April 26, 2005

Richard Satkin
Matrix Environmental Services L.L.C.
180 Headquarters Drive, Building 61
Anniston, AL 36205

Subject: Final Geophysical Prove-Out Letter Report for the Alpha Area Supplemental Engineering Evaluation/Cost Analysis

Dear Mr. Satkin:

URS is pleased to provide this letter report presenting the results of the geophysical prove-out (GPO) activities that were conducted 13–22 December 2004 and 9 March 2005 at the former Fort McClellan (McClellan) Ammunition Supply Point (ASP), Anniston, Alabama. The purpose of the GPO was to demonstrate the effectiveness of the geophysical instrumentation, navigation systems, personnel, data processing, and target identification prior to the initiation of fieldwork.

The GPO main plot at McClellan was established in an irregular configuration to take full advantage of the available land (see Attachment 1, Figure 1). The plot measures 238.84 ft (eastern boundary), 142.38 ft (southern boundary), 227.69 ft (western boundary), and 84.64 ft (northern boundary). The GPO main plot is supplemented with a separate 150-ft linear GPO transect (see Attachment 1, Figure 2). The GPO transect was installed in the tree line adjacent to the GPO main plot and is representative of the terrain and vegetation conditions expected in the Alpha Area during the conduct of the Supplemental Engineering Evaluation/Cost Analysis (EE/CA). The GPO transect includes a traverse point along its length to represent what may occur during the EE/CA as proposed transect routes encounter impassable terrain features or heavy vegetation that cannot be removed. Attachment 2 provides photographic documentation of the GPO installation.

Seventy-five inert ordnance seed items were randomly distributed in the GPO main plot (see Attachment 1, Figure 3) and GPO transect (see Attachment 1, Figure 4) at various depths and orientations. The placement depths of the seed items were derived from Section 3.2 of the Final Supplemental EE/CA Work Plan (URS 2005) and are based on the expected maximum detection depths. The maximum practical detection depth can be considered to be the detection depth achieved at the response threshold that provides an acceptable false alarm (no find) rate while satisfying the maximum expected detection depth. The expected maximum detection depths are based on U.S. Army Corps of Engineers (USACE) EM-1110-1-4009 (USACE 2000). Sixty seed items were placed in the GPO main plot and 15 seed items were placed along the GPO transect. The items in the GPO main plot were planted so that orientations would be indicative of a firing point to the south of the impact area with weapons being fired to the north.

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The seed items placed in the GPO main plot and GPO transect are indicative of the ordnance items encountered during previous investigations of the Alpha Area and ordnance items that have documented use throughout McClellan. The 3-in. 50 caliber projectile was substituted for the 75mm projectile due to its availability and similar size to the 75mm. The purpose of adding ordnance items not strictly indicative of the Alpha Area was to allow the plot to be used as a baseline and validation plot for any remaining work to be conducted at McClellan. The coordinates, types of items, orientation, and depth are documented in Attachment 1, Table 1.

The instruments used for the GPO at McClellan were the Geonics EM61-MK2 and the Geometrics G-858 cesium vapor magnetometer. The EM61-MK2 is a time-domain electromagnetic (EM) instrument designed to detect, with high spatial resolution, shallow ferrous and non-ferrous metallic objects. The applicability of the instrument for ordnance detection has been widely demonstrated at sites across the United States and it has been used extensively during previous investigations at McClellan. The instrument consists of two air-cored coils (1 by 0.5 m), batteries, processing electronics, and an Allegro digital data recorder. The larger of the two coils functions as the EM source and receiver and is positioned 40 cm below a second receiver coil. Secondary currents induced in both coils are measured in millivolts (mV). The MK2 system records multiple time gates, recording the response in the receiver coil at four points in time after the EM pulse is generated. Earlier time gates are able to detect smaller metallic sources, but may also demonstrate increased noise.

The Geometrics G-858 portable cesium vapor magnetometer was also tested during the GPO effort. The G-858 system comprises a belt-mounted display/logging console connected to two cesium sensors mounted on a handheld counterbalanced staff. The console contains electronics to acquire magnetic field data with position and display it on an LCD screen for review and edit. The G-858 has been extensively used for ordnance detection; however, the system is less reliable in areas exhibiting a metals-enriched geological background. The G-858 was used to collect data at a sampling rate of 0.5 sec in the gradiometer mode, with the two sensors separated by 1 m. The G-858 has an operating range of 17,000 to 100,000 nT.

Three types of precision survey equipment were used during the construction and mapping of the GPO main plot and GPO transect. For the initial establishment of survey control and positional mapping of the GPO main plot during the background surveys, the Trimble Real-Time Kinematic (RTK) differential global positioning system (DGPS) was used. A Trimble 5600 robotic total station (RTS) was used for the placement of the GPO transect end points and traverse point. For positional data during the mapping of the seeded GPO main plot and GPO transect, the Leica 1205 RTS was utilized. No additional navigation tests were conducted during the GPO due to the use of the Leica RTS, which is a precision survey instrument. Navigation and positional accuracy were verified during the back sighting of the

survey equipment and completion of the 6 line test as outlined in Section 3.2.1.6 of the Final Supplemental EE/CA Work Plan. The positional accuracy of the RTS was checked by back sighting known survey points. This involves the RTS being set upon a known survey point and being back sighted (verified) to another known survey point. If there were any discrepancies between the setup point and the back sight point, the RTS unit was not initialized. If for any reason fiducials are used during the EE/CA, additional navigation tests will be preformed in accordance with Section 3.2.1.6 of the Work Plan.

The Trimble 5700 base/rover global positioning system (GPS) was used to establish initial positional control data for the GPO main plot and GPO transect, as no established stable positional control was available within reasonable distance of the ASP (3 miles) (see Attachment 1, Table 2). Static Infill with Online Positioning User Service (OPUS) correction was the method of data collection used to establish a positional control point within the confines of the ASP. This method consisted of setting up a static Trimble 5700 Base Station over an unknown point and collecting positional data for 4 hours. The positional data were then transferred into Trimble's Geodetic Office (TGO) software and converted into a Receiver Independent Exchange (RINEX) file format. It was then processed using OPUS, which allows users to submit RINEX format GPS data files online to the National Geodetic Survey (NGS) of the National Oceanic and Atmospheric Administration, where the data are processed to determine a position using NGS computers and software. Each RINEX file was processed with respect to three National Continuously Operating Reference Stations. Using time-configured radiofrequency and triangulation based on existing NGS monuments, the data were reduced, voiding out erroneous positions. The resulting position was then checked for accuracy based on a known aerial target control point. Once the corrected positions were obtained, they where confirmed by collecting GPS data on known points, and comparing that GPS data with the original data associated with the aerial target. The aerial target position was previously provided by the Army (see Attachment 1, Table 2). This processed control point was then used as a base point for setting two additional control points within the ASP confines. All positional control points at the ASP were set in asphalt with steel pins as control point markers. In preparation for the Alpha Area transect survey, Skipper Engineering tied into the URS established control point as a check. URS control points checked with less than 1 cm of error (roughly 0.003 ft).

Background surveys of the GPO main plot (see Attachment 1, Figure 5) and the GPO transect were conducted with the EM61-MK2 on 15 December 2004. The background surveys were conducted to establish the background readings of the GPO area and detect any natural or man-made anomalies that may have existed in the GPO main plot and GPO transect. Positional data within the GPO main plot were collected using a Trimble 5700 RTK system; no positional data were collected for the GPO transect.

The background survey of the GPO main plot was accomplished by using the EM61-MK2 in wheel mode, with a bottom coil height of 16 in. A line spacing of 2.5 ft was used to

ensure 100% coverage of the GPO. As the EM61-MK2 was operated through the GPO main plot, biodegradable paint was used to mark the coverage completed per pass. This provided the operator a visual reference of the completed coverage and allowed the operator to ensure a data overlap of approximately 1 ft. Positional data were provided by an RTK base station set on the established control point within the ASP. Corrections were sent via Trimble Trimmark III radio link to the Trimble Rover antenna, which was mounted on the standard 1-m high Geonics GPS tripod.

The background survey of the GPO transect was accomplished using the EM61-MK2 in the same configuration as the GPO main plot; however, positional tracking was not used. The operator visually observed the Allegro data collector for mV response while traversing the transect. Since the intent of the GPO transect is to be representative of the Alpha Area, it was determined that the anomalies present in the GPO transect would remain in place.

The data were sent electronically to the URS data processor in Denver, Colorado, and processed using Geosoft's Oasis Montaj program. An image file was sent via e-mail from the Denver office to the survey crew showing the color-contoured data from the background surveys. Seventy-five anomalies were identified in the background survey of the GPO main plot, while one anomaly was identified along the GPO transect. The baseline threshold used for the target selection of the background survey was 4 mV. Due to the high number of anomalies detected in the proposed plot location, an alternate location was considered. However, due to the uncertainty of the redevelopment schedule of McClellan, other sites were determined unsuitable. It should be noted that redevelopment of McClellan may still affect the current plot placement. However, development is not anticipated for several years and is not a certainty.

After discussions with Matrix Environmental Services LLC (Matrix), and their third party quality assurance contractor, NAEVA Geophysics, Inc. (NAEVA), it was determined that the best course of action was to use the initially selected site and intrusively investigate the 75 detected anomalies in the GPO main plot. Initially, no further action was planned for the anomaly located along the GPO transect; however, during excavation for the placement of a seed item, the anomaly was inadvertently removed due to it's proximity to the proposed seed item placement. The former ASP is not within the confines of the Alpha Area, nor was it considered a munitions and explosives of concern (MEC) site, and as such, investigation of the anomalies was not considered an MEC investigation. Excavation of the anomalies revealed man-made metallic objects, naturally occurring ferrous concentrations in the soil, and six practice hand grenade bodies. Attachment 1, Table 3 lists the results of the intrusive investigation of the 75 anomalies. Attachment 3 details URS's response to the excavation of unexpected practice hand grenades.

Fifty-three of the anomalies investigated were man-made metallic objects, including the 6 practice grenades, and the remaining 22 were determined to be naturally occurring ferrous

concentrations. These naturally occurring ferrous concentrations ranged from individual rocks to a handful of soil, which produced a signal when inspected with a magnetometer. All attempts were made to remove as much of the natural ferrous material as possible from the excavations prior to backfilling.

The intrusive investigation of the background anomalies allowed URS to verify the achieved positional accuracy of the equipment during background mapping efforts. The anomaly positions fell within the required 90% reacquisition of anomalies within a critical radius distance of 3 ft of the mapped position as set forth in Section 3.2.1.12 of the Final Supplemental EE/CA Work Plan (URS 2005). Most of the reacquired targets were within inches of the surveyed points. Upon consultation with Matrix and NAEVA, it was determined that reacquisition of the background anomalies would be used for the reacquisition quality control assessment of GPO positional accuracy.

On 18 December 2004, after the excavation of the 75 background anomalies, the EM61-MK2 was again used to map the GPO main plot to record a post-excavation background (see Attachment 1, Figure 6) and to determine whether any anomalies remained within the plot. Forty-one anomalies were mapped, of which six were again investigated (see Attachment 1 Figure 6). The investigation of these six anomalies resulted in the excavation of natural ferrous concentrations, and as such, no further effort was made to remove these anomalies. The anomalies will be accounted for in all future GPO plot/equipment validation data processing (Attachment 1, Table 4 details the remaining anomalies).

A background survey was also performed on 18 December 2004 with the Geometrics G-858 across the GPO main plot after the excavation of the original 75 background anomalies (see Attachment 1, Figure 7). For the G-858 magnetometer survey, the Trimble rover antenna was mounted on a backpack worn by the operator. The offset (x,y,z) from the sensor was measured, and corrections applied to the recorded positions using the GPS offset function in Geometrics Mag Map 2000 software. On occasion during the survey, the GPS lost communication with satellites due to tree coverage. This data gap was rectified by using the latency features inherent with the Oasis Montaj data processing software.

To alleviate any issues associated with the direction of data collection, each transect line was collected to a new data line. A line spacing of 2 ft was used to ensure 100% coverage of the GPO. Line transects were established by placing 300-ft tape measures across the width of the northern and southern extents of the established GPO. A polypropylene rope was then extended the length of the GPO area. As each transect was completed, the rope was moved to the next progressive interval of 2 ft and so on.

The data were analyzed, and even after the removal of the initial 75 background anomalies, the results indicated high concentrations of ferrous materials in the eastern, central, and northwestern portions of the GPO main plot. Based on the indicated prevalence of high

ferrous content in the soils throughout McClellan, and the inherent inability to detect non-ferrous metals, magnetometer surveying is not considered applicable for use at McClellan at this time.

Upon completion of the background survey on 18 December 2004, excavation for the placement of the inert ordnance seed items began. The inert items were buried at various depths and orientations (see Attachment 1, Table 1) within the GPO main plot and along the GPO transect. The seed items placed in the GPO main plot were arranged within the plot in a manner that would allow the plot to be used in both the 100% coverage approach or the transect approach, while the GPO transect was only set up for the transect approach. The items were placed with a minimum of 10 ft spacing between individual items to ensure that seed items were not masked by other seed items. The seed item orientation was derived from the weapon systems that would have launched, fired, thrown, or placed the item. As such, projectiles fired from howitzers and mortars are more likely to be in a more vertical plane (orientation), while gun-fired projectiles are more likely be in a horizontal plane. The seed items placed in the plot that would have been thrown by individual soldiers were placed in both the horizontal and vertical plane, while mines, which would have been purposefully planted by soldiers, were placed in the manner that was indicative of their use. Some of seed items required excavation to 7 ft below ground surface (bgs) for placement, and weathered rock was encountered at approximately 4 ft bgs. The seed items were then placed in the excavations and their orientation was verified with an inclinometer and recorded. After the seed items were set, an Alabama Licensed Land Surveyor, Skipper Engineering, established the survey positions of the seed items. The nose, base, and center of mass were surveyed for large items, such as 75mm and 155mm projectiles. For smaller items, such as grenades, the center of mass was surveyed. The coordinates for the seed items are shown in Attachment 1, Table 1. Upon completion of the surveying, the excavations were backfilled with efforts to ensure seed item positions and orientation were not affected. The excavations have shown some settling since initial backfilling. In order to prevent introducing ferrous-laden soils into the established plot, only bagged topsoil was used to bring the excavations up to grade.

After successful completion of the seed item burial, URS performed a number of surveys with a combination of systems in an effort to solve the unique problems of positional accuracy and data production at McClellan. These surveys are described below.

- URS performed a 100% grid survey of the GPO main plot on 22 December 2004 using the EM61-MK2 in wheeled mode and the Trimble 5700 RTK system. The survey was performed during a period of high winds and rain, and unfortunately, the GPS base station was blown over prior to completion of the survey. Approximately 60% of the survey grid was covered with adequate GPS signal.
- URS performed a transect survey on the main GPO main plot on 18 January 2005. Equipment used for this survey included the EM61-MK2 in wheel mode and the

Trimble 5700 RTK system. The base station was placed on the established control point within the ASP. Corrections were sent via radio to the rover unit using the Trimble Trimmark III radio. For the EM61-MK2, the rover antenna was mounted on the standard 1-m high Geonics GPS tripod mount for the background survey. Each transect consisted of a single coil width lane along each of the lines where seeded items were emplaced. Heavy foliage along the western side of the GPO area and a large tree in the northern portion of the GPO caused loss of GPS signal. A Positional Delusion of Precision (PDOP) mask of six was set to eliminate any unwanted precessional drop-out (GPS set to satellites at optimal geometry and at least 13 degrees above the horizon).

- During the week of 21 February 2005, several attempts were made to collect the GPO data using Trimble RTS equipment. It became apparent that the Trimble RTS unit would not provide sufficient time stamps to the output position data. Position data and accompanying time stamps are needed at a rate of one reading per second for matching with EM61-MK2 readings (collected at a rate of 10 readings per second). Despite prior assurances from Trimble technical representatives, the Trimble RTS was not capable of time stamping position data more than once a minute. URS attempted to interpolate missing time stamps in Excel (using an Excel formula, extrapolating each minute time stamp into 0.1 minute positions); however, the time required to interpolate the large volumes of data was considered too extensive for the overall project schedule. In addition, the interpolation of numerous time values ultimately resulted in “smearing” of the known targets in the GPO main plot in a direction parallel to data collection.
- A geophysical survey of the GPO area with the Leica RTS unit began on 1 March 2005 with final mapping of the GPO main plot and transect on 9 March 2005. Data were collected along the 12 transects within the GPO main plot and the GPO transect in the wooded area. The EM61-MK2 unit was man carried using nylon straps that clip directly to the EM coils and suspend the coils from the operator’s shoulders. The system was operated in the half meter wide aspect so as to allow the operator ease of movement. This required that an additional pass along transects with the EM61-MK2 be conducted to fully map the width of the transect. Experimentation with coil height (modified by adjusting the coil harness) indicated the most successful detection rate at a height of 16 in.

The final GPO data collection effort was performed on 9 March 2005. The EM61-MK2 was used in harness mode with a coil height set at 16 in. The system was positionally referenced using the Leica 1205 RTS. A detection threshold of 3 mV was used based on previous background survey results and target anomaly responses. The results yielded three seed items that were not selected, including:

- FTMC-18
- FTMC-34
- FTMC-64

Seed items FTMC-18 and FTMC-34 were missed in the GPO main plot, while seed item FTMC-64 was missed in the wooded transect. This equates to a 96% detection rate. The detailed target list can be found in Attachment 4, Tables 1 and 2.

FTMC-18 is a 105mm projectile buried to a depth of 30 in. at a 45 degree angle. FTMC-18 was not detected due to a loss of positional tracking caused by a large oak tree located in the northern portion of the GPO main plot this can be seen on Attachment 4 Figure 3. The oak tree is approximately 2 ft in diameter and interfered with the RTS unit's line of site with the EM61-MK2. Geophysical data were collected in the area obscured by the tree; however, during pre-processing of the data by the DAT 61 program, geophysical data that did not have corresponding positional data were discounted by the program and not provided for further processing. Had the RTS unit been set on a different control point and positional data for that area been available, the EM61-MK2 would have more than likely detected the seed item as two other 105mm projectiles were planted at deeper depths in the GPO main plot and were detected. The two other 105mm projectiles were planted at 34 in. at a 49 degree angle and at 36 in. at a 75 degree angle. These seed items had a 4.7 mV and 5.0 mV response, respectively.

FTMC-34 is a 155mm projectile buried at a depth of 48 in. and at a 60 degree angle. FTMC-34 produced a 1.23 mV response during the survey of the GPO main plot, which is below the target threshold of 3.0 mV. The plot only contained one other similar 155mm projectile, FTMC-20, which was buried at a depth of 42 in. and at a 45 degree angle. FTMC-20 produced a response of just 4.3 mV. The additional 6 in. of depth associated with the placement of FTMC-34 at 48 in. may account for the drop in mV response below the established threshold for the GPO area.

FTMC-64 is an MK2 fragmentation grenade buried at 6 in. in a horizontal orientation. FTMC-64 did not produce an identifiable mV response peak in the data collected for the wooded transect. Positional tracking indicates the EM61-MK 2 passed over the seed item as seen in Attachment 4 Figure 4. Two identical items were planted in the GPO main plot and were detected and recorded as targets. These MK2 grenades were planted at 6 in. with a horizontal orientation and 12 in. with a vertical orientation. These grenades produced a response value of 4.2 mV and 10.7 mV, respectively.

The target picks were analyzed within the GPO database to establish the distance of the reported anomaly from the baseline target item within the horizontal plane. The system was scored against the baseline target set. For an anomaly to represent a buried target, it was

required to be within a circle from the center of the target, with a radius (R) referred to as the critical radius (R_{crit}). Performance assessment was based on an R_{crit} of 3 feet. The target matching procedure matched declarations falling within R_{crit} to the baseline item. If the declaration did not fall within R_{crit}, the target was scored as undetected.

While R_{crit} measured the probability of detection within a 3 foot radius in a "pass/fail" method, the "Accuracy of Detection" (A_d) evaluated how close (within the 3 foot radius) the detector system could locate an anomaly. The average accuracy of detection was calculated for the selected detector system using spatial analysis tools within the Geophysical Systems Validation software.

A false alarm is defined as a reported target not associated with an emplaced item. To compute the number of false alarms (N_{FA}), reported targets not matched to the emplaced baseline target set were declared false alarms. The false alarm rate (FAR) is the number of non-anomalies that would be investigated as a percentage of the total anomalies and is defined as:

$$\text{FAR} = \frac{\text{Number of False Alarms}\left(N_{FA}\right)}{\text{Declared Targets, both MEC and Non - MEC}\left(\text{within } R_{crit}\right)}$$

Measures were taken to remove existing metal from the GPO main plot; however, non-emplaced items could potentially exist. Any anomaly that was detected by at least two systems (within R_{crit} of each other) was marked as a "non-emplaced" target. Non-emplaced targets were not counted as false alarms in calculating the FAR. FAR was not evaluated in the pass/fail of single-path linear transects.

Based upon a review of the data collected with the EM61-MK2 during the GPO, it is recommended that a baseline millivolt threshold of 3.0 mV be utilized for the evaluation of data collected in the Alpha Area during the Supplemental EE/CA. This millivolt threshold is above the background response in the GPO main plot and allowed for the detection of up to 96% of the seeded items during the GPO.

It is recommended that the 3.0-mV threshold be used strictly as a baseline and that all additional data available be used in the selection of target anomalies for intrusive investigation. This data may include all other forms of data gathered during the Supplemental EE/CA, the previous EE/CA conducted by USACE, or historic documents such as the Archives Search Report. Data points that may be used for the selection of target anomalies include discovery of MEC, MEC scrap, weapons fragmentation, possible training areas, or historic range fans. The areas where MEC, MEC scrap, weapons fragmentation, or

evidence of training are discovered may be considered for a bias of a higher percentage of intrusive investigations. The areas displaying high anomaly population but no evidence of weapons use should be considered for a lower percentage of intrusive investigations.

Prioritization of targets for intrusive investigation will be instituted to allow the most efficient and thorough data evaluation within the scoped 1,250 total targets. Intrusive investigation feedback will allow adjustment of the prioritization scheme to more effectively focus on MEC type targets based on actual site-specific anomaly responses and target identification. Signal amplitude, while important for prioritization, will not be the only benchmark for target selection. A range of signal responses, including responses at or near background noise thresholds, will be included in the set of priority targets. Target prioritization may be biased toward areas that exhibit target concentrations or MEC types of particular interest indicative of specific source areas.

The completion of the GPO process has led to the following conclusions:

- Upon reviewing the data from both the EM61-MK2 and the G-858, it was determined that the EM61-MK2 is better suited for the collection of the Alpha Area data. The G-858 data reflected a tendency to highlight geological background (naturally-occurring iron deposits). This causes problems with anomaly isolation, could potentially cause missed targets in the field, and would likely lead to high false positive responses.
- As transect survey operations progressed, it became apparent that the planned method of carrying the EM61 system (litter mode) was going to be a safety hazard due to extreme terrain. It was decided that the harness mode, or “skirt” mode, would be a much safer way to carry the coils over this terrain. As this method requires the coils to be carried length wise (coil width perpendicular to the axes of the transect), it will require the geophysical crews to traverse one additional length of the transect (to meet data coverage requirements).
- It became apparent during the week of 21 January 2005 that the Trimble RTS would not allow for the time stamping of each position collected during geophysical operations. After discussions with Trimble representatives, the Trimble system was abandoned and the Leica 1205 RTS was introduced. The Leica system allows for the necessary time stamp, but inherently requires extra pre-processing steps. The point file exported from the system has additional information that is not compatible with the EM61 data merging software. A four-step conversion process is necessary. URS designed a Microsoft Excel macro to speed up this process.
- A detection rate of 96% was achieved, in excess of the required 90% detection rate metric included in Section 3.2.1.12 of the Work Plan.

- It is recommended that a 3-mV baseline threshold be utilized for initial prioritization of target anomalies. This baseline threshold should continue to be evaluated as more production data are collected.
- Comparison of the geophysical data of like seed items placed in the GPO area and the grenades recovered during the background survey of the GPO main plot yielded no definitive information beyond that which may be expected in a GPO plot. Specific depths of detection will vary; however, the following table lists what may be possible maximum detection depths of various ordnance items. Attachment 4, Table 3 details the like seed items that were compared to arrive at the possible maximum detection depths listed below.

Ordnance Item	**Possible Maximum Detection Depth**
105mm Projectile	36 in.
37mm Projectile	14 in.
3-in. 50 Caliber	In excess of 24 in.
3.5-in. Rocket	In excess of 18 in.
60mm Mortar	24 in.
Hand Grenade	14 in.

Accompanying this letter, please find the following items related to the GPO:

- Attachment 1: Location Maps, Seed Item Data, Survey Control Point Data, Background Anomaly Investigation Data, and Post Excavation Target List.
- Attachment 2: Photographs of GPO Installation.
- Attachment 3: Response to Excavation of Grenades.
- Attachment 4: Track Maps of the Geophysical Data, Target Lists, and Seed Item Comparison Data.

If you have questions regarding this submittal, please contact me at (615) 642-1198.

Sincerely,

John E. Krowitz

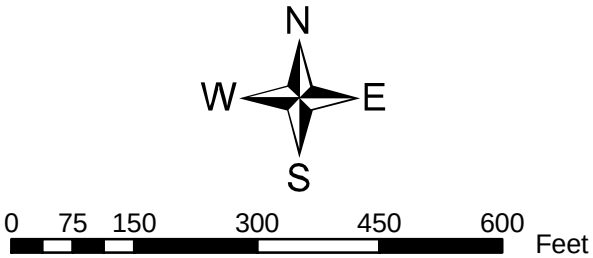
John Krowitz
Project Manager

JK:rm

Attachments

Attachment 1
Location Maps, Seed Item Data, Survey Control Point Data,
Background Anomaly Investigation Data, and Post Excavation Target List

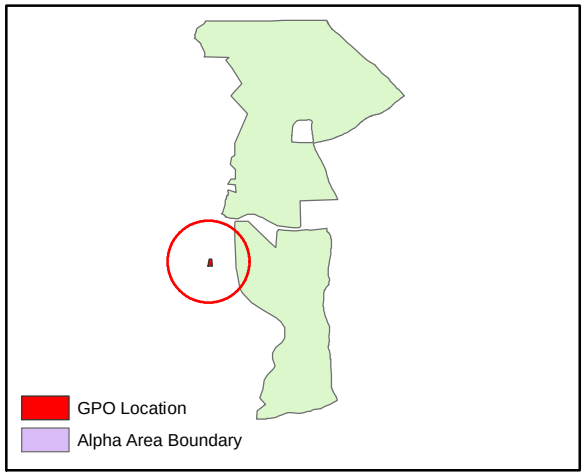
McClellan, Alabama
GPO Location
Figure 1

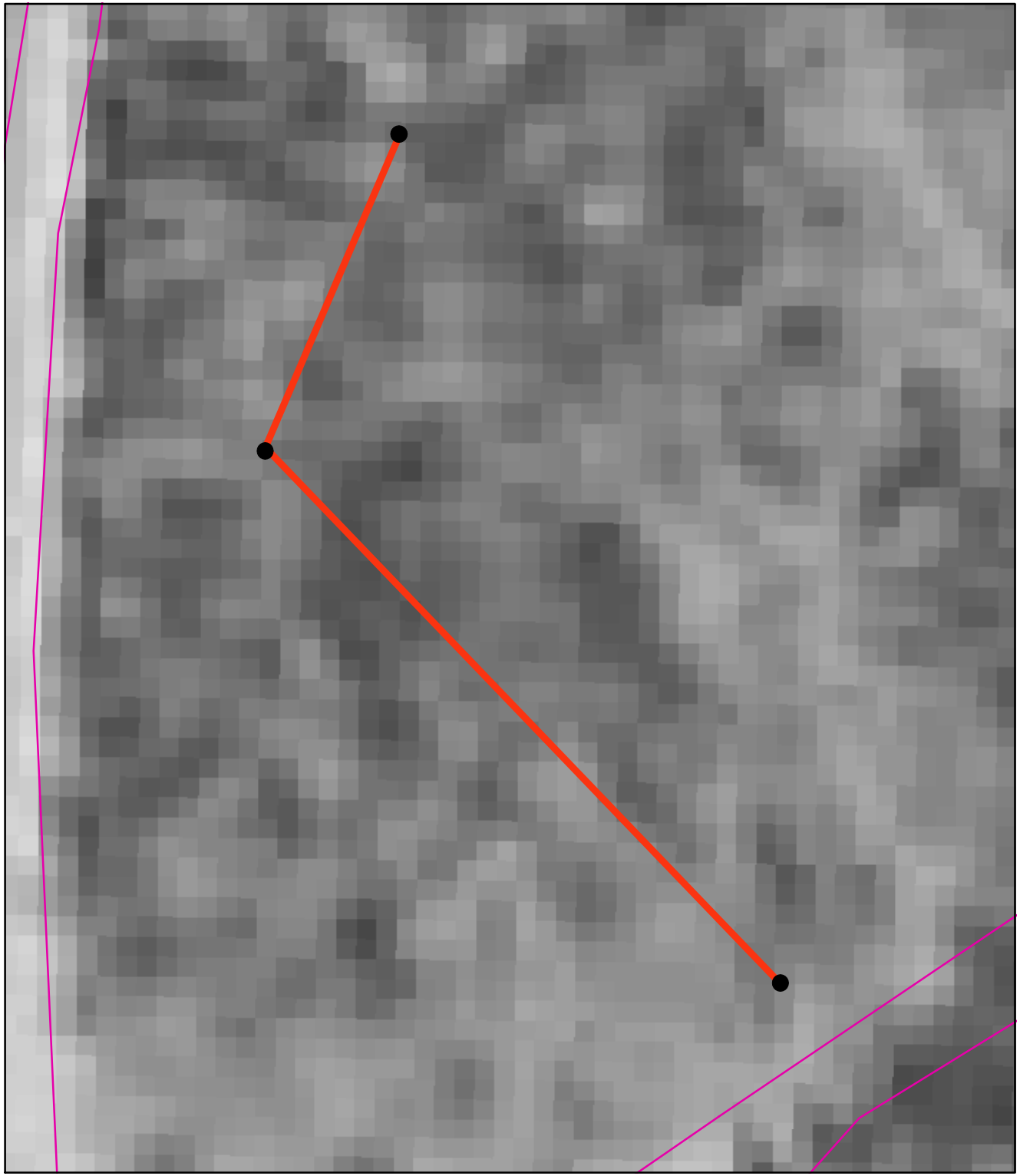


LEGEND

- Roads
- Wooded Transect
- Buildings
- GPO Boundary

Aerial Image produced from Terrasync
Aerial Image is shown in 1 meter res.
Map is displayed in NAD83, SPC, Alabama East, US Ft





McClellan, Alabama GPO Wooded Transect Location Figure 2

N
W E
S

0 5 10 20 30 40 Feet

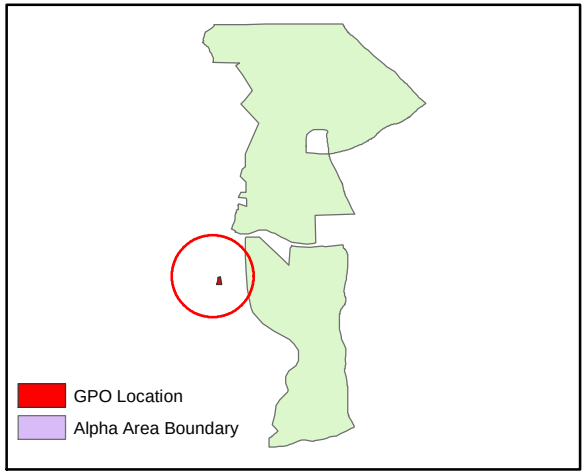
LEGEND

Roads

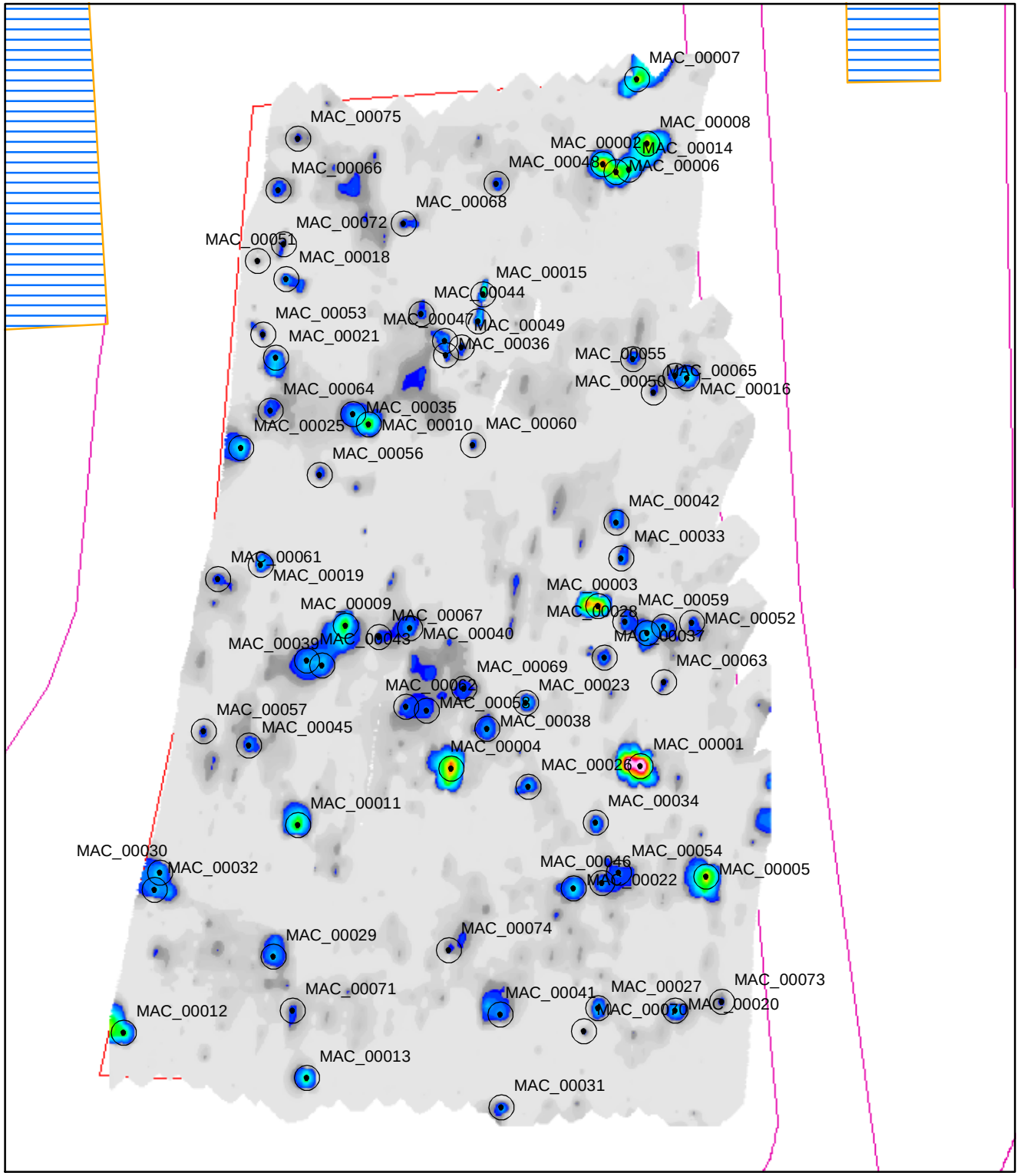
Wooded Transect

Transect Points

Aerial Image produced from Terrasync
Aerial Image is shown in 1 meter res.
Map is displayed in NAD83, SPC, Alabama East, US Ft



McClellan, Alabama
Pre-Anomaly Investigation
Background Survey
With Selected Targets
121505
Figure 5



N
W E
S

0 10 20 40 60 80 Feet

LEGEND

Roads

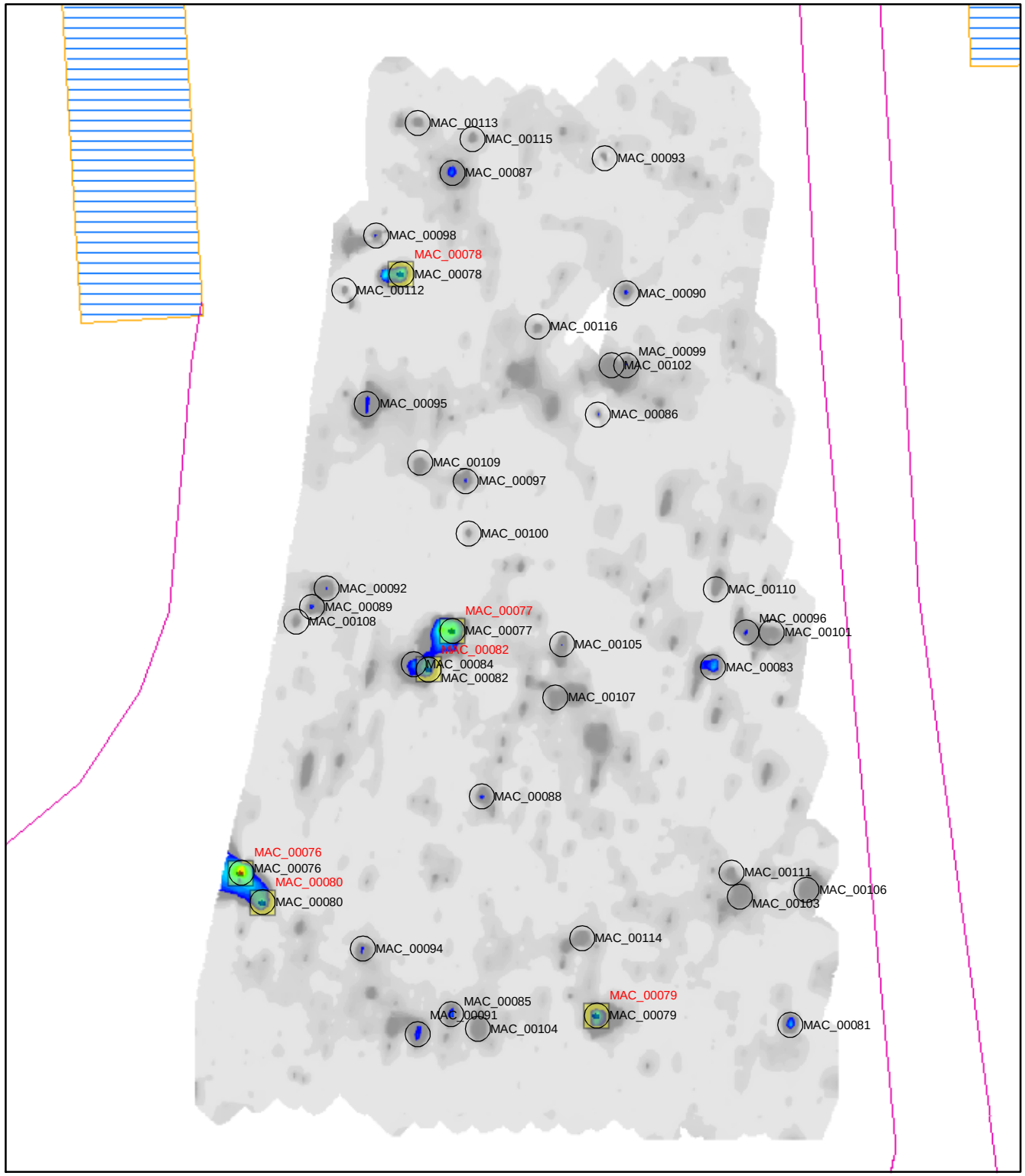
Selected Targets

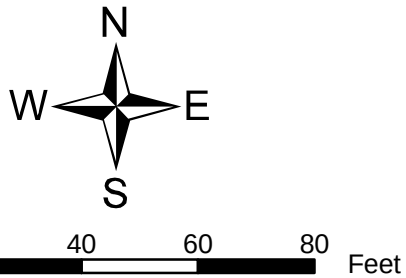
Buildings

mV
EM61MkII Ch3
0.0 1.3 2.5 6.0 11.0 18.0 25.0 32.0 39.0 46.0

Map is displayed in NAD83, SPC, Alabama East, US Ft

McClellan, Alabama
Post Anomaly Investigation Background Survey With Selected Targets and Investigated Targets
121804
Figure 6

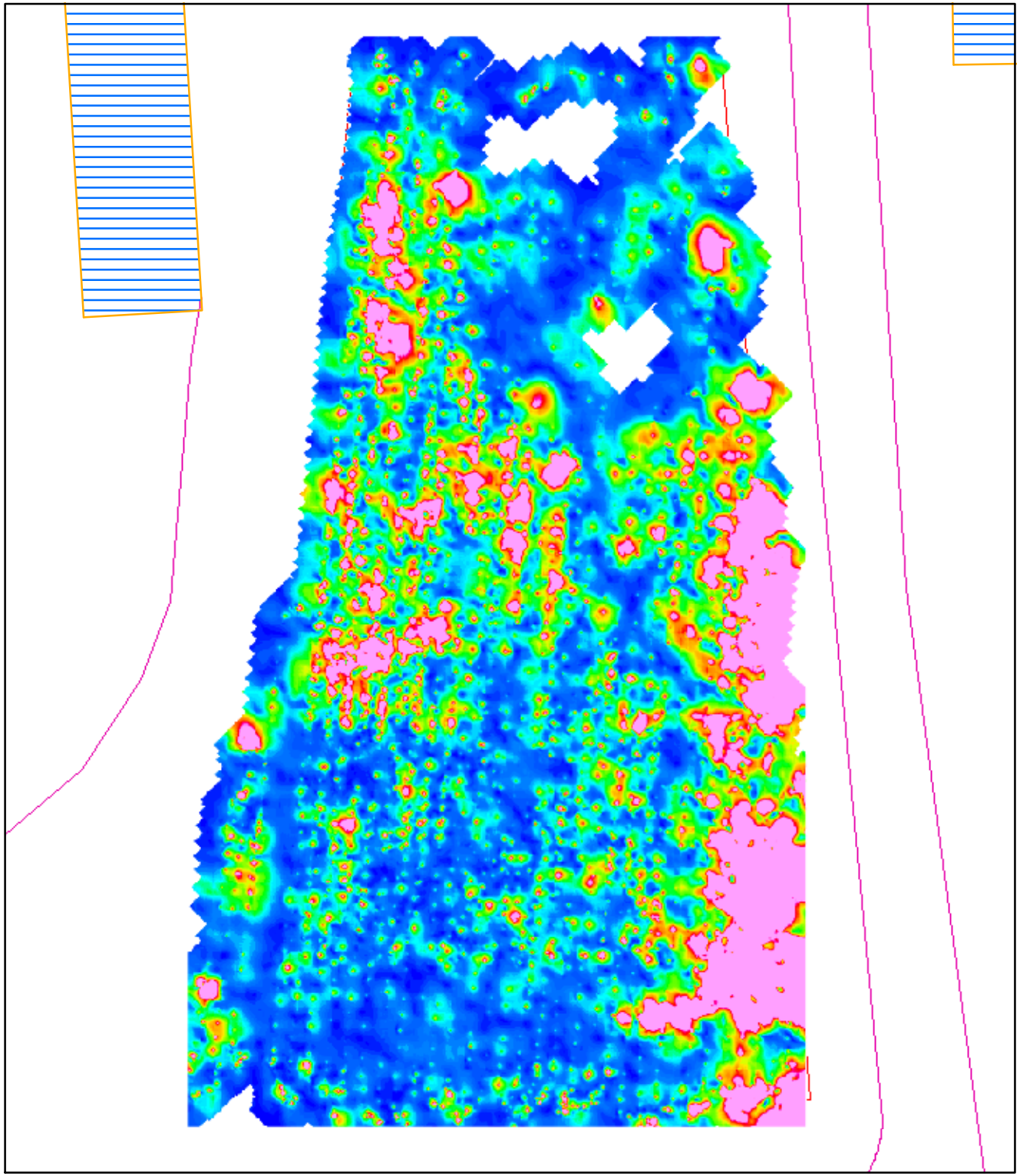




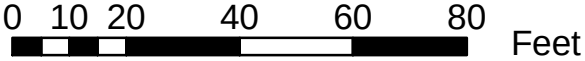
LEGEND

- Roads
- Buildings
- Selected Targets
- Reaquired Targets

mV
EM61MkII Ch3
0.0 1.3 2.5 6.0 11.0 18.0 25.0 32.0 39.0 46.0



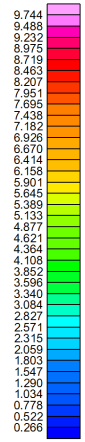
McClellan, Alabama
GPO Post Background Target Reaquisition Geophysical Survey
G-858 Gradiometer
121804
Figure 7



LEGEND

Roads

Buildings



Map is displayed in NAD83, SPC, Alabama East, US Ft

URS Corporation GPO/VDS Plot Seed Item Placement McClellan Anniston Alabama									
Item	**Nomenclature**	**Depth[1]**	**Orientation**	**Item Nose**		**Center of Mass**		**Item Base**	
				Northing	**Easting**	**Northing**	**Easting**	**Northing**	**Easting**
GPO/VDS Plot									
FTMC 1	3.8" Shrapnel	12"	10°						
FTMC 2	Landmine AP	4"	Horizontal						
FTMC 3	81mm Mortar Teardrop	12"	10°						
FTMC 4	3.5" Rocket	6"	Horizontal						
FTMC 5	Grenade MK 2	6"	Horizontal						
FTMC 6	2.36" Rocket	6"	Horizontal						
FTMC 7	Grenade WP	2"	Horizontal						
FTMC 8	81mm Mortar WP	18"	9°						
FTMC 9	3" 50Cal	12"	8°						
FTMC 10	81mm Mortar Teardrop	24"	55°						
FTMC 11	40mm Grenade	2"	Horizontal						
FTMC 12	60mm Mortar	12"	Horizontal						
FTMC 13	37mm 1 PRD Hoskins	2"	Horizontal						
FTMC 14	3" 50Cal	24"	70°						
FTMC 15	105mm Projectile	36"	75°						
FTMC 16	40mm Grenade	6"	Horizontal						
FTMC 17	37mm 1 PRD Hoskins	6"	42°						
FTMC 18	105mm Projectile	30"	45°						
FTMC 19	105 mm Projectile	12"	Horizontal						
FTMC 20	155mm Projectile	42"	45°						
FTMC 21	Grenade M26	8"	30°						
FTMC 22	3.5" Rocket	12"	15°						
FTMC 23	60mm Mortar	18"	25°						

Table 1

URS Corporation GPO/VDS Plot Seed Item Placement (Continued) McClellan Anniston Alabama									
Item	**Nomenclature**	**Depth[1]**	**Orientation**	**Item Nose**		**Center of Mass**		**Item Base**	
				Northing	**Easting**	**Northing**	**Easting**	**Northing**	**Easting**
GPO/VDS Plot									
FTMC 24	37mm 1 PRD Hoskins	8"	22°						
FTMC 25	3.5" Rocket	12"	32°						
FTMC 26	81mm Mortar WP	24"	50°						
FTMC 27	75mm Projectile	24"	75°						
FTMC 28	60mm Mortar	24"	75°						
FTMC 29	Grenade Rifle	6"	Horizontal						
FTMC 30	40mm Grenade	10"	47°						
FTMC 31	75mm Projectile	12"	50°						
FTMC 32	81mm Mortar	12"	12°						
FTMC 33	105mm Projectile	18"	28°						
FTMC 34	155mm Projectile	48"	60°						
FTMC 35	37mm 1 PRD Hoskins	10"	30°						
FTMC 36	3" 50Cal	18"	30°						
FTMC 37	Landmine AT	3"	Horizontal						
FTMC 38	105mm Projectile	34"	49°						
FTMC 39	3" 50Cal	20"	50°						
FTMC 40	2.36" Rocket	18 "	20°						
FTMC 41	Grenade Rifle	16"	40°						
FTMC 42	3" 50Cal	24"	76°						
FTMC 43	60mm Mortar	12"	15°						
FTMC 44	3 inch Stokes	24"	43°						
FTMC 45	Grenade WP	8"	65°						
FTMC 46	3" 50Cal	12"	33°						

Table 1

URS Corporation
GPO/VDS Plot Seed Item Placement (Continued)
McClellan
Anniston Alabama

Item	Nomenclature	Depth[1]	Orientation	Item Nose		Center of Mass		Item Base	
				Northing	Easting	Northing	Easting	Northing	Easting
GPO/VDS Plot									
FTMC 47	3.8" Shrapnel	24"	46°						
FTMC 48	37mm 1 PRD Hoskins	12"	30°						
FTMC 49	105mm Projectile	24"	30°						
FTMC 50	37mm 1 PRD Hoskins	14"	36°						
FTMC 51	Grenade M33	14"	Vertical						
FTMC 52	3" 50Cal	18"	40°						
FTMC 53	155mm Projectile	36"	50°						
FTMC 54	60mm Mortar	18"	53°						
FTMC 55	Landmine AT	6"	Horizontal						
FTMC 56	81mm Mortar WP	32"	75°						
FTMC 57	Grenade MK 2	12"	Vertical						
FTMC 58	Landmine AP	2"	Horizontal						
FTMC 59	3.5" Rocket	14"	10°						
FTMC 60	3.5" Rocket	18"	38°						

Table 1

URS Corporation
GPO/VDS Plot Seed Item Placement (Continued)
McClellan
Anniston Alabama

Item	Nomenclature	Depth[1]	Orientation	Item Nose		Center of Mass		Item Base	
				Northing	Easting	Northing	Easting	Northing	Easting
GPO Transect									
FTMC 61	Landmine AT	6"	Horizontal						
FTMC 62	37mm 1 PRD Hoskins	12"	37°						
FTMC 63	81mm Mortar WP	18"	Horizontal						
FTMC 64	Grenade Mk 2	6"	Horizontal						
FTMC 65	3" 50Cal	18"	Horizontal						
FTMC 66	81mm Mortar WP	18"	Horizontal						
FTMC 67	60mm Mortar	20"	55°						
FTMC 68	Rifle Grenade	12"	Horizontal						
FTMC 69	155mm Projectile	33"	65°						
FTMC 70	60mm Mortar	12"	Horizontal						
FTMC 71	3 inch Stokes	16"	54°						
FTMC 72	Grenade Rifle	16"	Horizontal						
FTMC 73	81mm Mortar Teardrop	12"	52°						
FTMC 74	3" 50cal	24"	65°						
FTMC 75	105mm Projectile	30"	70°						

1. The depth of the seed items were measured at the point at which the item would first be encountered while conducting intrusive activities.
2. Smaller ordnance items which have a minimal distance between the nose and base, or land mines which do not have a nose and base were strictly surveyed in at the center of mass.

Table 1

URS Corporation
GPO/VDS Survey Control Points
McClellan
Anniston Alabama

Control ID	Northing	Easting	Remarks
URS 100			Iron pin set approx 65 feet west/ 54 feet north of the SW corner of GPO Plot
URS 102			Plastic stake set approx 37 feet east/22 feet south of NE corner of GPO plot
URS 106			Nail spike set on road south of GPO 46 feet south/27 feet east of SW corner of GPO
Trans 102a			GPO Transect Southern End Point
Trans 103a			GPO Transect Travers Point
Trans 104a			GPO Transect Northern End Point
Boundry1			GPO Boundary stake
Boundry2			GPO Boundary stake
Boundry3			GPO Boundary stake
Boundry4			GPO Boundary stake
Boundry5			GPO Boundary stake
GPO Trans 200			GPO Plot Transect End Point
GPO Trans 201			GPO Plot Transect End Point
GPO Trans 202			GPO Plot Transect End Point
GPO Trans 203			GPO Plot Transect End Point
GPO Trans 204			GPO Plot Transect End Point
GPO Trans 205			GPO Plot Transect End Point
GPO Trans 206			GPO Plot Transect End Point
Aerial Target			Army Provided Aerial Target Control Point

Table 2

URS Corporation GPO/VDS Plot Background Anomaly Investigation McClellan Anniston Alabama						
Target ID	**Depth[1]**	**Investigation Description**	**Northing**	**Easting**	**mV Value**	**Disposition**
Mac0001	Surface	Rebar			93.9	Removed
Mac0002	8	Natural Ferrous Concentration			50.9	Majority Removed/Portions Remain
Mac0003	8	Metal Plate			50.9	Removed
Mac0004	5	Metal Debris			38.8	Removed
Mac0005	8	Rebar			36.3	Removed
Mac0006	18	Rebar			31.6	Removed
Mac0007	4	Metal Debris			29.6	Removed
Mac0008	18	Rebar			26.9	Removed
Mac0009	8	Natural Ferrous Concentration			24.2	Majority Removed/Portions Remain
Mac0010	3	Metal Debris			23.6	Removed
Mac0011	6	Metal Debris			23.6	Removed
Mac0012	5	Rebar			20.5	Removed
Mac0013	4	155mm Projectile Lifting Lug			18.4	Removed
Mac0014	18	Rebar			17.0	Removed
Mac0015	5	Metal Rod			16.0	Removed
Mac0016	5	Natural Ferrous Concentration			13.2	Majority Removed/Portions Remain
Mac0017	5	Natural Ferrous Concentration			12.9	Majority Removed/Portions Remain
Mac0018	8	Nail			12.7	Removed
Mac0019	6	Grenade Body/Empty			12.6	Removed
Mac0020	10	M1 Firing Device/Spent			11.8	Removed
Mac0021	9	Metal Debris			11.8	Removed
Mac0022	10	Horse Shoe			11.7	Removed
Mac0023	8	Grenade Body/Empty			10.8	Removed
Mac0024	8	Natural Ferrous Concentration			10.3	Majority Removed/Portions Remain
Mac0025	4	Natural Ferrous Concentration			10.1	Majority Removed/Portions Remain

Table 3

1. Depth to anomaly is in inches.

URS Corporation GPO/VDS Plot Background Anomaly Investigation (Continued) McClellan Anniston Alabama						
Target ID	**Depth[1]**	**Investigation Description**	**Northing**	**Easting**	**mV Value**	**Disposition**
Mac0026	8	Metal Bucket Handle			9.9	Removed
Mac0027	5	Grenade Body/Empty			9.8	Removed
Mac0028	8	Natural Ferrous Concentration			9.4	Majority Removed/Portions Remain
Mac0029	8	Metal Bolt			9.4	Removed
Mac0030	6	Natural Ferrous Concentration			9.2	Majority Removed/Portions Remain
Mac0031	8	Pliers			8.9	Removed
Mac0032	4	Nails			8.5	Removed
Mac0033	7	Nails			8.2	Removed
Mac0034	10	Metal Rod			8.2	Removed
Mac0035	10	Cable Clamp			8.0	Removed
Mac0036	14	Metal Rod			7.9	Removed
Mac0037	4	Horse Shoe			7.9	Removed
Mac0038	9	Natural Ferrous Concentration			7.5	Majority Removed/Portions Remain
Mac0039	8	Natural Ferrous Concentration			7.4	Majority Removed/Portions Remain
Mac0040	9	Horse Shoe			7.3	Removed
Mac0041	11	Metal Debris			7.2	Removed
Mac0042	8	Metal Rod			7.2	Removed
Mac0043	8	Natural Ferrous Concentration			6.9	Majority Removed/Portions Remain
Mac0044	10	Metal Debris			6.8	Removed
Mac0045	8	Nails			6.6	Removed
Mac0046	8	Nails			6.6	Removed
Mac0047	5	Grenade Body/Empty			6.2	Removed
Mac0048	Surface	Metal Plate			6.2	Removed
Mac0049	6	Natural Ferrous Concentration			6.0	Majority Removed/Portions Remain
Mac0050	6	Grenade Body/Empty			5.9	Removed

Table 3

1. Depth to anomaly is in inches.

URS Corporation GPO/VDS Plot Background Anomaly Investigation (Continued) McClellan Anniston Alabama						
Target ID	**Depth[1]**	**Investigation Description**	**Northing**	**Easting**	**mV Value**	**Disposition**
Mac0051	4	Metal Debris			5.8	Removed
Mac0052	8	Natural Ferrous Concentration			5.6	Majority Removed/Portions Remain
Mac0053	17	Metal Rod			5.6	Removed
Mac0054	6	Metal Debris			5.6	Removed
Mac0055	7	Metal Debris			5.4	Removed
Mac0056	4	Metal Debris			5.4	Removed
Mac0057	8	Grenade Body/Empty			5.3	Removed
Mac0058	8	Metal Debris			5.3	Removed
Mac0059	8	Natural Ferrous Concentration			5.2	Majority Removed/Portions Remain
Mac0060	5	Natural Ferrous Concentration			5.2	Majority Removed/Portions Remain
Mac0061	4	Ferrous Rock			5.2	Removed
Mac0062	8	Nails			5.1	Removed
Mac0063	8	Natural Ferrous Concentration			4.9	Majority Removed/Portions Remain
Mac0064	6	Metal Debris/Hot Rock			4.9	Removed
Mac0065	4	Natural Ferrous Concentration			4.9	Majority Removed/Portions Remain
Mac0066	5	Nails			4.9	Removed
Mac0067	8	Natural Ferrous Concentration			4.8	Majority Removed/Portions Remain
Mac0068	4	Metal Rod			4.7	Removed
Mac0069	8	Natural Ferrous Concentration			4.6	Majority Removed/Portions Remain
Mac0070	8	Spanner Wrench			4.6	Removed
Mac0071	6	Grenade Body/Empty			4.3	Removed
Mac0072	7	Nails			4.3	Removed
Mac0073	8	Natural Ferrous Concentration			4.2	Majority Removed/Portions Remain
Mac0074	8	Natural Ferrous Concentration			4.2	Majority Removed/Portions Remain
Mac0075	8	Nails			4.1	Removed

Table 3

1. Depth to anomaly is in inches.

URS Corporation Post Excavation Target List McClellan Anniston Alabama					
Target ID	**Northing**	**Easting**	**Investigated**	**mV Value**	**Date**
MAC_00076			Yes	40.31	12/18/2004
MAC_00077			Yes	17.08	12/18/2004
MAC_00078			Yes	13.34	12/18/2004
MAC_00079			Yes	12.23	12/18/2004
MAC_00080			Yes	12.20	12/18/2004
MAC_00081			No	10.35	12/18/2004
MAC_00082			No	10.16	12/18/2004
MAC_00083			No	9.25	12/18/2004
MAC_00084			Yes	8.29	12/18/2004
MAC_00085			No	7.59	12/18/2004
MAC_00086			No	7.14	12/18/2004
MAC_00087			No	6.98	12/18/2004
MAC_00088			No	6.89	12/18/2004
MAC_00089			No	6.82	12/18/2004
MAC_00090			No	6.67	12/18/2004
MAC_00091			No	6.44	12/18/2004
MAC_00092			No	5.94	12/18/2004
MAC_00093			No	5.80	12/18/2004
MAC_00094			No	5.75	12/18/2004
MAC_00095			No	5.72	12/18/2004
MAC_00096			No	5.64	12/18/2004
MAC_00097			No	5.63	12/18/2004
MAC_00098			No	5.46	12/18/2004
MAC_00099			No	5.17	12/18/2004
MAC_00100			No	4.89	12/18/2004
MAC_00101			No	4.88	12/18/2004
MAC_00102			No	4.81	12/18/2004
MAC_00103			No	4.80	12/18/2004
MAC_00104			No	4.76	12/18/2004
MAC_00105			No	4.75	12/18/2004
MAC_00106			No	4.58	12/18/2004
MAC_00107			No	4.57	12/18/2004
MAC_00108			No	4.50	12/18/2004
MAC_00109			No	4.48	12/18/2004
MAC_00110			No	4.42	12/18/2004
MAC_00111			No	4.35	12/18/2004
MAC_00112			No	4.28	12/18/2004

URS Corporation
Post Excavation Target List
McClellan
Anniston Alabama

Target ID	Northing	Easting	Channel ID	mV Value	Date
MAC_00113			No	4.18	12/18/2004
MAC_00114			No	4.12	12/18/2004
MAC_00115			No	4.10	12/18/2004
MAC_00116			No	4.04	12/18/2004

Table 4

Attachment 2
Photographs of GPO Installation

GPO Plot Background Survey

Reacquisition of Background Anomalies

Excavation of Background Anomalies

First Grenade Body Encountered (MK2)

Grenade Bodies Recovered From GPO Plot

Examples of Man-Made Metallic

Objects Recovered From GPO Plot

EM61-MK2 Background Survey of GPO Plot

After Excavation of Initial Anomalies

Calibration of G-858

Background Survey of GPO Plot with G-858

After Excavation of Initial Anomalies

Inert Ordnance Seed Items Prior to Preparation

Preparation of Inert Ordnance Seed Items

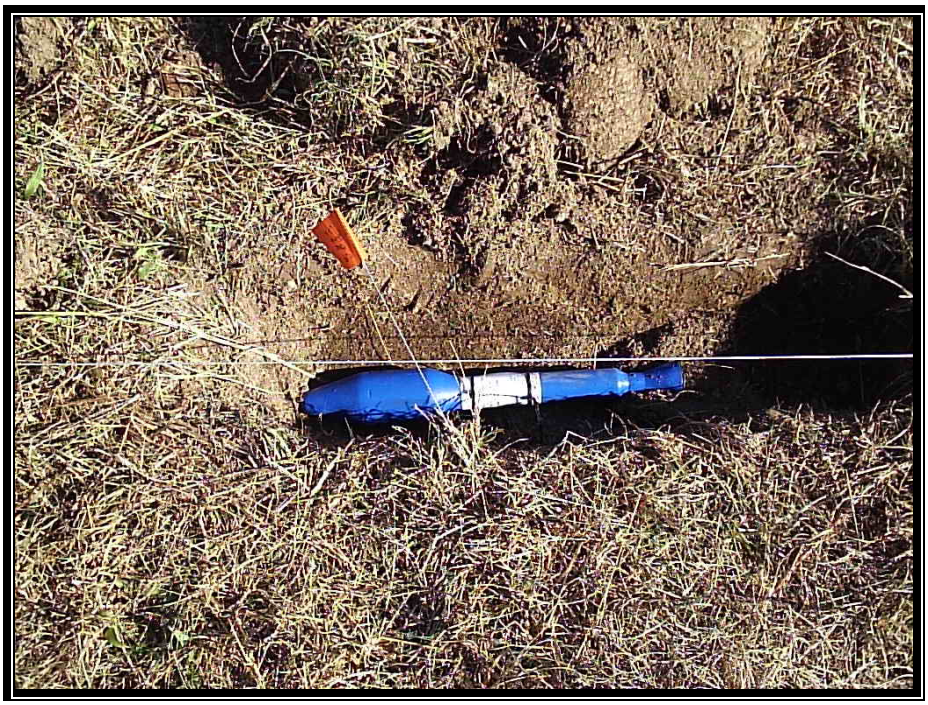
Inert Ordnance Seed Items Tagged and Ready for Placement

155mm Inert Projectile Seed Items

Excavating for the Placement of Seed Items

Placement of Seed Item

Placement of M12A1 Heavy Anti-Tank Mine



Placement of 3.5-In. Rocket

Placement of 60mm Mortar

Placement of 2.36-In. Rocket

Placement of M2 Anti-Personnel Land Mine

155mm Projectile Buried to 4 Ft "First Encounter"

Preparing to Map Seeded GPO Plot

Mapping Seeded GPO Plot

Preparing to Map Seeded GPO Transect

Mapping Seeded GPO Transect

Attachment 3
Response to Excavation of Grenades

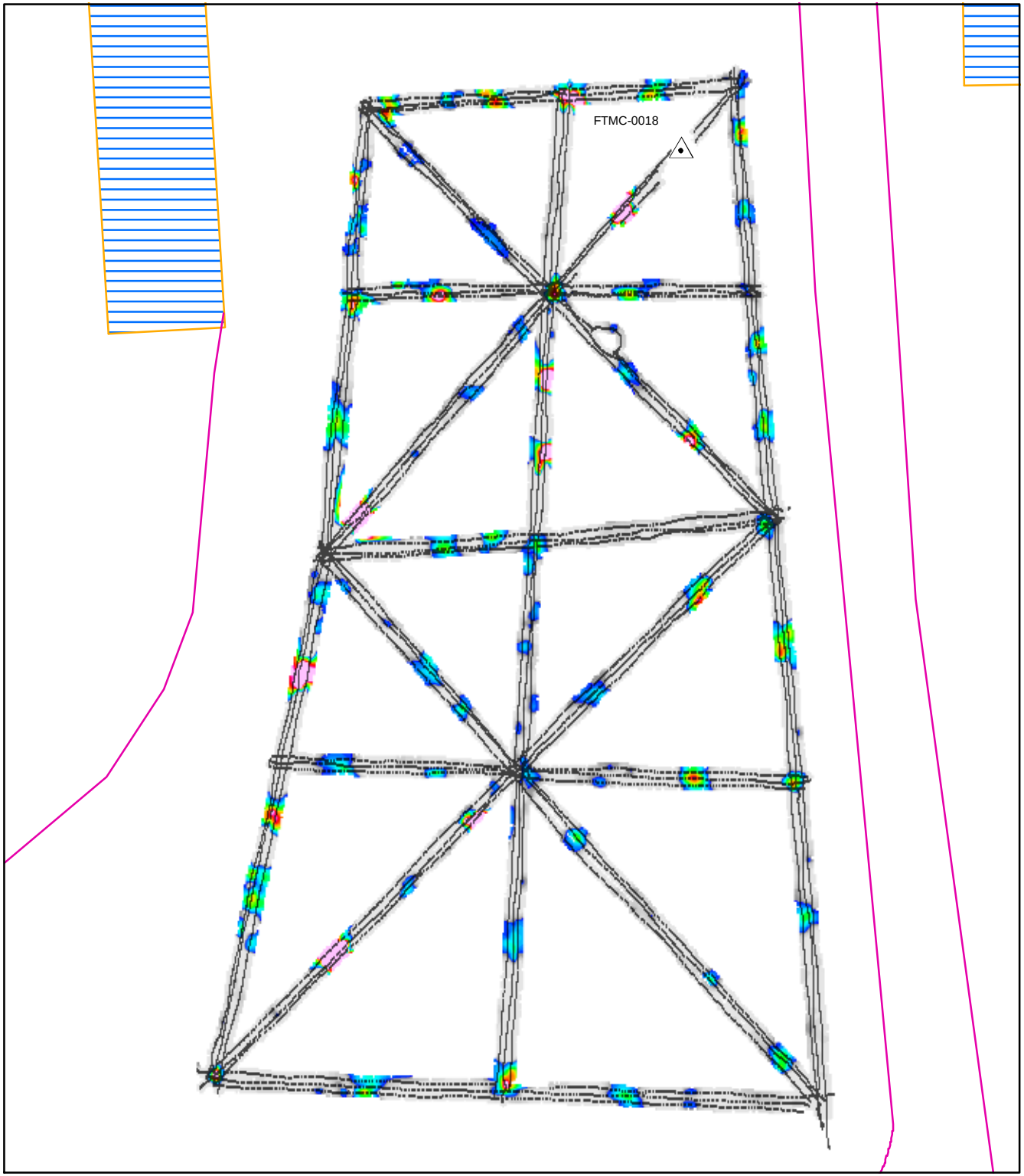
Attachment 3
Response to Excavation of Grenades

On 16–17 December 2004, during the excavation of the 75 background anomalies in the GPO main plot, URS encountered six practice grenades. URS was not equipped for the possible disposal of MEC since the ASP was outside the Alpha Area, did not lie within any of the historic ranges, and had been turned over to the Joint Powers Authority by the USACE as an area needing no further action.

The first hand grenade body excavated was a World War II MK2 "Pineapple" type grenade. It appeared to have a sheared off fuse and some form of plug in the base. As stated above the ASP does not fall within URS scope of work in the Alpha Area, and therefore, any possible MEC encountered in the ASP is the responsibility of local law enforcement and the U.S. Army. URS immediately notified the Matrix Unexploded Ordnance (UXO) Quality Assurance Officer (QAO) and the Anniston Police Department of the discovery. URS discontinued operations and secured the site awaiting the arrival of the Anniston Police. Upon arrival, the police officer contacted the dispatch center, who in turn called the FBI. The FBI turned over the incident to the local Explosive Ordnance Disposal (EOD) unit assigned to Anniston Army Depot. The EOD unit responded and inspected the grenade. The EOD unit made the determination that the grenade contained no energetic material and was no threat to public safety. They removed the grenade body from the site. This shut down in operations delayed the progress of the installation of the GPO by several hours; however, it demonstrated that the established contingency plan for such an event was followed and was successful.

The following day the second grenade body was excavated from the GPO and again caused a shut down in the installation of the GPO. However, this grenade body was positively identified by the URS UXO Project Manager (UXO Qualified) and Matrix QAO as free of energetic material and no threat to public safety. The discovery was reported to the USACE Transition Force who made the determination that any item positively identified by UXO Technicians as free of energetic material and no threat to public safety did not require the notification of local law enforcement. Work on the plot was continued and included the discovery of four additional grenade bodies, all of which were determined to be free of energetic material. The six grenade body types included four MK2 (Pineapple), one M26 (Lemon), and one M33 (Baseball). All grenade bodies will be demilitarized and disposed of as MEC scrap.

Attachment 4
Track Maps of the Geophysical Data, Target Lists, and Seed Item Comparison Data



McClellan, Alabama
Geophysical Survey
GPO Area
W Unit 030905
Coil Height of 16 Inches
Figure 3

N
W E
S

0 10 20 40 60 80 Feet

LEGEND

Roads

Seed Item Locations

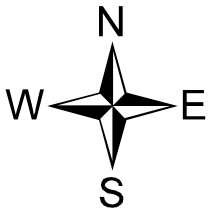
Geophysical Line Paths

Buildings

mV
EM61MkII Ch3

0.0 1.3 2.5 6.0 11.0 18.0 25.0 32.0 39.0 46.0

McClellan, Alabama
Geophysical Survey
Wooded Transect
W Unit 030905
Coil Height of 16 Inches
Figure 4



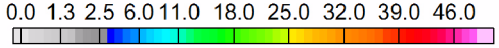
LEGEND

Roads

Seed Item Locations

Geophysical Line Paths

mV
EM61MkII Ch3



URS Corporation
Target List W Unit GPO Plot 03/09/05
McClellan
Anniston Alabama

Target ID	Item	Nomenclature	Depth[1]	Orientation	mV Value	Surveyed Northing	Surveyed Easting	Recorded Northing	Recorded Easting	Target Offset (ft)
FTMC_GPO_601					5.4					0.00
FTMC_GPO_602	FTMC 42	3" 50Cal	24"	76°	16.5					0.00
FTMC_GPO_603	FTMC 43	60mm Mortar	12"	15°	30.1					0.00
FTMC_GPO_604	FTMC 59	3.5" Rocket	14"	10°	50.8					0.00
FTMC_GPO_605	FTMC 49	105mm Projectile	24"	30°	17.1					0.00
FTMC_GPO_606	FTMC 50	37mm 1 PRD Hoskins	14"	36°	16.5					0.00
FTMC_GPO_607	FTMC 55	Landmine AT	6"	Horizontal	1564.2					0.00
FTMC_GPO_608	FTMC 53	155mm Projectile	36"	50°	12.9					0.00
FTMC_GPO_609					11.0					
FTMC_GPO_610	FTMC 51	Grenade M33	14"	Vertical	3.4					0.00
FTMC_GPO_611	FTMC 44	3 inch Stokes	24"	43°	14.7					0.00
FTMC_GPO_612	FTMC 3	81mm Mortar Teardrop	12"	10°	28.5					0.00
FTMC_GPO_613	FTMC 54	60mm Mortar	18"	53°	13.4					0.00
FTMC_GPO_614	FTMC 52	3" 50Cal	18"	40°	20.1					0.00
FTMC_GPO_615	FTMC 2	Landmine AP	4"	Horizontal	328.5					0.00
FTMC_GPO_616	FTMC 46	3" 50Cal	12"	33°	51.7					0.00
FTMC_GPO_617					5.2					
FTMC_GPO_618					6.7					
FTMC_GPO_619	FTMC 45	Grenade WP	8"	65°	36.7					0.00
FTMC_GPO_620	FTMC 31	75mm Projectile	12"	50°	53.4					0.00
FTMC_GPO_621	FTMC 56	81mm Mortar WP	32"	75°	7.4					0.00
FTMC_GPO_622	FTMC 48	37mm 1 PRD Hoskins	12"	30°	19.8					0.00
FTMC_GPO_623	FTMC 47	3.8" Shrapnel	24"	46°	12.8					0.00
FTMC_GPO_625	FTMC 39	3" 50Cal	20"	50°	19.5					0.00

1. The depth of the seed items were measured at the point at which the item would first be encountered while conducting intrusive activities.

Table 1

URS Corporation
Target List W Unit GPO Plot 03/09/05 (Continued)
McClellan
Anniston Alabama

Target ID	Item	Nomenclature	Depth[1]	Orientation	mV Value	Surveyed Northing	Surveyed Easting	Recorded Northing	Recorded Easting	Target Offset (ft)
FTMC_GPO_626					5.5					
FTMC_GPO_627	FTMC 40	2.36" Rocket	18 "	20°	9.2					0.00
FTMC_GPO_628	FTMC 4	3.5" Rocket	6"	Horizontal	135.3					0.00
FTMC_GPO_629					12.9					
FTMC_GPO_630	FTMC 32	81mm Mortar	12"	12°	43.2					0.00
FTMC_GPO_631					7.9					
FTMC_GPO_632	FTMC 38	105mm Projectile	34"	49°	4.7					0.00
FTMC_GPO_633	FTMC 41	Grenade Rifle	16"	40°	6.6					0.00
FTMC_GPO_634	FTMC 33	105mm Projectile	18"	28°	54.1					0.00
FTMC_GPO_635	FTMC 5	Grenade MK 2	6"	Horizontal	10.7					0.00
FTMC_GPO_636	FTMC 36	3" 50Cal	18"	30°	23.7					0.00
FTMC_GPO_637	FTMC 35	37mm 1 PRD Hoskins	10"	30°	18.1					0.00
FTMC_GPO_638					19.9					
FTMC_GPO_639	FTMC 60	3.5" Rocket	18"	38°	20.6					0.00
FTMC_GPO_640	FTMC 37	Landmine AT	3"	Horizontal	2692.0					0.00
FTMC_GPO_641	FTMC 30	40mm Grenade	10"	47°	4.5					0.00
FTMC_GPO_642	FTMC 6	2.36" Rocket	6"	Horizontal	165.6					0.00
FTMC_GPO_643	FTMC 13	37mm 1 PRD Hoskins	2"	Horizontal	77.4					0.00
FTMC_GPO_644	FTMC 12	60mm Mortar	12"	Horizontal	27.1					0.00
FTMC_GPO_645	FTMC 26	81mm Mortar WP	24"	50°	25.2					0.00
FTMC_GPO_646	FTMC 28	60mm Mortar	24"	75°	7.8					0.00
FTMC_GPO_647	FTMC 7	Grenade WP	2"	Horizontal	123.2					0.00
FTMC_GPO_648					11.9					
FTMC_GPO_649	FTMC 14	3" 50Cal	24"	70°	16.7					0.00

1. The depth of the seed items were measured at the point at which the item would first be encountered while conducting intrusive activities.

Table 1

URS Corporation
Target List W Unit GPO Plot 03/09/05 (Continued)
McClellan
Anniston Alabama

Target ID	Item	Nomenclature	Depth[1]	Orientation	mV Value	Surveyed Northing	Surveyed Easting	Recorded Northing	Recorded Easting	Target Offset (ft)
FTMC_GPO_650	FTMC 11	40mm Grenade	2"	Horizontal	32.6					0.00
FTMC_GPO_651	FTMC 27	75mm Projectile	24"	75°	10.2					0.00
FTMC_GPO_652					6.5					
FTMC_GPO_653	FTMC 25	3.5" Rocket	12"	32°	50.8					0.00
FTMC_GPO_654	FTMC 1	3.8" Shrapnel	12"	10°	73.6					0.00
FTMC_GPO_655					34.1					
FTMC_GPO_656	FTMC 29	Grenade Rifle	6"	Horizontal	48.4					0.00
FTMC_GPO_657	FTMC 15	105mm Projectile	36"	75°	5.0					0.00
FTMC_GPO_658					22.1					
FTMC_GPO_659	FTMC 10	81mm Mortar Teardrop	24"	55°	4.3					0.00
FTMC_GPO_660	FTMC 24	37mm 1 PRD Hoskins	8"	22°	16.5					0.00
FTMC_GPO_661	FTMC 19	105 mm Projectile	12"	Horizontal	188.4					0.00
FTMC_GPO_662	FTMC 16	40mm Grenade	6"	Horizontal	16.7					0.00
FTMC_GPO_663					69.8					
FTMC_GPO_664	FTMC 23	60mm Mortar	18"	25°	5.1					0.00
FTMC_GPO_665	FTMC 17	37mm 1 PRD Hoskins	6"	42°	43.7					0.00
FTMC_GPO_666	FTMC 22	3.5" Rocket	12"	15°	42.5					0.00
FTMC_GPO_667	FTMC 9	3" 50Cal	12"	8°	41.4					0.00
FTMC_GPO_668					17.3					
FTMC_GPO_669	FTMC 58	Landmine AP	2"	Horizontal	155.7					0.00
FTMC_GPO_670	FTMC 8	81mm Mortar WP	18"	9°	33.9					0.00
FTMC_GPO_671	FTMC 20	155mm Projectile	42"	45°	4.3					0.00
FTMC_GPO_672	FTMC 21	Grenade M67	8"	30°	6.7					0.00
FTMC_GPO_673	FTMC 57	Grenade MK 2	12"	Vertical	4.2					0.00

1. The depth of the seed items were measured at the point at which the item would first be encountered while conducting intrusive activities.

Table 1

URS Corporation
Target List W Unit GPO Transect 03/09/05
McClellan
Anniston Alabama

Target ID	Item	Nomenclature	Depth[1]	Orientation	mV Value	Surveyed Northing	Surveyed Easting	Recorded Northing	Recorded Easting	Target Offset (ft)
FTMC_GPO_674	FTMC 75	105mm Projectile	30"	70°	12.8					0.00
FTMC_GPO_675	FTMC 74	3" 50cal	24"	65°	14.8					0.00
FTMC_GPO_676	FTMC 73	81mm Mortar Teardrop	12"	52°	68.0					0.00
FTMC_GPO_678	FTMC 72	Grenade Rifle	16"	Horizontal	4.6					0.00
FTMC_GPO_679	FTMC 71	3 inch Stokes	16"	54°	35.5					0.00
FTMC_GPO_680	FTMC 70	60mm Mortar	12"	Horizontal	8.4					0.00
FTMC_GPO_681	FTMC 69	155mm Projectile	33"	65°	20.9					0.00
FTMC_GPO_682	FTMC 68	Rifle Grenade	12"	Horizontal	7.4					0.00
FTMC_GPO_683	FTMC 67	60mm Mortar	20"	55°	20.1					0.00
FTMC_GPO_684	FTMC 66	81mm Mortar WP	18"	Horizontal	46.8					0.00
FTMC_GPO_685	FTMC 65	3" 50Cal	18"	Horizontal	12.2					0.00
FTMC_GPO_686	FTMC 63	81mm Mortar WP	18"	Horizontal	71.8					0.00
FTMC_GPO_687	FTMC 62	37mm 1 PRD Hoskins	12"	37°	3.4					0.00
FTMC_GPO_688	FTMC 61	Landmine AT	6"	Horizontal	1575.8					0.00

1. The depth of the seed items were measured at the point at which the item would first be encountered while conducting intrusive activities.

Table 2

Seed Item Comparison McClellan Anniston Alabama					
Target ID	**Item**	**Nomenclature**	**Depth[1]**	**Orientation**	**mV Value**
105mm Projectile					
FTMC_GPO_661	FTMC 19	105mm Projectile	12"	Horizontal	188.4
FTMC_GPO_634	FTMC 33	105mm Projectile	18"	28°	54.1
FTMC_GPO_605	FTMC 49	105mm Projectile	24"	30°	17.1
* FTMC_GPO_674	FTMC 75	105mm Projectile	30"	70°	12.8
FTMC_GPO_632	FTMC 38	105mm Projectile	34"	49°	4.7
FTMC_GPO_657	FTMC 15	105mm Projectile	36"	75°	5.0
37mm Projectile					
FTMC_GPO_643	FTMC 13	37mm 1 PRD Hoskins	2"	Horizontal	77.4
FTMC_GPO_665	FTMC 17	37mm 1 PRD Hoskins	6"	42°	43.7
FTMC_GPO_660	FTMC 24	37mm 1 PRD Hoskins	8"	22°	16.5
FTMC_GPO_637	FTMC 35	37mm 1 PRD Hoskins	10"	30°	18.1
FTMC_GPO_622	FTMC 48	37mm 1 PRD Hoskins	12"	30°	19.8
* FTMC_GPO_687	FTMC 62	37mm 1 PRD Hoskins	12"	37°	3.4
FTMC_GPO_606	FTMC 50	37mm 1 PRD Hoskins	14"	36°	16.5
3" 50 Caliber Projectile					
FTMC_GPO_616	FTMC 46	3" 50Cal	12"	33°	51.7
FTMC_GPO_667	FTMC 9	3" 50Cal	12"	8°	41.4
FTMC_GPO_614	FTMC 52	3" 50Cal	18"	40°	20.1
* FTMC_GPO_685	FTMC 65	3" 50Cal	18"	Horizontal	12.2
FTMC_GPO_636	FTMC 36	3" 50Cal	18"	30°	23.7
FTMC_GPO_625	FTMC 39	3" 50Cal	20"	50°	19.5
FTMC_GPO_602	FTMC 42	3" 50Cal	24"	76°	16.5
FTMC_GPO_649	FTMC 14	3" 50Cal	24"	70°	16.7
* FTMC_GPO_675	FTMC 74	3" 50cal	24"	65°	14.8
3.5" Anti Tank Rocket					
FTMC_GPO_628	FTMC 4	3.5" Rocket	6"	Horizontal	135.3
FTMC_GPO_666	FTMC 22	3.5" Rocket	12"	15°	42.5
FTMC_GPO_653	FTMC 25	3.5" Rocket	12"	32°	50.8
FTMC_GPO_604	FTMC 59	3.5" Rocket	14"	10°	50.8
FTMC_GPO_639	FTMC 60	3.5" Rocket	18"	38°	20.6

Table 5

Seed Item Comparision McClellan Anniston Alabama					
Target ID	**Item**	**Nomenclature**	**Depth[1]**	**Orientation**	**mV Value**
60mm Mortar					
FTMC_GPO_603	FTMC 43	60mm Mortar	12"	15°	30.1
* FTMC_GPO_680	FTMC 70	60mm Mortar	12"	Horizontal	8.4
FTMC_GPO_644	FTMC 12	60mm Mortar	12"	Horizontal	27.1
FTMC_GPO_664	FTMC 23	60mm Mortar	18"	25°	5.1
FTMC_GPO_613	FTMC 54	60mm Mortar	18"	53°	13.4
* FTMC_GPO_683	FTMC 67	60mm Mortar	20"	55°	20.1
FTMC_GPO_646	FTMC 28	60mm Mortar	24"	75°	7.8
Grenades					
Mac0027	Recovered	Grenade Body/Empty	5"		9.8
Mac0047	Recovered	Grenade Body/Empty	5"		6.2
Mac0050	Recovered	Grenade Body/Empty	6"		5.9
Mac0071	Recovered	Grenade Body/Empty	6"		4.3
FTMC_GPO_635	FTMC 5	Grenade MK 2	6"	Horizontal	10.7
Mac0023	Recovered	Grenade Body/Empty	8"		10.8
Mac0057	Recovered	Grenade Body/Empty	8"		5.3
FTMC_GPO_672	FTMC 21	Grenade M67	8"	30°	6.7
FTMC_GPO_673	FTMC 57	Grenade MK 2	12"	Vertical	4.2
FTMC_GPO_610	FTMC 51	Grenade M33	14"	Vertical	3.4

1. The depth of the seed items were measured at the point at which the item would first be encountered while conducting intrusive activities.

* Denotes seed items placed along the GPO's wooded transect.

Table 5