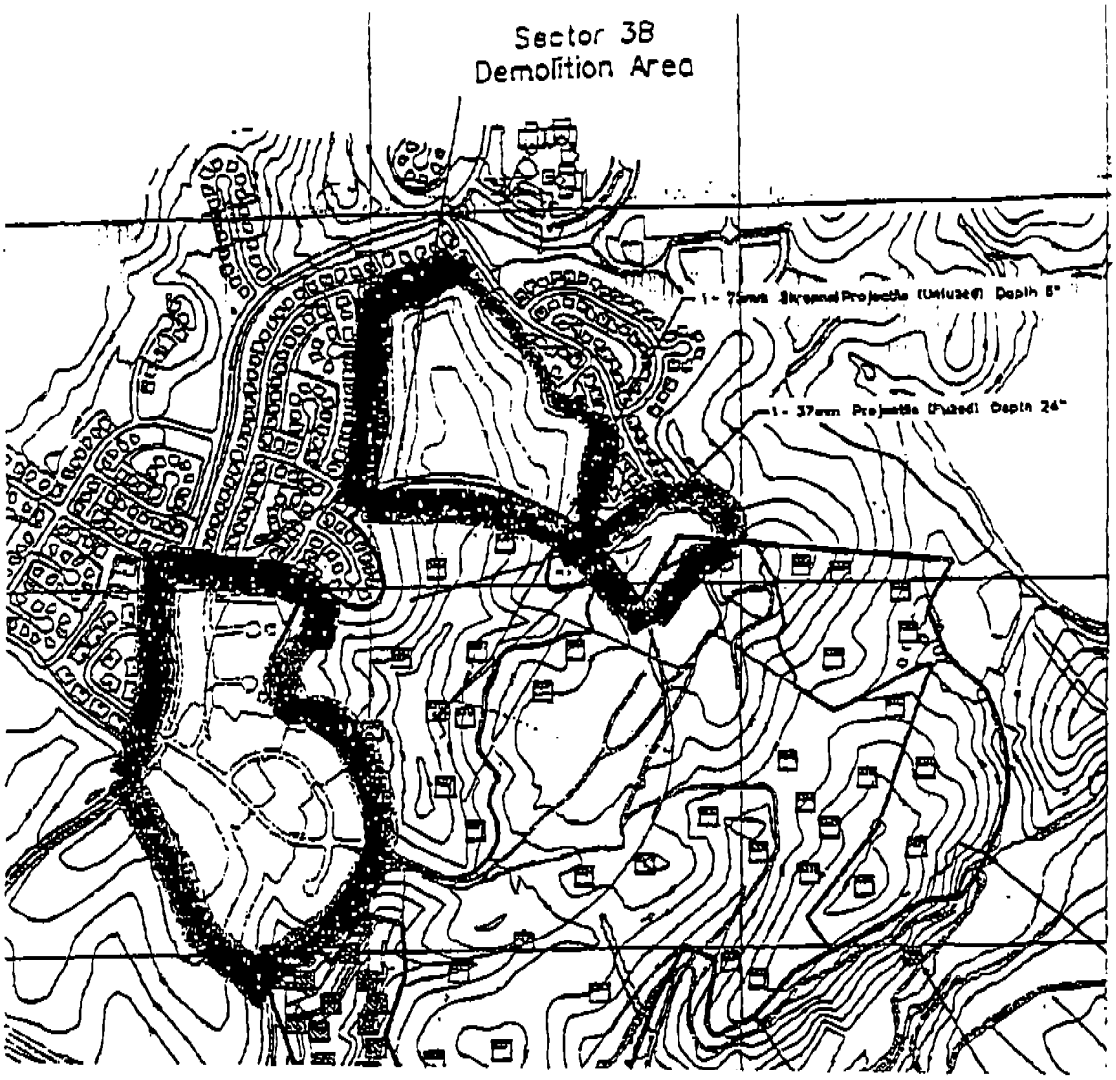


FIGURE 3. Potential Minimum Separation Distance (MSD) for OE Expansion from Sectors 3A and 3B Tourtelot Property.

KEY

Intrusive Work Areas in Potential Expansion Area Adjacent to Sectors 3A and 3B.

200-foot MSD Arc around intrusive Work areas In Expansion Area. (MSD Based Either on an Unarmed 37 MM Projectile or an Unarmed 60 MM Mortar as the MPM Extending From the Adjacent Sector, Both having the same 1 Hazardous Fragment In 600 Sq. Ft. MSD= Arc of 200 Feet.)

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TOURTELOT CLEANUP PROJECT ORDNANCE AND EXPLOSIVES REMEDIATION MINIMUM SEPARATION DISTANCE

Dear Mr. Handel and Mr. Splitter:

The purpose of this letter is to respond to your request to implement the United States Army Corps of Engineer (ACE) recommended Minimum Separation Distance (MSD) of 200 feet during ordnance and explosives (OE) remediation for the Tourtelot Cleanup Project. It is the Department of Toxic Substances Control's (DTSC) understanding that Granite and ACE intend to use the ACE recommended 200 foot MSD to establish an area in which all nonessential personnel will be withdrawn for their protection in the event of an accidental detonation during the OE remedial activities. Although some risk remains to the surrounding people and property, it is DTSC's understanding that Granite and the ACE are willing to appropriately address any injury or damage caused by a detonation at the site.

DTSC initially requested the use of the maximum fragmentation distance of the most probable munition as the MSD for the site. The current maximum fragmentation distance is estimated at 1,080 or 1,181 feet based on the most probable munitions to be found across the site. Granite and ACE have requested the MSD be based on the calculated distance that represents the location at which fragments in flight from an accidental detonation of the most probable munition will equal 1 hazardous fragment in a 600 square foot area (1/600). This is approximately a 1% chance for a person six feet tall and approximately one foot wide, standing in the open at the 1/600 MSD distance to be hit by a hazardous fragment in the event of an accidental detonation.

ACE has advised us that there have been no reported accidents involving clearance operations while employing the 1/600 MSD. The use of the 1/600 is not normally used for OE projects unless certain site and ordnance conditions are met. Additionally, ACE

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov.

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goes on to state in writing that "The reduction to 1 hazardous fragment in 600 square feet MSD is a risk to the public that must be assumed by those officials approving the adoption of this reduced MSD". To date, neither Granite nor ACE have provided sufficient supporting information to allow DTSC to fully analyze the associated risk of the recommended 200 foot MSD. DTSC recognizes the ACE's experience with OE safety issues, but has concerns regarding the 1% risk. Given the above, DTSC can accept ACE's recommended 200 foot MSD, with the addition of a voluntary separation distance (VSD) encompassing the maximum fragmentation distance for the most probable munition.

DTSC believes that the OE investigation and remediation can be protective of the local community provided the following requirements are implemented and maintained throughout the course of the investigation and remediation:

1. Granite will delegate safety and quality control oversight of OE investigation, detection and remediation to ACE. All field decisions for blow-in-place or storage for destruction in a chamber will remain with the ACE.

2. ACE, in their oversight capacity, will be assured by Granite that the Minimum Separation Area Notification and Implementation Plan (MSAP) is operational and in place according to the final approved OE Remedial Design Document (RDD).

3. At a minimum, all Defense Department Explosive Safety Board recommendations and requirements will be implemented when performing OE scanning and removal of OE.

4. Properly trained ACE OE experts will be present on the project site with authority to stop work and/or modify procedures if site conditions dictate.

5. ACE will monitor all field activities to provide compliance with Quality Assurance/Quality Control plans and safety procedures. ACE will also be authorized to randomly check the OE work through appropriate means.

6. In addition to the 200 foot MSD recommended by ACE, a VSD encompassing the broader area of all residents, businesses and schools located within the maximum fragmentation distance for the most probable munition, currently 1,080 and 1,181 feet, will be notified of the potential hazards associated with an accidental detonation. The notification of all residents, businesses and schools within the VSD will include a public meeting and notification component so people can make informed decisions on the risks posed to them by this activity. Any residents, schools or businesses located within the VSD choosing to temporarily withdraw, will be offered the same support services as residents, schools and businesses located within the 200 foot MSD.

7. Both the 200 foot MSD and the VSD will be implemented at any time when OE intrusive activities are being performed. Intrusive activities include, but are not limited to, digging to identify surface and subsurface anomalies and excavation and grading activities in OE suspect areas.

8. Affected individuals within the 200 foot MSD and the VSD will be offered support services. Procedures for implementing the withdrawal will be contained in the MSAP approved by DTSC prior to the start of field work. At a minimum, the MSAP will address notification, transportation, hospitality accommodations and issues of special needs for all affected people. The MSAP will also address security for all homes and businesses of those affected individuals. Specific procedures for cost reimbursement to residents for damage caused by detonation associated with OE remediation will also be included in the MSAP as part of the final OE RDD.

9. A separate MSD will be required for handling and treatment of explosive concentrations of Trinitrotoluene (TNT) contaminated soils. To date ACE has not provided a recommended MSD. DTSC will review the proposed MSD and associated safety procedures for TNT when Granite and ACE submit the information in the OE RDD.

10. For controlled intentional detonations or controlled anomaly digs, a different MSD than the 200 foot MSD/VSD approach identified above for accidental detonations may be applied. This MSD would be based on the specific OE location, size and protective measures used for the controlled detonations or anomaly digs. The use of these types of MSDs will need to be discussed as part of the OE RDD.

If additional information or site conditions warrant changes in the above MSDs and associated activities, they may be modified upon written approval by the DTSC. My staff will be available to meet with you to discuss any questions you may have. Please feel free to contact Mr. Stewart Black at (916) 255-3712.

Sincerely,

Anthony J. Landis, P.E.
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Northern California Operations
Office of Military Facilities

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To establish a minimum safe distance surrounding the TNT strips during OE operations, the "blast distance" calculated for the greatest TNT concentration hotspot detected during RI/FS sampling will be used. The blast distance is calculated using formulas provided by DoD Manual DA PAM 385-64, which considers soil volume, weight, and TNT concentration to derive an explosive weight according to:

$$\text{Blast Distance} = 40 \times (\text{soil volume} \times \text{soil weight} \times \text{percentage TNT})^{1/3}$$

For the Project Site, the maximum detected TNT concentration is 38 percent, the hotspot radius was 2 feet (as determined from the decrease in concentration in samples offset by 2 feet), the depth of the hotspot was taken as 2 feet bgs (TNT concentration at 2 feet was 11 percent, versus 38 percent a 1 foot bgs), and the soil weight was 115 pounds per cubic foot (as taken from RI/FS sampling results). The calculated blast distance (BD) then is:

$$BD = 40 \times (25.14\ ft^3 \times 115\ lb/ft^3 \times 0.38)^{1/3} = 411.78, \text{ or } 412 \text{ feet.}$$

APPENDIX C

Attachment B

STANDARD OPERATIONS PROCEDURES
DEMOLITION/DISPOSAL OPERATIONS

ATTACHMENT B
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ATTACHMENT B
STANDARD OPERATING PROCEDURES
OE OPERATIONS - DEMOLITION/DISPOSAL OPERATIONS

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the minimum procedures and safety and health requirements applicable to the conduct of demolition/disposal operations on sites contaminated with ordnance and explosives (OE). If procedures in this SOP conflict with procedures or guidelines in the OE SSHP and OE RDD, the more stringent requirement will be applied.

2.0 SCOPE

This SOP applies to all site personnel, including contractor and subcontractor personnel, involved in the conduct of OE demolition/disposal operations on an OE contaminated site. This SOP is not intended to contain all of the requirements needed to ensure complete compliance, and should be used in conjunction with project plans and applicable federal, state, and local regulations.

3.0 REGULATORY REFERENCES

Applicable sections and paragraphs in the documents listed below will be used as references for the conduct of OE demolition/disposal operations:

- OSHA General Industry Standards, 29 CFR 1910
- OSHA Construction Standards, 29 CFR 1926
- CEHNC Safety Concepts and Basic Considerations for Unexploded Ordnance
- USACE EM 385-1-1, Safety and Health Requirements Manual
- DOD 4145.26-M, Contractor's Safety Manual for Ammunition and Explosives
- DOD 4160.21-M, Defense Reutilization and Marketing Manual
- DOD 6055.9-STD, DOD Ammunition and Explosives Safety Standards
- AR 385-64, Ammunition and Explosive Safety
- AR 385-10, Army Safety Program
- DA PAM 385-64, Ammunition and Explosives Safety Standards
- TM 9-1300-206, Ammunition and Explosive Standards
- TM 9-1300-200, Ammunition General
- TM 9-1300-214, Military Explosives
- TM 60A-1-1-31, EOD Disposal Procedures
- AR 190-11, Physical Security of Arms, Ammunition and Explosives
- ATF 5400.7, Alcohol Tobacco and Firearms Explosives Laws and Regulations
- Applicable sections of DOT, 49 CFR 100 to 199.

4.0 RESPONSIBILITIES

4.1 PROJECT MANAGER

The Project Manager shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures, and training for disposal of OE.

4.2 SENIOR OE SUPERVISOR

The Senior UXO Supervisor (SUXOS) will be responsible for assuring that adequate safety measures and housekeeping are taken during all phases of site operation, to include demolition activities, and shall visit site demolition locations routinely to ensure that demolition operations are carried out in a safe, clean, efficient, and economical manner.

4.3 DEMOLITION SUPERVISOR

Prior to initiation of demolition operations, the SUXOS shall designate an experienced and trained UXO Supervisor to act as the Demolition Supervisor (DS). The demolition activities shall then be conducted under the direct control of the DS, who will have the responsibility of supervising all demolition operations within the area. The DS shall be responsible for training all on-site OE personnel regarding the nature of the materials handled, the hazards involved and the precautions necessary. The DS will also ensure that the Daily Operational Log and Demolition Shot Records are properly filled and accurately depict the demolition events and demolition material consumption for each day's operations. The DS shall be present during all demolition operations or designate a competent, qualified person to be in charge during any absences.

4.4 SITE SAFETY OFFICER

The Site Safety Officer (SSO) for the site is responsible for ensuring that all demolition operations are being conducted in a safe and healthful manner, and is required to be present during all OE demolition operations. The only exception to this rule is when the project site has multiple sites conducting various types of OE investigation and remediation operations being conducted concurrently with periods where there may be continuous demolition operations throughout the day. In that event, a demolition team SSO will be designated. This individual will report to the SSO and assume the SSO's responsibilities at the demolition range. In this situation, the SSO will conduct periodic safety audits of the demolition team and assist the demolition team SSO in the performance of their duties. The SSO will report demolition safety issues directly to the OE Safety Manager (OESM).

4.5 QUALITY CONTROL SPECIALIST

The Quality Control Specialist (QCS) is responsible for ensuring the completeness of disposal operations and for weekly inspection of the Daily Operational Log and Demolition Shot Records. The QCS, assisted by demolition team personnel, will inspect each disposal site and the area encompassed by the "sand bag

throw" distance after each disposal shot to ensure there are no residual OE or components or recognizable OE scrap items. Any OE considered "unsafe to move" that is discovered during the QC check will be marked and disposed of by BIP that day. Extreme caution must be exercised when handling OE that has been exposed to the forces of detonation.

5.0 GENERAL OPERATIONAL AND SAFETY PROCEDURES

All personnel, including contractor and subcontractor personnel, involved in operations on OE-contaminated sites shall be familiar with the potential safety and health hazards associated with the conduct of demolition/disposal operations, and with the work practices and control techniques used to reduce or eliminate these hazards. During demolition operations, general safety provisions listed below shall be followed by all demolition personnel. Noncompliance with the general safety provisions listed may result in discipline, to include termination of employment:

- All safety regulations applicable to demolition activities shall be complied with.
- All requirements of OE SSHP shall be complied with.
- Demolition of any kind is prohibited without the express permission from the client.
- The use of sandbags or other engineering controls for mitigation of fragmentation and blast effects due to intentional detonation of munitions will be conducted in accordance with Appendix H of the OE RDD. The quantity of OE to be destroyed in a single shot will be limited to one item to reduce noise travel into residential areas.
- In the event of an electrical storm or heavy snow or dust storms, immediate action will be taken to cease all disposal site operations and evacuate the area.
- In the event of a fire or unplanned explosion, if possible, put out the fire. If unable to do so, notify the fire department and evacuate the area. If injuries are involved, remove victims from danger, administer first aid, and seek medical attention.
- The DS is responsible for reporting all injuries and accidents that occur during disposal operations to the SSO.
- Personnel on site will not tamper with any safety devices or protective equipment.
- Methods of demolition shall be conducted in accordance with this procedure and approved changes thereto.
- Adequate first aid equipment shall be provided at all times.
- All personnel engaged in the destruction of OE shall wear under and outer garments made of natural fiber, close-weave clothes, such as cotton. Synthetic material such as nylon is not authorized unless treated with anti-static material.
- Care will be taken to minimize exposure to the smallest number of personnel, for the shortest time, to the least amount of hazard, consistent with safe and efficient operations.

- Work locations will be maintained in a neat and orderly condition.
- All hand tools shall be maintained in a good state of repair.
- Each heavy equipment and/or vehicle operator will have in their possession a valid state driver's license.
- Equipment and other lifting devices designed and used for lifting will have the load rating and date of next inspection marked on them. The load rating will not be exceeded and the equipment will not be used without a current inspection date.
- Leather or leather-palmed gloves will be worn when handling wooden boxes, munitions, or OE.
- Lifting and carrying require care. Improper methods cause unnecessary strains. Observe the following preliminaries before attempting to lift or carry:
    - When lifting, keep your arms and back as straight as possible, bend your knees, and lift with your leg muscles; and
    - Be sure you have good footing and hold; lift with a smooth, even motion.
- Telephone and/or radio communication will be available and used during disposal operations.
- Motor vehicles and material handling equipment (MHE) used for transporting OEO or demolition materials must meet the following requirements:
    - Exhaust systems shall be kept in good mechanical repair at all times.
    - Lighting systems shall be an integral part of the vehicle.
    - One Class ABC-rated, portable fire extinguisher shall, if possible, be mounted on the vehicle outside of the cab, on the driver's side, and one Class ABC fire extinguisher shall be mounted inside the cab.
    - Wheels of carriers must be chocked and brakes set during loading and unloading.
    - No demolition material or OE shall be loaded into or unloaded from motor vehicles while their motors are running.
- Motor vehicles and handling equipment used to transport demolition material and OE shall be inspected prior to use to determine that:
    - Fire extinguishers are filled and in good working order.
    - Electrical wiring is in good condition and properly attached.
    - Fuel tank and piping are secure and not leaking.
    - Brakes, steering, and safety equipment are in good condition.
    - The exhaust system is not exposed to accumulations of grease, oil, gasoline, or other fuels, and has ample clearance from fuel lines and other combustible materials.

- Employees are required to wear leather or rubber gloves when handling demolition materials. The type of glove worn is dependent on the type of demolition material.

- An observer will be stationed at a location where there is a good view of the air and surface approaches to the disposal site before material is detonated. It shall be the responsibility of the observer to warn the DS to suspend firing if any aircraft, vehicles, or personnel are sighted approaching the disposal site.

- Two-way radios shall not be operated at the disposal site while the shot is primed or during the priming process. The charts shown in Tables B-1 and B-2 shall be used for determining the safe distances from transmitter antennas.

- Disposal operations will not be left unattended once explosives are on site and operations have begun.

- No disposal operations will be conducted if there is less than a 2,000-foot ceiling or if wind velocity exceeds 20 mph.

- Disposal shots must be fired during daylight hours (i.e., between 30 minutes after sunrise and 30 minutes before sunset).

- No more than two persons shall ride in a truck transporting demolition material or OE, and no passengers are authorized to ride in the trailer/bed.

- Vehicles shall not be refueled when carrying demolition material or OE, and must be 100 feet from magazines or trailers containing such items before refueling.

- All explosive vehicles will be cleaned of visible explosive and other contamination before releasing the vehicles for other tasks.

- Prior to conducting any other task, personnel shall clean their face and hands after handling demolition material or OE.

5.1 FIRE PREVENTION FOR DISPOSAL OPERATIONS

The following procedures will be adhered to on each disposal shot:

- For OE that cannot be moved, measures will be taken to carefully plan fire suppression accesses and procedures prior to detonating shots. All disposal and safety personnel will be fully briefed on fire suppression procedures.

- Immediately after the detonation, all safety personnel will report status of the disposal site.

- If fire or smoke in the vegetation surrounding the site is present, the demolition team will proceed immediately to the site with field fire suppression equipment and attempt to suppress any fires present.

- If a fire becomes uncontrollable, emergency notifications to local fire agencies will be made and all field workers will stand by to assist as necessary.

The fire prevention goals are to plan effectively for all potential fire suppression obstacles, ensure prevailing winds are not going to take potential smoke towards populated areas, ensure that adequate fire suppression equipment is on site, and keep vigilant communications with the local fire department during all disposal operations.

6.0 SPECIAL REQUIREMENTS FOR DEMOLITION ACTIVITIES

The following safety and operational requirements shall be followed during disposal site operations. Any deviations from this procedure shall be allowed only after receipt of written approval from the Earth Tech Project Manager and the client. Failure to adhere to the requirements and procedures listed in the paragraphs below could result in serious injury or death; therefore, complete compliance with these requirements will be strictly enforced.

6.1 GENERAL REQUIREMENTS

The general disposal operations requirements listed below shall be followed at all times:

- Material awaiting destruction shall be stored in magazines..
- OE or bulk explosives to be destroyed by detonation should be detonated in a blast chamber or in a pit constructed as set forth in Section 4.11 of the OE RDD. The components should be placed on their sides or in a position to expose the largest area to the influence of the demolition material. The demolition material should be placed in direct contact with the item to be detonated and held in place by tape or earth packed over the demolition materials. The total quantity to be destroyed at one time shall be kept at a minimum.
- Detonations will be counted to ensure detonation. After each shot, a search shall be made of the surrounding area for OE. Items such as lumps of explosives or unfuzed ammunition may be picked up and prepared for the next shot.
- Prevailing weather condition information will be obtained from the U.S. Weather Service and the data logged in the Demolition Shot Log before each shot or round of shots.
- All shots shall be dual-primed.
- A minimum of 30 seconds will be maintained between each detonation.
- After each detonation and at the end of each day's operations, surface exposed scrap metal, casings, fragments, and related items shall be recovered from the disposal site and disposed of in accordance with OE scrap procedures, as well as all applicable environmental regulations. All collected scrap metal will be 100 percent inspected for absence of explosive materials by OE personnel and certified by the SUXOS.
- When operated in accordance with the conditions of this procedure, the disposal site should not present a noise problem to the surrounding community. However, if a noise complaint is received, the name, address, and telephone number of the complainant should be recorded and reported to the SUXOS who, in turn, shall report it to the Earth Tech Project Manager.

- Prior to and after each shot, the Demolition Shot Record is to be filled out by the DS with all applicable information.

6.2 ELECTRIC DETONATOR USE

The following requirements are necessary when using electric detonators and blasting circuits:

- Electric detonators and electric blasting circuits may be energized to dangerous levels from outside sources such as static electricity, induced electric currents, and radio communication equipment. Safety precautions will be taken to reduce the possibility of a premature detonation of the electric detonator and explosive charges of which they form a part. Radios will not be operated while the site is primed or during the priming process.

- The shunt shall not be removed from the leg wires of the detonator until the continuity check of the detonator.

- When uncoiling or straightening the detonator leg wires, keep the explosive end of the detonator pointing away from the body and away from other personnel. When straightening the leg wires, do not hold the detonator itself; rather, hold the detonator leg wires approximately 1 inch from the detonator body. Straighten the leg wires by hand; do not throw or wave the wires through the air to loosen them.

- Prior to use, the detonators shall be tested for continuity. To conduct the test, place the detonators in a pre-bored hole in the ground or place them in a sand bag, and walk facing away from the detonators and stretch the wires to their full length, or to 25 feet, whichever is less, being sure to not pull the detonators from the hole or sand bag. With the leg wires stretched to their full length, test the continuity of the detonators one at a time by un-shunting the leg wires and attaching them to the galvanometer and checking for continuity. After the test, re-shunt the wires by twisting the two ends together. Repeat this process for each detonator until all detonators have been tested. This process shall be accomplished at least 25 feet from any OE or demolition materials and out of the demolition range personnel and vehicle traffic flow pattern. In addition, all personnel on the demolition range shall be alerted prior to the test being conducted.

NOTE: When testing the detonator prior to connecting the detonator to the firing circuit, the leg wires of the detonator must be shunted by twisting the bare ends of the wires together immediately after testing. The wires shall remain short circuited until time to connect them to the firing line.

- At the power source end of the blasting circuit, the ends of the wires shall be shorted or twisted together (shunted) at all times, except when actually testing the circuit or firing the charge. The connection between the detonator and the circuit firing wires must not be made unless the power end of the firing wires are shorted and grounded or the firing panel is off and locked.

- The firing line will be checked using pre-arranged hand signals or through the use of two-way radios if the demolition pit is not visible from the firing point. If radios are used, communication shall be accomplished a minimum of 25 feet from the demolition pit and detonators. The firing line will be checked for electrical continuity in both the open and closed positions, and will be closed/shunted prior to connecting the detonator leg wires.

- OE to be detonated/vented shall be placed in the demolition pit or blast chamber and the demolition material placed/attached in such a manner as to ensure the total detonation/venting of the OE. Once the OE and demolition material are in place and the shot has been tamped, the detonators

will be connected to the demolition material. Prior to handling any detonators that are connected to the firing line, personnel shall ensure that they are grounded. The detonators will then be carried to the demolition pit with the end of the detonators pointed away from the individual. The detonators are then connected to the detonation cord, Non-El, etc., ensuring that the detonator is not covered with tamping material to allow for ease of recovery/investigation in the event of a misfire.

- Prior to making connections to the blasting machine, the entire firing circuit shall be tested with a galvanometer for electrical continuity and ohmic resistance to ensure the blasting machine has the capacity to initiate the shot.

- The individual assigned to make the connections at the blasting machine or panel will not complete the circuit at the blasting machine or panel and will not give the signal for detonation until satisfied that all personnel in the vicinity have been evacuated to a safe distance. When in use, the blasting machine or its actuating device shall be in the blaster's possession at all times. When using the panel, the switch must be locked in the open position until ready to fire, and the single key must be in the blaster's possession.

- Prior to initiating a demolition shot(s), a warning will be given, the type and duration of such will be determined by the prevailing conditions at the demolition range. At a minimum, this should be an audible signal using a siren, air horn or megaphone that is sounded for a duration of 1 minute, 5 minutes prior to the shot and again 1 minute prior to the shot.

6.3 DETONATING CORD USE

The following procedures are required when using detonating cord (det cord):

- Detonation cord should be cut using approved crimpers and only the amount required should be removed from inventory.

- When cutting the detonation cord, the task should be performed outside the magazine.

- For ease of inventory control, only remove the detonation cord in 1-foot increments.

- The detonation cord should not be placed in clothing pockets or around the neck, arm, or waist, and should be transported to the demolition location in either an approved "day box" or a cloth satchel, depending upon the magazine location and proximity to the demolition area.

- The detonation cord should be placed at least 25 feet away from detonators and demolition materials until ready for use. To ensure consistent safe handling, each classification of demolition material shall be separated by at least 25 feet until ready for use.

- When ready to "tie in" either the detonation cord to demolition materials, or the detonation cord to the detonator, the detonation cord will be connected to the demolition material and secured to the OE. The cord is then strung out of the hole and secured in place with soil, being sure to leave a 1-foot tail exposed outside the hole.

- Once the hole is filled, make a loop in the detonation cord that is large enough to accommodate the detonation cord detonator, place the detonator in the loop, and secure it with tape. The explosive end of the detonator will face down the detonation cord, toward the demolition material or parallel to the main line.

- In all cases, ensure there is sufficient detonation cord extending out of the hole to allow for ease of detonator attachment and detonator inspection/replacement should a misfire occur.

- If the detonation cord detonators are electric, they will be checked, tied in to the firing line, and shunted prior to being taped to the loop. If the detonation cord detonators are Non-EI, the time/safety fuse will be prepared with the igniter in place prior to taping the detonators to the detonation cord loop. If the detonation cord detonators are non-electric, simply tape the detonators into the loop as described above.

- In the event that a time/safety fuse is used and an igniter is not available and a field expedient initiation system is used (i.e., matches), do not split the safety fuse until the detonator is taped into the detonation cord loop.

6.4 TIME/SAFETY FUSE USE

The following procedures are required when using a time/safety fuse:

- Prior to each daily use, the burn rate for the time/safety fuse must be tested to ensure the accurate determination of the length of time/safety fuse needed to achieve the minimum burn time of 5 minutes needed to conduct demolition operations.

- To ensure both ends of the time/safety fuse are moisture-free, use approved crimpers to cut 6 inches off the end of the time/safety fuse roll, and place the 6-inch piece in the time/safety fuse container.

- Take the 6-foot section out of the magazine and attach a fuse igniter.

- In a safe location, removed from demolition materials and OE, ignite the time/safety fuse, measure the burn time from the point of initiation to the "spit" at the end, and record the burn time in the DS's Log.

- To measure the burn time, use a watch with a second hand or chronograph.

- To calculate the burn rate in seconds per foot, divide the total burn time (in seconds) by the length (in feet) of the test fuse.

- Whenever using time/safety fuse for demolition operations, the minimum amount of fuse to be used for each shot will be the amount needed to permit a minimum burn time of 5 minutes.

6.5 PERFORATOR USE

The following procedures are required when using perforators:

- Only remove from inventory the number of perforators required to perform the task.

- Transport perforators in an approved "day box," cloth satchel, or plastic container, depending upon magazine location and proximity to the demolition operations.

- Keep perforators stored at the demolition site at least 25 feet away from detonators and demolition materials until ready for use.

- When ready to use, place the detonation cord through the slot on the perforator and knot the detonation cord, ensuring the cord fits securely and has good continuity with the perforator.
- Once the detonation cord is secure, place the perforator in the desired location and secure it in place.
- Proceed from this point as described in Section 6.3.

6.6 USE OF TWO-COMPONENT EXPLOSIVES

The following procedures are required when using two-component explosives as demolition material:

- Only remove from inventory the amount of two-component required to perform the task.
- When transporting the solid and liquid, they need only be placed apart in the bed of a truck.
- Do not mix the solid and liquid components until certain that it will be used, since the resulting mixture is classified as a Class 1.1 explosive by Department of Transportation.
- When mixing the solid and liquids components, follow the manufacturer's instructions, while being sure to wear rubber gloves and goggles. Mix components in an area away from other demolition materials, the OE, and if possible, sheltered from the wind.
- Once the components have been mixed, it is essential that the lid to the solid bottle is put on securely as soon as possible after mixing to prevent evaporation of the liquid.
- Attach the detonation cord as recommended by the manufacturer, place the assembled unit in the desired location in the hole, and secure the unit.
- Proceed from this point as described in Section 6.3.

7.0 METEOROLOGICAL CONDITIONS

In order to control the effects of demolition operations and to ensure the safety of site personnel, the following meteorological limitations and requirements shall apply to demolition operations:

- Demolition operations will not be conducted during electrical storms or thunderstorms.
- No demolition operations shall be conducted if the surface wind speed is greater than 10 miles per hour.
- Demolition operations will not be conducted during periods of visibility of less than 1 mile caused by, but not limited to, dense fog, blowing snow, rain, sand, or dust storms.
- Demolition shall not be carried out on extremely cloudy days, which are defined as overcast (more than 80 percent cloud cover) with a ceiling of less than 2,000 feet.
- Demolition operations will not be conducted during any atmospheric inversion condition (low or high altitude).

- Demolition operations will not be conducted during periods of local air quality advisories.

- Demolition operations will not be initiated until 30 minutes after sunrise, and will be secured at least 30 minutes prior to sunset.

8.0 PRE-DEMOLITION/DISPOSAL PROCEDURES

8.1 PRE-DEMO/DISPOSAL OPERATIONAL BRIEFING

The DS will brief all personnel involved demolition operations in the following areas:

- Type of OE being destroyed
- Type, placement, and quantity of demolition material being used
- Use of sandbags for mitigation of fragmentation and blast effects
- Method of initiation (electric, non-electric or Non-EI)
- Means of transporting and packaging OE
- Route to the disposal site
- Equipment being used (e.g., galvanometer, blasting machine, firing wire)
- Misfire procedures
- Fire prevention procedures
- Post shot clean up of site.

8.2 PRE-DEMO/DISPOSAL SAFETY BRIEFING

The SSO will conduct a safety briefing for all personnel involved in operations in the following areas:

- Care and handling of explosive materials

- Personal hygiene

- Two man rule

- Potential trip/fall hazards

- Location of emergency shelter (if available)

- Parking area for vehicles (vehicles must be positioned for immediate departure, with the keys in the ignition)

- Location of emergency vehicle (keep engine running)

- Wind direction (to assess potential toxic fumes)

- Location of first aid kit and fire extinguishers

- Route to nearest hospital or emergency aid station

- Type of communications in event of an emergency.

8.3 TASK ASSIGNMENTS

Individuals with assigned tasks will report the completion of the task to the DS. The types of tasks that may be required are:

- Contact local police, fire personnel, and FAA as required.
- Contact hospital/emergency response personnel if applicable.
- Secure all access roads to the disposal site.
- Visually check PWD for any unauthorized personnel.
- Check firing wire for continuity and shunt.
- Prepare designated disposal sites as required.
- Check continuity of detonators.
- Check time/safety fuse and its burn rate.
- Designate a technician to maintain custody of blasting machine, fuse igniters, or Non-EI initiator.
- Secure detonators in a safe location.
- Place OE in pit and place charge in desired location.

8.4 PREPARING EXPLOSIVE CHARGE FOR INITIATION

To prepare the explosive charge for initiation, the procedures listed below will be followed:

- Ensure firing wire is shunted.
- Connect detonator to the firing wire.
- Isolate or insulate all connections.
- Place demolition charge on OE.
- Prime the demolition charge.
- Depart to firing point (if using non-electric firing system, obtain head count, pull igniters, and depart to designated safe area).
- Ensure all personnel are out of the minimum separation distance.
- Give 1-minute warning signal, using a bullhorn or siren, 5 minutes prior to detonation, and again at 1 minute prior to detonation.
- Yell **"fire in the hole"** three times (or an equivalent warning) and take cover.
- If using electric firing system, connect firing wires to blasting machine, and initiate charge.
- Remove firing wires from blasting machine and shunt.
- Remain in designated safe area until DS announces "**All Clear**." This will occur after a post-shot waiting period of 5-minutes and the DS has inspected the site(s).

9.0 POST DEMOLITION/DISPOSAL PROCEDURES

Do not approach a smoking hole or allow personnel out of the designated safe area until cleared to do so, and follow the below listed procedures:

- After the **"All Clear"** signal, check site for low orders, kick outs, and fires.
- Inspect inside of the Blast Chamber for low orders, as necessary, and remove all debris.
- Inspect site and dispose of any residual OE or recognizable OE scrap.
- Backfill hole as necessary.
- Police up all equipment.
- Notify police, fire, etc., that the operation is complete.

10.0 MISFIRE PROCEDURES

A thorough check of all equipment, firing wire, and detonators will prevent most misfires. However, if a misfire does occur, the procedures outlined below shall be followed.

10.1 ELECTRIC MISFIRES

To prevent electric misfires, one technician will be responsible for all electrical wiring in the circuit. If a misfire does occur, it must be cleared with extreme caution, and the responsible technician will investigate and correct the situation using the steps outlined below:

- Check firing line connections to the blasting machine and make a second attempt to initiate charge.
- If unsuccessful, disconnect and connect to another blasting machine (if available) and attempt to initiate charge.
- If unsuccessful, commence a 30-minute wait period.
- After the maximum delay predicted for any part of the shot has passed, the designated technician will proceed to the site to inspect the firing system, and a safety observer must watch from a protected area.
- Disconnect and shunt the detonator wires, connect a new detonator to the firing circuit, and prime the charge without disturbing the original detonator (replacement detonator must have been checked for continuity as outlined in Section 6.2, after disconnecting the defective detonator).
- Follow normal procedures for effecting initiation of the charge.

10.2 NON-ELECTRIC MISFIRES

Working on a non-electric misfire is the most hazardous of all operations. Investigation and corrective action should be undertaken by the technician that placed the charge using the following procedure:

- If a charge fails to detonate at the determined time, initiate a 60-minute wait period plus the time of the safety fuse (i.e., 5-minute safety fuse plus 60 minutes, for a total of 65-minute wait period).

- After the wait period has expired, a designated technician will proceed to the site to inspect the firing system. A safety observer must watch from a protected area.

- Prime the shot with a new non electric firing system and install a new fuse igniter.

- Follow normal procedures for initiation of the charge.

10.3 NON-EL MISFIRE

The use of a shock tube for blast initiation can present misfires which require the following actions:

- If charge fails to detonate, it could be the result of the shock tube not firing. Visually inspect the shock tube, if it is not discolored (i.e., slightly black), it has not fired.

- If it has not fired, cut a 1-foot piece off the end of the tube, re-insert the tube into the firing device, and attempt to fire again.

- If the device still does not fire, wait 30 minutes and proceed to the site to replace the shock tube with a new tube.

- If the tube is slightly black, then a "Black Tube" misfire has occurred, and the shock tube will have to be replaced. When replacing the shock tube, be sure to remove the tube with the detonator in place. Without removing the detonator from the end of the tube, place the defective tube on the shot for disposal.

10.4 DETONATING CORD MISFIRE

The detonation cord will be used to tie in multiple demolition shots and to ensure that electric detonators are not buried. Since detonation cord initiation will be either electrical or non-electrical, the procedures presented in Sections 10.1, 10.2, or 10.3, as appropriate to the type of detonator used, will be used to clear a detonation cord misfire. In addition, the following will be conducted:

- If there is no problem with the initiating system, wait the prescribed amount of time and inspect the initiator to the cord connection to ensure it is properly connected. If it was a bad connection simply attach a new initiator and follow the appropriate procedures in Section 6.0.

- If the initiator detonated and the cord did not, inspect the cord to ensure it is the detonation cord and not the time fuse. Also, check to ensure there is PETN in the cord at the connection to the initiator.

- At this point, it may be necessary to uncover the detonation cord and replace it. If this is required, it must be accomplished carefully to ensure that the demolition charge and the OE item(s) are not disturbed.

10.5 PERFORATOR MISFIRE

The use of perforators is both cost-effective and considerably safer than the use of C-4 and many other demolition materials. However, if the perforator is not initiated properly, it could malfunction. Since the perforator is covered with tamping material, the detonation cord is used as the initiator. Therefore, in the

event of a misfire, the procedures presented in Section 10.4 will be followed, along with the items presented below.

- If everything went but the perforator, one of four things has occurred:
  - The detonation cord grain size was insufficient to initiate the perforator
  - The detonation cord was dislodged from the perforator when placing tamping materials
  - The perforator was defective
  - The perforator was moved during the placement of tamping materials.

- Check to ensure the grain size of the detonation cord is sufficient, with 80 grain size or greater being the recommended size.

- If the detonation cord connection to the perforator was the problem, ensure that the next connection is secure (use duct tape if necessary).

- If it is evident that the perforator was moved, then ensure it is properly secured for the next shot.

- If cord size and connection are sufficient, replace the perforator, leaving the defective one on the shot

11.0 RECORD KEEPING REQUIREMENT

To document the demolition operations procedures and the completeness of the demolition of OE, the following record keeping requirements shall be met:

- Earth Tech will obtain and maintain all required permits.

- The DS will ensure the accurate completion of the logs, and the SUXOS will monitor the entries in the log for completeness, accuracy, and compliance with meteorological conditions.

- The DS shall enter the appropriate data on the Demolition Shot Record to reflect the OE destroyed.

- The quantities of OE recovered must also be the quantities of OE destroyed or disposed of as scrap.

- Earth Tech will retain a permanent file of all Demolition Records, including permits, training records, inspector reports, waste manifests if applicable, and operating logs.

- Copies of ATF License and any state or local permits must be on hand.

12.0 SAFETY AND PPE REQUIREMENTS

The following safety measures and personal protective equipment (PPE) shall be used in preventing or reducing exposure to the hazards associated with OE demolition/disposal operations. These requirements will be implemented unless superseded by site-specific requirements stated in the SSHP.

- Steel-toed safety boots will not be worn by personnel conducting demolition/disposal operations, unless a toe crush hazard exists, in which case personnel will wear boots with plastic or fiber toed safety toes;

- Unless a serious head, eye, or face hazard exists, OE personnel will not be required to wear hard hats, safety glasses, or face shields when conducting operations involving the handling of demolition explosives or OE; and

- In the event that a serious head, eye, or face hazard does exist, OE personnel will wear the required PPE, but positive means shall be required to secure the PPE and prevent it from falling and causing an accidental detonation.

13.0 AUDIT CRITERIA

The following items related to demolition/disposal operations on an OE contaminated site will be audited to ensure compliance with these SOPs:

- The Demolition Shot Record
- The Site Daily Operational and Safety Logs
- The OE Operations Daily/Weekly Report
- The Safety Training Attendance Forms, for the initial site hazard training
- The Safety Training Attendance Forms, for the Daily Tailgate Safety Briefings
- The Daily Safety Inspection and Audit Log.

TABLE B-1
MINIMUM SAFE DISTANCE FROM TRANSMITTER ANTENNAS

Average or Peak Transmitter Power in Watts	Minimum Distance to Transmitter in Meters / Feet
0 - 5	7.5 / 25
6 - 30	30 / 98.4
31 - 50	50 / 164.1
51 - 100	110 / 360
101 - 250	160 / 525
251 - 500	230 / 755
501 - 1,000	305 / 1,000
1,001 - 3,000	480 / 1,575
3,001 - 5,000	610 / 2,001
5,001 - 20,000	915 / 3,002
20,001 - 50,000	1,530 / 5,020
50,001 - 100,000	3,050 / 10,007
100,001 - 400,000	6,100 / 20,014
400,001 - 1,600,000	12,200 / 40,028
1,600,001 - 6,400,000	24,400 / 80,056

Note: When the transmission is a pulsed or pulsed continuous wave type and its pulse width is less than 10 microseconds, the power column indicates average power. For all other transmissions, including those with pulse widths greater than 10 microseconds, the power column indicates peak power.

TABLE B-2
MINIMUM SAFE SEPARATION FORMULAS

Unknown (Worst Case)	Without Metal Pack		With Metal Pack	
	Frequency	Formula	Frequency	Formula
Use Table 120D-1-1	≤2.3 KHz	$D = 0.093 \times (PG)^{0.5}$	≤73 KHz	$D = 0.093 \times (PG)^{0.5}$
	2.3 KHz - 0.45 MHZ	$D = 39.7 \times F \times (PG)^{0.5}$	73 KHz - 0.45 MHZ	$D = 126 \times F \times (PG)^{0.5}$
	0.45 MHZ - 400 MHZ	$D = 18 \times (PG)^{0.5}$	0.45 MHZ - 400 MHZ	$D = 0.6 \times (PG)^{0.5}$
	400 MHZ - 75 GHz	$D = (7137 / F) \times (PG)^{0.5}$	400 MHZ - 2.4 GHz	$D = (226 / F) \times (PG)^{0.5}$
	>75 GHz	$D = 0.093 \times (PG)^{0.5}$	>2.4 GHz	$D = 0.093 \times (PG)^{0.5}$

Where :

D = Safe distance to the transmitter in feet (multiply feet by 0.305 to obtain meters)

P = Output power of the transmitter in watts

G = Numerical gain of transmitter antenna

F = Frequency in MHZ (divide KHz by 1,000 to obtain MHZ, and multiply GHz by 1,000 to obtain MHZ)

To properly use this table, the following assumptions are made:

- The no-fire current of the EED is 10 mA.
- At least 10 dB below the no-fire current in EED is considered to be safe.
- The metal pack provides at least 30 dB of shielding.
- Non-metal packs provide no shielding.
- A 1 volt/meter field intensity is considered to be safe.
- At no time should personnel or munitions be exposed to more than 200 volts/meter.

APPENDIX D

ELECTRONIC COPY OF NORCAL GEOPHYSICAL DATA, SUMMARY OF ORDNANCE DATA, AND DIG SHEETS

2 CDs

REMEDIAL ACTION
WORK PLAN INVESTIGATION:
Tour. Property N. Valley
Landfill EM61 Data
5/26/00 & 5/30/00

NORCAL: Tour. Property
Vertical Magnetic
Gradient Data
EM61 I Data

NORCAL TOURTELOT PROPERTY VERTICAL MAGNETIC GRADIENT DATA

Subdirectory		Contents
Data	-	Vertical Magnetic Gradient Data, Surface Plots, and Surface Plot Input Files
NE	-	Vertical Magnetic Gradient Data, Northeast Grids
NW	-	Vertical Magnetic Gradient Data, Northwest Grids
SE	-	Vertical Magnetic Gradient Data, Southeast Grids
SW	-	Vertical Magnetic Gradient Data, Southwest Grids
Srf	-	Vertical Magnetic Gradient Data Plots
Em	-	EM61 data Identified by Grid.

Remedial Action Work Plan Investigation Tourtelot Property North Valley Landfill EM61 data Identified by Grid.

Table D-1.
August 1996 OE Clearance
OE-Related Items Recovered from Tourtelot Property

Grid/Section	Anomaly ID	Item #	Category	Description	Quantity	Depth (inches)	Estimated Weight (Pounds)
A/1C	5	1	OE Scrap	Large frag piece with smaller frag pieces	NA	12	4.00
A/1C	7	1	OE Scrap	Frag	1	6	NA
A/1C	9	1	OE Scrap	Small frag mixed with gravel	NA	6	NA
A/2A	35	1	OE Scrap	Frag mixed with gravel	NA	24	0.25
A/2A	36	1	OE Scrap	Small frag mixed with gravel	NA	12	2.00
A/2B	21	1	OE Scrap	Frag mixed with gravel	NA	18	0.50
A/2B	22	1	OE Scrap	Small frag mixed with gravel	NA	24	0.50
A/2C	23	1	OE Scrap	Frag	NA	6	0.13
A/2C	38	1	OE Scrap	Frag	NA	6	0.25
B/1B	30	1	OE Scrap	Frag	2	3	0.50
B/2A	47	1	OE Scrap	Large frag mixed with gravel	NA	12	20.00
B/2A	59	1	OE Scrap	Frag mixed with gravel	NA	12	4.00
B/2B	11	1	OE Scrap	Side of 155mm	1	8	10.00
B/2B	12	1	OE Scrap	Frag	NA	8	1.00
B/2B	15	1	OE Scrap	Large frag piece	1	6	0.50
B/2B	16	1	OE Scrap	Large frag pieces	2	8	2.00
B/2B	18	1	OE Scrap	Large frag piece	1	6	1.00
B/2B	21	1	OE Scrap	Large frag piece	1	4	2.00
B/2B	24	1	OE Scrap	Large frag piece	1	8	0.50
B/2B	25	1	OE Scrap	Large frag pieces	NA	12	20.00
B/2B	26	1	OE Scrap	Large frag pieces	6	12	10.00
B/2B	27	1	OE Scrap	Large frag pieces	NA	12	10.00
B/2B	28	1	OE Scrap	Large frag pieces	NA	12	0.50
B/2B	29	1	OE Scrap	Frag	NA	12	1.00
B/2B	46	1	OE Scrap	Frag mixed with gravel	NA	6	2.00
B/2B	49	1	OE Scrap	Frag mixed with gravel	NA	6	0.25
B/2B	52	1	OE Scrap	Frag mixed with gravel	NA	12	60.00
B/2B	52x	1	OE Scrap	Frag mixed with gravel	NA	6	0.50
B/2B	53	1	OE Scrap	Frag mixed with gravel	NA	6	0.50
B/2B	56	1	OE Scrap	Small frag mixed with gravel	NA	6	1.00
B/2B	57x	1	OE Scrap	Frag mixed with gravel	NA	12	2.00
B/2B	58	1	OE Scrap	Frag mixed with gravel	NA	6	1.00
B/2B	62	1	OE Scrap	Large frag piece in gravel	1	6	10.00
B/2B	69	1	OE Scrap	Large frag pieces	5	6	10.00
B/2C	33	1	OE Scrap	Frag	NA	6	0.25
B/2C	44	1	OE Scrap	Frag mixed with gravel	NA	8	1.00
B/2C	48x	1	OE Scrap	Frag mixed with gravel	NA	6	0.06
B/2C	50	1	OE Scrap	Frag mixed with gravel	NA	6	5.00
B/2C	51x	1	OE Scrap	Frag	1	8	0.06
B/3B	7	1	OE Scrap	Large frag pieces	NA	12	10.00
B/3B	9	1	OE Scrap	Large frag pieces	NA	8	0.25
B/3B	10	1	OE Scrap	Large frag pieces	NA	8	1.00
B/3B	71	1	OE Scrap	Base section of concrete-filled 155mm w/ small frag	NA	8	20.00
C/2D	6	1	OE Scrap	Concrete-filled 90mm	1	4	15.00
C/2D	7	1	OE Scrap	Large frag piece	1	3	1.00
C/2D	9	1	OE Scrap	Frag	NA	6	NA
D/3B	1	1	OE Scrap	Large frag pieces	NA	24	NA
D/3B	8	1	OE Scrap	Frag	NA	4	NA
D/3B	9	1	OE Scrap	Frag	NA	12	20.00
D/3B	11	1	OE Scrap	Frag mixed with gravel	NA	6	1.00
D/3C	7	1	OE Scrap	Frag mixed with gravel	NA	6	NA
D/4B	28	1	OE Scrap	Frag; 60mm mortar frag	NA	18	30.00
D/4C	14	1	OE Scrap	Large frag piece	1	3	NA
D/4C	15	1	OE Scrap	Frag	NA	6	3.00
D/4C	20	1	OE Scrap	Frag	NA	12	10.00
D/4C	26	1	OE Scrap	Frag	NA	4	0.25
D/4C	30	1	OE Scrap	Frag	NA	6	NA
D/5B	32	1	OE Scrap	Base of 20mm HE round	1	2	NA
D/5B	32	2	OE Scrap	Frag	NA	8	0.13
D/5C	33	1	OE Scrap	Frag	1	6	1.00
N/1B	57	1	OE Scrap	Small frag piece (possibly from 60mm tail fin)	1	6	0.13
P/1A	67	1	OE Scrap	Frag (possibly from 75mm)	NA	1	0.50
P/1B	68	1	OE Scrap	Frag (possibly from 75mm)	NA	1	0.50
P/1B	70	1	OE Scrap	Frag (possibly from 105mm)	NA	2	0.50
P/2A	64	1	OE Scrap	Frag from 37mm HE	NA	1	0.25
P/2A	65	1	OE Scrap	Frag (possibly from 75mm)	NA	0	0.50
P/2A	66	1	OE Scrap	Frag (possibly from 105mm)	NA	1	0.50
P/2B	72	1	OE Scrap	Large frag piece	1	0	0.25
P/2B	73	1	OE Scrap	Frag	1	1	0.25
P/3B	74	1	OE Scrap	Large frag piece	1	2	0.13

Notes: NA = information was not available
Total OE recovered from Tourtelot Property: 0
Source: Explosive Disposal Engineering and Technology, Grid Work Progress/Completion Accounting Sheets and Daily Reports, August 1996.

Table D-2.
December 1996 OE Clearance
OE-Related Items Recovered from Tourtelot Property

Grid/Section	Anomaly ID	Item #	Category	Description	Quantity	Depth (inches)	Estimated Weight (Pounds)
I-14/1	3N,42E	1	OE	40mm HE	1	12	NA
I-14/1	27N,42E	1	OE Scrap	Grenade fuze, inert (originally considered live)	1	12	NA
I-14/1	72N,53E	1	OE Scrap	40mm HE, inert (originally considered live)	1	12	NA
I-14/1	Multiple	--	OE Scrap	OE scrap (783 anomalies investigated)	1,216	NA	NA
J-14/3	NA	1	OE Scrap	OE scrap	1	NA	NA
J-14/3	NA	1	OE Scrap	OE scrap	1	NA	NA
N-15/1	NA	1	OE Scrap	Projectile fragments	1	NA	NA
N-15/1	NA	1	OE Scrap	Projectile fragments	1	NA	NA
N-15/2	NA	1	OE Scrap	40mm frag	1	NA	NA
N-15/2	NA	1	OE Scrap	Shell casing	2	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/3	NA	1	OE Scrap	OE scrap	NA	NA	NA
N-15/4	NA	1	OE Scrap	OE scrap	1	NA	NA
O-15/1	NA	1	OE Scrap	OE scrap	1	NA	NA
O-15/2	NA	1	OE Scrap	OE scrap	1	4	NA
O-15/2	NA	1	OE	60mm mortar with fuze	1	2	NA
O-15/3	NA	1	OE Scrap	OE scrap	1	NA	NA
O-15/4	NA	1	OE Scrap	OE scrap	1	NA	NA
O-15/4	NA	1	OE Scrap	OE scrap	1	NA	NA
P-14/3	92N,25E	1	OE Scrap	OE scrap	NA	3	NA
P-14/3	55N,39E	1	OE Scrap	OE scrap	NA	6	NA
P-14/3	15N,0E	1	OE Scrap	OE scrap	NA	6	NA
P-14/4	51N,49E	1	OE Scrap	OE scrap	NA	8	NA
P-14/4	73N,1E	1	OE Scrap	OE scrap	NA	2	NA
P-15/1	61N,40E	1	OE	40mm, unfired	1	8	NA
P-15/1	78N,2E	1	OE Scrap	OE scrap	NA	4	NA
P-15/3	17N,28E	1	OE Scrap	OE scrap	1	4	NA
P-15/3	31N,2E	1	OE Scrap	OE scrap	1	2	NA
P-15/3	24N,14E	1	OE Scrap	OE scrap	1	2	NA
P-15/3	34N,7E	1	OE Scrap	OE scrap	1	1	NA
P-15/3	38N,15E	1	OE Scrap	OE scrap	1	2	NA
P-15/3	51N,70E	1	OE Scrap	OE scrap	1	2	NA
P-15/3	57N,25E	1	OE Scrap	OE scrap	1	4	NA
P-15/3	65N,60E	1	OE Scrap	OE scrap	1	1	NA
P-15/3	66N,80E	1	OE Scrap	OE scrap	1	6	NA
P-15/3	85N,2E	1	OE Scrap	OE scrap	1	2	NA
Q-13/2	22N,22E	1	OE Scrap	OE scrap	NA	2	NA
Q-14/3	75N,100E	1	OE Scrap	OE scrap	NA	1	NA
Q-14/3	73N,64E	1	OE Scrap	OE scrap	NA	1	NA
Q-14/3	57N,41E	1	OE Scrap	OE scrap	NA	12	NA
Q-14/3	16N,13E	1	OE Scrap	OE scrap	NA	2	NA
Q-14/3	43N,10E	1	OE Scrap	OE scrap	NA	3	NA
Q-15/1	27N,33E	1	OE Scrap	OE scrap	NA	8	NA
Q-15/2	54N,24E	1	OE Scrap	OE scrap	NA	6	NA
R-13/1	18N,6E	1	OE Scrap	OE scrap	NA	3	NA
R-13/3	21N,60E	1	OE Scrap	OE scrap	NA	2	NA
R-13/4	48N,48E	1	OE Scrap	OE scrap	NA	2	NA
R-14/1	39N,90E	1	OE Scrap	OE scrap	NA	2	NA
R-14/1	34N,80E	1	OE Scrap	OE scrap	NA	6	NA
R-15/3	55N,5E	1	OE Scrap	OE scrap	1	6	NA

Notes: NA = information was not available
Total OE recovered from Tourtelot Property: 3
Source: Explosive Disposal Engineering and Technology Grid Work Progress/Completion Accounting Sheets, December 1996.

Table D-3.
Former Benicia Arsenal Engineering Evaluation/Cost Analysis
OE-Related Items Recovered from Tourtelot Property

Grid	Anomaly ID	Item #	Category	Description	Quantity	Depth (Inches)	Estimated Weight (Pounds)
0301	03010001	1	OE Scrap	Frag	1	6	0.25
0301	03010008	1	OE Scrap	Frag	1	6	0.13
0301	03010009	1	OE Scrap	Frag	1	6	0.25
0301	03010013	1	OE Scrap	Frag	1	2	0.13
0301	03010014	1	OE Scrap	Frag	1	10	0.31
0301	03010015	1	OE Scrap	Frag	1	4	0.13
0301	03010023	1	OE Scrap	Frag	1	6	0.38
0301	03010028	1	OE Scrap	Frag	1	0	0.19
0301	03010031	1	OE Scrap	Frag	1	3	0.31
0301	03010035	1	OE Scrap	Frag	1	0	0.50
0301	03010036	1	OE Scrap	Frag	1	2	0.31
0301	03010037	1	OE Scrap	Frag	1	6	0.38
0301	03010039	1	OE Scrap	OE Scrap	1	8	0.13
0302	03020001	1	OE Scrap	Frag	1	6	0.50
0302	03020003	1	OE Scrap	Frag	1	4	0.63
0302	03020004	1	OE Scrap	Frag	1	4	0.19
0302	03020005	1	OE Scrap	Frag	1	6	0.63
0302	03020009	1	OE Scrap	Frag	1	4	0.13
0302	03020011	1	OE Scrap	Fuze Adaptor	1	6	0.50
0302	03020013	1	OE Scrap	Frag	1	6	0.31
0302	03020014	1	OE Scrap	Frag	1	3	0.06
0302	03020015	1	OE Scrap	Frag	1	6	1.00
0302	03020016	1	OE Scrap	Frag	1	7	1.00
0302	03020021	1	OE Scrap	OE Scrap	1	7	0.50
0306	03060003	1	OE Scrap	Frag	1	0	0.13
0306	03060010	1	OE Scrap	Frag	1	0	0.38
0306	03060022	1	OE Scrap	Frag	1	4	0.25
0306	03060023	1	OE Scrap	Frag	1	8	1.00
0306	03060024	1	OE Scrap	Frag	1	4	0.25
0306	03060026	1	OE Scrap	Frag	1	4	0.19
0306	03060026	2	OE Scrap	Frag	1	4	0.19
0306	03060029	1	OE Scrap	Frag	1	4	0.19
0306	03060039	1	OE Scrap	Frag	1	7	0.06
0306	03060040	1	OE Scrap	Frag	1	3	0.75
0306	03060042	1	OE Scrap	Frag	1	0	1.40
0306	03060043	1	OE Scrap	Frag	1	6	0.25
0306	03060044	1	OE Scrap	Frag	1	0	0.19
0306	03060045	1	OE Scrap	Frag	1	0	0.19
0306	03060046	1	OE Scrap	Frag	1	3	0.19
0306	03060046	2	OE Scrap	Frag	1	3	0.19
0306	03060047	1	OE Scrap	Frag	1	0	0.13
0306	03060049	1	OE Scrap	Frag	1	2	0.19
0306	03060051	1	OE Scrap	Frag	1	0	0.75
0306	03060052	1	OE Scrap	Frag	1	0	0.38
0306	03060052	2	OE Scrap	Frag	1	0	0.13
0306	03060053	1	OE Scrap	Frag	1	0	0.25
0306	03060054	1	OE Scrap	Frag	1	0	0.13
0306	03060054	2	OE Scrap	Frag	1	0	0.19
0307	03070001	1	OE Scrap	Frag	1	10	0.38
0307	03070002	1	OE Scrap	Frag	1	2	0.13
0307	03070003	1	OE Scrap	Frag	1	18	0.13
0307	03070004	1	OE Scrap	Frag	1	4	0.25
0307	03070005	1	OE Scrap	Frag	1	2	0.06
0307	03070006	1	OE Scrap	Frag	1	2	0.19
0307	03070012	1	OE Scrap	Frag	1	3	0.25
0307	03070013	1	OE Scrap	Frag	1	6	0.50
0307	03070013	2	OE Scrap	Frag	1	6	0.50
0307	03070017	1	OE Scrap	Frag	1	4	0.06
0307	03070018	1	OE Scrap	Frag	1	4	0.13
0307	03070019	1	OE Scrap	Frag	1	3	0.25
0307	03070020	1	OE Scrap	Frag	1	6	0.50
0307	03070022	1	OE Scrap	Frag	1	6	1.00
0307	03070023	1	OE Scrap	Frag	1	0	0.13
0307	03070024	1	OE Scrap	Frag	1	3	0.19
0307	03070025	1	OE Scrap	Frag	1	2	0.13
0307	03070026	1	OE Scrap	Frag	1	6	0.25
0307	03070026	2	OE Scrap	Frag	1	6	0.25
0307	03070029	1	OE Scrap	Frag	1	2	0.25
0308	03080003	1	OE Scrap	OE Scrap	1	6	1.00
0308	03080006	1	OE Scrap	Frag	1	6	0.38
0308	03080007	1	OE Scrap	OE Scrap	1	3	0.38
0308	03080008	1	OE Scrap	OE Scrap	1	6	0.50
0308	03080009	1	OE Scrap	OE Scrap	1	0	2.00
0308	03080010	1	OE Scrap	OE Scrap	1	6	0.50

Table D-3.
Former Benicia Arsenal Engineering Evaluation/Cost Analysis
OE-Related Items Recovered from Tourtelot Property

Grid	Anomaly ID	Item #	Category	Description	Quantity	Depth (inches)	Estimated Weight (Pounds)
0308	03080011	1	OE Scrap	OE Scrap	1	4	0.50
0308	03080012	1	OE Scrap	OE Scrap	1	6	0.19
0308	03080013	1	OE Scrap	OE Scrap	1	4	0.38
0308	03080014	1	OE Scrap	OE Scrap	1	6	0.50
0308	03080015	1	OE Scrap	Frag	1	20	0.75
0308	03080015	2	OE Scrap	Frag	1	20	0.75
0308	03080016	1	OE Scrap	OE Scrap	1	6	0.31
0308	03080017	1	OE Scrap	OE Scrap	1	6	0.19
0308	03080018	1	OE Scrap	OE Scrap	1	6	0.50
0308	03080020	1	OE Scrap	OE Scrap	1	24	0.13
0308	03080020	2	OE Scrap	OE Scrap	1	24	0.13
0308	03080021	1	OE Scrap	OE Scrap	1	22	0.38
0308	03080022	1	OE Scrap	OE Scrap	1	20	0.50
0308	03080023	1	OE Scrap	OE Scrap	1	24	0.13
0311	03110001	1	OE Scrap	Frag	1	4	0.13
0311	03110001	2	OE Scrap	Frag	1	4	0.13
0311	03110002	1	OE Scrap	Frag	1	48	0.19
0311	03110003	1	OE Scrap	Frag	1	3	0.50
0311	03110004	1	OE Scrap	Frag	1	4	0.06
0311	03110005	1	OE Scrap	Frag	1	12	1.00
0311	03110009	1	OE Scrap	Frag	1	6	0.09
0311	03110009	2	OE Scrap	Frag	1	6	0.09
0311	03110009	3	OE Scrap	Frag	1	6	0.09
0311	03110009	4	OE Scrap	Frag	1	6	0.09
0311	03110010	1	OE Scrap	Frag	1	6	0.38
0311	03110012	1	OE Scrap	Frag	1	2	0.13
0311	03110013	1	OE Scrap	Frag	1	0	0.25
0311	03110013	2	OE Scrap	Frag	1	0	0.56
0311	03110015	1	OE Scrap	Frag	1	6	1.00
0311	03110016	1	OE Scrap	Frag	1	6	0.13
0311	03110017	1	OE Scrap	Frag	1	6	0.06
0311	03110018	1	OE Scrap	Frag	1	6	0.13
0311	03110019	1	OE Scrap	Frag	1	3	0.50
0311	03110021	1	OE Scrap	Frag	1	0	0.13
0311	03110022	1	OE Scrap	Frag	1	4	0.31
0311	03110023	1	OE Scrap	Frag	1	4	0.06
0311	03110026	1	OE Scrap	Frag	1	4	0.38
0312	03120002	1	OE Scrap	OE Scrap	1	8	1.00
0312	03120010	1	OE Scrap	Frag	1	12	2.00
0312	03120016	1	OE Scrap	Frag	1	30	10.00
0312	03120017	1	OE Scrap	Frag	1	11	0.38
0312	03120017	2	OE Scrap	Frag	1	11	0.38
0312	03120018	1	OE Scrap	Frag	1	8	0.38
0312	03120019	1	OE Scrap	Frag	2	8	--
0312	03120021	1	OE Scrap	Frag	6	18	5.00
0312	03120022	1	OE Scrap	Frag	1	24	8.00
0312	03120023	1	OE Scrap	Grenade, Hand, Practice, M-21	1	8	2.00
0312	03120026	1	OE Scrap	Frag	1	2	0.50
0312	03120026	2	OE Scrap	Frag	1	2	0.50
0312	03120026	3	OE Scrap	Frag	2	2	1.00
0312	03120029	1	OE Scrap	Frag	1	18	3.00
0312	03120032	1	OE Scrap	Frag	1	4	4.00
0312	03120033	1	OE Scrap	Frag	1	24	2.00
0312	03120034	1	OE Scrap	OE Scrap	1	4	1.00
0312	03120039	1	OE Scrap	Frag	1	5	0.25
0312	03120039	2	OE Scrap	Frag	1	5	0.25
0312	03120045	1	OE Scrap	Frag	1	6	0.13
0312	03120046	1	OE Scrap	Frag	1	6	5.00
0312	03120047	1	OE Scrap	Frag	1	12	1.00
0312	03120050	1	OE Scrap	Frag	1	24	2.00
0312	03120051	1	OE Scrap	Frag	1	9	0.25
0312	03120054	1	OE Scrap	Frag	1	3	10.00
0312	03120054	2	OE Scrap	37mm	1	3	2.00
0312	03120056	1	OE Scrap	Frag	1	20	1.00
0312	03120056	2	OE Scrap	M52 Series Fuze	2	12	--
0312	03120057	1	OE	37mm projectile, fuzed	1	24	--
0312	03120057	2	OE Scrap	Frag	15	18	5.00
0312	03120057	3	OE Scrap	M52 Series Fuze	1	12	--
0312	03120057	4	OE Scrap	PTTF Fuze	1	12	--
0312	03120057	5	OE Scrap	Booster Adapter	1	12	--
0312	03120059	1	OE Scrap	Frag	1	0	4.00
0312	03120059	2	OE Scrap	Frag	1	0	4.00
0312	03120064	1	OE	75mm shrapnel projectile, unfuzed	1	6	0.50
0312	03120064	2	OE Scrap	M-21 Grenade Shell	1	6	0.50

Table D-3.
Former Benicia Arsenal Engineering Evaluation/Cost Analysis
OE-Related Items Recovered from Tourtelot Property

Grid	Anomaly ID	Item #	Category	Description	Quantity	Depth (Inches)	Estimated Weight (Pounds)
0312	03120064	3	OE Scrap	Frag	1	6	0.50
0312	03120064	4	OE Scrap	Frag	1	24	0.50
0312	03120070	1	OE Scrap	75mm (No nose, empty casing)	1	3	2.00
0312	03120072	1	OE Scrap	105mm (plaster load)	1	26	20.00
0312	03120074	1	OE Scrap	Frag	1	4	0.21
0312	03120074	2	OE Scrap	Frag	1	4	0.21
0312	03120074	3	OE Scrap	Frag	1	4	0.21
0312	03120075	1	OE Scrap	Frag	1	30	2.00
0312	03120075	2	OE Scrap	Frag	1	30	2.00
0312	03120078	1	OE Scrap	Frag	1	12	10.00
0312	03120078	2	OE Scrap	Frag	1	12	10.00
0312	03120081	1	OE Scrap	Frag	1	10	0.67
0312	03120081	2	OE Scrap	Frag	1	10	0.67
0312	03120081	3	OE Scrap	Frag	1	10	0.67
0312	03120083	1	OE Scrap	Frag	1	14	6.00
0312	03120084	1	OE Scrap	Frag	1	8	1.00
0312	03120084	2	OE Scrap	Frag	1	8	1.00
0312	03120084	3	OE Scrap	Frag	1	8	1.00
0312	03120088	1	OE Scrap	Frag	1	18	5.00
0312	03120089	1	OE Scrap	75mm (no nose, empty case)	3	20	15.00
0312	03120092	1	OE Scrap	Frag	1	12	1.00
0312	03120095	1	OE Scrap	Frag	1	10	1.00
0312	03120096	1	OE Scrap	Frag	1	10	1.00
0312	03120097	1	OE Scrap	Frag	1	24	2.00
0312	03120100	1	OE Scrap	Frag	1	10	0.75
0312	03120101	1	OE Scrap	Frag	1	12	12.00
0312	03120103	1	OE Scrap	Frag	1	10	0.38
0312	03120109	1	OE Scrap	Frag	1	12	1.00
0312	03120111	1	OE Scrap	Frag	1	2	1.25
0312	03120111	2	OE Scrap	Frag	1	2	1.25
0312	03120111	3	OE Scrap	Frag	1	2	1.25
0312	03120111	4	OE Scrap	Frag	1	2	1.25
0312	03120113	1	OE Scrap	Frag	1	4	1.00
0312	03120113	2	OE Scrap	Frag	1	4	1.00
0312	03120114	1	OE Scrap	Frag	1	20	1.00
0312	03120116	1	OE Scrap	Tail Boom	1	4	0.33
0312	03120116	2	OE Scrap	37mm Base	1	4	0.33
0312	03120116	3	OE Scrap	Frag	1	4	0.33
0312	03120122	1	OE Scrap	Frag	1	8	20.00
0312	03120124	1	OE Scrap	M48 Series Fuze	1	12	1.00
0312	03120125	1	OE Scrap	Frag	1	0	0.38
0312	03120126	1	OE Scrap	Frag	1	3	1.00
0312	03120127	1	OE Scrap	Frag	1	18	0.50
0312	03120127	2	OE Scrap	Frag	1	18	0.50
0312	03120127	3	OE Scrap	Frag	1	18	0.50
0312	03120133	1	OE Scrap	Powder Train Time Fuze	1	6	1.00
0313	03130001	1	OE Scrap	Frag	1	0	0.19
0313	03130007	1	OE Scrap	Frag	1	3	0.38
0313	03130008	1	OE Scrap	Frag	1	36	0.13
0313	03130008	2	OE Scrap	Frag	1	36	0.25
0313	03130010	1	OE Scrap	Frag	1	6	0.13
0313	03130012	1	OE Scrap	Frag	1	6	0.38
0313	03130016	1	OE Scrap	Frag	1	4	0.75
0313	03130019	1	OE Scrap	Frag	1	0	0.13
0313	03130021	1	OE Scrap	Frag	1	6	0.13
0313	03130022	1	OE Scrap	Frag	1	6	0.13
0313	03130022	2	OE Scrap	Frag	1	6	0.13
0313	03130022	3	OE Scrap	Frag	1	6	0.25
0313	03130023	1	OE Scrap	Frag	1	6	0.25
0313	03130023	2	OE Scrap	Frag	1	6	0.19
0313	03130031	1	OE Scrap	Frag	1	1	0.19
0313	03130038	1	OE Scrap	Tail Boom	1	4	0.38
0313	03130039	1	OE Scrap	Frag	1	3	0.25
0313	03130042	1	OE Scrap	Tail Boom - Piece 1 of 3	1	6	0.19
0313	03130042	2	OE Scrap	Tail Boom - Piece 2 of 3	1	6	0.06
0313	03130042	3	OE Scrap	Tail Boom - Piece 3 of 3	1	6	0.13
0313	03130047	1	OE Scrap	Frag	1	2	0.38
0313	03130049	1	OE Scrap	Frag	1	6	0.38
0313	03130049	2	OE Scrap	Frag	1	6	0.13
0313	03130055	1	OE Scrap	Frag	1	4	0.19
0313	03130055	2	OE Scrap	Frag	1	4	0.25
0313	03130059	1	OE Scrap	Frag	1	12	0.19
0314	03140001	1	OE Scrap	Frag	1	3	1.00
0314	03140002	1	OE Scrap	Frag	1	0	0.13

Table D-3.
Former Benicia Arsenal Engineering Evaluation/Cost Analysis
OE-Related Items Recovered from Tourtelot Property

Grid	Anomaly ID	Item #	Category	Description	Quantity	Depth (inches)	Estimated Weight (Pounds)
0314	03140006	1	OE Scrap	Frag	1	5	0.19
0314	03140008	1	OE Scrap	Frag	1	3	0.13
0314	03140009	1	OE Scrap	Frag	1	5	0.13
0314	03140011	1	OE Scrap	Fuze Adaptor	1	6	0.50
0314	03140012	1	OE Scrap	Fuze Adaptor	1	6	0.50
0314	03140027	1	OE Scrap	Frag	1	10	0.19
0314	03140031	1	OE Scrap	Frag	1	9	0.16
0314	03140031	2	OE Scrap	Frag	1	9	0.16
0314	03140032	1	OE Scrap	Frag	1	8	0.09
0314	03140032	2	OE Scrap	Frag	1	8	0.09
0314	03140035	1	OE Scrap	OE Scrap	1	10	0.50
0314	03140039	1	OE Scrap	Frag	1	8	0.13
0314	03140058	1	OE Scrap	Frag	1	4	0.13
0314	03140063	1	OE Scrap	Frag	1	8	0.50
0316	03160004	1	OE Scrap	Frag	1	6	0.06
0317	03170001	1	OE Scrap	Frag	1	10	0.19
0317	03170001	2	OE Scrap	Frag	1	10	0.19
0317	03170002	1	OE Scrap	Frag	1	6	0.50
0317	03170003	1	OE Scrap	Frag	1	20	0.06
0317	03170004	1	OE Scrap	Frag	1	6	0.33
0317	03170004	2	OE Scrap	Frag	1	6	0.33
0317	03170004	3	OE Scrap	Frag	1	6	0.33
0317	03170005	1	OE Scrap	Frag	1	6	0.16
0317	03170005	2	OE Scrap	Frag	1	6	0.16
0317	03170006	1	OE Scrap	Frag	1	8	0.09
0317	03170006	2	OE Scrap	Frag	1	8	0.09
0317	03170007	1	OE Scrap	Frag	1	8	0.20
0317	03170007	2	OE Scrap	Frag	1	8	0.20
0317	03170007	3	OE Scrap	Frag	1	8	0.20
0317	03170007	4	OE Scrap	Frag	1	8	0.20
0317	03170007	5	OE Scrap	Frag	1	8	0.20
0317	03170008	1	OE Scrap	Frag	1	6	0.38
0317	03170009	1	OE Scrap	Frag	1	6	0.06
0317	03170011	1	OE Scrap	Frag	1	6	0.06
0317	03170012	1	OE Scrap	Frag	1	4	0.13
0317	03170014	1	OE Scrap	Frag	1	8	0.13
0317	03170015	1	OE Scrap	Frag	1	18	0.25
0317	03170015	2	OE Scrap	Frag	1	18	0.25
0317	03170016	1	OE Scrap	Frag	1	12	0.67
0317	03170016	2	OE Scrap	Frag	1	12	0.67
0317	03170016	3	OE Scrap	Frag	1	12	0.67
0317	03170017	1	OE Scrap	Frag	1	24	0.19
0321	03210008	1	OE Scrap	OE Scrap	1	4	0.50
0321	03210009	1	OE Scrap	OE Scrap	1	4	0.50
0321	03210014	1	OE Scrap	OE Scrap	1	12	0.25
0321	03210015	1	OE Scrap	OE Scrap	1	8	0.50
0321	03210016	1	OE Scrap	OE Scrap	1	24	0.06
0321	03210020	1	OE Scrap	OE Scrap	1	16	0.38
0321	03210022	1	OE Scrap	OE Scrap	1	8	0.50
0321	03210024	1	OE Scrap	OE Scrap	1	10	0.75
0321	03210039	1	OE Scrap	Frag	1	6	0.33
0321	03210039	2	OE Scrap	Frag	1	6	0.33
0321	03210039	3	OE Scrap	Frag	1	6	0.33
0321	03210040	1	OE Scrap	Frag	1	6	0.25
0321	03210040	2	OE Scrap	Frag	1	6	0.25
0321	03210040	3	OE Scrap	Frag	1	6	0.25
0321	03210041	1	OE Scrap	Frag	1	6	1.00
0321	03210045	1	OE Scrap	Frag	1	2	0.25
0321	03210045	2	OE Scrap	Frag	1	2	0.25
0321	03210045	3	OE Scrap	Frag	1	2	0.25
0321	03210051	1	OE Scrap	OE Scrap	1	18	0.13
0321	03210060	1	OE Scrap	Frag	1	6	0.38
0321	03210070	1	OE Scrap	Frag	1	4	0.25
0321	03210071	1	OE Scrap	Frag	1	8	0.13
0321	03210072	1	OE Scrap	Frag	1	6	0.38
0322	03220008	1	OE Scrap	Brass Rotating Bands	2	0	0.13
0322	03220009	1	OE Scrap	Frag	1	6	0.13
0322	03220021	1	OE Scrap	OE Scrap	1	6	0.50
0322	03220024	1	OE Scrap	155mm Base Section	1	0	30.00
0322	03220026	1	OE Scrap	Frag	1	6	2.00
0322	03220029	1	OE Scrap	Frag	1	6	0.50
0322	03220032	1	OE Scrap	Frag	1	4	0.75
0322	03220036	1	OE Scrap	Frag	1	4	1.00
0322	03220067	1	OE Scrap	Frag	1	4	1.50

Table D-3.
Former Benicia Arsenal Engineering Evaluation/Cost Analysis
OE-Related Items Recovered from Tourtelot Property

Grid	Anomaly ID	Item #	Category	Description	Quantity	Depth (inches)	Estimated Weight (Pounds)
0322	03220082	1	OE Scrap	155mm concrete filled projectile	1	12	100.00
0322	03220083	1	OE Scrap	155mm concrete filled projectile	1	18	100.00
0324	03240008	1	OE Scrap	Frag	1	6	0.63
0324	03240010	1	OE Scrap	Frag	1	4	0.38
0324	03240013	1	OE Scrap	Frag	1	24	0.06
0324	03240015	1	OE Scrap	OE Scrap	1	24	0.06
0324	03240016	1	OE Scrap	Frag	1	6	0.38
0324	03240019	1	OE Scrap	Frag	1	10	0.38
0326	03260013	1	OE Scrap	Frag	1	12	3.00
0326	03260014	1	OE Scrap	Frag	1	10	0.06
0326	03260015	1	OE Scrap	Frag	1	8	2.00
0326	03260017	1	OE Scrap	155mm cement filled round - rear portion only	1	18	18.00
0326	03260017	2	OE Scrap	Frag	1	18	1.00
0326	03260017	3	OE Scrap	Frag	1	18	1.00
0326	03260028	1	OE Scrap	Frag	1	24	0.75
0326	03260032	1	OE Scrap	Frag	1	12	2.00
0326	03260034	2	OE Scrap	Frag	1	24	0.06
0326	03260035	1	OE Scrap	Frag	1	3	0.38
0326	03260036	1	OE Scrap	Frag	1	24	20.00
0326	03260037	1	OE Scrap	Frag	1	4	1.00
0326	03260040	1	OE Scrap	OE Scrap	1	2	0.25
0326	03260041	1	OE Scrap	Frag	1	0	0.13
0326	03260049	1	OE Scrap	Frag	1	10	1.00
0326	03260052	1	OE Scrap	Frag	1	11	0.75
0326	03260055	1	OE Scrap	Frag	1	6	1.00
0326	03260056	1	OE Scrap	Frag	1	0	0.38
0326	03260061	1	OE Scrap	Frag	1	0	1.00
0326	03260064	1	OE Scrap	Frag	1	3	0.17
0326	03260064	2	OE Scrap	Frag	1	3	0.17
0326	03260064	3	OE Scrap	Frag	1	3	0.17
0326	03260065	1	OE Scrap	Frag	1	3	1.00
0326	03260070	1	OE Scrap	Frag	1	6	2.00
0326	03260075	1	OE Scrap	Frag	1	8	0.13
0326	03260077	1	OE Scrap	Frag	1	6	4.00
0326	03260100	1	OE Scrap	Frag	1	8	1.00
0326	03260105	1	OE Scrap	Frag	1	24	0.13
0326	03260112	1	OE Scrap	Frag	1	6	0.75
0326	03260115	1	OE Scrap	Frag	1	14	0.38
0326	03260121	1	OE Scrap	OE Scrap	1	6	0.38
0326	03260123	1	OE Scrap	OE Scrap	1	12	1.00
0326	03260123	2	OE Scrap	OE Scrap	1	12	1.00
0326	03260124	1	OE Scrap	Frag	1	6	0.38
0326	03260124	2	OE Scrap	Base Section of 155mm	1	6	20.00
0326	03260142	1	OE Scrap	Frag	1	12	1.00
0326	03260142	2	OE Scrap	Frag	1	12	1.00
0326	03260151	1	OE Scrap	Frag	1	6	0.38
0326	03260152	1	OE Scrap	Frag	1	4	0.25
0326	03260157	1	OE Scrap	Frag	1	12	3.00
0326	03260157	2	OE Scrap	Frag	1	12	3.00
0331	03310005	1	OE Scrap	Frag	1	4	0.13
0333	03330002	1	OE Scrap	Frag	1	6	2.00
0337	03370004	1	OE Scrap	OE Scrap	1	4	0.50
0337	03370005	1	OE Scrap	OE Scrap	1	6	0.50
0337	03370007	1	OE Scrap	OE Scrap	1	4	0.50
0337	03370008	1	OE Scrap	OE Scrap	1	20	0.50
0339	03390002	1	OE Scrap	Frag	1	6	0.19

Total OE recovered from Tourtelot Property: 2
Total OE scrap recovered from Tourtelot Property: 375
Source: Final Engineering Evaluation/Cost Analysis (EE/CA) Former Benicia Arsenal, Solano County, California (U.S. Army Engineering and Support Center, Huntsville, 2000)

Table D-4.
Tourtelot Cleanup Project Removal Action Investigation
OE-Related Items Recovered from North Valley Military Landfill

Line #	Anomaly ID	Item #	Category	Description	Quantity	Depth (inches)	Estimated Weight (Pounds)
0	23	1	OE Scrap	Frag	1	10	NA
0	24	1	OE Scrap	Frag	1	6	NA
3	49	1	OE Scrap	Fuze M542	1	3	NA
3	50	1	OE Scrap	Frag	1	4	NA
6	63	1	OE Scrap	Frag	1	2	NA
6	66a	1	OE Scrap	Frag	1	4	NA
6	67	1	OE Scrap	Frag	1	8	NA
6	69	1	OE Scrap	Frag	1	3	NA
9	80	1	OE Scrap	Frag	1	6	NA
9	81	1	OE Scrap	Frag	1	3	NA
9	82	1	OE Scrap	Frag	1	1	NA
9	84	1	OE Scrap	Frag	1	6	NA
9	85	1	OE Scrap	Frag	1	4	NA
9	86	1	OE Scrap	Frag	1	2	NA
9	87	1	OE Scrap	Push plate	1	3	NA
9	89	1	OE Scrap	Frag	1	3	NA
12	110	1	OE Scrap	Frag	1	4	NA
12	111	1	OE Scrap	Frag	1	1	NA
12	112	1	OE Scrap	Frag	1	12	NA
12	113	1	OE Scrap	Frag	1	8	NA
12	115	1	OE Scrap	Frag	1	2	NA
15	130	1	OE Scrap	Frag	1	1	NA
15	132	1	OE Scrap	Frag	1	8	NA
15	135	1	OE Scrap	Frag	1	0	NA
15	136	1	OE Scrap	Frag	1	3	NA
15	137	1	OE Scrap	Frag	1	2	NA
15	141	1	OE Scrap	Frag	1	4	NA
18	146	1	OE Scrap	Frag/burster tube	1	10	NA
18	157	1	OE Scrap	Frag	1	3	NA
18	158	1	OE Scrap	Frag	1	1	NA
18	160	1	OE Scrap	Frag	1	1	NA
18	161	1	OE Scrap	Frag	1	2	NA
18	163	1	OE Scrap	Frag	1	0	NA
18	165	1	OE Scrap	Frag	1	18	NA
18	166	1	OE Scrap	Frag	1	6	NA
18	168	1	OE Scrap	Frag	1	4	NA
18	169	1	OE Scrap	Frag	1	4	NA
21	188	1	OE Scrap	Frag	1	1	NA
21	191	1	OE Scrap	Frag	1	4	NA
21	194	1	OE Scrap	Fuze piece	1	10	NA
21	195	1	OE Scrap	Frag	1	4	NA
21	196	1	OE Scrap	Frag	1	0	NA
24	12	1	OE Scrap	Frag	1	0	NA
24	13	1	OE Scrap	Frag	1	0	NA
24	14	1	OE Scrap	Frag	1	4	NA
27	10	1	OE Scrap	Frag	1	12	NA
27	12	1	OE Scrap	Frag	1	6	NA
27	13	1	OE Scrap	Frag	1	4	NA
27	14	1	OE Scrap	Frag	1	4	NA
27	15	1	OE Scrap	Frag	1	2	NA
30	20	1	OE Scrap	Frag	1	2	NA
30	21	1	OE Scrap	Frag	1	8	NA
30	23	1	OE Scrap	Frag	1	2	NA
33	15	1	OE Scrap	Frag	1	2	NA
33	16	1	OE Scrap	Frag	1	2	NA
33	17	1	OE Scrap	Frag	1	2	NA
36	9	1	OE Scrap	Frag	1	2	NA
36	10	1	OE Scrap	Frag	1	8	NA
36	11	1	OE Scrap	Frag	1	2	NA

Notes: NA = information was not available

Total OE recovered from North Valley Military Landfill: 0

Total OE scrap recovered from North Valley Military Landfill: 59

Table D-5.
Engineering Evaluation/Cost Analysis
OE Items Recovered from Adjacent Property

Grid	Anomaly ID	Item #	Category	Description	Quantity	Depth (inches)	Estimated Weight (Pounds)
There was no OE or OE Scrap recovered from Adjacent Property during the EE/CA field investigation.							

Explosive Disposal Engineering and Technology

Grid Work Progress/ Completion Accounting Sheets and Daily Reports

Tourtelot Property

December 1996

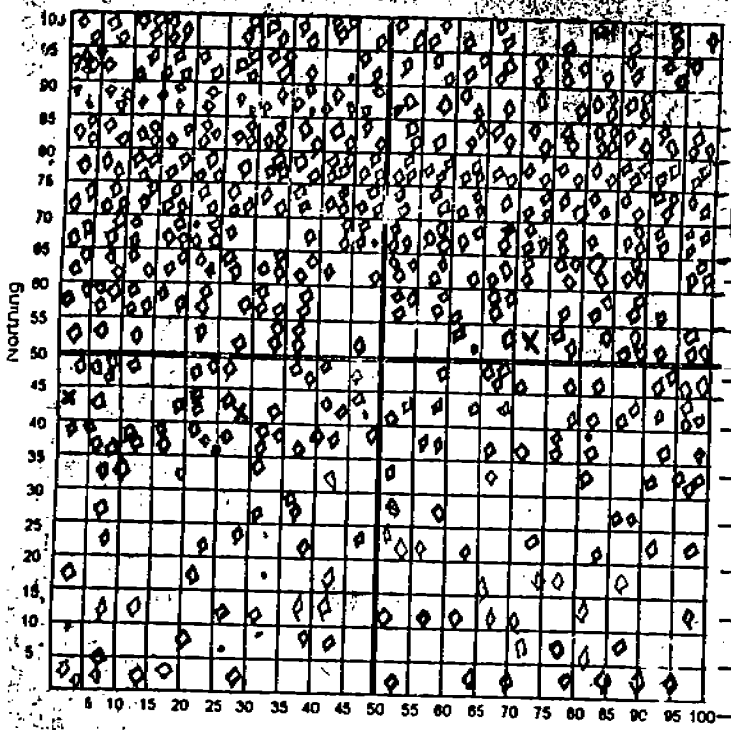
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
02 DEC (M)	42	0		1	63	42	18	FOUND 1EA 40mm HE SITE + EQUIP FAIR ONLY 2HRS OF DIGS		
03 DEC (T)	91	0		0	102	91	10			
04 DEC (W)	123	0		2	200	123	10	FOUND 1EA 40mm HE + 1EA GRNL FUZE		
05 DEC (T)	150	0		0	220	150	10			
06 DEC (F)	150	0		0	248	150	12			
09 DEC (M)	150	0		0	209	150	10			
10 DEC (T)	31	0		0	65	31	8	2HR RAIN DELAY		
11 DEC (W)	49	0		0	109	49	10	SEC. COMPLETE AT 1700HRS.		
								(TOTAL # OF DIGS 786)		

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 1

GRID: I 14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
02 DEC		N E 03 42	1	40mm	Live	1'
04 DEC		27 42	1	6 Ft	Live	1'
04 DEC		72 53	1	40mm	Live	1'

? Inert

(HRS. ON SITE)

RON BOYD - - 24 HRS

WENDEL CHEERS - 54 HRS

DEAN SMITH - 54 HRS

DRAFT

TOTAL 3 LIVE UXO

TOTAL 0 INERT

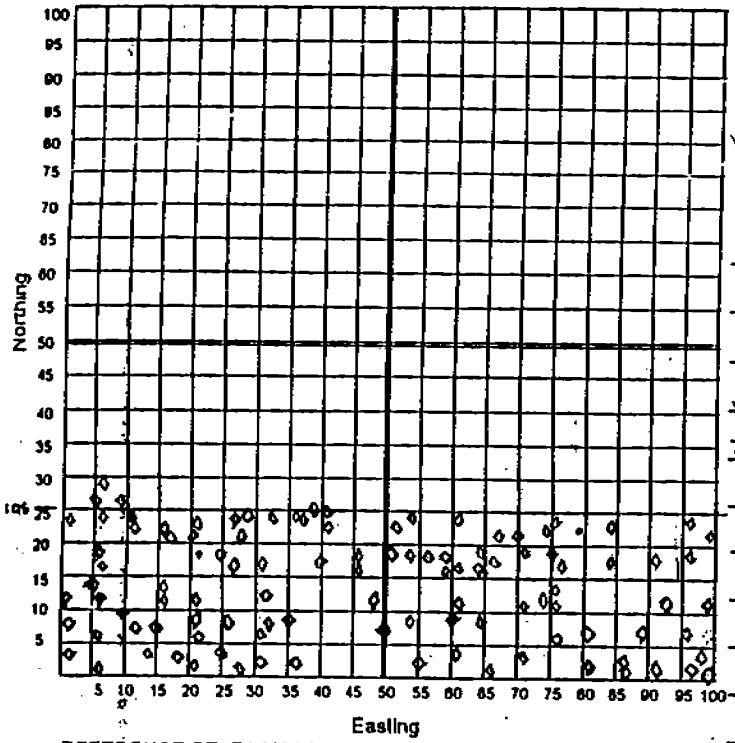
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
11 (W) DEC	0	0		0	0		0	MARKED SECTION W/LINES AT 1500 HRS		
12 (T) DEC	106	0		0	2		10	MARKED ALL ANOMOLIES & BEGAN DIGGING		
13 (F) DEC				1				CONT. DIGGING		

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3

GRID: J-14

REMARKS:

F N
20 15 - PADLOCK
75 20 - WIRE

(TOTAL HRS WORKED ON SITE)

RON BOYD - 18

WENDEL CHEERS - 12

DEAN SMITH - 10

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

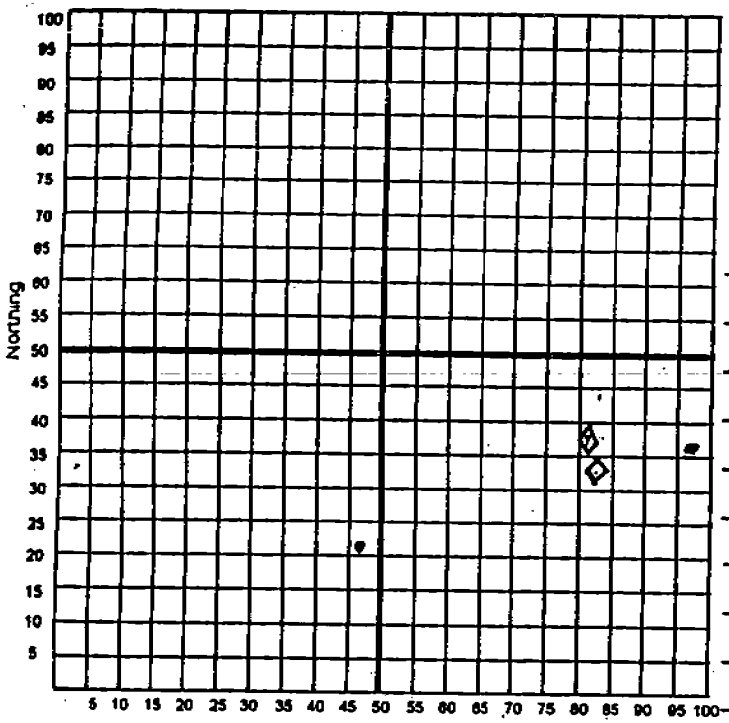
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 FL	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
12-3	4	0	8	0	2	4	1.5			

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 1

GRID: N-15

REMARKS:

2 ea. Proj. Fragments. Less Than 1lbs.

2 ea Non OEW Scrap Less Than 1/4 lbs.

DRAFT

Date	Section	Coordinates N	E	QTY	UXO	Condition (Live/Inert)	Depth
12							
~~3~~	~~1~~	~~3383~~		~~1~~	~~1~~	~~Inert~~	
~~03~~	~~1~~						

TOTAL 0 LIVE UXO

TOTAL 0 INERT

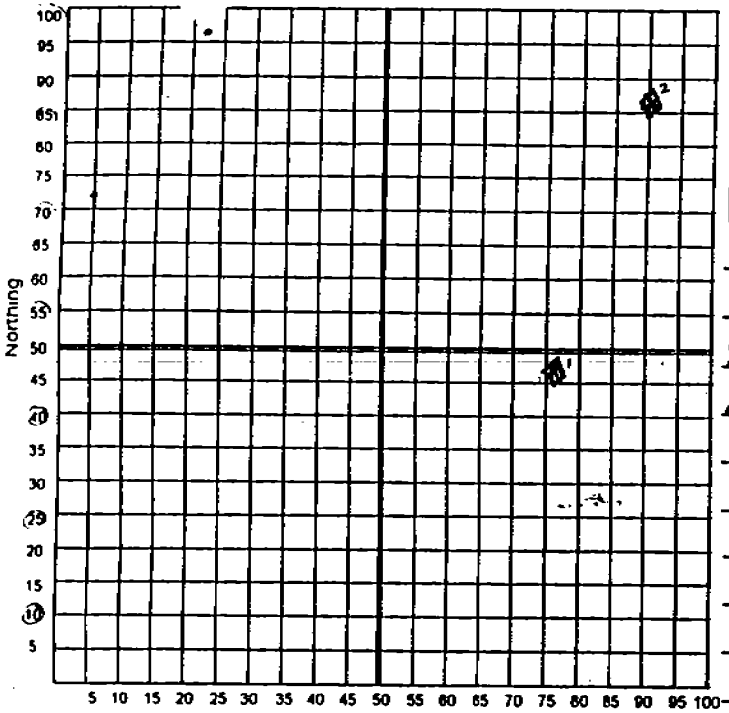
EXPLOSIVE[illegible]OSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Acco[illegible]ing Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
12-3	4		8	0	2	4	2			

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	~~2~~

SECTION: 2

GRID: N-15

REMARKS:

fence

1 40mm frag

2 shell casing

2 ea NON dew SCRAP

Less Than 1 lbs.

DRAFT

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth

TOTAL 0 LIVE UXO

TOTAL 0 INERT UXO

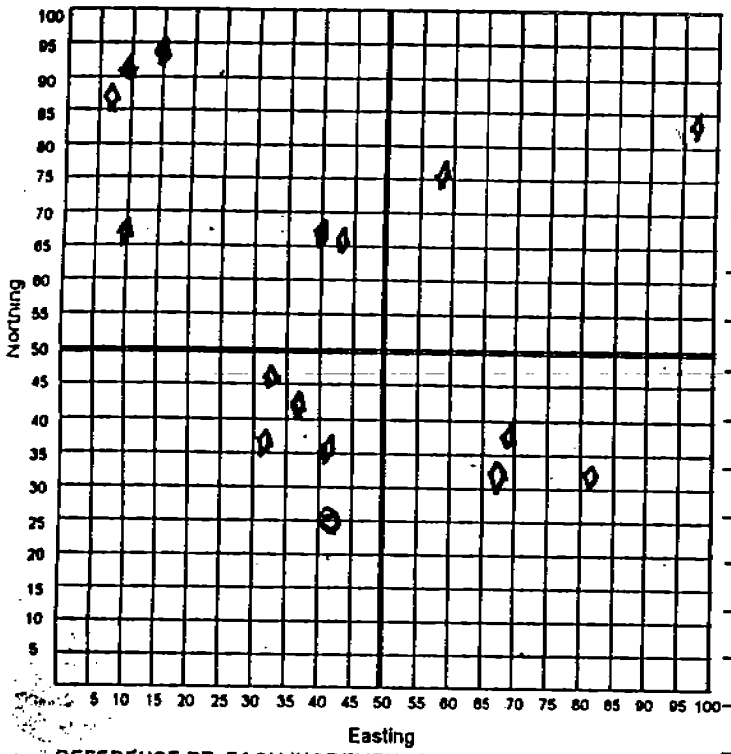
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

~~3~~	4
1	2

SECTION: 3

GRID: N 15

REMARKS:

All UXO SCRAP > 1/4 lbs

1 NON OEW SCRAP

DRAFT

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
[illegible]	-	[illegible]	1			

TOTAL _____ LIVE UXO

TOTAL _____ INERT

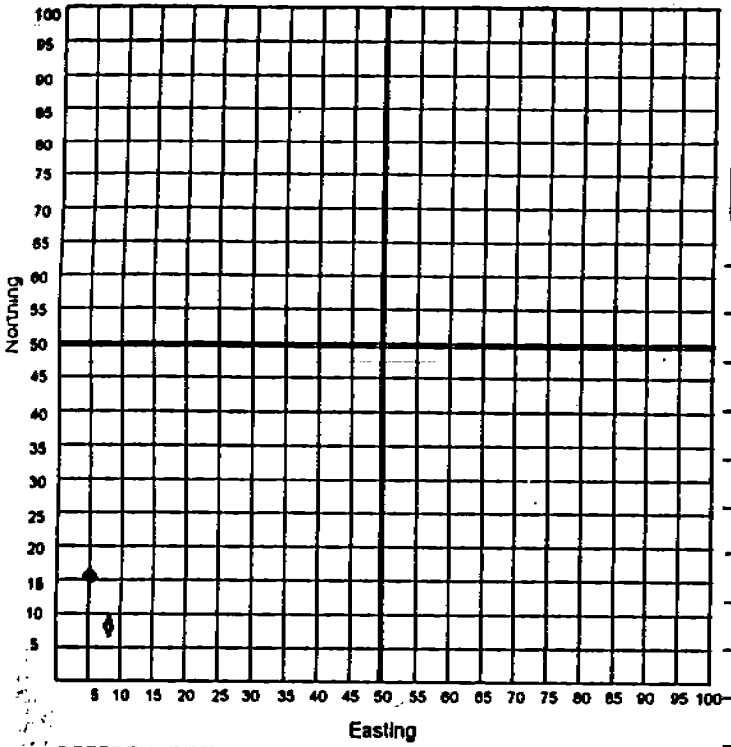
EXPLOSIV[illegible]SPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
4-1-C	2	0								

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	X
1	2

SECTION: 4

GRID: N-15

REMARKS:

DRAFT

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
4DEC		8x9	1		SCRAP	
4DEC		16x5	1		NON ORD	

TOTAL _____ LIVE UXO

TOTAL _____ INERT

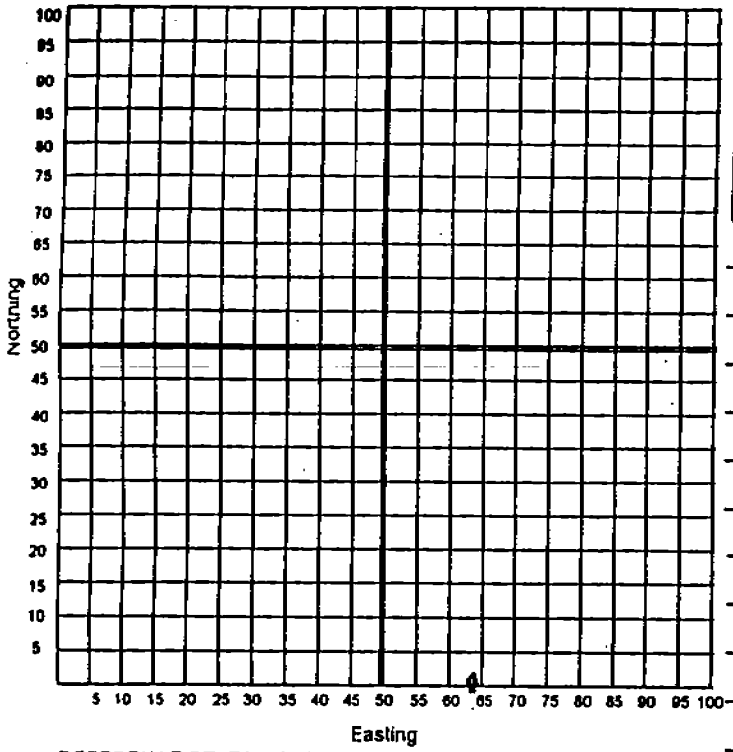
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
6 DEC	1			0	1		< 1/2			

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
X	2

SECTION: 1

GRID: 0-15

REMARKS:

DRAFT

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
6DEC		1 x 64	1		SCRAP	

TOTAL _____ LIVE UXO

TOTAL _____ INERT

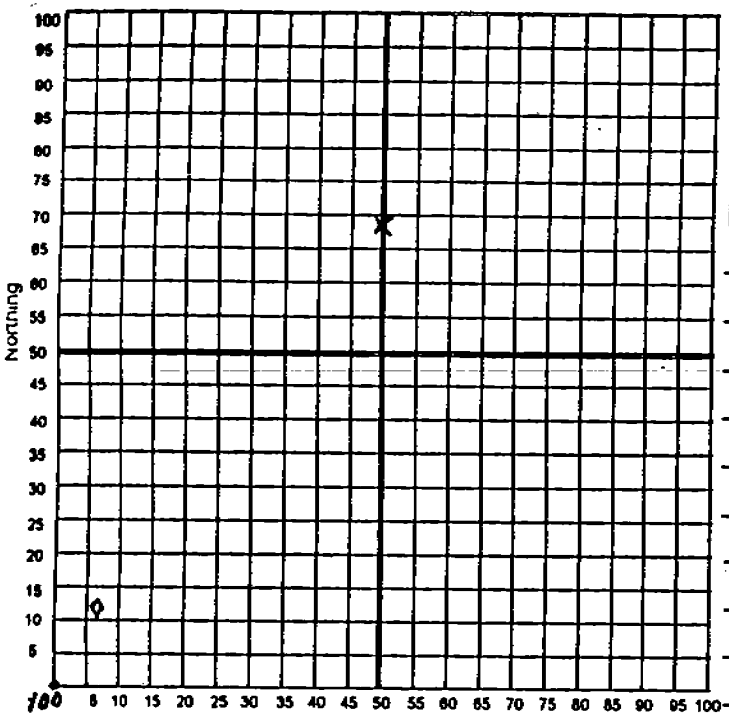
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
SLEC	2	0		1	1		> 1/4			

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	X

SECTION: 2

GRID: 0-15

REMARKS:

60 mm MORTAR WITH FUZE

Date	Section	Coordinates N X E	QTY	UXO	Condition (Live/Inert)	Depth
5 DEC		12 x 7	1		SCRAP	4"
5 DEC		068 x 150	1	1	LIVE	2"

TOTAL _____ LIVE UXO

TOTAL _____ INERT

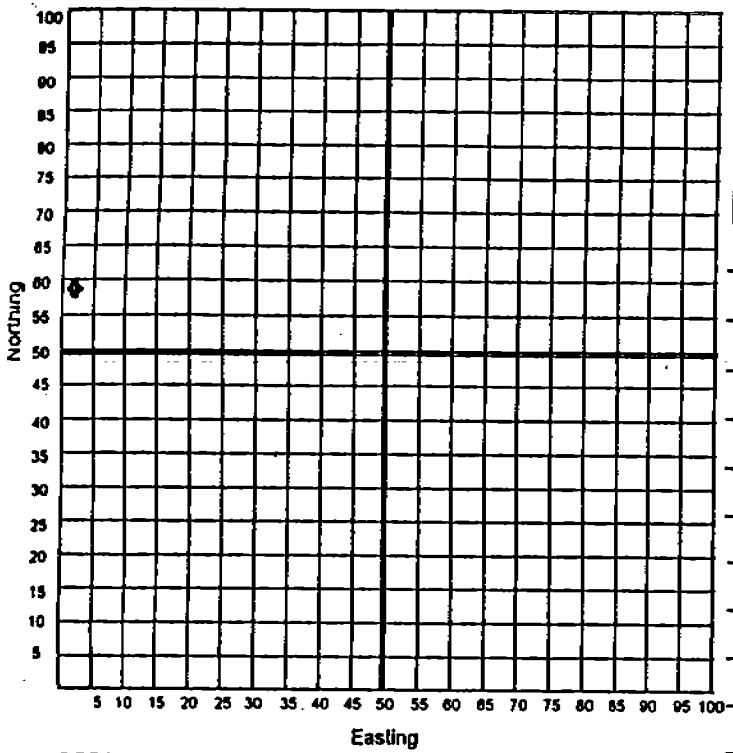
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
5oct	1				1		> 1/4			

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

X	4
1	2

SECTION: 3

GRID: 0-15

REMARKS:

DRAFT

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
5 DEC		59×2	1		SCRAP	

TOTAL _____ LIVE UXO

TOTAL _____ INERT

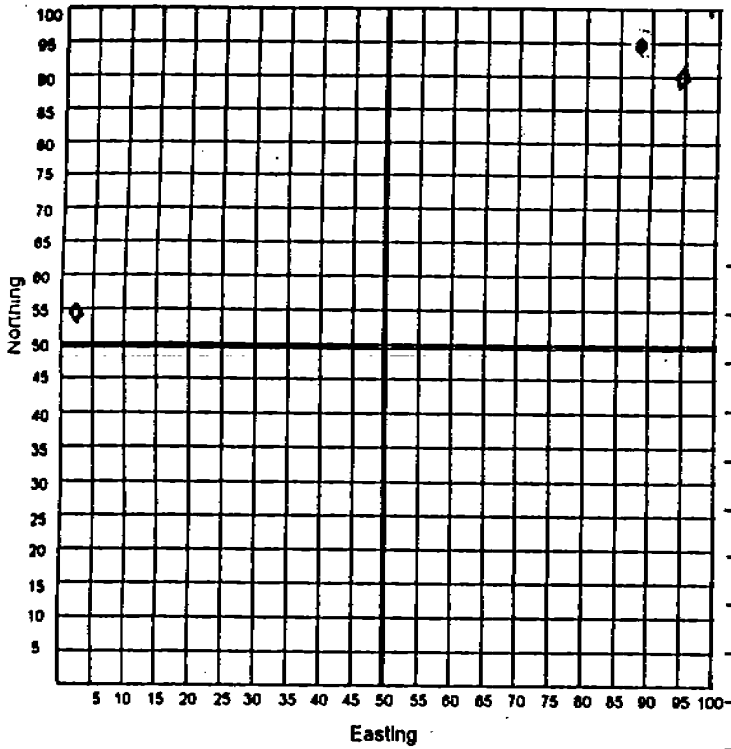
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
5 DEC	2				1		>1/4			

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	X
1	2

SECTION: 4

GRID: 0-15

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
5 DEC		55 x 3	1		SCRAP	
		95 x 88	1		NON ORD	
6 DEC		91 x 99	1		SCRAP	

TOTAL _____ LIVE UXO

TOTAL _____ INERT

EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			

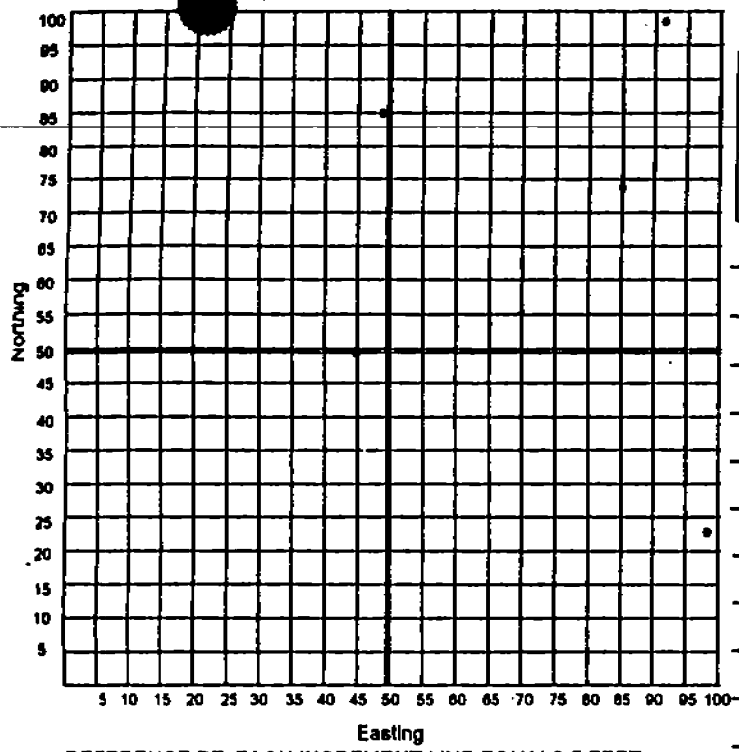
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
X	2

SECTION: 1

GRID: P-14

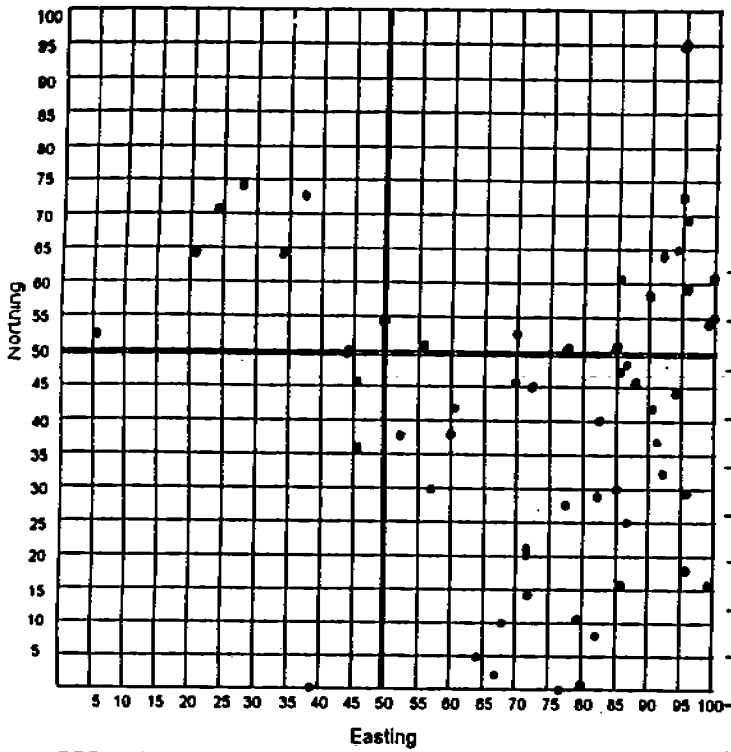
REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
11 DEC	*	98 x 92			NON ORD	2"
		85 x 49			NON ORD	3"
		74 x 85			NON ORD	3"
		50 x 45			NON ORD	6"
	*	23 x 98			NON ORD	6"

* HOLE IS CLEAR, DIRT OUTSIDE HOLE IS HOT DUE TO SMALL PIECES OF WIRE.

TOTAL _____ LIVE UXO

TOTAL _____ INERT



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	X 2

SECTION: 2

GRID: P-14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
10 DEC		1 x 80			NON ORD	6"
		0 x 77			NON ORD	6"
		3 x 67			NON ORD	3"
		0 x 39			NON ORD	1"
		5 x 64			NON ORD	1"
		10 x 68			NON ORD	6"
		8 x 82			NON ORD	6"
		11 x 79			NON ORD	2"
		14 x 72			NON ORD	2"
		16 x 99			NON ORD	2"
		16 x 98			NON ORD	2"
		18 x 96			NON ORD	2"
		16 x 86			NON ORD	2"
		20 x 72			NON ORD	2"
		21 x 72			NON ORD	2"
	*	25 x 87			NON ORD	2-6"
		30 x 96			NON ORD	2"
		29 x 83			NON ORD	SURFACE
		28 x 78			NON ORD	1"
		30 x 57			NON ORD	1"
		30 x 85			NON ORD	1"
	*	33 x 93			NON ORD	1"
		37 x 92			NON ORD	1"
		44 x 94			NON ORD	1"
		42 x 91			NON ORD	1"
		40 x 83			NON ORD	12"
		38 x 53			NON ORD	2"

* HOLE IS CLEAR, DIRT OUTSIDE HOLE IS NOT DUE TO SMALL PIECES OF WIRE.

TOTAL _____ LIVE UXO

TOTAL _____ INERT

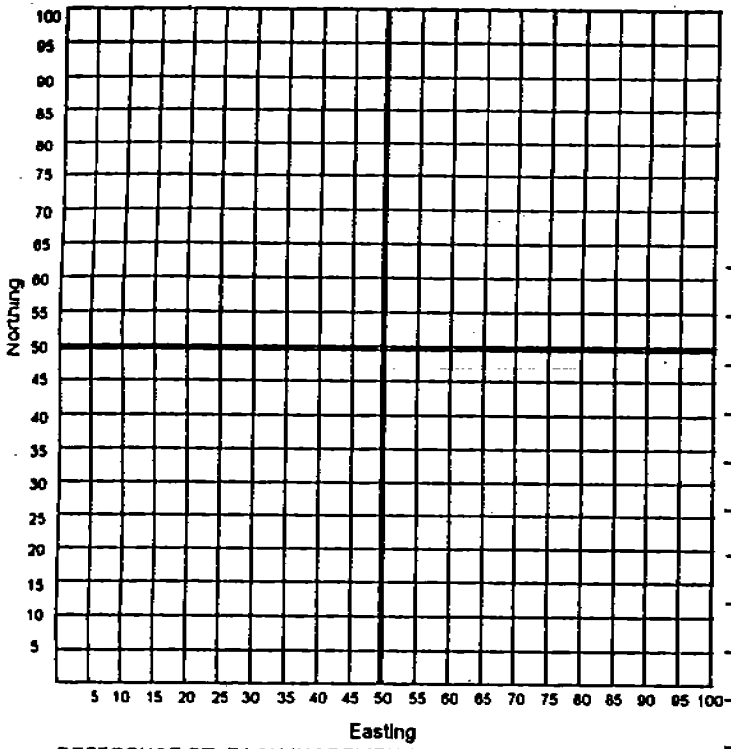
EXPLOSIVE[illegible]POSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	~~2~~

SECTION: 2

GRID: P-14

REMARKS: CONTINUED

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
10 DEC		38×60			NON ORD	6"
		36×46			NON ORD	8"
		45×73			NON ORD	3"
	*	42×61			NON ORD	2"
	*	46×46			NON ORD	2"
		50×44			NON ORD	1"
	*	46×70			NON ORD	1"
		53×6			NON ORD	1"
		47×86			NON ORD	1"
	*	48×87			NON ORD	1"
	*	46×88			NON ORD	2"
		54×50			NON ORD	2"
		51×56			NON ORD	2"
		55×100			NON ORD	1"
		59×96			NON ORD	1"
		58×90			NON ORD	1"
		53×70			NON ORD	2"
		51×78			NON ORD	1"
		51×85			NON ORD	1"
	*	54×99			NON ORD	1"
		61×86			NON ORD	1"
	*	64×93			NON ORD	1"
	*	65×94			NON ORD	1"
		61×100			NON ORD	1"
	*	69×94			NON ORD	1"
		73×95			NON ORD	1"
↓		73×37			NON ORD	SURFACE

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

* HOLE IS CLEAR, DIRT OUTSIDE HOLE IS NOT DUE TO SMALL PIECES OF WIRE.

DRAFT

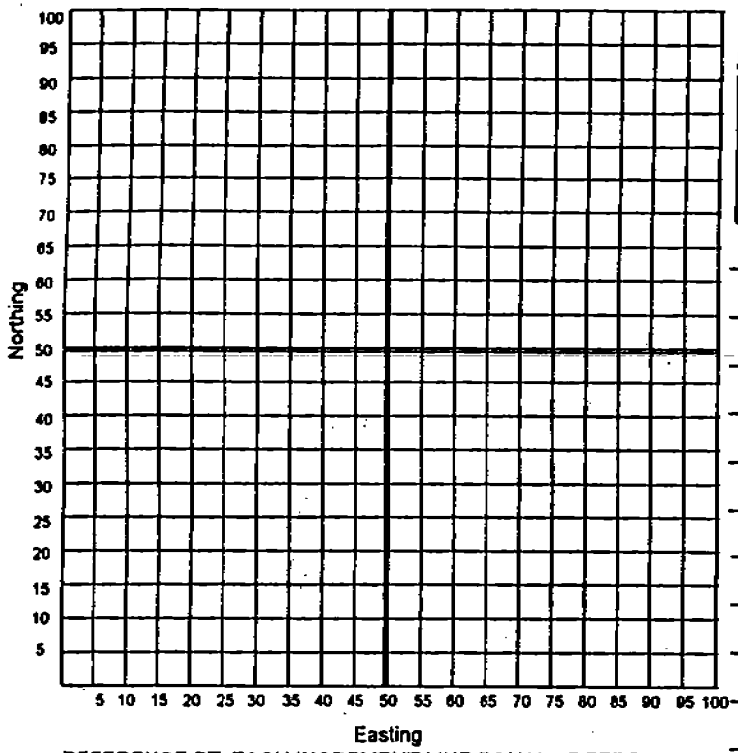
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	~~2~~

SECTION: 2

GRID: P-14

REMARKS: CONTINUED

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
10 DEC		74 x 28			NON ORD	1"
10 DEC		71 x 24			NON ORD	1"
10 DEC		64 x 34			NON ORD	2-6"
10 DEC		64 x 21			NON ORD	6"
11 DEC		95 x 95			NON ORD	3"

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

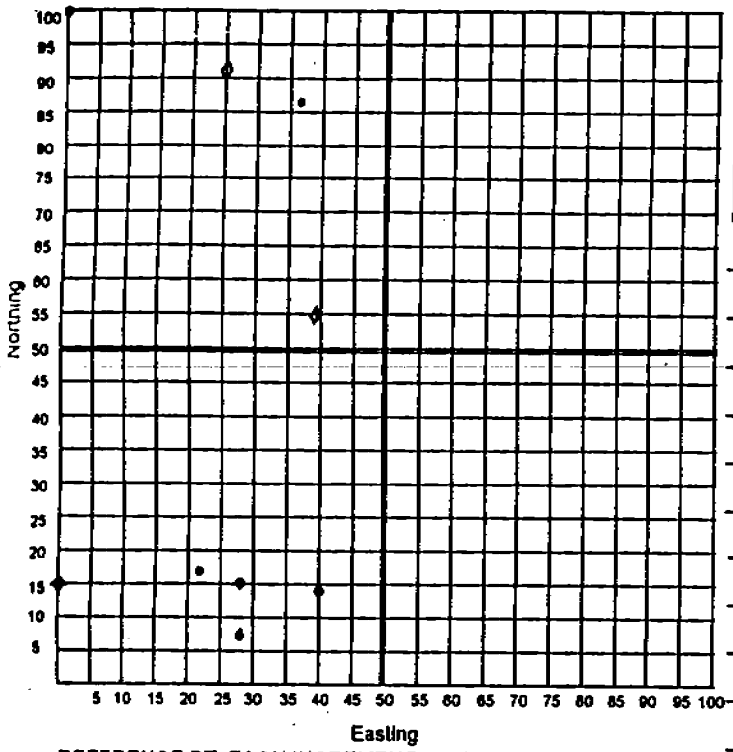
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



Quadrant

X	4
1	2

SECTION: 3

GRID: P-14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
11 DEC		100 x 0			NON ORD	1"
		92 x 25			SCRAP	3"
	*	86 x 42			NON ORD	2"
		55 x 39			SCRAP	6"
		17 x 22			NON ORD	1"
		15 x 0			SCRAP	6"
		15 x 28			NON ORD	1"
		7 x 28			NON ORD	2"
		14 x 40			NON ORD	2"

* HOLE IS CLEAR, DIRT OUTSIDE HOLE IS NOT DUE TO SMALL PIECES OF WIRE.

TOTAL _____ LIVE UXO

TOTAL _____ INERT

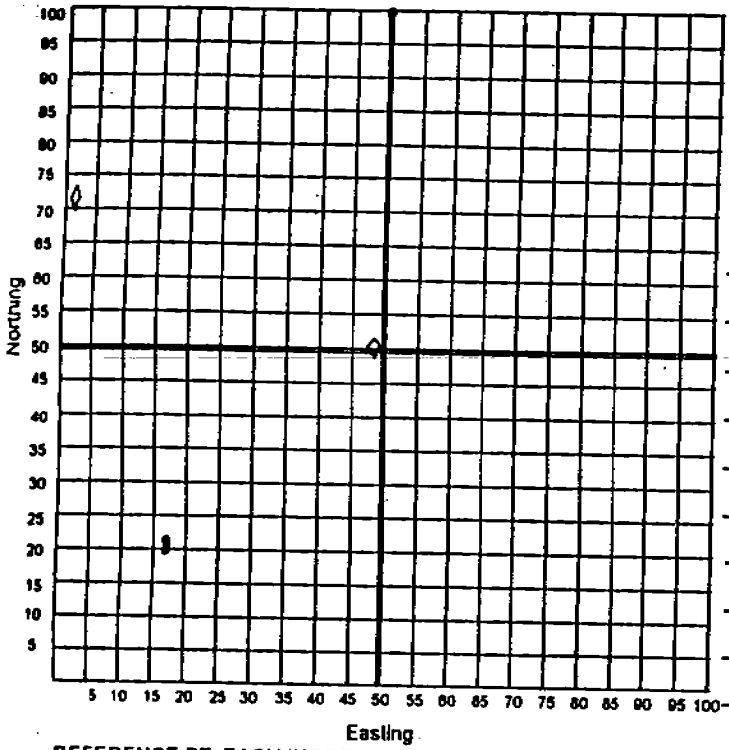
EXPLOSIVE POSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 4

GRID: P-14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
11 DEC		21 x 17			NON ORD	6"
↓		20 x 17			NON ORD	SURFACE
		51 x 49			SCRAP	8"
		73 x 1			SCRAP	2"
		100 x 50			NON ORD	3"

TOTAL _____ LIVE UXO

TOTAL _____ INERT

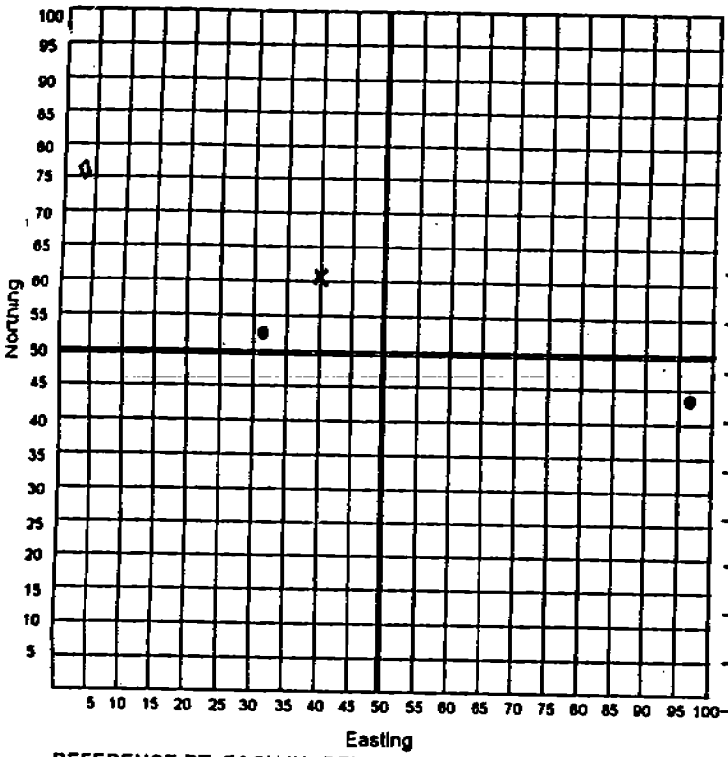
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
6 DEC	5	1		1	1			40mm UNFIRED / NEED BACKIDE		

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
X	2

SECTION: 1

GRID: P - 15

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
6DEC		44 x 96			NON ORD	2"
6DEC		52 x 31			NON ORD	2"
6DEC		61 x 40			LIVE	8"
		68 x 34	NEW		[illegible]	
6DEC		78 x 2			SCRAP	4"

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

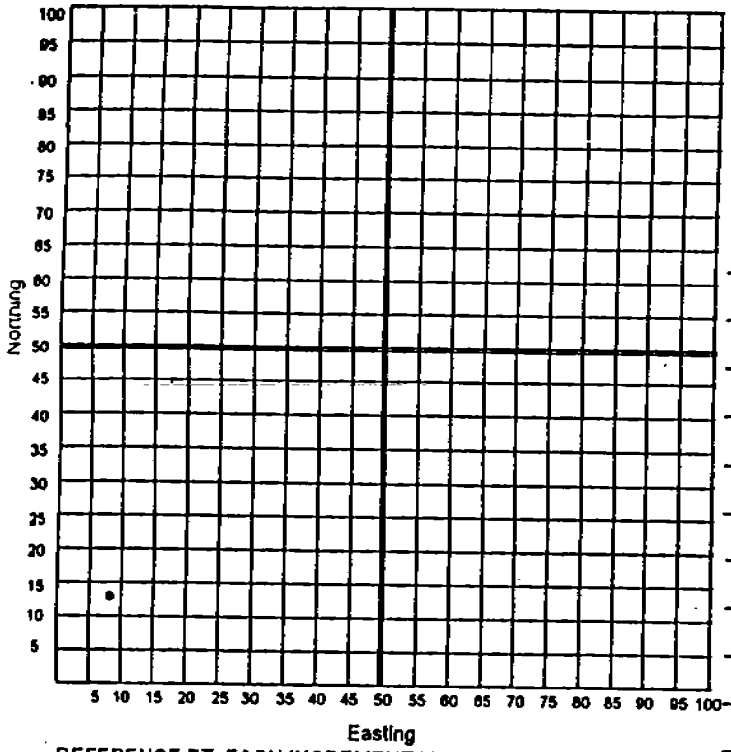
EXPLOSIVE [illegible]OSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 2

GRID: P-15

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
6DEC		12 x 8	1		NON ARD	4"

TOTAL _____ LIVE UXO

TOTAL _____ INERT

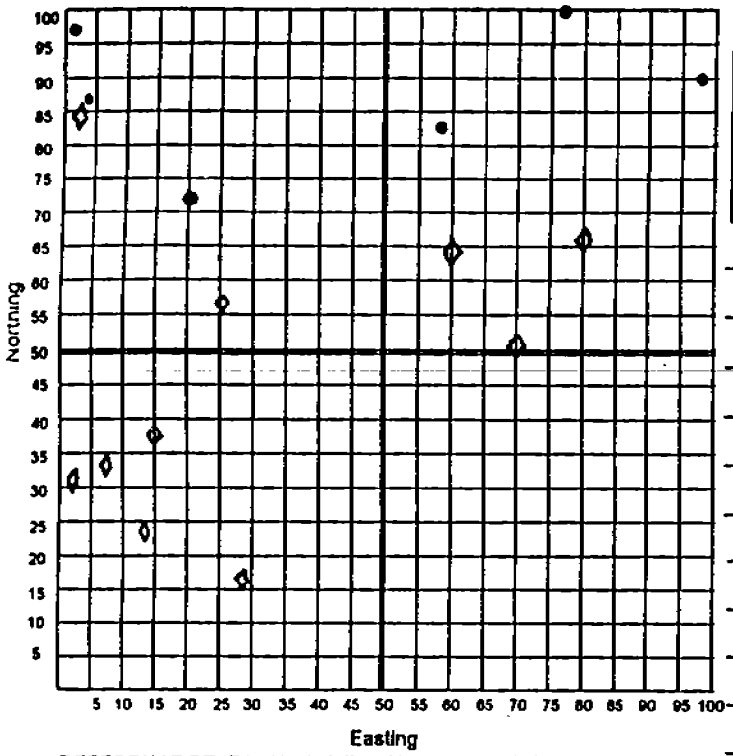
EXPLOSIVE[illegible]OSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
6 DEC	16	0		0	10					

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

~~3~~	4
1	2

SECTION: 3

GRID: P-15

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
6 DEC		17 x 28	1		SCRAP	4"
6 DEC		31 x 2	1		SCRAP	8"
6 DEC		24 x 14	1		SCRAP	2"
6 DEC		34 x 7	1		SCRAP	1"
6 DEC		38 x 15	1		SCRAP	2"
6 DEC		51 x 70	1		SCRAP	2"
6 DEC		57 x 25	1		SCRAP	4"
6 DEC		65 x 60	1		SCRAP	1"
6 DEC		73 x 23	1		NON ORD	1"
6 DEC		66 x 80	1		SCRAP	6"
6 DEC		85 x 2	1		SCRAP	2"
6 DEC		86 x 3	1		NON ORD	4"
6 DEC		83 x 58	1		NON ORD	1"
6 DEC		97 x 1	1		NON ORD	4"
6 DEC		90 x 98	1		NON ORD	1"
6 DEC		100 x 77	1		NON ORD	5"

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

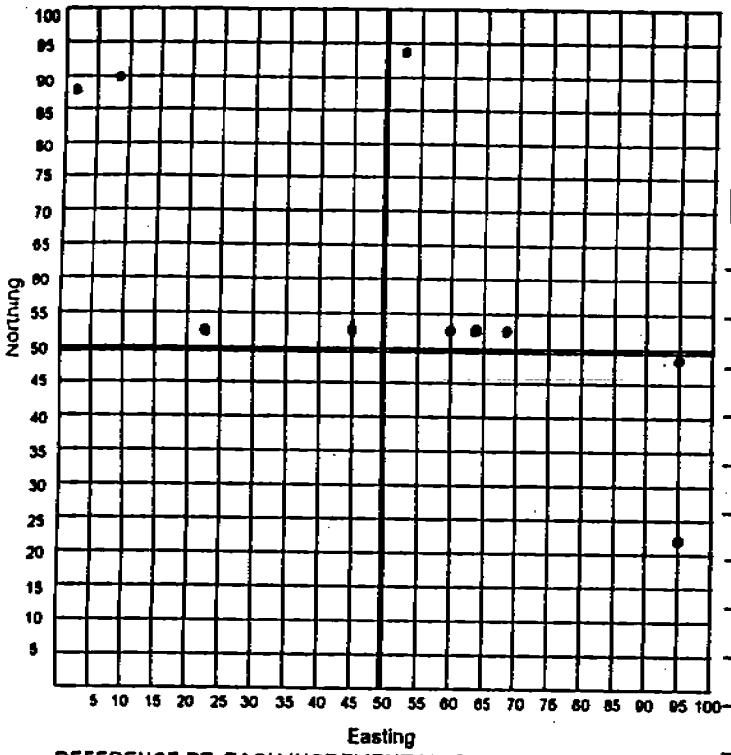
EXPLOSIVE[illegible]POSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	X
1	2

SECTION: 4

GRID: P-15

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
6DEC		27×95			NON ORD	2"
		49×95			NON ORD	2"
		53×68			NON ORD	SURFACE
		53×64			NON ORD	SURFACE
		53×60			NON ORD	SURFACE
		53×45			NON ORD	SURFACE
		53×23			NON ORD	SURFACE
9DEC		89×2			NON ORD	2"
9DEC		94×53			NON ORD	6"
9DEC		90×8			NON ORD	4"

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

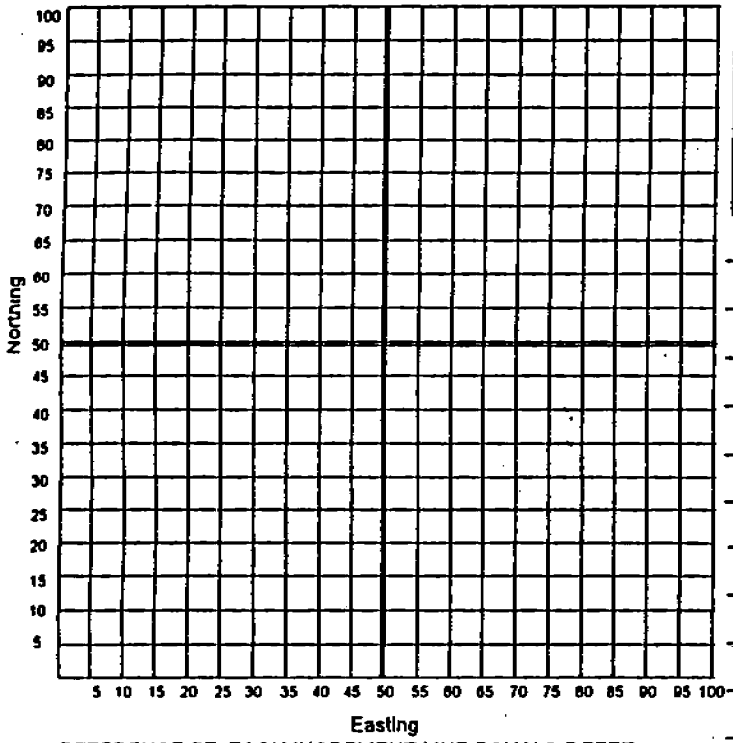
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
X	2

SECTION: 1

GRID: Q-13

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

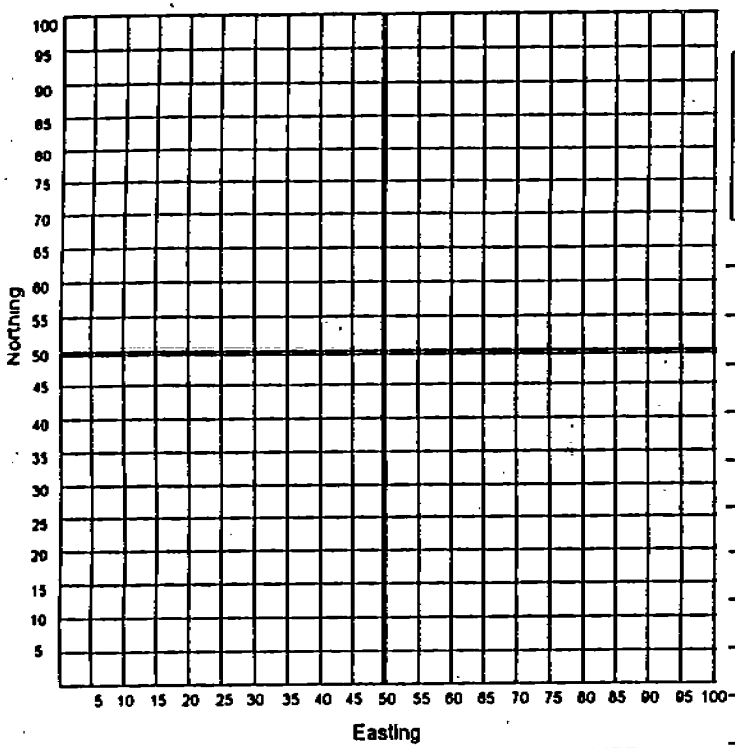
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	~~2~~

SECTION: 2

GRID: Q - 13

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
13 DEC		10 x 4			NON ORD	2-3"
		22 x 22			SCRAP	2"
		52 x 7			NON ORD	1"
		75 x 44			NON ORD	2"
		76 x 43			NON ORD	2-3"
	*	88 x 39			NON ORD	2-3"
	*	97 x 9			NON ORD	1"
		98 x 6			NON ORD	1"
		99 x 4			NON ORD	1"

TOTAL _____ LIVE UXO

TOTAL _____ INE[illegible]:O

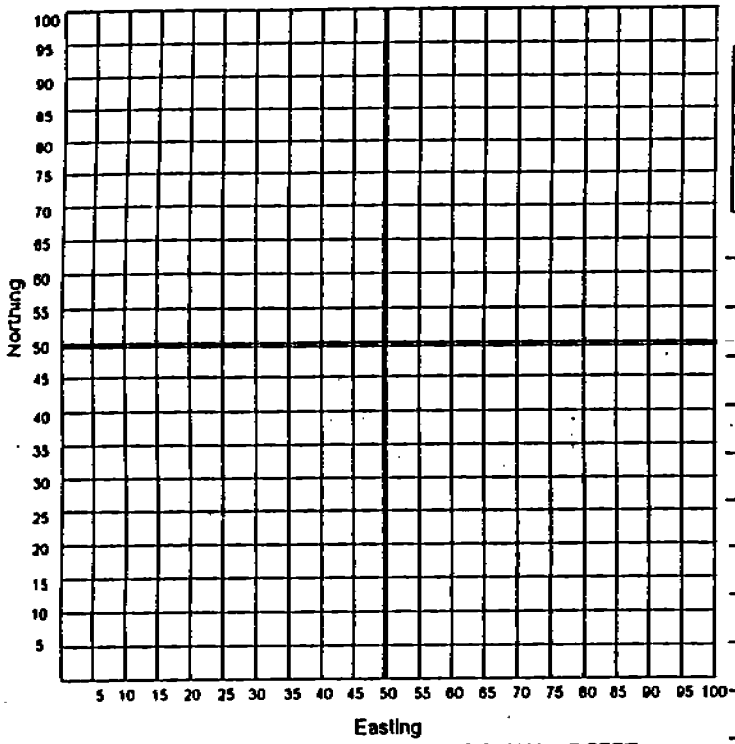
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3

GRID: Q-13

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

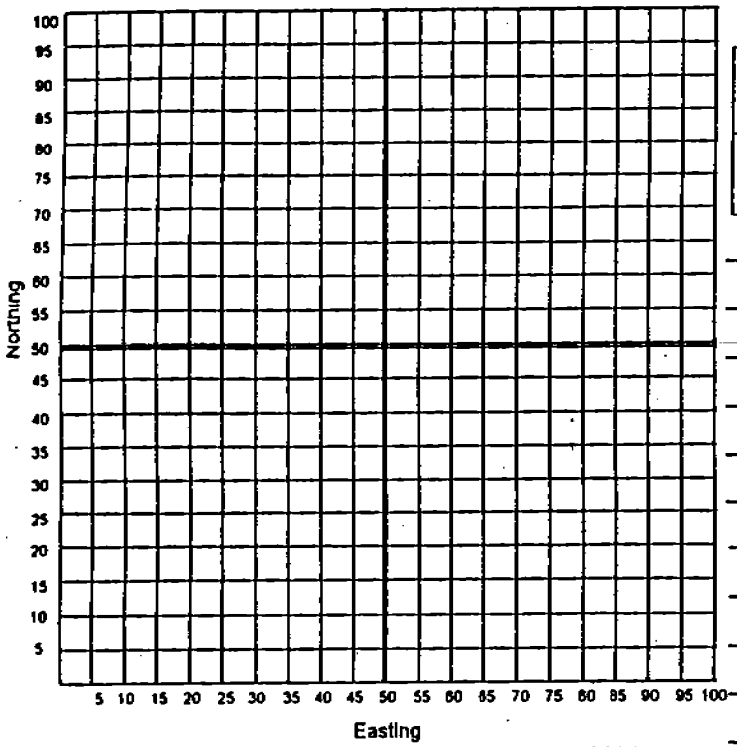
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 4

GRID: Q-13

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
13 DEC	*	1 x 9			NON ORD	1"
		9 x 53			NON ORD	2"
	*	7 x 10			NON ORD	6"
	*	13 x 1			NON ORD	2"
	*	13 x 6			NON ORD	2"
		18 x 21			NON ORD	6"
	*	19 x 6			NON ORD	3"
	*	18 x 2			NON ORD	2"

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

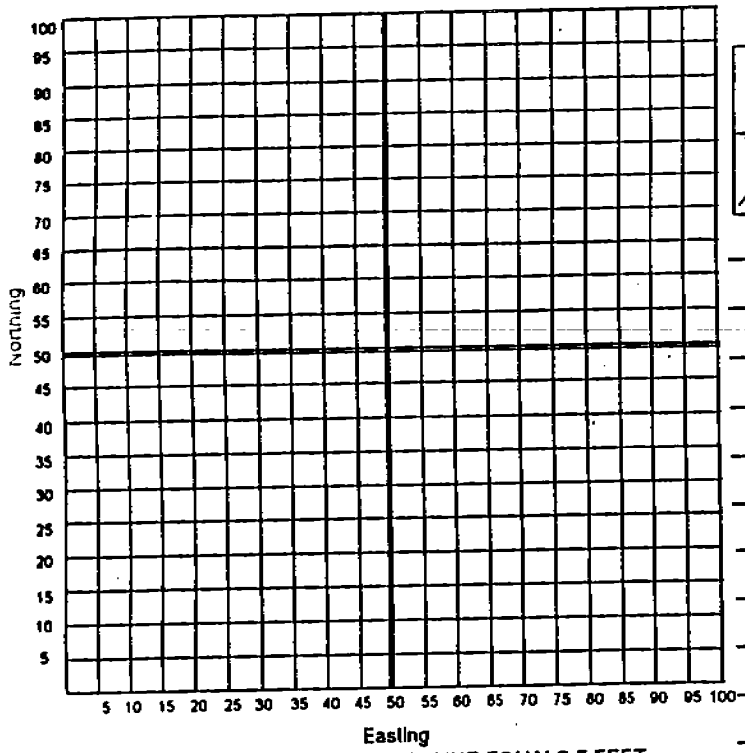
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
X	2

SECTION: 1

GRID: Q-14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
11 DEC		41 x 1			NON ORD	1"
		30 x 15			NON ORD	SURFACE
		54 x 57			NON ORD	2"
	*	58 x 54			NON ORD	2-3"
		59 x 28			NON ORD	1"
		62 x 2			NON ORD	2"
		56 x 19			NON ORD	1"
		56 x 18			NON ORD	1"
		56 x 15			NON ORD	1"
	*	66 x 51			NON ORD	2"
		57 x 2			NON ORD	2"
	*	56 x 0			NON ORD	2"
		76 x 1			NON ORD	6"
		77 x 1			NON ORD	SURFACE
		77 x 10			NON ORD	SURFACE
		80 x 12			NON ORD	6"
		77 x 19			NON ORD	SURFACE
	*	83 x 27			NON ORD	6"
		75 x 21			NON ORD	2"
		83 x 21			NON ORD	2"
		84 x 13			NON ORD	2"
		78 x 98			NON ORD	2"
		88 x 22			NON ORD	2"
		88 x 10			NON ORD	SURFACE
		88 x 14			NON ORD	SURFACE
		88 x 6			NON ORD	SURFACE
		86 x 4			NON ORD	SURFACE

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

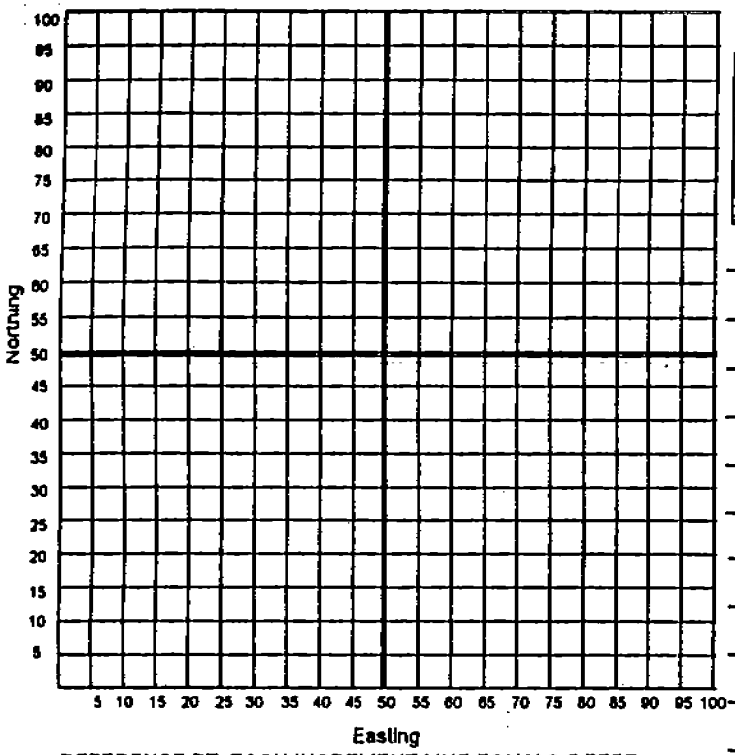
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 1

GRID: Q - 14

REMARKS: CONTINUED

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
11 DEC		98 x 14			NON ORD	6"

TOTAL _____ LIVE UXO

TOTAL _____ INER

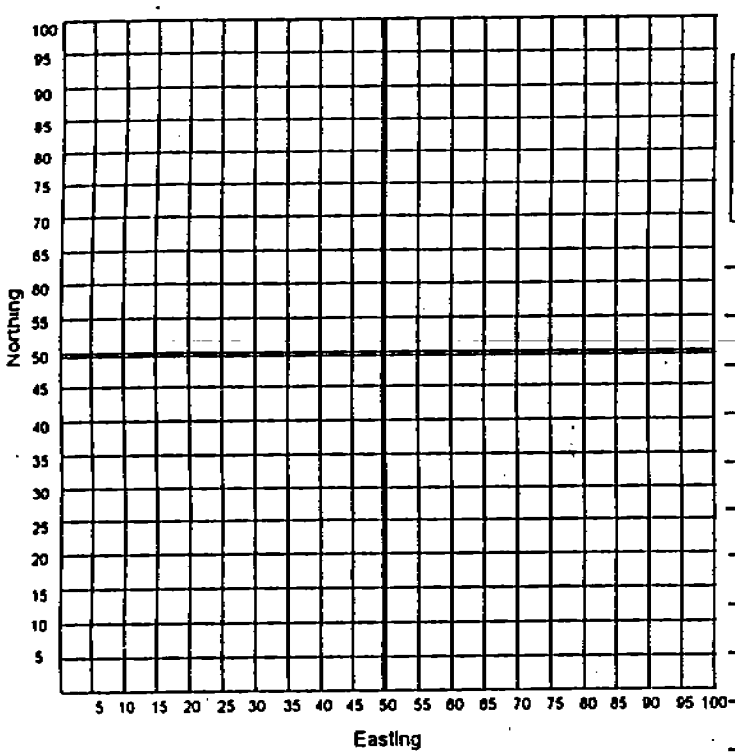
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3

GRID: Q - 14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
11 DEC		2 x 6			NON ORD	SURFACE
		3 x 6			NON ORD	SURFACE
		3 x 10			NON ORD	SURFACE
		3 x 14			NON ORD	SURFACE
		3 x 23			NON ORD	SURFACE
		3 x 33			NON ORD	SURFACE
	*	7 x 8			NON ORD	2-6"
		4 x 36			NON ORD	2"
		4 x 43			NON ORD	SURFACE
		1 x 50			NON ORD	1"
		12 x 42			NON ORD	3"
		18 x 69			NON ORD	SURFACE
		16 x 47			NON ORD	1"
		16 x 45			NON ORD	1"
		17 x 36			NON ORD	1"
		19 x 33			NON ORD	1"
12 DEC	*	18 x 27			NON ORD	2-6"
	*	53 x 35			NON ORD	2-3"
	*	58 x 35			NON ORD	2-3"
	*	64 x 35			NON ORD	2-3"
	*	64 x 50			NON ORD	2-3"
	*	50 x 35			NON ORD	2-3"
	*	64 x 37			NON ORD	2-3"
		75 x 100			SCRAP	1"
		73 x 64			SCRAP	1"
		73 x 33			NON ORD	1"
	*	67 x 35			NON ORD	2-8"

TOTAL _____ LIVE UXO

TOTAL _____ INE[illegible] [illegible]O

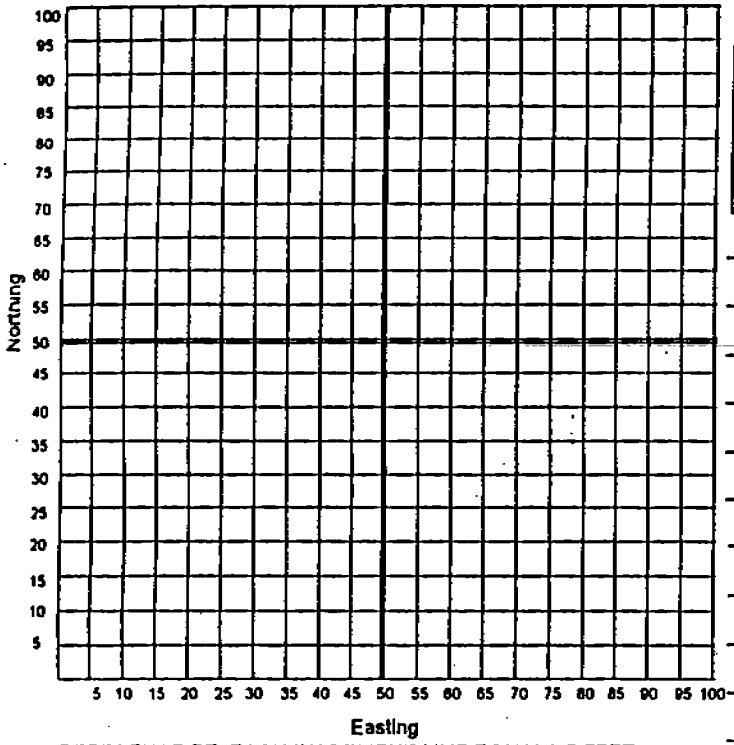
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3

GRID: Q-14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
12 DEC		73 × 80			NON ORD	1"
		79 × 57			NON ORD	1"
		82 × 52			NON ORD	1"
	*	82 × 51			NON ORD	2"
	*	82 × 46			NON ORD	2-6"
	*	76 × 34			NON ORD	2"
	*	86 × 26			NON ORD	2"
		93 × 12			NON ORD	2"
	*	86 × 37			NON ORD	2"
	*	86 × 42			NON ORD	2"
		87 × 70			NON ORD	3"
		86 × 74			NON ORD	3"
		89 × 97			NON ORD	1"
		94 × 27			NON ORD	8"
		92 × 67			NON ORD	2"
		92 × 75			NON ORD	2"
		96 × 55			NON ORD	2"
		97 × 85			NON ORD	SURFACE
		85 × 100			NON ORD	SURFACE
		71 × 51			NON ORD	SURFACE
		57 × 41			SCRAP	12"
		27 × 36			NON ORD	2"
		16 × 13			SCRAP	2"
		43 × 10			SCRAP	3"

TOTAL _____ LIVE UXO

TOTAL _____ INE[illegible] (O

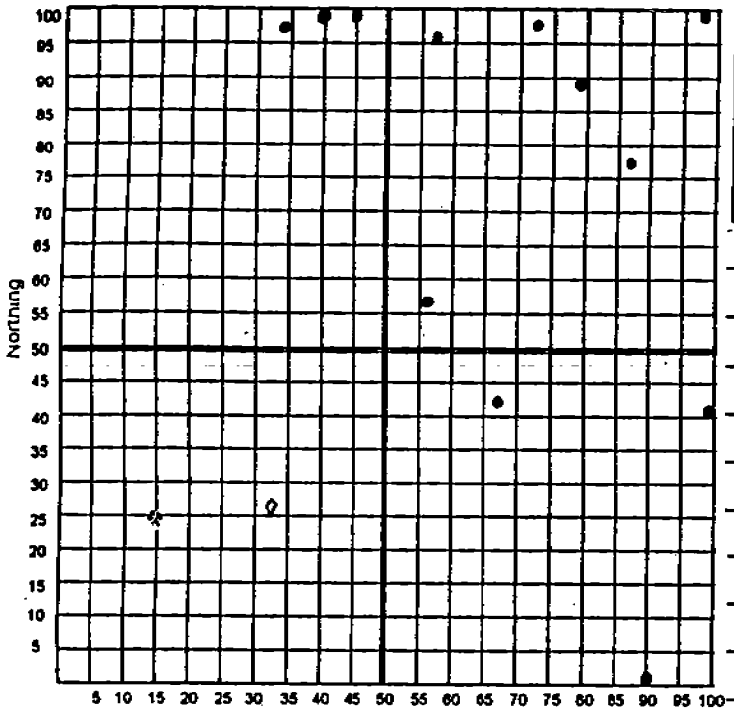
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
9 DEC 96	13	Ø		Ø	1					

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 1

GRID: Q-15

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
9DEC		1 x 90			NON ORD	18"
		27x33			SCRAP	8"
		41x99			NON ORD	1"
		43x67			NON ORD	1"
		57x56			NON ORD	10"
		78x87			NON ORD	1"
		89x79			NON ORD	1"
		99x98			NON ORD	1"
		98x73			NON ORD	1"
		96x57			NON ORD	2"
		99x45			NON ORD	1"
		99x40			NON ORD	2"
		97x34			NON ORD	6"

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

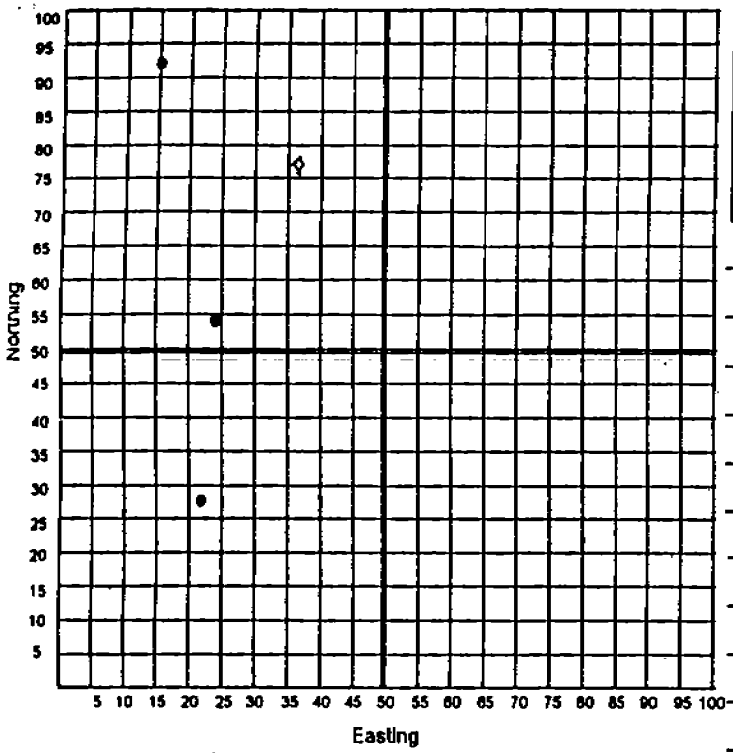
EXPLOSIVE POSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
9 DEC 96	4	Ø		Ø	1					

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	~~2~~

SECTION: 2

GRID: Q - 15

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
9-DEC		93 x 15			NON ORD	SURFACE
↓		78 x 36			NON ORD	2"
		54 x 24			SCRAP	6"
↓		28 x 22			NON ORD	2"

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

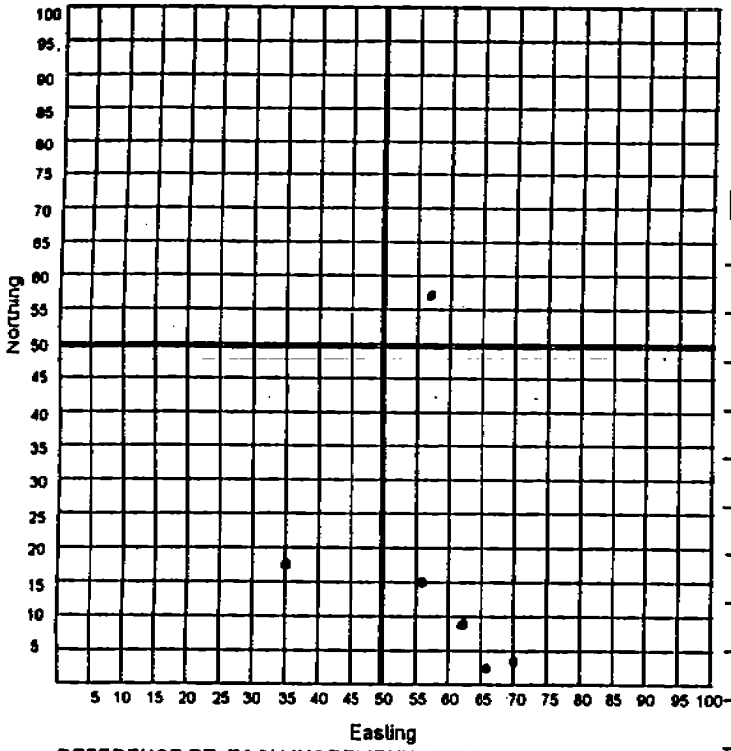
EXPLOSIVE [illegible]POSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
9DEC 96	6	Ø		Ø	Ø					

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

~~3~~	4
1	2

SECTION: 3

GRID: Q-15

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
9 DEC		3 x 66			NON ORD	6"
		4 x 70			NON ORD	1"
		9 x 63			NON ORD	2"
		15 x 56			NON ORD	6"
		17 x 35			NON ORD	2"
		57 x 57			NON ORD	6"

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

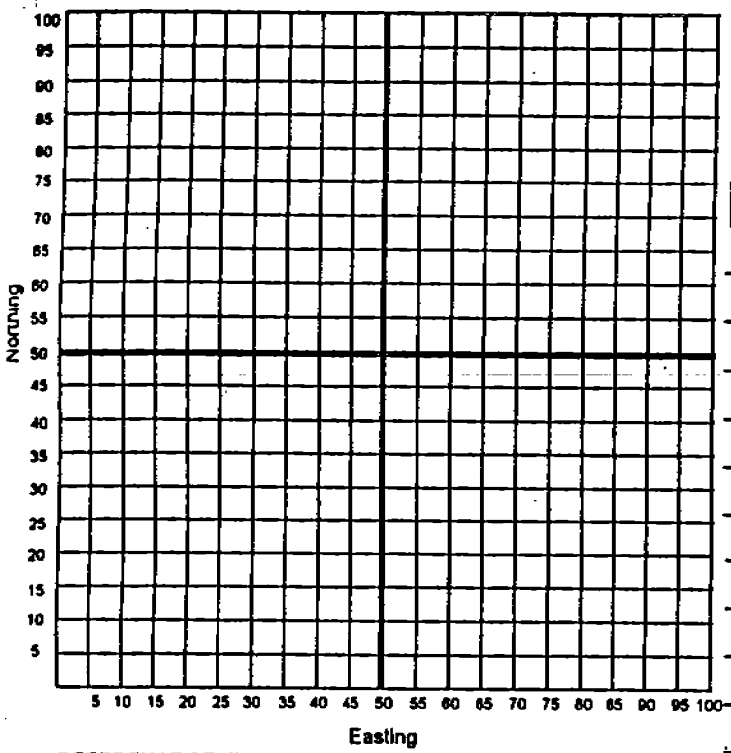
EXPLOSIVE[illegible]POSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 4

GRID: Q-15

REMARKS: NO HITS

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

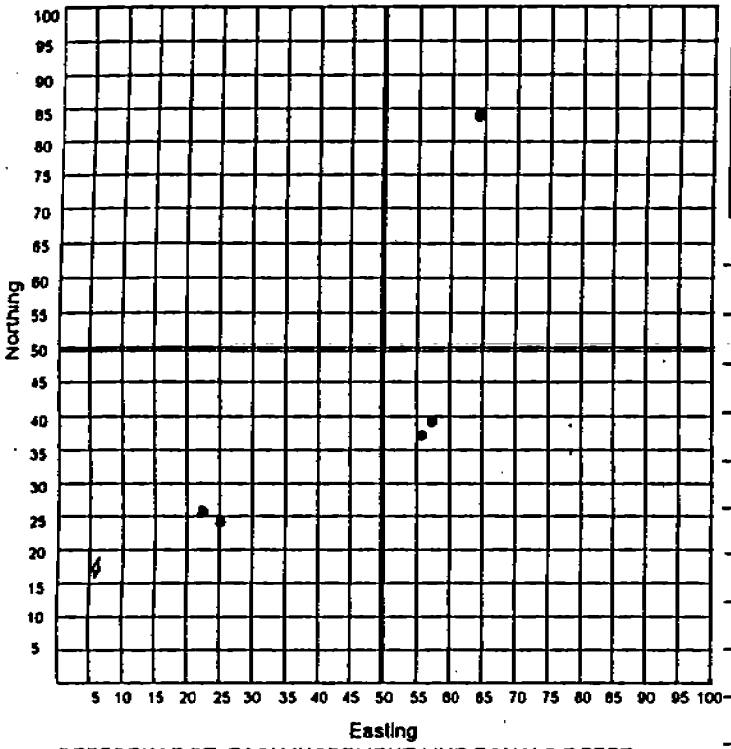
EXPLOSIVE D[illegible]OSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Acco[illegible]ng Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
X	2

SECTION: 1

GRID: R-13

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
13 DEC		18 x 6			SCRAP	3"
		24 x 25			NON ORD	3"
		26 x 23			NON ORD	3"
		39 x 57			NON ORD	1"
	*	37 x 56			NON ORD	1"
		84 x 64			NON ORD	1"

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

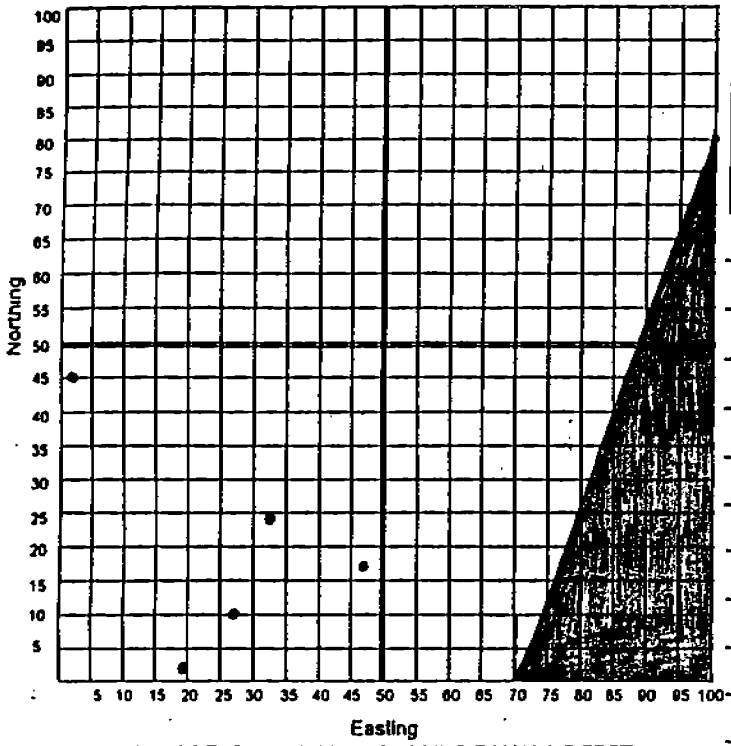
EXPLOSIVE D[illegible]OSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accou[illegible]ng Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 2

GRID: R-13

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
13 DEC		2x19			NON ORD	2"
↓		10x27			NON ORD	3"
		17x47			NON ORD	1"
		24x33			NON ORD	1"
		45x2			NON ORD	2"

TOTAL _____ LIVE UXO

TOTAL _____ INE[illegible]O

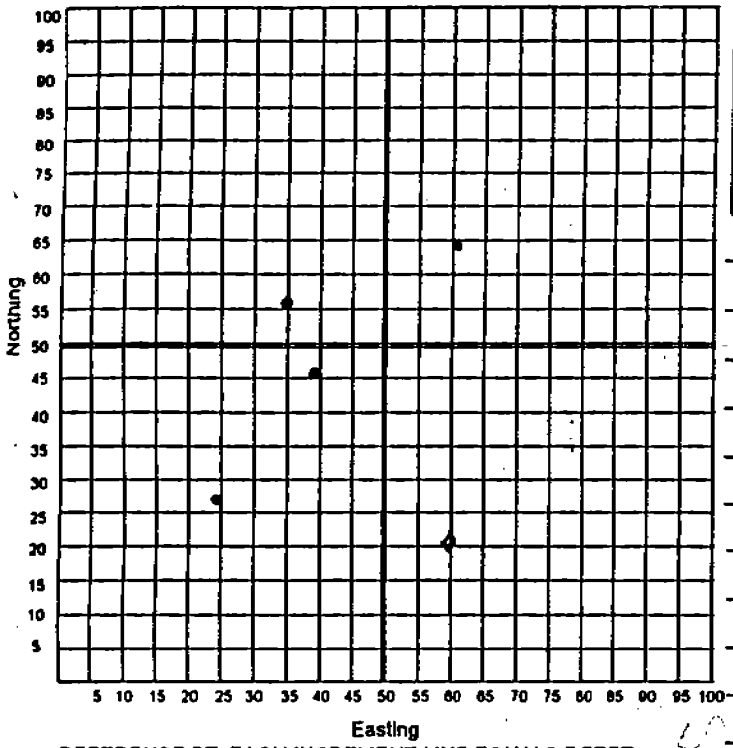
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3

GRID: R-13

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
13 DEC		21×60			SCRAP	2"
		27×24			NON ORD	1"
		46×39			NON ORD	2.6"
		56×35			NON ORD	2"
		64×61			NON ORD	2"

TOTAL _____ LIVE UXO

TOTAL _____ INE[illegible] :O

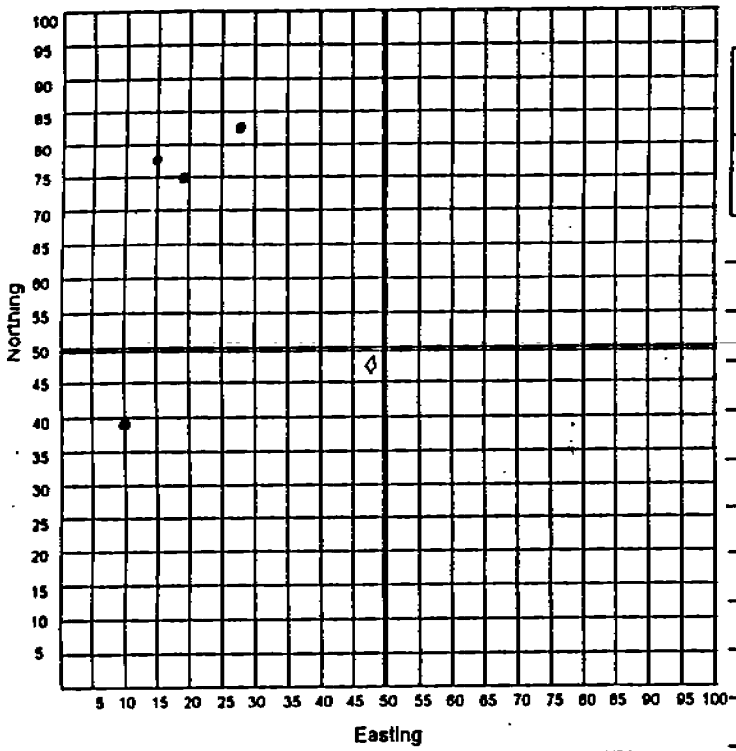
EXPLOSIVE [illegible]OSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Acco[illegible]ing Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 4

GRID: R-13

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
13 DEC		39 x 10			NON ORD	2"
		48 x 48			SCRAP	2"
	*	75 x 19			NON ORD	2-3"
	*	78 x 15			NON ORD	2-6"
	*	83 x 28			NON ORD	2-3"

TOTAL _____ LIVE UXO

TOTAL _____ INE[illegible]O

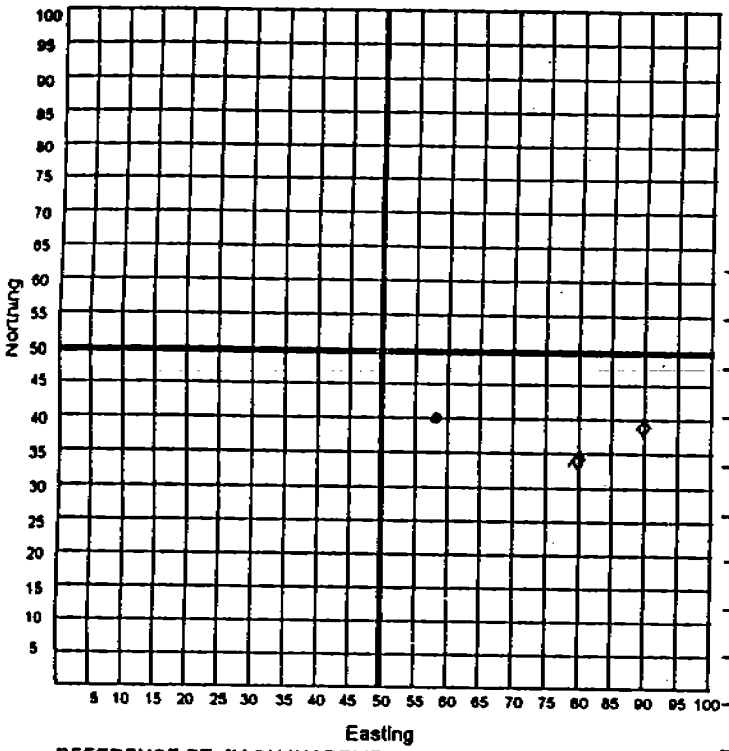
EXPLOSIVE[illegible]POSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
X	2

SECTION: 1

GRID: R-14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
12 DEC		39×90			SCRAP	2"
		34×80			SCRAP	6"
		40×58			NON ORD	1"

TOTAL _____ LIVE UXO

TOTAL _____ INERT

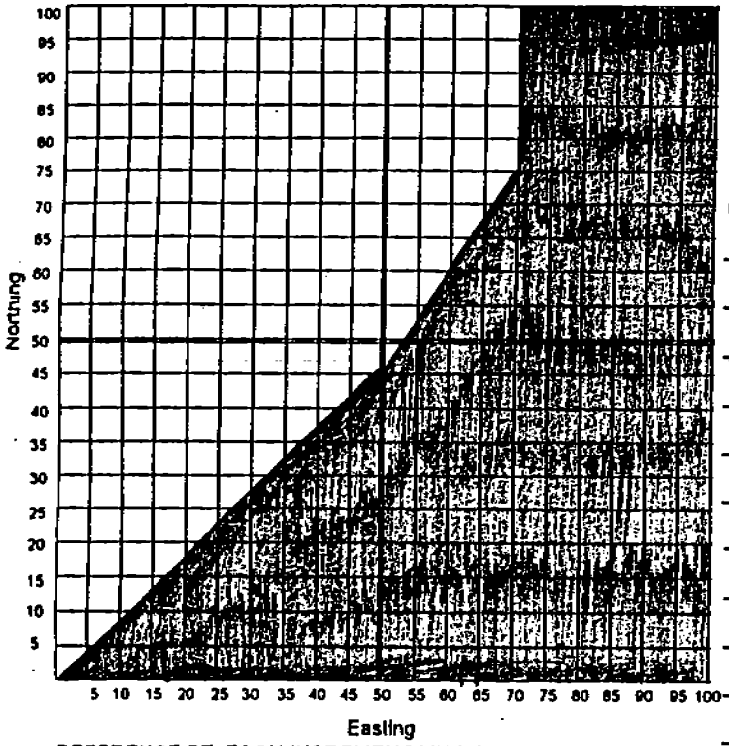
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 2

GRID: 2-14

REMARKS: NO HITS

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

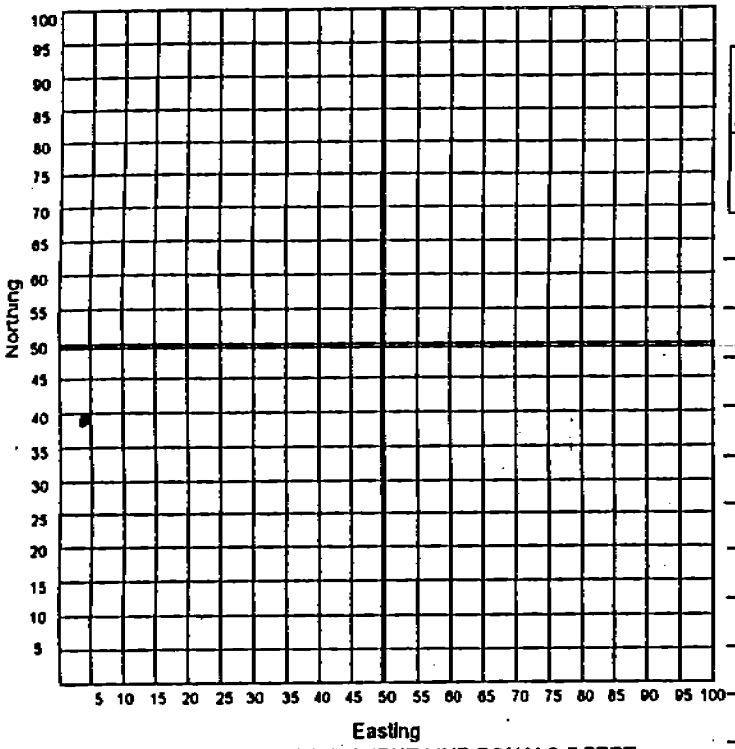
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

X	4
1	2

SECTION: 3

GRID: R-14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
DEC		39x4			NON ORD	6"

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

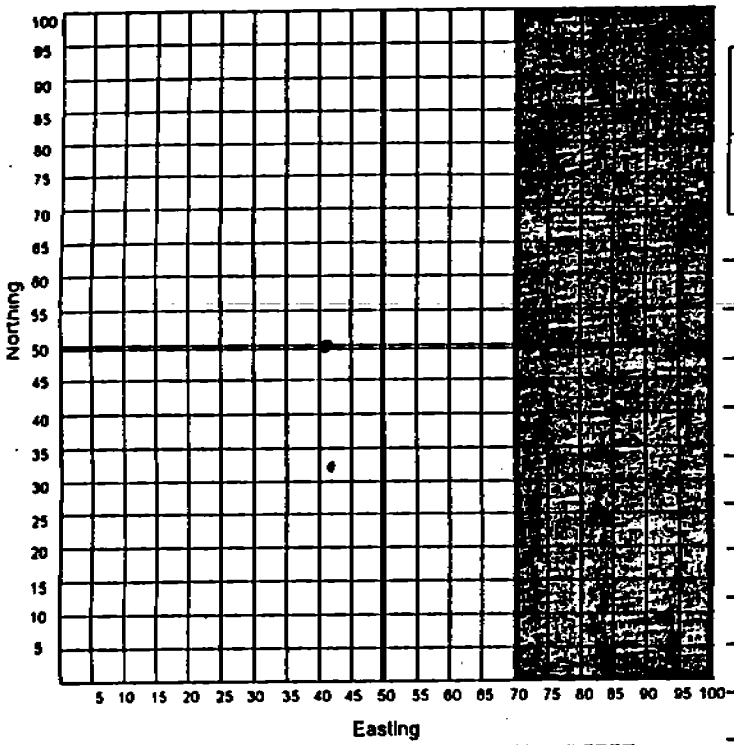
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 4

GRID: R-14

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
10 DEC	*	50 x 41			NON ORD	1-2"
12 DEC		33 x 42			NON ORD	SURFACE

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

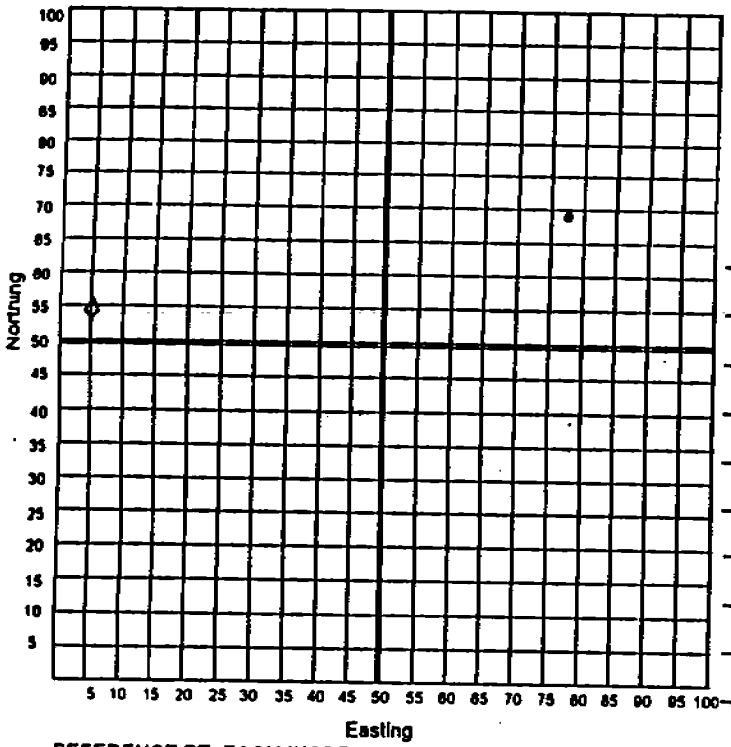
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: _____

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION:

GRID: R-15

REMARKS:

Date	Section	Coordinates	QTY	UXO	Condition (Live/Inert)	Depth
12 DEC		69 x 78	1		NON ORD	2"
12 DEC		55 x 5	1		SCRAP	6"

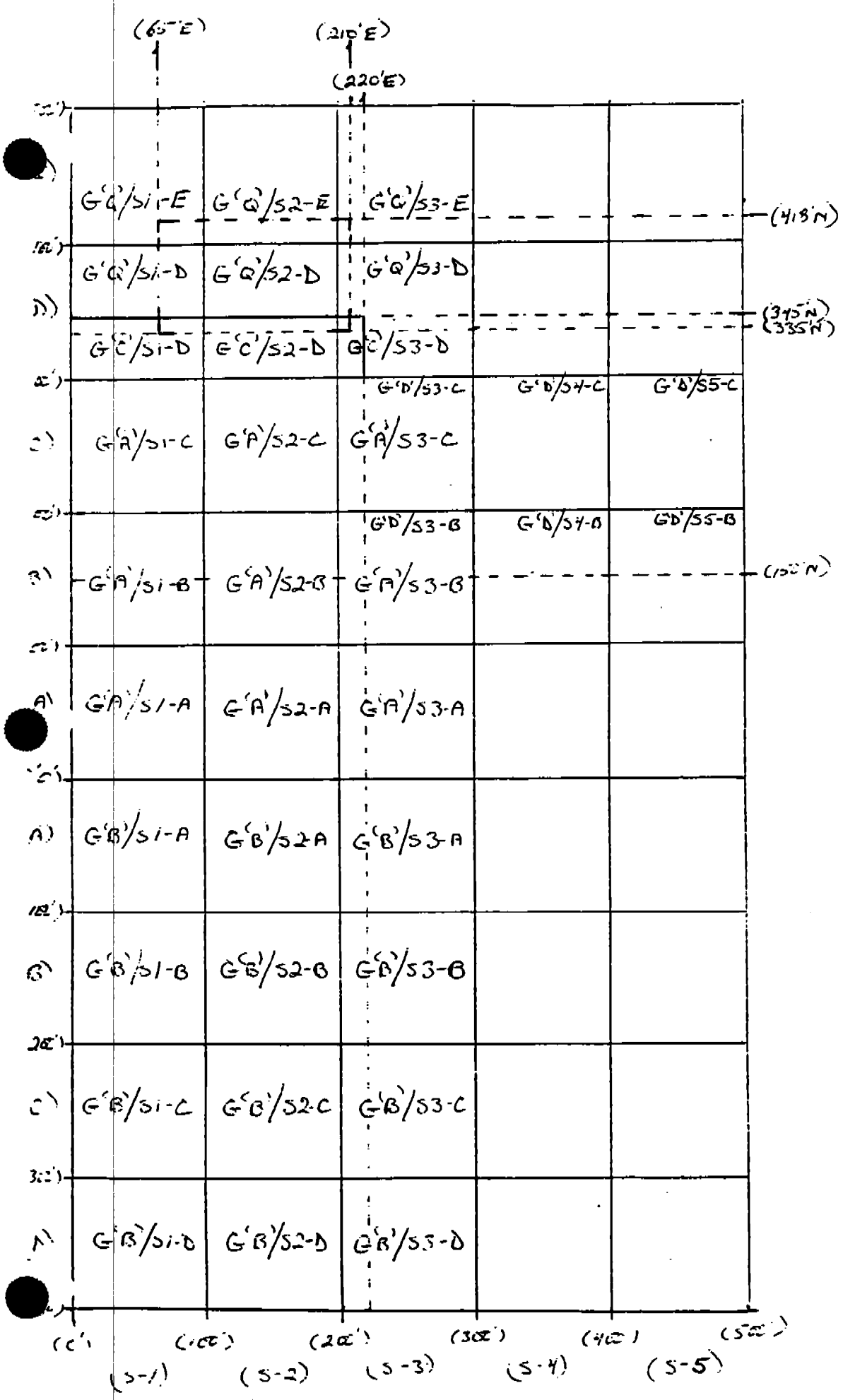
TOTAL _____ LIVE

TOTAL INERT

Explosive Disposal Engineering & Technology

Grid Work Progress/ Completion Accounting Sheets & Daily Reports

Tourtelot Property



GRID INDEX

SUB-GRIDS LISTED AS 'SECTIONS'

WORKSHEET GRID A

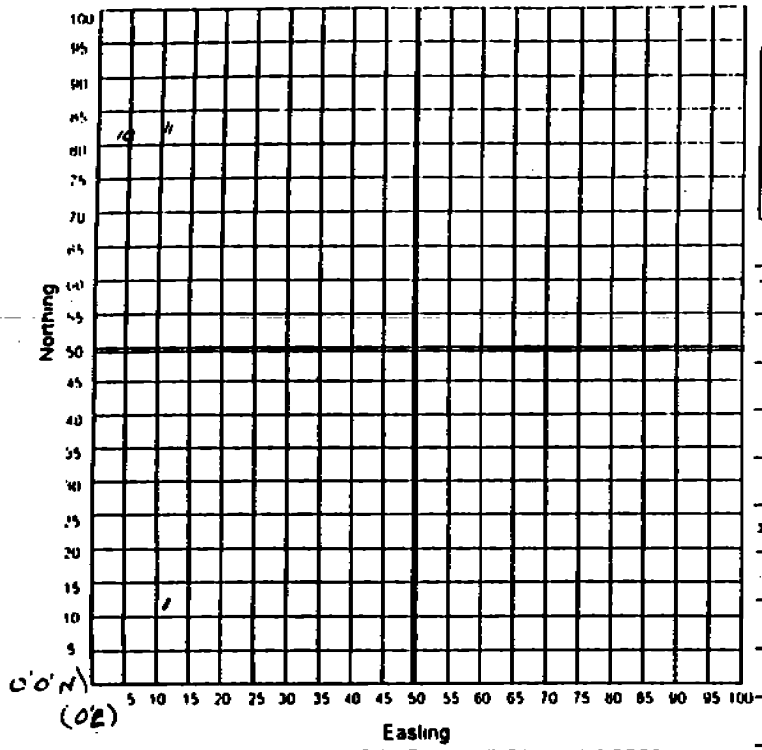
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID A - SECT. 1A

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
15 AUG	1		20 min	Ø	Ø	3	N/A	CULVERT		D.E. Parberton
22 AUG	2		1.5 hrs	Ø	Ø	N/A	N/A	BACK HOE DIG		D.E. Parberton

	Date	Remarks	Signature
MAG & complete			
Grid complete	22 AUG 96		D.E. Parberton
Quality control check complete			
Customer QA check complete			
Additional comments			



Quadrant

3	4
1	2

SECTION: 1 - A

GRID: A

REMARKS:

#1 - TOP OF CULVERT EXPOSED AT @2'. CULVERT IS @2' DIA AND EXTENDS N/E AND DOWN SLOPE ACROSS GRID 'A' FROM W/O ROAD TOWARD CONCRETE PAD.

#10 - THIS HIT WAS NOT DUG DUE TO NO SIGNAL AT SURFACE WITH MAG. AND UNABLE TO PINPOINT.

#11 - NO SIGNAL WITH MAG. TO PINPOINT.

*#10/11 - DUG BY BACKHOE TO 8' WITH NO SIGNAL IN THE BOTTOM

ITEM #	Date 7/6	~~Section~~ QUAD.	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#1	15 AUG	1	X -12.01 Y -11.79	N/A	ϕ	CULVERT	2'
#10	"	3	82.91 4.40	N/A	ϕ	UTL	NOT DUG
#11	"	3	83.57 10.55	N/A	ϕ	UTL	NOT DUG
#10/11	22 AUG	3	"	N/A	ϕ	"	DUG TO 8'

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

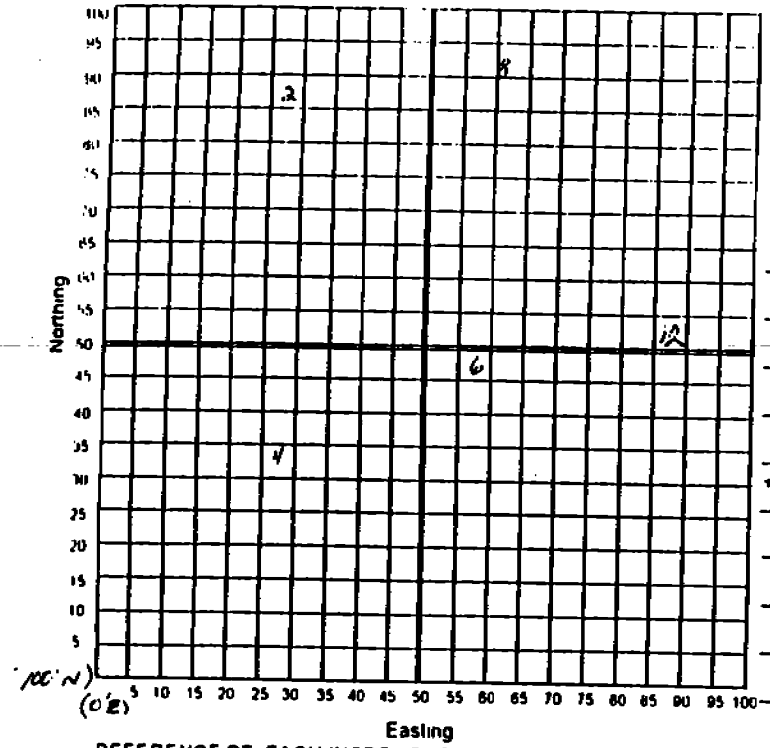
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: A - SECT. 1B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
15 AUG.	4		1.5 HRS	ϕ	ϕ	4	6 1/4	TRASH & FRAG.		D.E. Pulvertaft
22 AUG.	1		.5 HRS	ϕ	ϕ	1	N/A	BACKHOE DIG		D.E. Pulvertaft

	Date	Remarks	Signature
MAG & complete			
Grid complete	22 AUG.		D.E. Pulvertaft
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 1-B

GRID: A

REMARKS:

#2- LOST SIGNAL WITH REMOVAL OF STRAPPING.

#4- 5' STEEL PIPE ON SURFACE AND LOST SIGNAL WHEN MOVED

#6- LOST SIGNAL WITH REMOVAL OF WIRE

#8- THE HOLE WAS DUG TO 18" BELOW THE ROAD. THE SIGNAL CONTINUES WITH THE ROAD MATERIAL AND NOT THE BOTTOM OF THE HOLE. BACKHOE TO 24'

#12 - SIGNAL ASSOCIATED WITH ROAD BED. DUG TO 2' & LOST SIGNAL

ITEM #	Date 96	~~Section~~ Quad	Coordinates x = E y = N	~~Qty~~ lbs	UXO	Condition (Live/Inert)	Depth
#2	15 AUG	3	25.84 184.09	1	ϕ	18" PIECE OF METAL STRAP	2"
#4	"	1	27.64 134.44	5	ϕ	5' STEEL PIPE	0"
#6	"	2	57.69 146.10	1/4	ϕ	2-10" PIECES OF WIRE	1'
#8	"	4	00.52 191.65	N/A	ϕ	ROAD BED MATERIAL	6"-8"
#9	"						
#12	22 AUG	4	57.91 154.35	N/A	ϕ	ROAD BED MATERIAL	2'

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

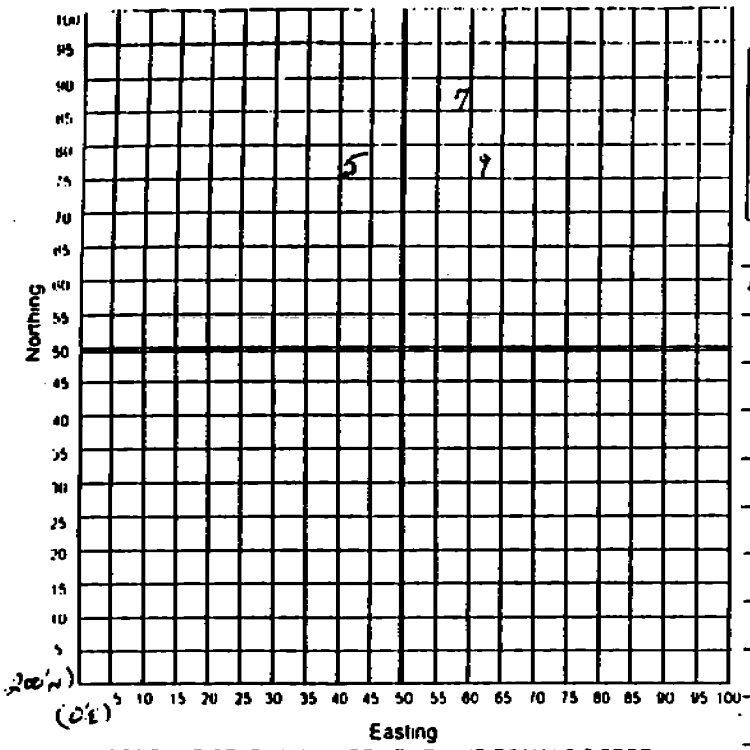
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID A - SECT. 1C

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
15 AUG	2		40 mins	ϕ		2	10+			D.E. Parkerton
21 AUG	1		20 mins	ϕ		1	4			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	21 AUG.		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 1 - C

GRID: A7

REMARKS:

#7 - PIECE OF FRAGMENT IN 6-8" OF ROAD SURFACE. THE HOLE WAS EXPANDED AND THE SIGNAL WAS LOST IN THE BOTTOM OF THE HOLE BUT MANY CONTACTS IN ROAD SURFACE MATERIAL.

#9 - 10" REBAR AND MANY SMALL PIECES OF FRAG, MIXED INTO GRAVEL SURFACE MATERIAL.

#5 = (3/16) LARGE FRAG PIECE RE MOVED AT 1' IN GRAVEL CONTAMINATED WITH SMALL FRAG. & AT @ 2' A BLACK-TOP LAYER IS HIT THAT PRODUCES SIGNALS OVER THE AREA.

Item #	Date 96	~~Section~~ QUAD	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#7	MAR	4	58.84 287.27	<1/4	ϕ	1 PIECE OF FRAG.	6-6"
#9	"	4	63.42 277.13	10	ϕ	10" REBAR & FRAG	6"
#5	21 AUG	3	42.10 277.34	4	ϕ	LARGE FRAG PIECE	12"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

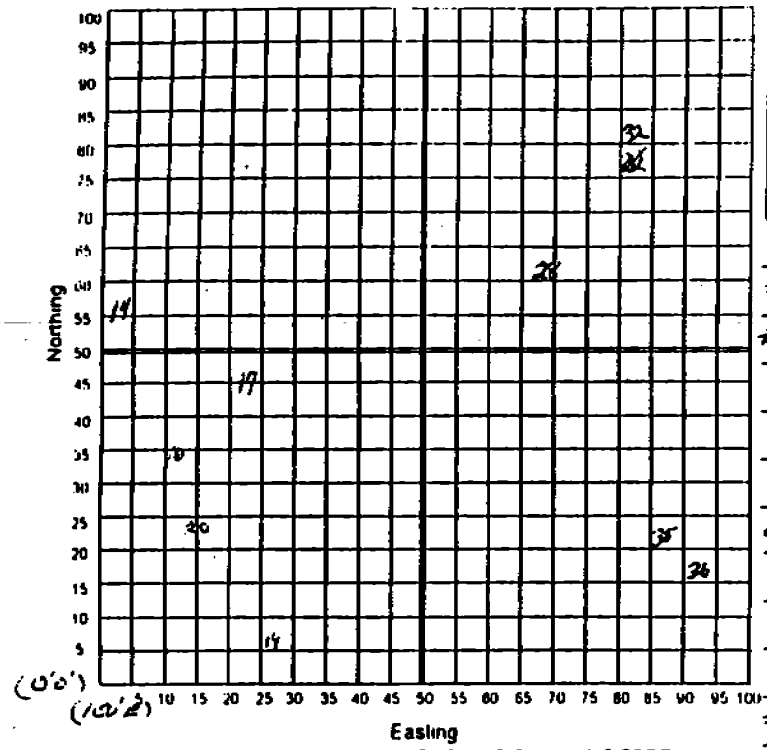
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID A-SECT. 2 A

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
15 AUG.	6		1.5 HRS	Ø		9	@3			J.E. Parkerton
23 AUG.	1		30 MINS	Ø		N/A		BACKHOE DIG TO ENLARGE DIA. OF HOLE TO RE-MAG.		J.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	23 AUG		J.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 2-A

GRID: A

REMARKS:

#14 - NOT DUG DUE TO NO SIGNAL

#16 - LIFTING LUG OF @ 1/2 FOUND JUST BELOW THE SURFACE

#17 - SHORT PIECE OF SHEET METAL JUST BELOW SURFACE

#17-19-20 - ALL ARE DEBRI IN BULL DOZED BERM AND HEAVY METAL GRATING IS JUTTING OUT OF BERM.

#28 - THIS IS PART OF THE LARGE CONCRETE PAD

#32 - PIPES EXTENDING VERTICALLY OUT OF CONCRETE PAD

#35 - SITE DUG TO 2' THROUGH FRAG. CONTAMINATED GRAVEL. MAG. CONTINUES TO SIGNAL ON SETTING #7 STRONGLY. UNABLE TO ISOLATE SIGNAL FROM GRAVEL.

#36 - GRAVEL IS CONTAMINATED WITH SMALL FRAG. THE SAME AS FOUND ON TOP OF THE BUNKER. ABOUT TWO POUNDS OF FRAG REMOVED.

* DUG WITH BACKHOE TO 18" WITH DIA. OF 5' AND UNABLE TO LOCATE SINGLE SOURCE.

172m #	Date '96	~~Section~~ QUAD	Coordinates 1= E 2= N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#14	15 AUG	3	109.74 55.86	N/A	Ø	UTL	NOT DUG
#16	"	1	111.30 34.74	1/2	Ø	LIFTING LUG	2"
#17	"	1	123.00 44.77	1/8	Ø	1/8 2" PIECE OF SHEET METAL	0"
#19	"	1	126.63 5.72	N/A	Ø	METAL GRATING	0"
#20	"	1	124.47 15.08	N/A	Ø	METAL GRATING	0"
#28	"	4	168.82 62.71	N/A	Ø	CONCRETE PAD	NOT DUG
#32	"	4	177.78 82.04	N/A	Ø	PIPES	NOT DUG
#35	"	2	186.03 21.17	1/4	Ø	SMALL FRAG IN GRAVEL	2'
#36	"	2	192.62 16.47	2	Ø	SMALL FRAG IN GRAVEL	1'
*	23 AUG	"	"		Ø	UTL	18"

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

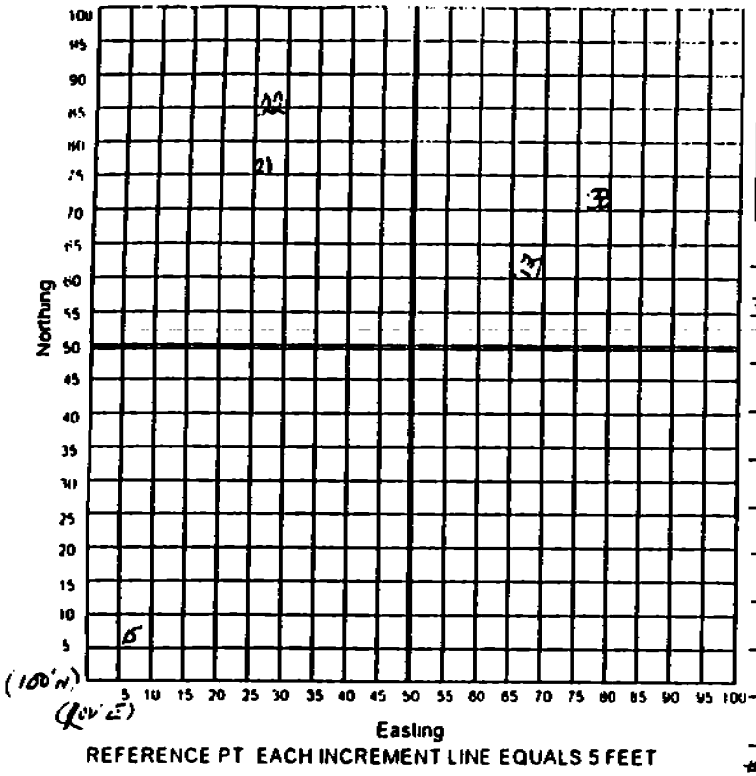
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: A-SECT. 2B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
15 AUG.	1		.5 HRS	ϕ		2	½			D.E. Parkerton
23 AUG.	3		2 HRS	ϕ		2	10½			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	23 AUG		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



Quadrant

3	4
1	2

SECTION: 2-B

GRID: A

REMARKS:

#15 - NOT DUG. LOCATION IS WHERE A LONG SECTION OF HEAVY 8" STEEL PIPE IS IN-BEDDED IN CONCRETE AND JUTTING @ 2' OUT OF THE GROUND.

#21 - ATTEMPTED TO ISOLATE SIGNAL BUT SIGNALS RECEIVED THROUGH OUT GRAVEL SPREAD OVER SURFACE

#33 - ABOVE GROUND PIPE

#22 - SMALL PIECES OF FRAG. IN TOP GRAVEL SURFACE MIX & (3) HEAVY GAUGE ALUM. INSULATED CABLES AT 2'. THE HOLE WAS DUG TO FIVE FEET & ANOTHER LAYER OF TRASH WAS HIT.

#27 - 2" PIPE WITH PARALLEL ELECT CABLE RUNNING N/S FROM FIRING LINE TO CONCRETE PAD. POSS. ROCKET HEAD AT 6"

*#33 - 23 AUG BACKHOE MOVED PIPE & CONTACT BELOW PIPE MADE WITH MAG. AND DUG. CONTACT LOST WITHIN 6" WITH REMOVAL OF TOP LAYER.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X=E Y=N	~~QTY~~ LBS	UXO	Condition (Live/Inert)	Depth
#15	15 AUG	1	106.06 167.16	N/A	Φ		NOT DUG
#21	"	3	126.31 176.35	1/2	Φ	FRAG. THRU GRAVEL	18"
#33	"	4	170.99 172.05	N/A	Φ	ABOVE GROUND PIPE.	NOT DUG
#22	23 AUG	3	127.10 185.95	1/2	Φ	3 ALUM CABLES & FRAG	2'
#27	23 AUG	4	106.75 163.61	10	Φ	2" PIPE W/ELECT. CABLE	4'-5'
#33*	23 AUG	—	—	N/A	Φ	— —	—

TOTAL Φ LIVE UXO

TOTAL Φ INERT UXO

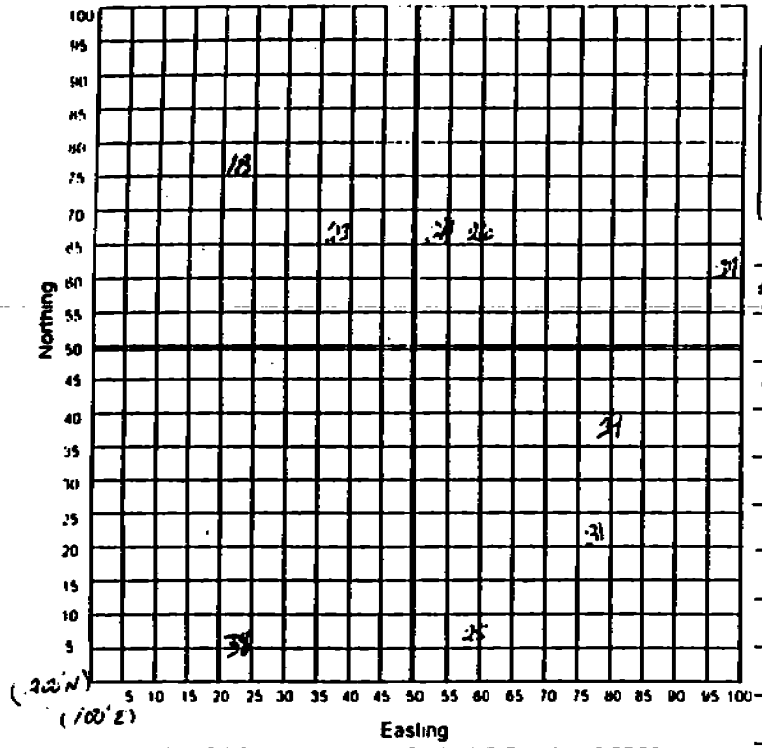
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: A – SECT 2C

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
20 AUG.	3		1.5 HRS	Ø		3	11	TRASH		D.E. Parbatton
23 AUG.	6		2Ø HRS	Ø		5	11			D.E. Parbatton
7 AUG	Ø		.25 HRS	Ø		1	N/A	UNABLE TO LOCATE		D.E. Parbatton

	Date	Remarks	Signature
MAG & complete			
Grid complete	23 AUG.		D.E. Parbatton
Quality control check complete			
Customer QA check complete			
Additional comments			



Quadrant	
3	4
1	2

SECTION: 2-C

GRID: A

REMARKS:

#25 - UNABLE TO LOCATE AND NOT DUG

#37 - LIGHT SHEET METAL AND WOOD SPREAD OVER WIDE AREA AT @ 6", AREA TOO CONTAMINATED TO MAG. PAST

#26 - WIRE AND BARS AND MAG SIGNALS ARE CHASING TRASH

#34 - 4' GROUNDING ROD LAYING FLAT WITH SCRAP METAL AT @ 1.2", AT @ 3' A 2" NORTH SOUTH RUNNING PIPE AND PARRALEL FLEX WIRE CONDUIT WAS EXPOSED. IT APPEARS TO RUN FROM THE FIRING POINT TO THE CONCRETE PAD.

#38 - SMALL PIECES MIXED WITH THE TOP 6", HOLE DUG TO 5' WITH NO SIGNAL IN THE BOTTOM

#18 - CONCRETE BLOCK WITH (4) ANCHOR BOLTS UNCOVERED AT 2" AND DUG TO 2', BLOCK CONTINUES DOWN FOR UNKNOWN DEPTH.

#28 - SMALL FRAG. IN TOP 6" AND HOLE DUG TO 2.5' AND LOST SIGNAL IN THE BOTTOM.

#24 - SMALL NAILS IN TOP 6" & POWDER CAN COVER AT 2'. HOLE DUG TO 7' AN NO SIGNAL IN THE BOTTOM.

#31 - N/S RUNNING PIPE WITH ELECT. CABLE

#037 - LANDFILL TRASH TO 2', DUG TO 5' & NO SIGNAL IN THE BOTTOM.

ITEM #	Date '96	Section QUAD	Coordinates X = E Y = N	QTY lbs	UXO	Condition (Live/Inert)	Depth
#25	15 AUG	2	159.15 207.53	N/A	Ø	UTL	NOT DUG
#37	20 AUG	4	199.29 260.36	5	Ø	TRASH	6"-12"
#26	"	4	160.28 266.42	1	Ø	TRASH	6"-12"
#34	"	2	180.99 239.34	5	Ø	GRNDG ROD & PIPE	12" & 3'
#38	23 AUG	1	124.65 205.19	1/4	Ø	SMALL FRAG IN TOP	6"
#18	23 AUG	3	123.26 276.47	?	Ø	CONCRETE BLK. W/ANCHOR	2"
#24	23 AUG	4	157.60 267.35	1/2	Ø	SMALL FRAGS IN TOP	6"
#23	23 AUG	3	138.83 267.88	1/8	Ø	SMALL FRAG IN TOP	6"
#31	23 AUG	2	179.37 220.91	10	Ø	2" PIPE & ELECT CABLE	2.5'
	23 AUG	—	—	—	Ø	BACK HOE UTL	5'

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

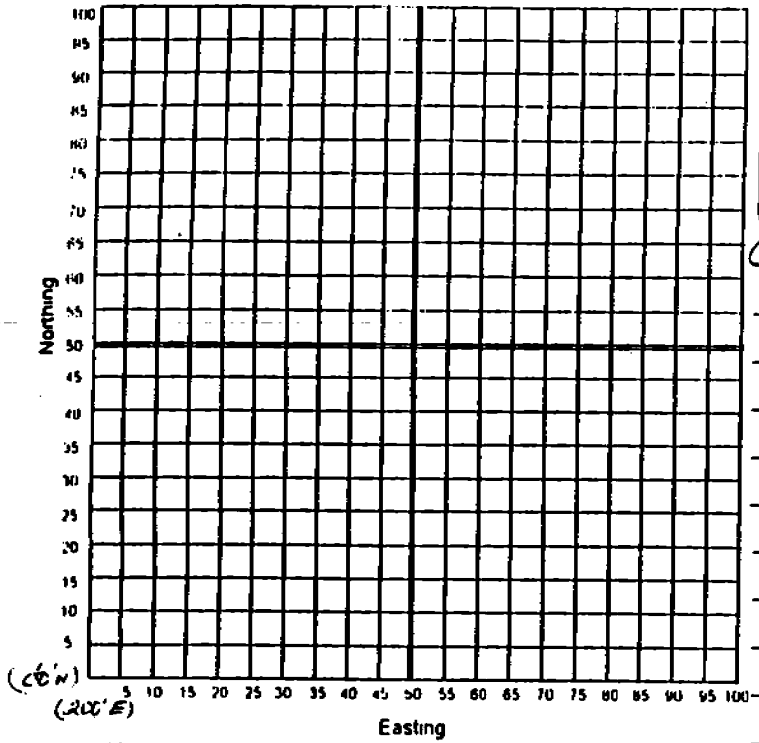
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: A - SECT. 3 A

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete	15 AUG.	THIS SECTION IS A 20' STRIP WITH NO ASSIGNED SITES	D.E. Robertson
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3-A

GRID: A

REMARKS:

(GRID ONLY TO 220'E)

ITEM #	Date 96	~~Section~~ QUAD	Coordinates X=E Y=N	QTY	UXO	Condition (Live/Inert)	Depth

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

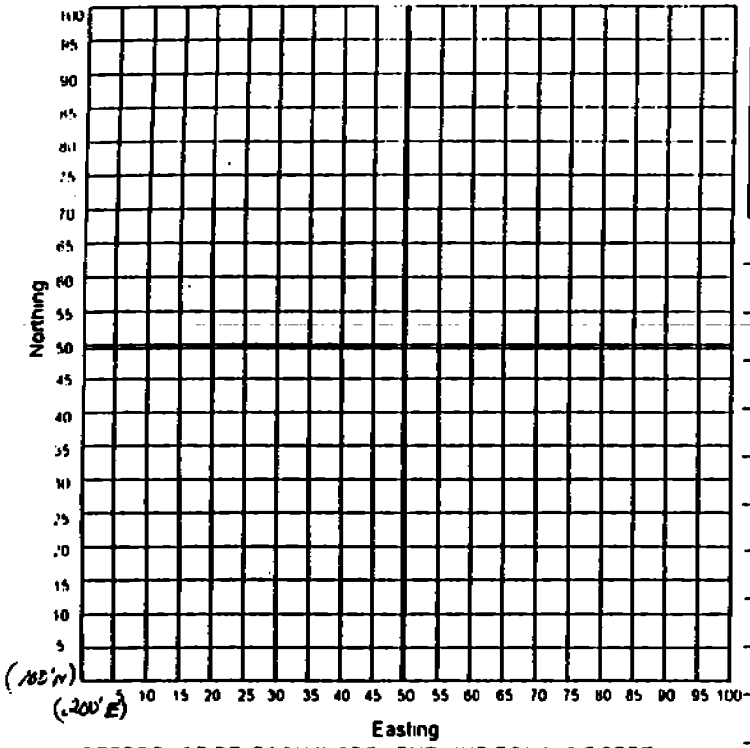
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: A. - SECT. 3B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete	15 AUG.	THIS SECTION IS A 20' STRIP WITH NO ASSIGNED SITES	D.E. Pearson
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3-13

GRID: A

REMARKS:

(GRID ONLY TO 220'E)

ITEM #	Date '96	Section QUAD	Coordinates X=E Y=N	QTY	UXO	Condition (Live/Inert)	Depth

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

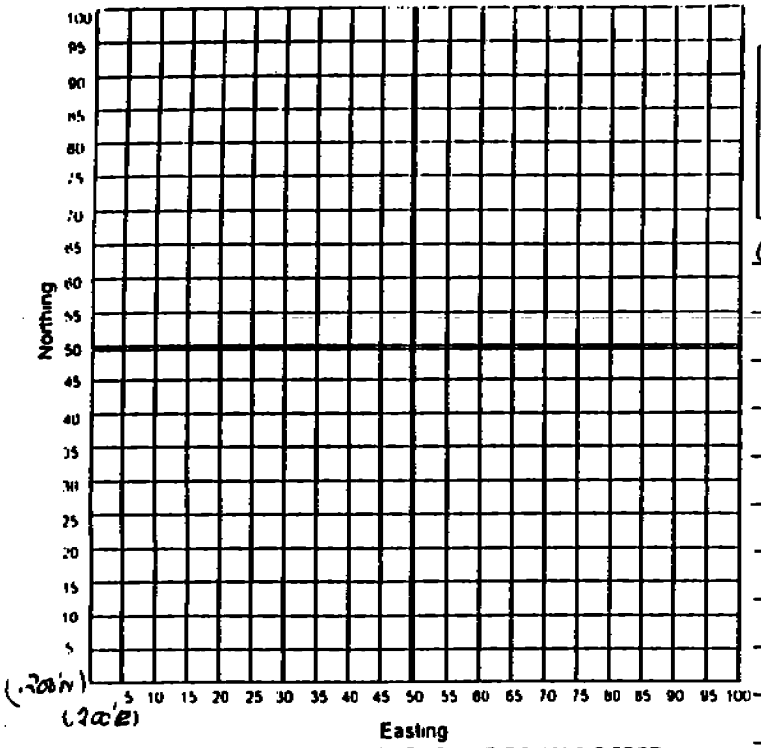
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: 19 - SECT, 3 c

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete	15 AUG	THIS SECTION IS A 20' STRIP WITH NO ASSIGNED SITES	[illegible]
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3-C

GRID: A

REMARKS:

(GRID ONLY TO 220' E)

ITEM #	Date '96	Section (GUAM)	Coordinates X=E Y=N	QTY	UXO	Condition (Live/Inert)	Depth

TOTAL ∅ LIVE UXO

TOTAL ∅ INERT UXO

WORKSHEET GRID B

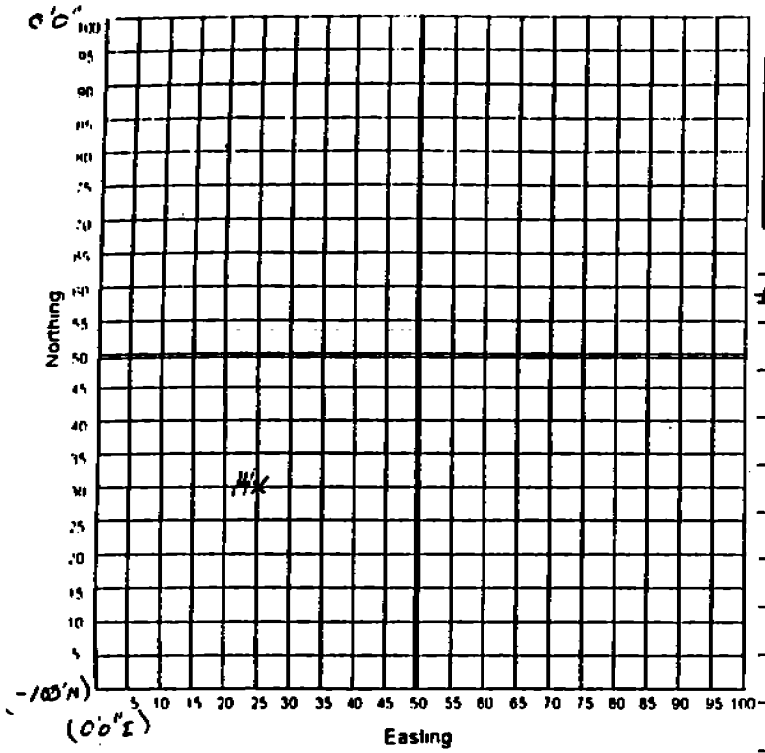
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B - SECT 1 - A

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
14 AUG.	1		10 MIN	ϕ		1	1/16	TRASH		D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	14 AUG.		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 1A

GRID: B

REMARKS:

#14X - RUSTED METAL COVER AT 4". UPON REMOVAL THE SIGNAL WAS LOST.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#14X	14 AUG	1	22.90 -70.90	1/16	ϕ	METAL COVER	4"
~~18X~~							

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

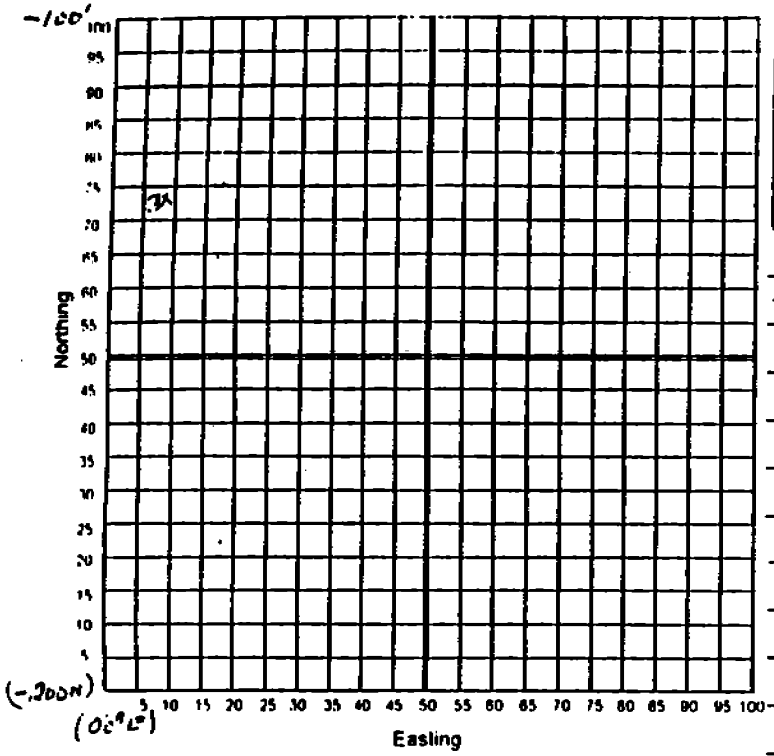
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID B - SECT. 1 - B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
14 AUG.	1			Ø	Ø	1	1/8	TRASH		D. E. Carpenter

	Date	Remarks	Signature
MAG & complete			
Grid complete	14 AUG.		D. E. Carpenter
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 1B

GRID: B

REMARKS:

#3X - MACHINE PARTS (BOLT & GEAR) MIXED IN ROAD SURFACE MATERIAL, NO DEFINITE CONTACT AT 1' EXCEPT IN ROAD MATERIAL.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#3X	14 AUG	3	5.49 -1.26 M	1/8	ϕ	MACHINE PARTS	6"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

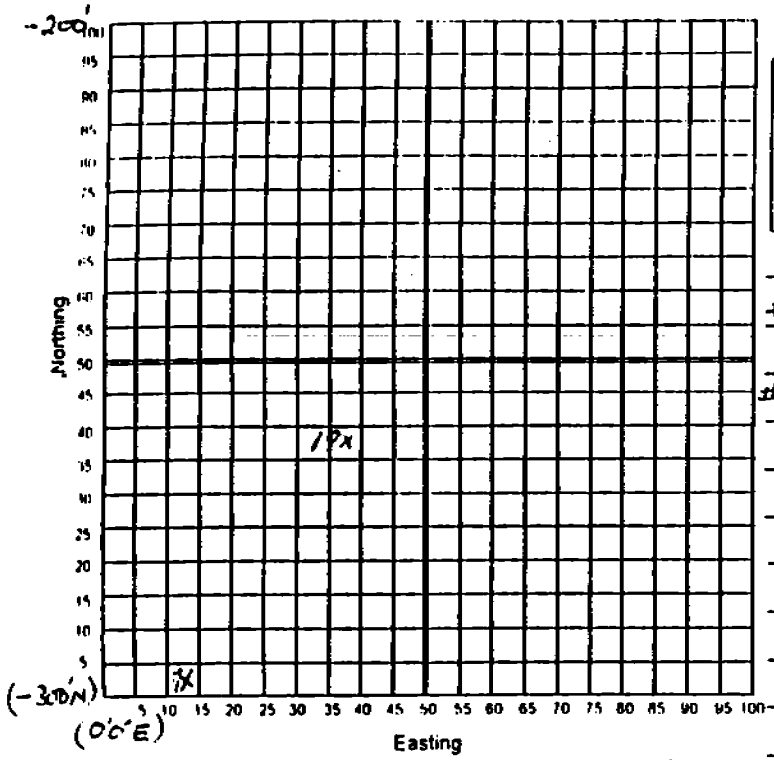
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B - SECT 1-C

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomalies	Lbs Scrap	Remarks	TM#	Signature
14 AUG.	Ø			Ø	Ø	2	Ø	UNABLE TO LOCATE A SIGNAL		D.E. Robertson

	Date	Remarks	Signature
MAG & complete			
Grid complete	14 AUG.		D.E. Robertson
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 1 C

GRID: B

REMARKS:

#7X - UNABLE TO LOCATE AND NOT DUG.

#19X - UNABLE TO LOCATE AND NOT DUG

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#7X	14 AUG	1	2.73 -297.96	N/A	ϕ	UTL	NOT DUG.
#19X	"	1	35.00 -262.99	N/A	ϕ	UTL	NOT DUG.

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

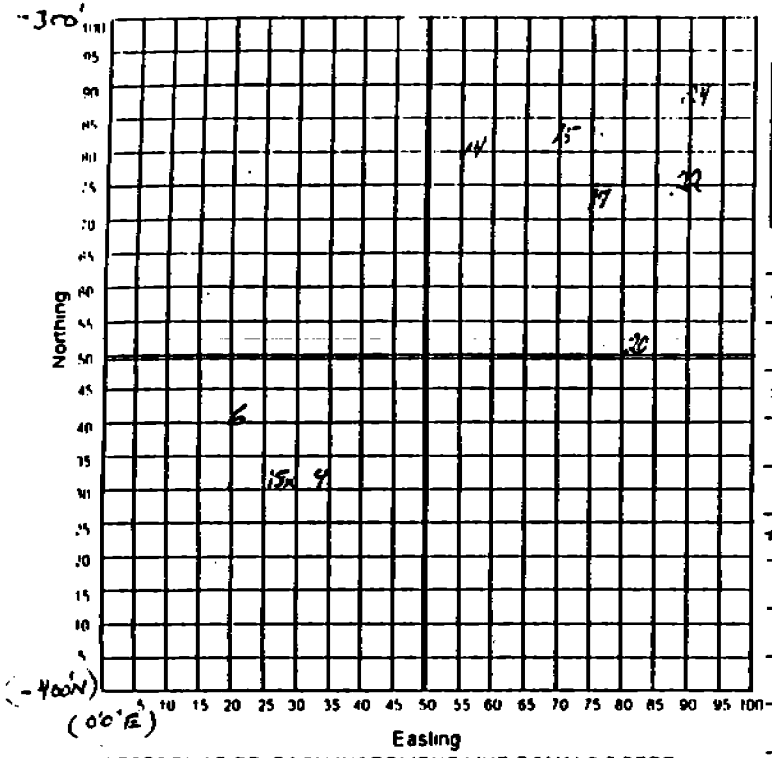
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B - SECT 1 - D

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomalies	Lbs Scrap	Remarks	TM#	Signature
14 AUG	7			Ø		9	44			[illegible]

	Date	Remarks	Signature
MAG & complete			
Grid complete	14 AUG		[illegible]
Quality control check complete			
Customer QA check complete			
Additional comments			



Quadrant	
3	4
1	2

SECTION: 1D

GRID: B

REMARKS:

#6 - UNABLE TO LOCATE WITH MAG.

#9 - TRASH HAD BEEN PUSHED INTO A PILE ON THE SURFACE

#14 - 2' LONG SECTION OF RAILROAD TRACK LYING FLAT AT @ 3" BELOW SURFACE

#15 - A 4'x6' WIRE FENCE WAS LAYING FLAT AT @ 8" DEEP AND PARRALLEL WITH THE ROAD, UPON REMOVAL SIGNAL WAS LOST.

#17 - A CHAIN LINK FENCE ABOUT 6' LONG WAS JUTTING THROUGH THE SURFACE, UPON REMOVAL THE SIGNAL WAS LOST,

#20 - SECOND WIRE FENCE (SAME AS #15) AND UPON REMOVAL THE SIGNAL WAS LOST,

#22 - WOODEN FENCE POST WRAPPED IN BARBED WIRE, REMOVED AND SIGNAL LOST,

#24 - OLD FENCE LINE OF BARBED WIRE BELOW SURFACE, WILL REQUIRE A LATERAL DIG FOR UNKNOWN DISTANCE.

#5X - TRASH PILE ON SURFACE

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X=E Y=N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#6	17 AUG	1	90.05 -300.28	N/A	ϕ	UTL	NOT DUG
#9	"	1	34.81 -369.01	N/A	ϕ	TRASH PILE ON SURFACE	NOT DUG
#14	"	4	55.07 -320.55	30	ϕ	2' LONG R.R. TRACK	3"
#15	"	4	71.76 -316.95	5	ϕ	WIRE FENCE	8"
#17	"	4	76.81 -326.65	5	ϕ	CHAIN LINK FENCE	0"
#20	"	4	83.24 -378.16	4	ϕ	WIRE FENCE	8"
#22	"	4	81.76 -325.13	NO PHOTO	ϕ	FENCE POST W/BARBED WIRE	0"
#24	"	4	90.19 -311.64	NO PHOTO	ϕ	BARBED WIRE FENCE	8"
#5X	"	1	26.34 -369.91	NO PHOTO	ϕ	TRASH PILE	0"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

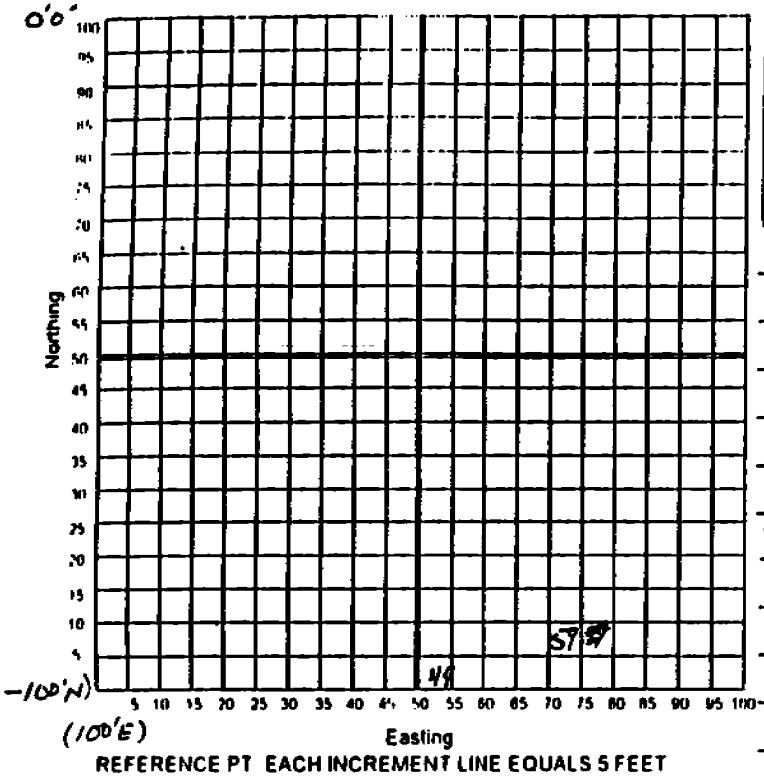
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B - SECT 2-A

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
19 AUG	2		40 min	Φ		2	24			D.E. Parkinson

	Date	Remarks	Signature
MAG & complete			
Grid complete	19 AUG		D.E. Parkinson
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 2A

GRID: B

REMARKS:

#47- APPROX 20 lbs OF LARGE FRAG, MIXED INTO THE GRAVEL, SIGNAL WEAKENS IN BOTTOM AND DOES NOT INDICATE 128 lbs.

#59- APPROX 4 lbs OF FRAG. REMOVED DOWN TO 1', THE HOLE WAS DUG TO 2' WITH SIGNALS STRONG TO THE SIDES BUT WEAK TO THE BOTTOM.

ITEM #	Date '96	Section GRID	Coordinates X E Y N	QTY lbs	UXO	Condition (Live/Inert)	Depth
#47	19 AUG	2	154.32 -44.97	20	ϕ	FRAG. IN GRAVEL	12"
#59	"	2	172.42 -93.73	4	ϕ	FRAG. IN GRAVEL	12"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

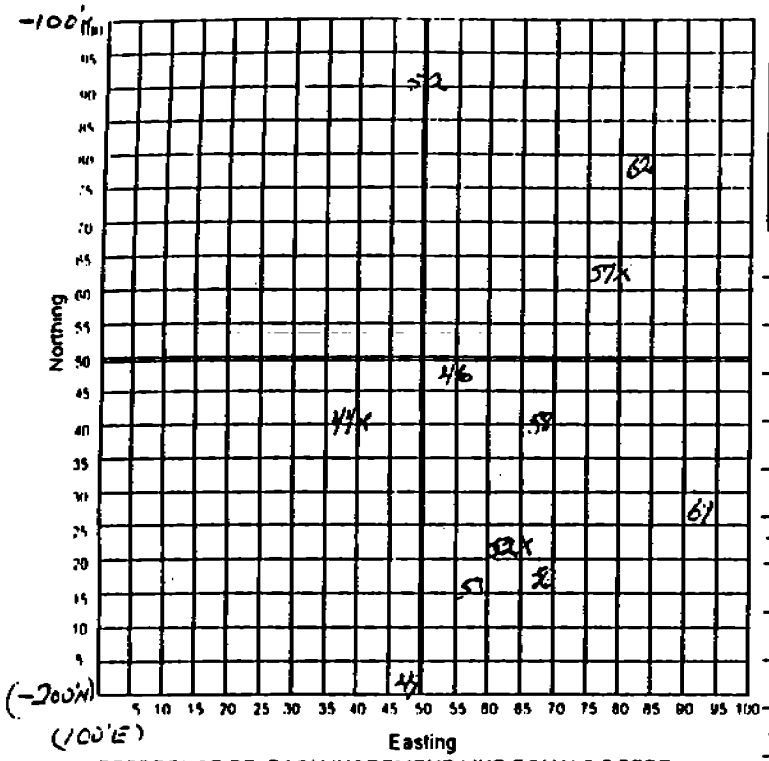
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B-SECT 2-B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
14 AUG	8		2.5 HRS	ϕ		8	17 ~~2½~~			D.E. Parbarton
19 AUG	1		1 HR	ϕ		1	60			D.E. Parbarton
22 AUG	2		20 mins	ϕ		2	11			D.E. Parbarton
24 AUG	1		20 mins	ϕ		1	1			D.E. Parbarton

	Date	Remarks	Signature
MAG & complete			
Grid complete	24 AUG.		D.E. Parbarton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 2B

GRID: B

REMARKS:

#46 - MANY PIECES OF FRAG. IN TOP 6" LAYER OF CONTAMINATED GRAVEL. LOST SIGNAL IN SOIL BELOW.

#49 - 6" OF CONTAMINATED GRAVEL REMOVED AND THE SIGNAL MOVES WITH THE GRAVEL.

#53 - AS IN #49 ABOVE

#58 - AS IN #49 & 53 ABOVE.

DUG TO 2' DEPTH, CONTACTS TO SIDES & LOST SIGNAL BELOW

#69 - (5) LARGE PIECES OF FRAG. REMOVED DOWN TO 6" & SIGNAL LOST

#52 - MANY PIECES OF FRAG DOWN TO ABOUT 1' & @ 60 lbs. HOLE DUG TO 2'

#62 - LARGE FRAG. PIECE AT @ 6" REMOVED BUT TOO MUCH GRAVEL WITH FRAG.

#56 - ALOT OF SMALL MIXED IN FRAG IN GRAVEL. DUG TO 4' & LOST SIGNAL.

#44X - A SMALL WIRE WAS REMOVED ON THE SURFACE AND THE SIGNAL WAS LOST.

#52X - TOP 6" OF FRAG. CONTAMINATED GRAVEL REMOVED AND SIGNAL WEAKENED GREATLY IN BOTTOM OF HOLE

#57X - TOP 8"-12" OF FRAG. CONTAMINATED GRAVEL REMOVED AND SIGNALS FROM THE SIDES CONTINUE BUT THE SIGNALS WEAKEN GREATLY FROM THE BOTTOM.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#46	14 AUG	2	152.58 -159.54	2	ϕ	FRAG. IN GRAVEL	6"
#49	"	1	154.06 -147.67	1/4	ϕ	FRAG. IN GRAVEL	6"
#53	"	2	157.96 -185.67	1/2	ϕ	FRAG. IN GRAVEL	6"
#58	"	2	166.28 -159.93	1	ϕ	FRAG. IN GRAVEL	6"
#69	"	3	193.77 -173.98	10	ϕ	LARGE FRAG PIECES (5)	6"
#52	19 AUG	3	157.59 -111.39	60	ϕ	FRAG. IN GRAVEL	12"
#62	22 AUG	4	183.77 -121.51	10	ϕ	LARGE FRAG PIECE	6"
#56	22 AUG	2	168.58 -183.23	1	ϕ	FRAG. IN GRAVEL	4"-6"
#44X	14 AUG	1	138.99 -160.35	1/16	ϕ	SMALL WIRE	0"
#52X	"	2	162.56 -178.58	1/2	ϕ	FRAG. IN GRAVEL	6"
#57X	"	4	179.75 -137.43	2	ϕ	FRAG. IN GRAVEL	8"-12"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

PAGE 20

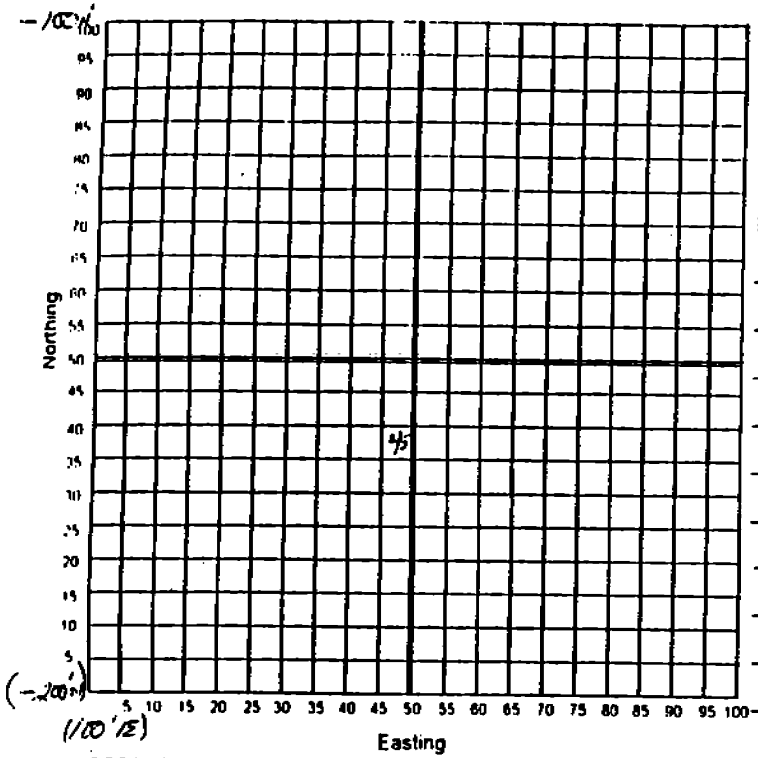
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B-SECT. 2-B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomalies	Lbs Scrap	Remarks	TM#	Signature
24 AUG	1		20 mins	ϕ		1	1	*REPEATED/LOGGED ON PG. # 1 of 2		[illegible]

	Date	Remarks	Signature
MAG & complete			
Grid complete			
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 2B

GRID: B

REMARKS:

#45 - A SIGNAL WAS RECEIVED AT THE SURFACE. A HOLE WAS DUG TO 18" REMOVING THE TOP LAYER OF CONTAMINATED GRAVEL/SOIL MIX AND THE SIGNAL WAS UNABLE TO BE LOCATED.

ITEM #	Date '96	Section QUAD	Coordinates X-E Y-N	QTY 165	UXO	Condition (Live/Inert)	Depth
#45	24 AUG	1	147.71 -161.22	1	Ø	UTL	18"

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

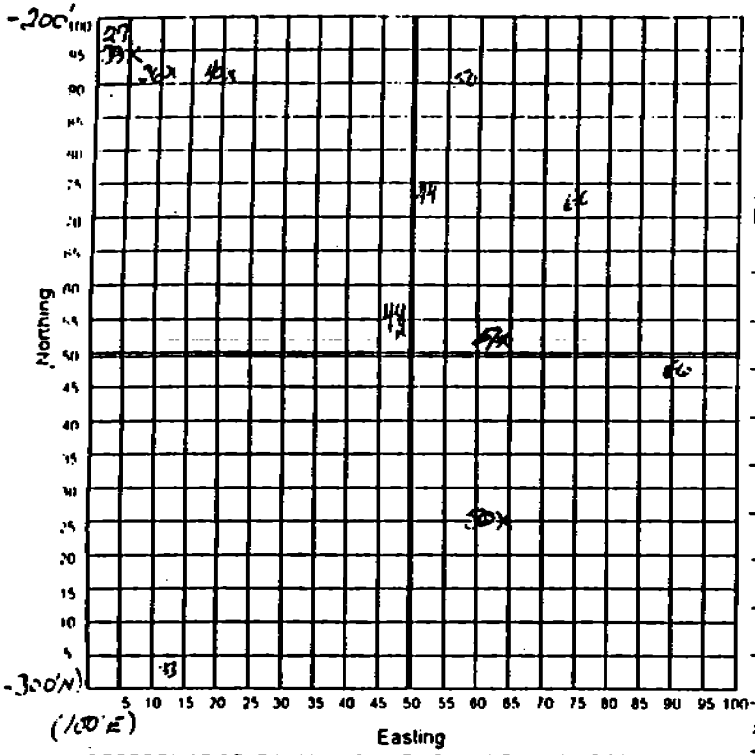
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID B - SECT 2-2

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
14 AUG	9		1.5 HRS	Ø		9	56			D.E. Palmer
22 AUG	4		4 HRS	Ø		4	1 1/8			D.E. Palmer

	Date	Remarks	Signature
MAG & complete			
Grid complete	22 AUG		D.E. Palmer
Quality control check complete			
Customer QA check complete			
Additional comments			



Quadrant

3	4
1	2

SECTION: 2-C

GRID: B

REMARKS:

#27-(3) LARGE HEAVY GAUGE METAL PLATES LYING FLAT JUST BELOW SURFACE, WITH REMOVAL THE SIGNALS WERE LOST.

#33-SMALL FRAG. AND MANY PIECES OF WIRE REMOVED WITH TOP 6" OF SOIL. SIGNAL WEAKENED GREATLY.

#50-SIGNAL WEAKENED GREATLY WITH REMOVAL OF GRAVEL 6" DOWN AND 3' DIAMETER.

#60-4' LONG DOUBLE STRAND HEAVY GAUGE WIRE REMOVED AT 2" AND SIGNAL LOST.

#66-UNABLE TO LOCATE AND NOT DUG ON 22 AUG BACKHOE DUG TO 9' & UNABLE TO LOCATE A SIGNAL

#44-FRAG. IN GRAVEL IN 6"TOS". HOLE DUG TO 2' AND SIGNAL LOST.

#33X-UNABLE TO LOCATE AND NOT DUG.

#36X-UNABLE TO LOCATE AND NOT DUG.

#40X-REMOVED @ 30'16 METAL PLATE AT 1" AND LOST SIGNAL.

#50X-UNABLE TO LOCATE AND NOT DUG.

#57X-SMALL PIECE OF FRAG. REMOVED AT 3" AND SIGNAL LOST

#48X-FRAG. IN GRAVEL TO 6"TOS" & SATURATING MAG.

ITEM #	Date '96	Section QUAD	Coordinates X = E Y = N	QTY 163	UXO	Condition (Live/Inert)	Depth
#27	14 AUG	3	103.46 -201.38	20	ϕ	(3) LARGE METAL PLATES	1"
#33	"	1	112.69 -296.49	1/4	ϕ	SMALL FRAG & WIRE	2"-6"
#50	"	4	153.54 -210.12	5	ϕ	FRAG. IN GRAVEL	6"
#60	"	4	175.44 -227.12	1/2	ϕ	4' DBL WIRE STRAND	2"
#66	"	2	190.56 -251.46	N/A	ϕ	UTL	NOT DUG
#66	22 AUG	"	"	"	ϕ	UTL.	DUG TO 9'
#44	22 AUG	4	150.99 -226.56	1	ϕ	FRAG. IN GRAVEL	6"8"
#48X	22 AUG	3	147.31 -234.57	<1/16	ϕ	FRAG. IN GRAVEL	6"
#33X	14 AUG	3	103.07 -205.63	N/A	ϕ	UTL	NOT DUG
#36X	"	3	108.71 -207.96	N/A	ϕ	UTL	NOT DUG
#40X	"	3	118.51 -209.45	30	ϕ	30 lb METAL PLATE	1"
#50X	"	2	160.57 -275.79	N/A	ϕ	UTL	NOT DUG
#57X	22 AUG	4	161.71 -249.47	<1/16	ϕ	SMALL FRAG	3"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

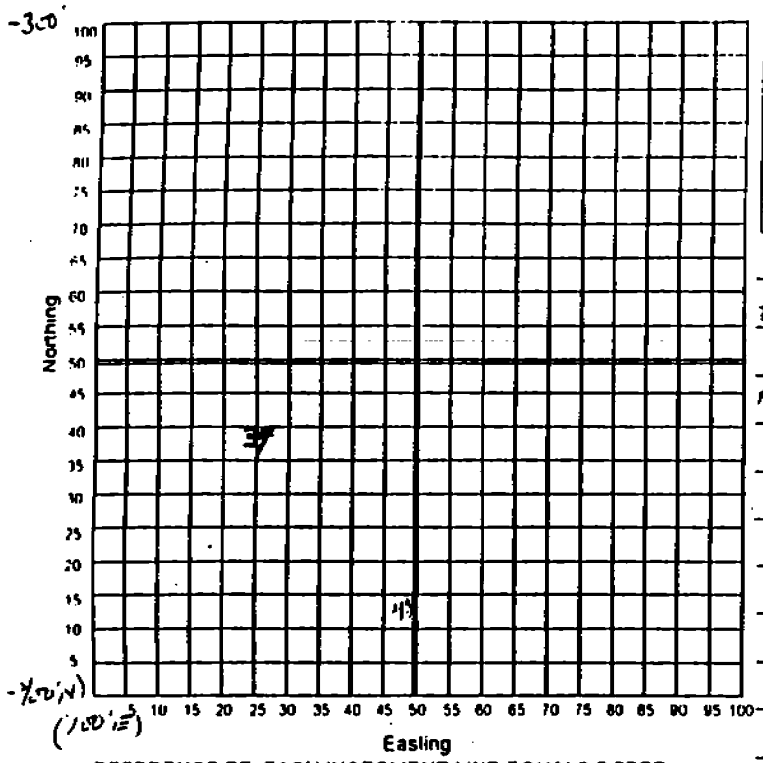
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B - SECT. Q - D

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
14 AUG	1		20 MIN	ϕ		2	1/16			D.E. Robertson

	Date	Remarks	Signature
MAG & complete			
Grid complete	14 AUG.		D.E. Robertson
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 2D

GRID: B

REMARKS:

#37 - UNABLE TO LOCATE WITH MAG, AND NOT DUG

#48 - 6" WIRE @ 6" DOWN AND LOST SIGNAL IN BOTTOM OF HOLE UPON REMOVAL

Item #	Date '96	~~Section~~ GRID	Coordinates X=E Y=N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#37	14 AUG	1	125.00 362.93	N/A	Ø	UTL	NOT DUG
#48	"	1	154.95 387.17	1/4	Ø	WIRE 6"	6"

TOTAL _____ LIVE UXO

TOTAL _____ INERT UXO

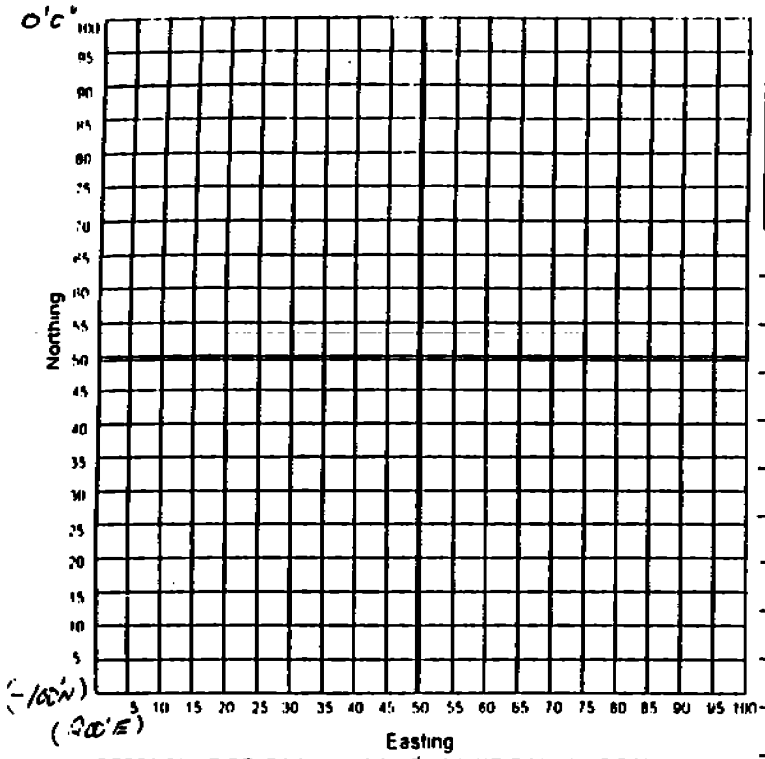
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B - SECT 3-A

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete	14 AUG	NO LISTED CONTACTS IN THIS GRID	[illegible]
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 3A

GRID: B

REMARKS:

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth

TOTAL ∅ LIVE UXO

TOTAL ∅ INERT UXO

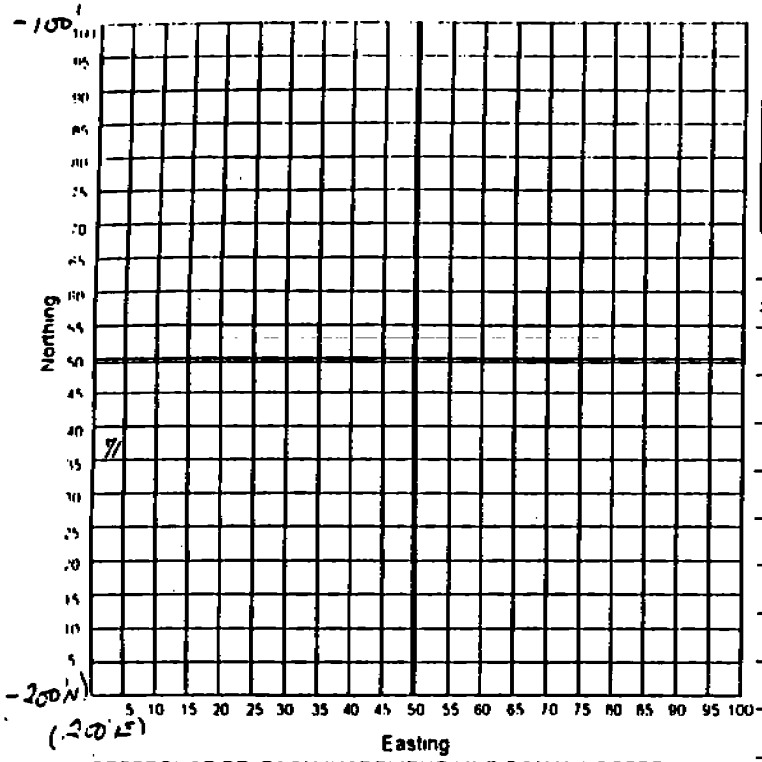
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B - SECT 3 - B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
14 AUG	1		20 mins	ϕ		1	20			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	14 AUG		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3B

GRID: B

REMARKS:

#71- LARGE BASE SECTION OF 155mm FRAG (CONCRETE) WITHIN 2" OF SURFACE AND SMALLER FRAG. DOWN TO 8" IN GRAVEL.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#71	14 AUG	1	202.48 -167.18	20	Ø	BASE SECT. OF 155 FRAG	8"

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

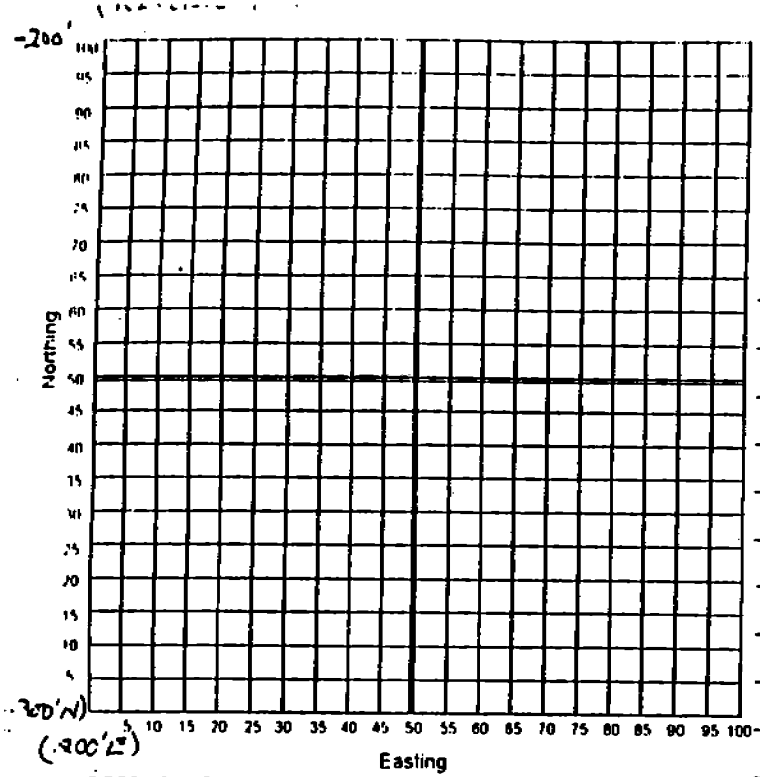
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B-SECT 3-2

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete	14 AUG.	NO LISTED CONTACTS IN THIS GRID	D.E. Colbertson
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 3C

GRID: B

REMARKS:

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X=E Y=N	~~QTY~~ 160	UXO	Condition (Live/Inert)	Depth

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

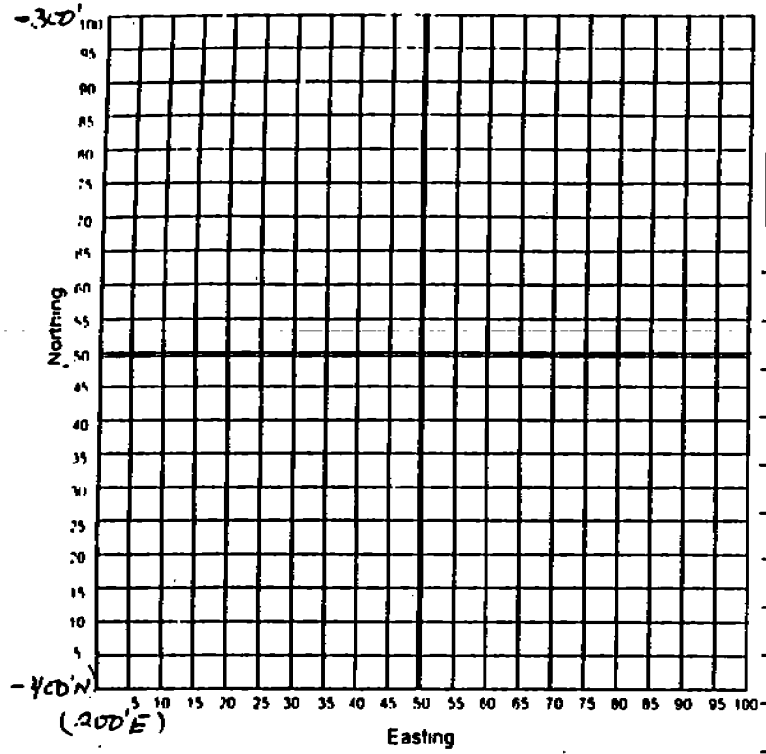
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B - SECT 3-D

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomalies	Lbs. Scrap	Remarks	TM#	Signature

	Date	Remarks	Signature
MAG & complete			
Grid complete	14 AOG	NO LISTED CONTACTS IN THIS GRID	[illegible]
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 3-D

GRID: B

REMARKS:

ITEM #	Date 1/96	~~Section~~ 4UAD	Coordinates $\hat{y} = \sqrt{N}$	~~QTY~~ 1/65	UXO	Condition (Live/Inert)	Depth

TOTAL ∅ LIVE UXO

TOTAL ∅ INERT UXO

WORKSHEET GRID C

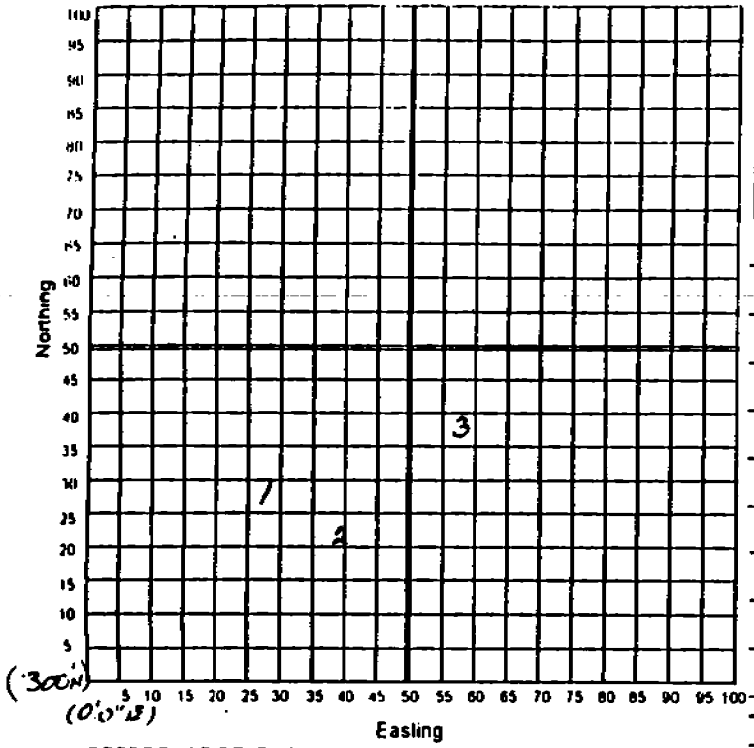
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: C-SECT. 1-D

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
20 AUG	1		20 mins	ϕ		1	1/2			D.E. Parbeston
23 AUG	2		40 mins	ϕ		2	1/4			D.E. Parbeston

	Date	Remarks	Signature
MAG & complete			
Grid complete	23 AUG.		D.E. Parbeston
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 1-D

GRID: C

REMARKS:

#2 - 8"x1" PIECE OF FLAT STEEL FOUND AT 6". HOLE WIDENED & DUG TO 18". SIGNALS FROM TOP SURFACE MATERIAL & LOST SIGNAL IN BOTTOM

#3 - ASPHAULT TYPE SURFACE REMOVE AND HOLE DUG TO 18" WITH SIGNAL LOST IN THE BOTTOM

#1 - ASPHAULT TYPE SURFACE REMOVE TO 18" & SIGNAL LOST.

ITEM #	Date 4/6	~~Section~~ QUAD	Coordinates X Y	~~QTY~~ LBS	UXO	Condition (Live/Inert)	Depth
#2	20 AUG	1	39.42 322.30	1/2	Ø	8" FLAT STEEL	6"
#3	23 AUG	2	59.59 351.54	1/4	Ø	SURFACE MATERIAL	6"
#1	23 AUG	1	28.70 329.41	N/A	Ø	SURFACE MATERIAL	6"

TOTAL Ø LIV O

TOTAL Ø

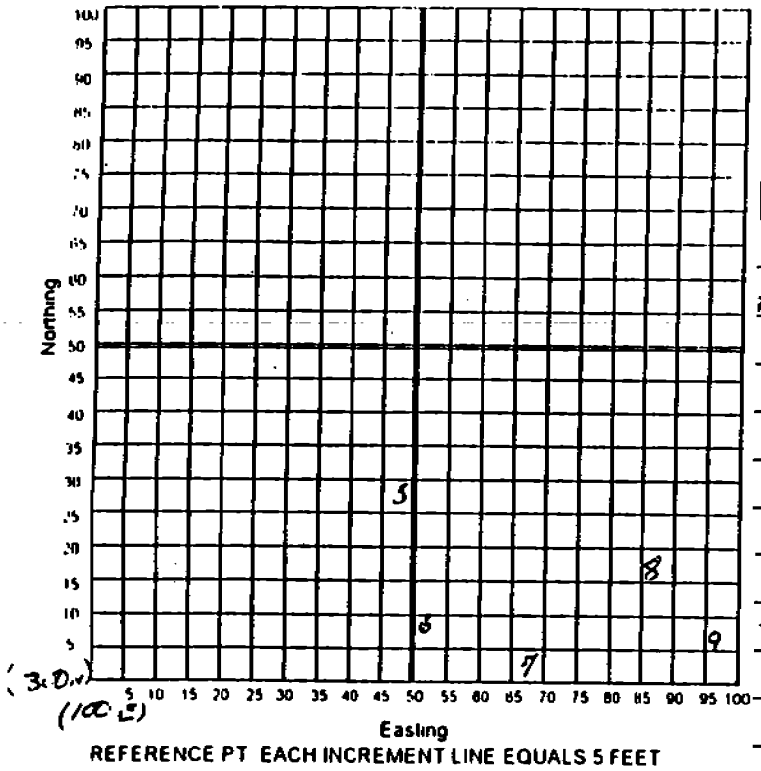
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: C – SECT. 2-D

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomalies	Lbs. Scrap	Remarks	TM#	Signature
20 AUG	3		80 MINS	ϕ		3	26			D.E. Parbarton
23 AUG	2		50 MINS	ϕ		2	N/A			D.E. Parbarton

	Date	Remarks	Signature
MAG & complete			
Grid complete	23 AUG		D.E. Parbarton
Quality control check complete			
Customer QA check complete			
Additional comments			



Quadrant

3	4
1	2

SECTION: 2-D

GRID: C

REMARKS:

#6- 90mm CONCRETE FILLED HULL FOUND AT @ 4" WEIGHING @ 5-lbs. HOLE DUG TO 18" WITH SIGNAL ONLY FROM TOP SURFACE MATERIAL

#7 -(1) LARGE PIECE OF FRAG. @ 1'6, REMOVED AT 3" & HOLE DUG TO 18" WITH NO SIGNAL IN BOTTOM

#9- FRAG. REMOVED AT 6" AND RE-BARS & WIRE FOUND AT 2' WIRE CONTINUES TO EMERGE FROM BOTTOM & SIDES MAKING MAG. USE FUTILE. THIS APPEARS TO BE A TRASH PIT.

#8- TRASH PILE WITH BED SPRING AND ASPHALT TYPE SURFACE REMOVED.

#5- STRONG SIGNAL REMOVED WITH TOP SURFACE OF ASPHALT TYPE MATERIAL AND DUG TO 3' WITH ONLY WEAK BACKGROUND.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#6	20 AUG	2	150.49 307.13	15	ϕ	HULL OF A 90mm	4"
#7	"	2	167.68 303.13	1	ϕ	LARGE FRAG PIECE	3"
#9	20 AUG	2	196.73 307.58	10	ϕ	FRAG., REBAR & WIRE	6"-24"
#8	23 AUG	2	186.13 317.73	N/A	ϕ	SURFACE TRASH	
#5	23 AUG	1	149.07 329.58	N/A	ϕ	TOP SURF. REMOVED	3'

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

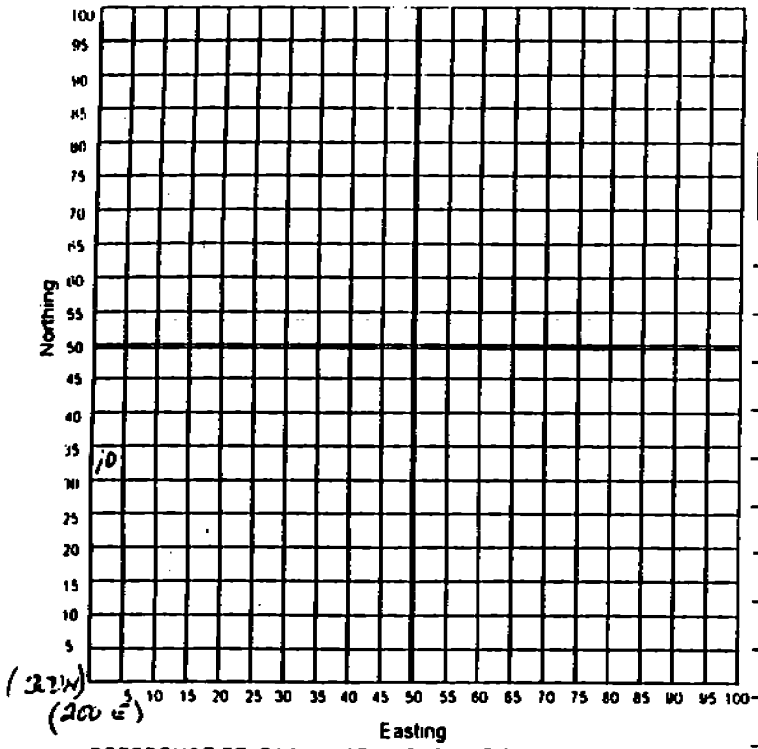
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: C – SECT. 3-D

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
23 AUG	1		30 mins	ϕ		1	N/A			D.E. Robertson

	Date	Remarks	Signature
MAG & complete			
Grid complete	23 AUG		D.E. Robertson
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 3-D

GRID: C

REMARKS:

#10 - STRONG SIGNAL REMOVED WITH ASPHALT TYPE SURFACE AND THE N/S ELECTRICAL CABLE WAS FOUND AT @2' DEPTH.

ITEM #	Date 96	~~Section~~ QUAD	Coordinates X = 13 Y = 14	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#10	23 AUG	1	204.22 334.72	N/A	ϕ	ELECT CABLE TOP SURFACE	2'

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

WORKSHEET GRID D

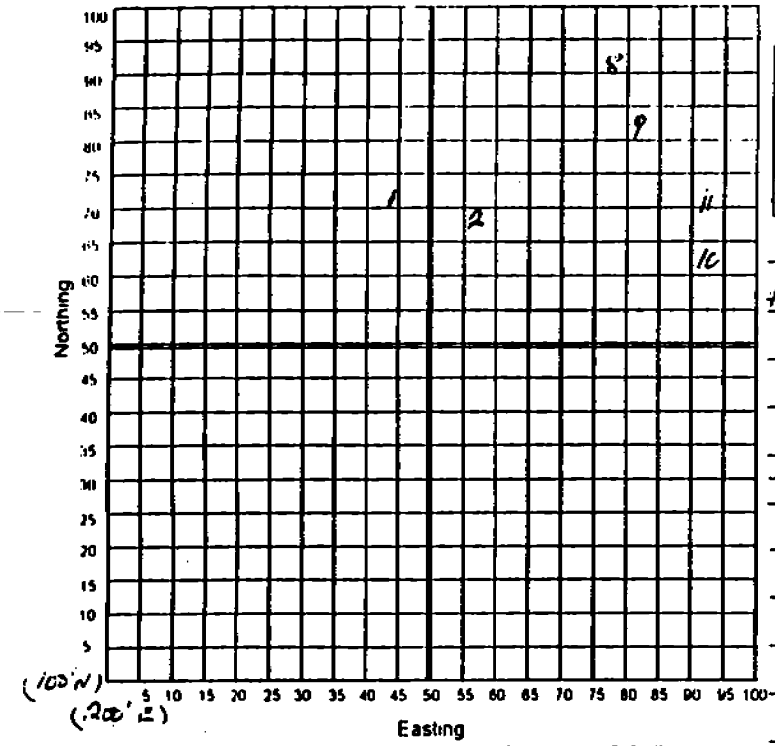
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: D - SECT 3 - B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
15 AUG	2		40 MINS	ϕ		2	6			D.E. Parkerton
23 AUG	4		2 HRS	ϕ		4	21			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	23 AUG		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



Quadrant	
3	4
1	2

SECTION: 3-B

GRID: D

REMARKS:

172m #
#8
#11
#10
#1
#2
#9

#8 - PIECE OF REBAR AND FRAGMENTS IN FIRST 4" OF GRAVEL, LOST SIGNAL IN BOTTOM OF HOLE.

#11 - FRAG. IN THE FIRST 6" OF GRAVEL LAYER, LOST SIGNAL TO BOTTOM, SURROUNDING SIDES CONTINUE TO HAVE CONTACTS, @ 1'6" OF FRAG.

#10 - BOX HINGES, THIS APPEARS TO BE THE LOWEST EDGE OF A TRASH SITE FOR RANGE OPERATIONS AT THIS SITE. REF. TO ITEM #13 FOR A POSSIBLE CENTER OF AN AREA WHERE BOXES & DEBRI MIGHT HAVE BEEN DISPOSED OF BY BURNING.

#1 - LARGE PIECES OF FRAG. AND VERY LARGE AMOUNT OF REBAR AND BROKE UP CONCRETE, THIS IS LANDFILL.

#2 - SAME AS #1. #1 & #2 ARE THE SAME PILE.

#9 - ALOT OF FRAG IN TOP 12" AND HOLE DUE TO 2' + WITH NO SIGNAL IN BOTTOM.

Date '96	~~Section~~ QUAD	Coordinates X=E Y=N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
15 AUG	4	277.67 191.22	5	Ø	REBAR & FRAG.	4"
"	4	293.60 172.27	1	Ø	FRAG. IN GRAVEL	6"
23 AUG	4	243.49 161.43	1	Ø	HINGE	12"
"	3	244.53 172.73	?	Ø	FRAG & REBAR	2'
"	4	256.63 168.11	?	Ø	REBAR	2'
29 AUG	4	282.24 182.08	20	Ø	FRAG. IN TOP SURFACE	12"

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

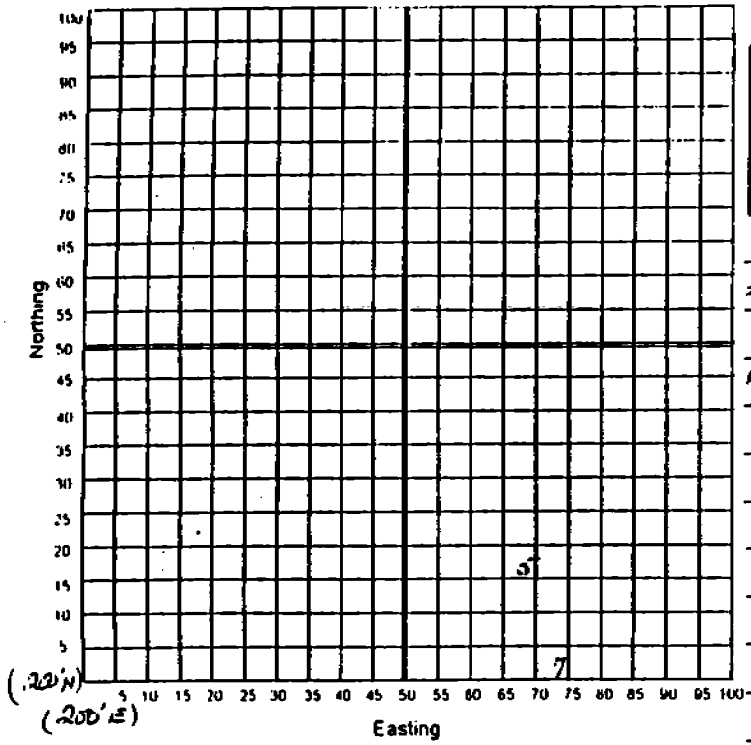
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: D - SECT 3 - C

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
15 AUG	2		2/0 mins	ϕ		2	12			[signature]

	Date	Remarks	Signature
MAG & complete			
Grid complete	15 AUG		[signature]
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 3-C.

GRID: D

REMARKS:

#5 - SHEET METAL @ 1" BELOW THE SURFACE

#7 - 5' PIECE OF 1" REBAR IN FRAG. CONTAMINATED GRAVEL, 200D/ STRONG SIGNAL LOST BUT GRAVEL CONTINUES TO PRODUCE CONTACTS.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X=E Y=N	~~OTT~~ VGS	UXO	Condition (Live/Inert)	Depth
#5	15 AUG	2	268.21 217.27	2	ϕ	1'x4' SHEET METAL	1"
#7	"	2	274.22 201.05	10	ϕ	1" REBAR 5' LONG & FRAG	6"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

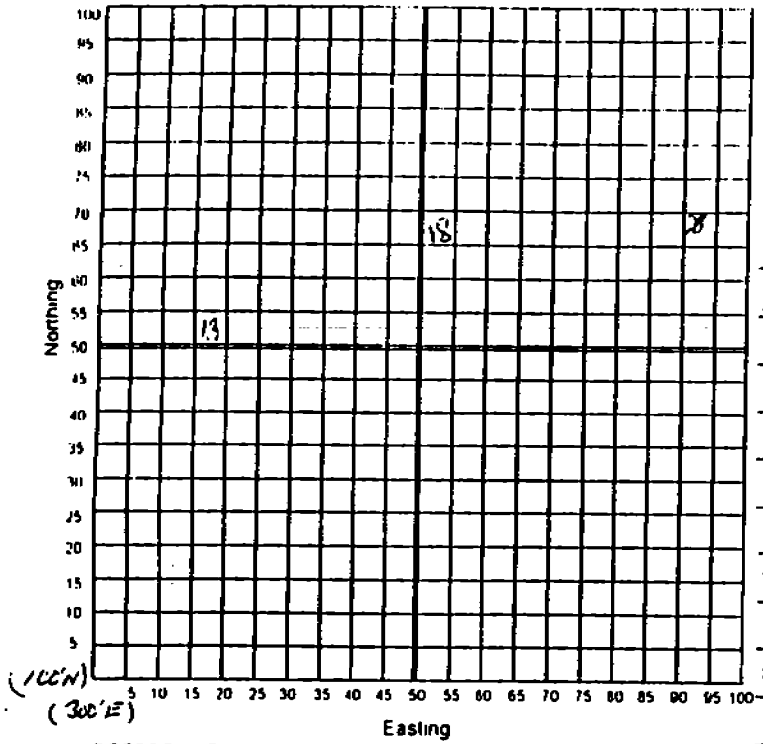
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: D - SECT 4-B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
22 AUG	3		1.5 HRS	ϕ		3	31			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	22 AUG		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 21-B

GRID: D

REMARKS:

#28 - FRAG. MIXED THROUGHOUT TOP LAYER, FRAG OF GRAY MORTAR AMONG DEBRI. THE FRAG IS TO ABOUT 18" THE HOLE WAS DUG TO ABOUT 2' & SIGNAL LOST IN BOTTOM

#18 - 6" TOP LAYER REMOVED AND SIGNAL LOST

#13 - TRASH METAL IN TOP 12" OF SOIL, BELOW 12" ASH FROM BURNING (DOWN TO 3'), LOST SIGNAL IN BOTTOM

ITEM #	Date '96	Section QUAD	Coordinates N = E Y = N	QTY lbs	UXO	Condition (Live/Inert)	Depth
#28	21 AUG	4	391.33 169.44	30	ϕ	FRAG. IN TOP LAYER	18
#18	22 AUG	4	353.07 166.44	N/A	ϕ	(JT)	6"
#13	"	3	313.97 155.26	1	ϕ	TRASH IN TOP SURFACE	12"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

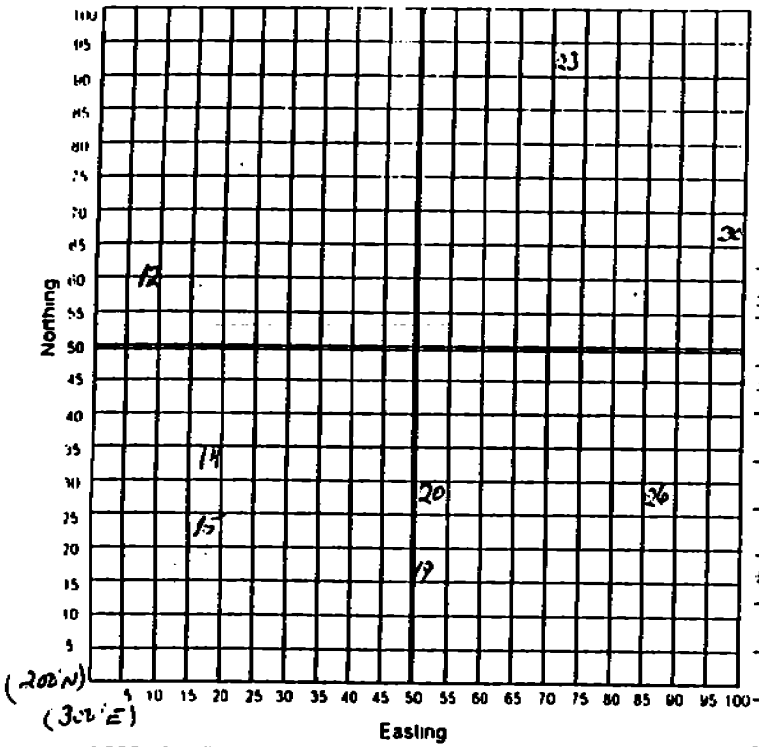
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID D - SECT 4-C

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
15 AUG	5		80 mins	ϕ		5	17+			D.E. Parkerton
23 AUG	3		1 HR.	ϕ		3	13			D.E. Parkerton
24 AUG	1		20 min	ϕ		1	1/2			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	28 AUG		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 4 C

GRID: D

REMARKS:

#14 - (1) LARGE PIECE OF FRAG, AND A 6' LONG PIPE

#19 - FIRE EXTINGUISHER ON SURFACE WAS MOVED AND ONLY SIGNAL WAS FROM THE RUST ON SURFACE.

#23 - THE METAL WINDOW FRAME ON THE SURFACE WAS MOVED AND THE SIGNAL LOST.

* THE BURIED CALIBRATION 155 mm TARGET IS 15' WEST OF THIS SPOT AT @ 96/6.

#26 - THE FRAG. CONTAMINATED TOP LAYER WAS REMOVED AND THE HOLE EXPANDED. THE SIGNAL WAS LOST IN THE BOTTOM OF THE HOLE.

#30 - WITH THE REMOVAL OF THE TOP 6" CONTAMINATED SOIL AND GRAVEL THE SIGNAL WAS LOST.

#15 - @ 3/10 PIECE OF FRAG AT 6" AND MANY SMALL PIECES IN TOP LAYER

#20 - @ 10 lbs OF PIECES OF FRAG IN TOP 12" LAYER. HOLE DUG TO @ 3' & LOST SIGNALS TO BOTTOM. SIDES CONTINUE TO RING OFF.

#12 - 1/4" STEEL CABLE DISENIGRATING INTO PIECES. REMOVED MANY PIECES AT @ 12" AND SIGNAL KEPT CHASING CABLE TO SIDES WITH NO STRONG SIGNAL TO BOTTOM.

ITEM #	Date '96	Section QUAD	Coordinates X=E Y=N	QTY lbs	UXO	Condition (Live/Inert)	Depth
#14	15 AUG	1	314.23 334.62	10	ϕ	PIECE OF FRAG & 6' PIPE	3"
#19	"	2	350.19 215.80	5	ϕ	FIRE EXTINGUISHER	0"
#23	"	4	370.77 293.15	2	ϕ	METAL WINDOW FRAME	0"
#26	"	2	385.70 228.38	1/4	ϕ	FRAG. IN TOP LAYER	4"
#30	"	4	398.49 267.52	N/A	ϕ	FRAG. IN TOP LAYER	6"
#15	23 AUG	1	324.40 224.00	3	ϕ	FRAG IN TOP LAYER	6"
#20	"	2	351.62 228.51	10	ϕ	FRAG IN TOP LAYER	12"
#12	24 AUG	3	308.21 260.11	1/2	ϕ	1/4" STEEL CABLE	12"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

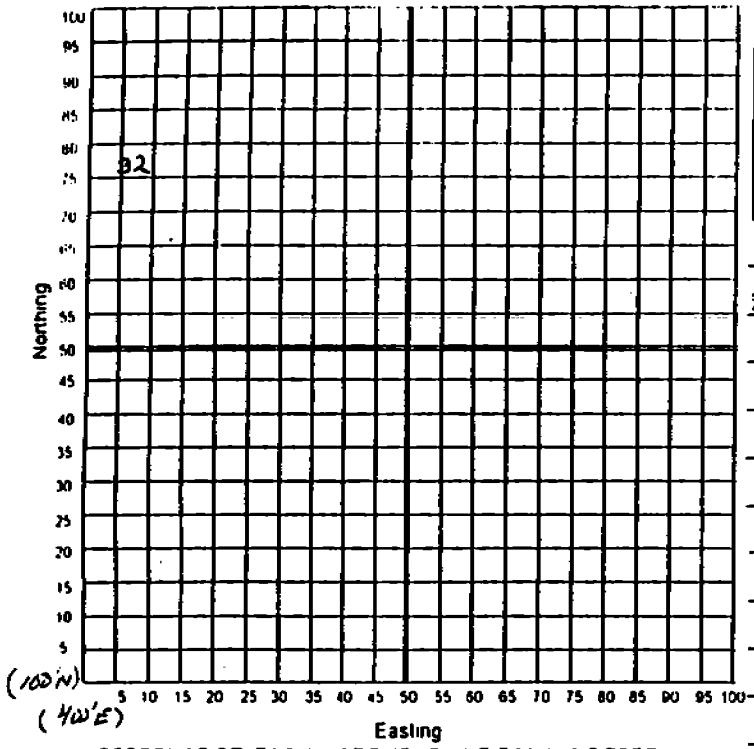
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: D - SECT 5-B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
15 AUG	1		20 MINS	Ø		1	1/8			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	15 AUG.		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT. EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 5-B

GRID: D

REMARKS:

#32 - A BASE SECTION OF A 20mm HE ROUND WAS FOUND AT ABOUT 2" DEEP. IT APPEARS TO HAVE COME FROM SOME OTHER LOCATION AND WAS MIXED WITH THE FRAG. CONTAMINATED TOP LAYER. THE LAYER WAS REMOVED TO AN 8" DEPTH AND THE SIGNAL WEAKENED GREATLY.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X=E Y=N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#32	15 AUG	3	405.31 177.40	1/8	Ø	FRAG, CONT, TOP LAY	8"
—		—	—			20mm HE BASE FRAG	2"

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

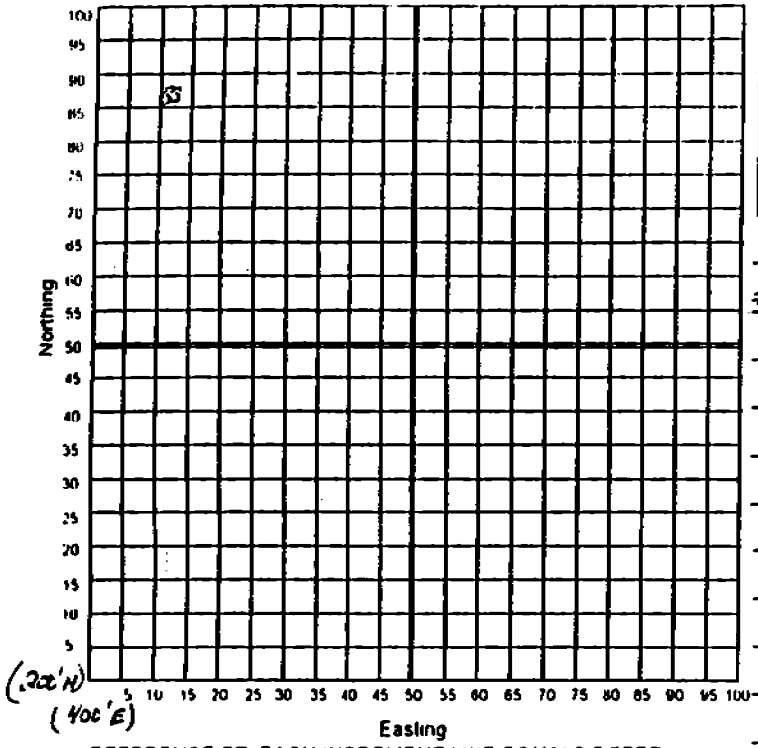
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: D-SECT 5-C

Date	Excavations	Contacts >2 Ft.	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
15 AUG	1		20 MIN	Ø		1	1			D.E. Parkston

	Date	Remarks	Signature
MAG & complete			
Grid complete	15 AUG		D.E. Parkston
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 5-C

GRID: D

REMARKS:

#33- A PIECE OF SIX INCH LONG REBAR AND A PIECE OF FRAG WHERE REMOVED WITH THE TOP 6" CONTAMINATED SOIL AND THE SIGNAL WAS LOST IN THE BOTTOM.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X=E Y=N	QTY	UXO	Condition (Live/Inert)	Depth
#33	15 AUG	3	411.09 256.99	1	Ø	6" PIECE OF REBAR & FRAG	6"

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

UNLISTED GRID

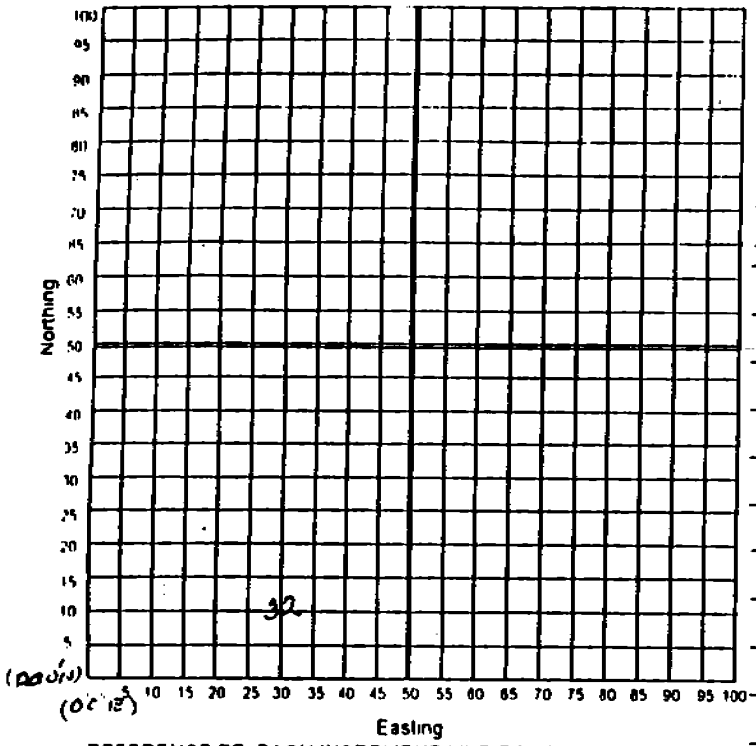
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID A – SECTION 1B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomalies	Lbs Scrap	Remarks	TM#	Signature
21 AUG	1		30 mins	ϕ		1	N/A			D.E. Parberton

	Date	Remarks	Signature
MAG & complete			
Grid complete	21 AUG		D.E. Parberton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 1B

GRID: A

REMARKS:

#32- UNABLE TO LOCATE ANY SPECIFIC SIGNAL DOWN TO 2' WEAK BACKGROUND CONTINUES ON SETTING #4.

ITEM #	Date 96	~~Section~~ QUAD	Coordinates X = E Y = N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#32	21 Aug	1	30'E 210'N	N/A	Ø	UTL	2'

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

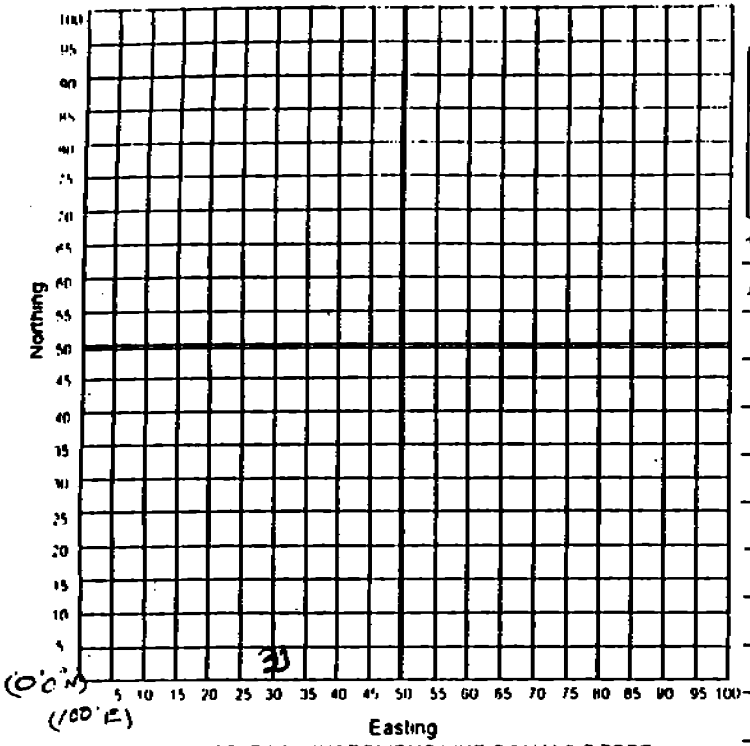
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: A – SECTION 2A

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
21 AUG	1		20 mins	Ø		1	50			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	21 AUG		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 2 A

GRID: A

REMARKS:

#33 - 2" PIPE LEADING TO BULLET TRAP BUNKER FROM ELECT (METAL) JUNCTION BOX.

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X = E Y = N	QTY	UXO	Condition (Live/Inert)	Depth
#33	21 AUG	1	130'E 02'N	50	ϕ	PIPE & ELECT MET. BOX	@1"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

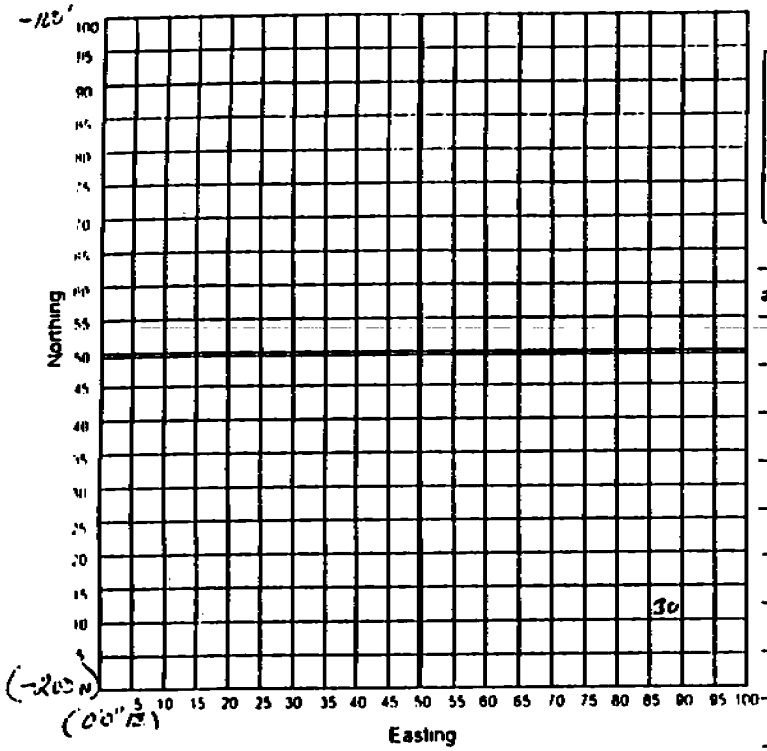
Grid Work Progress/Completion Accounting Sheet

GRID B-SECTION 1-B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
19 AUG	1		20 mins	ϕ		1	1/2			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	19 AUG		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			

(NON-LIFT CONTACTS)



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant

3	4
1	2

SECTION: 1-B

GRID: B

REMARKS:

#30-(2) PIECES OF FRAG. REMOVED AND THE SIGNAL WAS LOST

ITEM #	Date	~~Section~~ QUAD	Coordinates X=E Y=N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#30	19 AUG	2	87.00 188.00	1/2	ϕ	PIECES OF FRAG.	3"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO

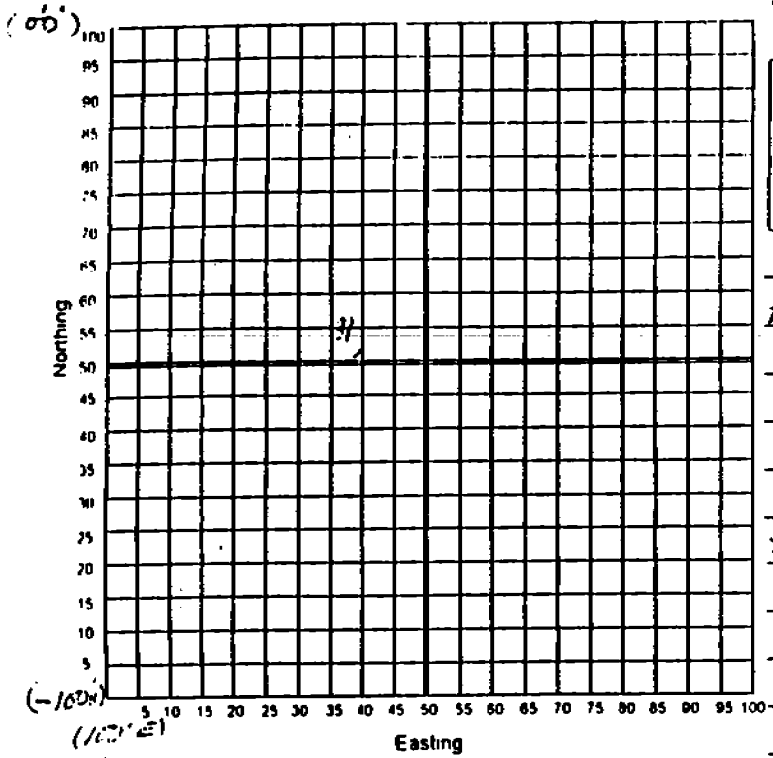
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID B - SECTION 2A

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs Scrap	Remarks	TM#	Signature
19 AUG	1		20/MIN	ϕ		1	1/8			D.E. Parkerton

	Date	Remarks	Signature
MAG & complete			
Grid complete	19 AUG		D.E. Parkerton
Quality control check complete			
Customer QA check complete			
Additional comments			



REFERENCE PT EACH INCREMENT LINE EQUALS 5 FEET

Quadrant	
3	4
1	2

SECTION: 2-A

GRID: B

REMARKS:

#3 - CO2 CART. ON SURFACE WITH HIGH BACKGROUND ON SETTING #1. HOLE DUG TO 2' OVER FACE OF BUNKER WITHOUT FURTHER CONTACT

* MAG CONTACTS OVER BUNKER FACE SO HIGH PINPOINT CONTACTS ARE NOT DECERNABLE.

172.M #	Date	~~Section~~ GRID	Coordinates X=E Y=N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
31	19 AUG	3	[illegible]	1/8	Ø	CO2 CART.	[illegible]

TOTAL Ø LIVE UXO

TOTAL Ø INERT UXO

PAGE 2 OF 2

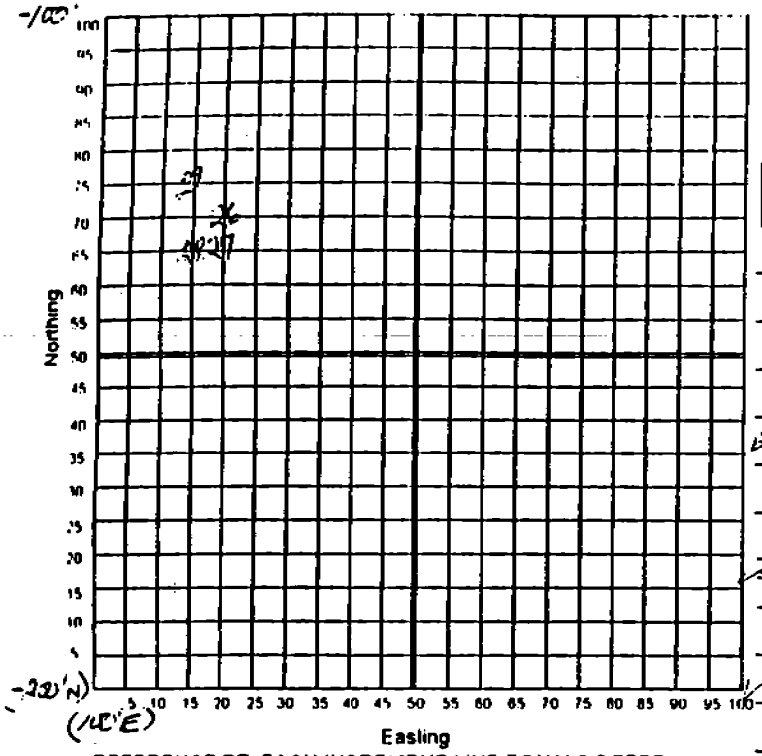
EXPLOSIVE DISPOSAL ENGINEERING & TECHNOLOGY, LTD.

Grid Work Progress/Completion Accounting Sheet

GRID: B - SECTION 2-B

Date	Excavations	Contacts >2 Ft	M/H	UXO's Found	UXO Scrap	Flagged Anomolies	Lbs. Scrap	Remarks	TM#	Signature
19 AUG	4		1.5 HRS	Ø		4	—			D.E. Parberton

	Date	Remarks	Signature
MAG & complete			
Grid complete	19 AUG.		D.E. Parberton
Quality control check complete			
Customer QA check complete			
Additional comments			



Quadrant	
3	4
1	2

SECTION: 2-B

GRID: B

REMARKS:

#26-(6) PIECES OF LARGE FRAG, IN SLOPE MATERIAL WHICH CONTINUES TO GIVE SIGNALS

#27-LARGE PIECES OF FRAG, REMOVE AND SURROUNDINGS CONTINUE TO GIVE SIGNALS

#28-SAME AS #26 & #27. THE SLOPE MATERIAL IS TOO CONTAMINATED

#29-MANY PIECES OF FRAG REMOVED TO 12" WITH SIGNAL FROM BUNKER FENCE TO STRONG

ITEM #	Date '96	~~Section~~ QUAD	Coordinates X=E Y=N	~~QTY~~ lbs	UXO	Condition (Live/Inert)	Depth
#26	19 AUG	3	120.00 - 130.00	10	ϕ	MANY PIECES OF FRAG	12"
#27	"	3	120.00 - 130.00	10	ϕ	MANY PIECES OF FRAG.	12"
#28	"	3	115.00 - 130.00	1/2	ϕ	MANY PIECES OF FRAG	12"
#29	"	3	115.00 - 125.00	1	ϕ	MANY PIECES OF FRAG	12"

TOTAL ϕ LIVE UXO

TOTAL ϕ INERT UXO